Opportunities, Challenges and Practices in Industrial Land Identification: Cross-Jurisdictional Comparison and Recommendations for British Columbia

Prepared by
James Johnson
Master of Public Administration Candidate
University of Victoria

Supervisor
Dr. John Langford
Professor
School of Public Administration
University of Victoria

Client
Glenn Farenholtz
Economist
Industrial and Land Initiatives Branch
Economic Development Division
BC Ministry of Jobs, Tourism and Skills Training

EXECUTIVE SUMMARY

Purpose and Objectives

This project's main research question is: *What are the industrial land identification practices the BC Government may consider adopting?*

This research achieves the following objectives:

- Identifying challenges and opportunities that may affect the implementation of industrial land identification initiatives;
- Determining the most common practices in industrial land identification in British Columbia and five other similar jurisdictions - Washington State, Oregon, Alberta, Ontario and Australia; and
- Making recommendations on the Province's role in the industrial land identification process.

ILI has been involved with industrial land identification since mid-2012, when it started the process of creating a list of known properties that could accommodate industrial use, and collecting information about their characteristics that may attract investment. ILI is motivated to answer the research question because it is interested in becoming more proactive in identifying industrial land. As part of becoming more proactive, ILI requires a more complete understanding of what is already being done to identify it.

Methodology

This paper employs two methods to achieve its objective of exploring practices in industrial land identification. They are:

1. Literature review
2. Qualitative content analysis

The review of relevant literature explores conventional thinking about the process of industrial land identification and the role of government crossing time periods and perspectives.

The second research component consists of a qualitative content analysis of industrial land identification practices revealed through public-facing documents in British Columbia, Washington State, Oregon, Alberta, Ontario and Australia. The purpose of this component is to determine the key attributes that are seen to be important in attracting industrial investment and the key techniques that are used to measure them, within an institutionally and economically similar context so that the information's relevance to the Province is improved.

Literature Review

Businesses making location decisions are a cornerstone of industrial land identification. Overall, academics and practitioners agree that businesses make location decisions based on a number of factors they associate with the land, but disagree about what is specifically important. Badri (2007) found that location factors could be separated into ten discrete categories:

transportation, labour, raw materials, markets, industrial site status, utilities, government attitude, tax structure, climate and community. Broadly, these criteria are valued across many if not most industries, but the determination of the most important specific location factors relies upon contextual factors like the firm's industry, size and the geographic field of search, necessitating an examination of the context of British Columbia to provide direction to the Province. Businesses consider these location factors within the context of a multi-stage decision making process that involves narrowing geographic choices from the national to the site-specific.

The government makes the industrial land identification process more complex in many ways. The meaning of the term public interest is contested, which reflects the issue of conflict within and among governments considering a role in industrial land identification. Historical government involvement in industrial land identification – in the form of regulatory and incentive-based approaches – was ineffective and failed to recognize the importance of business decision making. The informational approach is the necessary cornerstone of industrial land identification as an input and output.

Industrial land identification informational initiatives are adaptable, and therefore their implementation must consider questions including how the process is initiated, what data is collected, how it is presented, how often it is updated and what are the consequences of public disclosure. They also face challenges of ensuring governments interests are served when businesses use information, adopting a common understanding of information and possessing adequate resources. The extent of agreement about information is that all interested parties have been found to value consistency, accuracy and timeliness. The literature review concluded the process is complex, and the only common best practices underpinning all systems are a clear vision and a wide acceptance of the objectives.

Qualitative Content Analysis

A set of six questions was derived through the literature review which is applied as a practical framework of analysis to assess the public-facing industrial land identification initiative documents. They are:

- What location factors does the industrial land identification initiative measure?
- What level of business decision making does the industrial land identification initiative target? (Thompson, 1961)
- What agency collects information? (Godschalk et al., 1986)
- What methodology does the initiative use to collect information? (Godschalk et al., 1986)
- How is the information presented? (Godschalk et al., 1986)
- How often is the information updated? (Godschalk et al., 1986)

The qualitative content analysis demonstrated that collaboration between industry, agencies and governments is a necessary component to identifying industrial land. The Industrial and

Land Initiatives group may add value to the process by drawing together existing threads of information in the creation of an Industrial Land Inventory.

The qualitative content analysis highlighted the following findings, in parts divergent from the findings of the literature review:

- The answers to who, what, where, how and why industrial land is identified varies from place to place.
- Industrial land identification initiatives are led or drafted on behalf of all levels of government and private organizations. Each has their own perspective and scope of possible land to identify.
- Industrial land identification initiatives tend to measure more transportation, utilities and industrial site status location factors.
- In practice, few publicly-focused industrial land identification initiatives target investment in specific industrial sectors.
- The methods used for identifying industrial land are more a function of ability and resources. Ground truthing is better for identifying specific characteristics of sites, but because it is resource intensive it is under-utilized. A majority of industrial land identification initiatives therefore rely on secondary qualitative data research, suggesting the importance of collaboration.
- Industrial land identification is an iterative process best served by strategically understanding the whole of a region before pinpointing particular sites for marketing.
- A majority of industrial land identification initiatives are completed only once. Budgetary constraints, the challenge of balancing of multiple priorities and the absence of sustained leadership are among the reasons why this occurs.
- Consultants are often engaged to resolve the issue of competing priorities, though they are only engaged for single reports.
- In the absence of sustained leadership, legislation is one method used to ensure that industrial land identification is a dynamic process that is not forgotten after the initial product is delivered.
- Although most industrial land identification initiatives attempt to bring together cross-functional teams, the economic development perspective is traditionally overshadowed in the industrial land identification process by the planning perspective.
- Many organizations are replicating the efforts of others: fully understanding the overlap points facilitates a transition from industrial land identification to industrial land promotion.
- British Columbia industrial land identification initiatives comparatively measure fewer location factors and are led mostly by regional government planners during the process of amending Regional Growth Strategies and Official Community Plans.

Recommendations

The following practices are recommended for ILI to consider adopting.

Recommendation 1: Developing a consistent vision and framework for identifying industrial land and classifying location factors.

The analysis identified the contribution that a consistent vision and framework for identifying industrial land and classifying location factors can make to achieving an industrial land identification initiative's objectives and helping businesses and other interested parties absorb information.

Recommendation 2: Engaging the existing identifiers of industrial land to refine the framework.

The analysis identified the importance of adopting the practice of collaboration in developing the inputs of an industrial land identification initiative.

Recommendation 3: Examining where existing industrial land identification initiatives are duplicating efforts.

The analysis identified that multiple jurisdictions are duplicating efforts in the same area, which could be making British Columbia less attractive for industrial and manufacturing investment.

Recommendation 4: Building a list of sites for potential industrial investment according to the consistent framework.

The analysis discovered that businesses make decisions about industrial and manufacturing investment on land based on preferred location factors. Therefore, the B.C. government may adopt the practice of creating a database of properties that could potentially support investment, based on the framework and collected secondary data developed through previous recommendations.

Recommendation 5: Designing a mechanism that ensures information collection is sustained.

The analysis identified the need to regularly refresh information about land because its use changes over time. Some potential options are:

1. Capacity building support for local and regional governments through development of an industrial land identification handbook based on the framework, with its principles to be reaffirmed through contact between Regional Economic Operations officials and local governments, and Union of British Columbia Municipalities workshops.
2. Working with the Ministry of Community, Sport and Cultural Development to reform the *Local Government Act* to mandate more consistent industrial land identification practices based on the framework.

Next Steps

Although this research contributes to ILI's understanding of the issue and suggests practices for adoption, the next step should be to initiate deeper research. The objective of this study was chiefly to emphasize key types of industrial land initiatives used in attracting investment from industrial and manufacturing businesses. The literature search and document review have explored the common industrial land identification practices, but cannot evaluate their effectiveness. A second major limitation was the use of public-facing documents, and assuming they communicated the whole story. Therefore, deeper research is required to determine the outcomes of these strategies, and ascertain details that are not disclosed in public-facing documents. These details could include the challenges and process of implementation, and the influence of political, social and economic contexts in which the industrial land identification practices were chosen and formed. An outcome of deeper research is improving ILI's implementation of the recommendations. For example, ILI may learn more about the implementation of the Land Information Inventory project in Alberta as a means to implement a similar initiative to achieve the recommendation of examining duplication of efforts.

Some initiatives that are recommended for deeper study are:

- In British Columbia: the Bulkley Nechako Regional District, the City of Kamloops and the Regional District of Fraser-Fort George.
- In Alberta: The Land Information Inventory project.
- In Ontario: The Northern Ontario Investment Readiness Test, Peel Region and the Region of Waterloo.
- In Washington: The industrial land bank and authorized port district policies.
- In Oregon: The industrial site certification program and Deschutes County's large lot industrial land need analysis.
- In Australia: Perth and Peel and Tasmania.

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INTRODUCTION

Purpose and Objectives

The purpose of this project is to explore and determine land-related attributes and characteristics industrial economic development agents identify as being of regional strategic interest in British Columbia. This research will involve scanning other jurisdictions and identifying common interests, risks, methods and presentation styles. This project's main research question is: *What are the industrial land identification practices the BC Government may consider adopting?*

This research achieves the following objectives:

- Identifying challenges and opportunities that may affect the implementation of industrial land identification initiatives;
- Determining the most common practices in industrial land identification in British Columbia and five other similar jurisdictions - Washington State, Oregon, Alberta, Ontario and Australia; and
- Making recommendations on the Province's role in the industrial land identification process.

This research is done on behalf of the Industrial and Land Initiatives (ILI) Branch of the Economic Development Division in the Ministry of Jobs, Tourism and Skills Training (JTST). ILI has recognized the need for information on identifying developable industrial land in support of major investment opportunities, including lands already identified by local and regional governments and other organizations. This branch has no statutory decision-making power, but acts in a coordinating and advisory role on files where industrial development and land use is a major component of economic development.

This research is important because global market trends, British Columbia's resource base and geographic proximity to the Asia Pacific market are making the Province increasingly attractive to major international investors looking to build large projects, such as liquefied natural gas terminals. However, the Province does not currently have a defined strategy to identify industrial lands that might support such major investment. As part of this gap, ILI does not have a comprehensive understanding of whether and how others identify industrial lands. Without this understanding, the Province risks:

- acting from a position of uncertainty in identifying lands,
- failing to identify clear opportunities,
- being at the mercy of ad hoc advocacy, region-centric, or biased analysis that provide advantage to single interest parties,
- repeating or overlapping with existing initiatives,
- failing to attract investment efficiently, and/or
- failing to realize public value for public lands.

The findings of this paper may be used by economic development officials and land managers in both provincial and local governments.

Background

The British Columbia resource sector is the primary economic driver of this research. Industrial operations in these industries are land intensive, and finding land sufficiently large to handle those operations is difficult. In the natural gas sector, industry investment grew from $1.8 billion in 2000 to $7.3 billion in 2010 (B.C. Ministry of Energy and Mines, 2012b). The ministry reported innovations allowing the recovery of shale gas have opened new opportunities in British Columbia, as the Province moves towards developing the liquefied natural gas industry to facilitate export for the purpose of meeting rising Asian demand (B.C. Ministry of Energy and Mines, 2012c). In BC, the mining industry generated a production value of $8.6 billion in 2011, as worldwide demand for coal, metals and minerals continues to expand, particularly from rapidly urbanizing China and India (B.C. Ministry of Energy and Mines, 2012a). British Columbia private and public organizations promote the province's unique and strategic geographic position to capitalize on Asia Pacific market opportunities: the Port of Prince Rupert is North America's closest port to Asia, and a trip from Port Metro Vancouver is 32 hours shorter than from Los Angeles (Prince Rupert Port Authority, n.d.). The Province has committed to pursuing these opportunities, as the B.C. Jobs Plan (B.C. Ministry of Jobs, Tourism and Skills Training, 2011) is focused on promoting eight key industries where the province has competitive advantage, including natural gas and mining.

ILI has been involved with industrial land identification since mid-2012, when it started the process of creating a list of known properties that could accommodate industrial use, and collecting information about their characteristics that may attract investment. This initiative has involved collaboration with interested parties within the Ministry of Jobs, Tourism and Skills Training including the Major Investments Office, Regional Economic Policy & Projects and Regional Economic Operations, as well as partners in other ministries such as the Ministry of Forests, Lands and Natural Resource Operations. Major Investments Office and Regional Economic Policy & Projects are also working on a guide for local communities with the objective of helping them facilitate development. The overall interest in industrial land identification followed from the Province receiving queries about properties north of Prince Rupert and south of Terrace for developments related to the natural resource sector. The Province did not have immediate prior knowledge of these properties, driving the interest in becoming more proactive in identifying industrial land. As part of becoming more proactive, ILI requires more information about what makes land attractive for industrial investment and a more complete understanding of what is already being done to identify it.

METHODOLOGY

This paper employs two methods to achieve its objective of exploring practices in industrial land identification. They are:

1. Literature review
2. Qualitative content analysis

The literature review contributes progressively to the qualitative content analysis, building information and argument to answer the following research question: *What are the industrial land identification practices the BC Government may consider adopting?* The following section will describe the objectives and processes involved with those methods, and identify some of the limitations and potential mitigating strategies found in the literature and in other jurisdictions.

Literature Review

The following review of relevant literature relates to the process of industrial land identification, the role of government and explores conventional thinking about industrial land identification and the role of government crossing time periods and perspectives. The intent is to understand theory and elements related to industrial land identification. With this approach, the research endeavours to examine:

- the location factors that are considered important to industrial business;
- the decision making process used by business to select land for its operations;
- the differences in objectives and abilities of information providers;
- the diversity of techniques used to identify industrial land;
- the differences in how information is interpreted by businesses; and
- how land use and relationships between its users and managers can change over time.

Sources of information for this study include peer-reviewed publications, organizational research and reflections by planning and economic development practitioners. These sources are collected through searches of internet databases and academic libraries. The following table raises potential limitations of the literature review and mitigating strategies.

Table 1: Literature Review Limitations

Potential Limitation	Mitigating Strategy
Literature does not embody industrial land identification methods commonly used by practitioners.	Research strategy is to seek out literature with different perspectives (i.e. academic and practitioner, advocate and critic).
Literature does not include key attributes associated with industrial land identification thinking.	Literature review is multi-jurisdictional, surveys a diverse array of economic development agencies, and ensures relevancy

	given the likely evolution of learning by practitioners over time. Also, the researcher conducted the review over a period of several months to reduce chances of missing key content, and to ensure diversified sources in searches in order to reduce the likelihood of selection bias.

Qualitative Content Analysis

The second research component consists of a qualitative content analysis of industrial land identification practices. The purpose of this component is to determine the key attributes that are seen to be important in attracting industrial investment and the key techniques that are used to measure them, within an institutionally and economically similar context so that the information's relevance to the BC government is improved.

As the paper is exploratory, the objective is to discover these attributes and techniques. The conceptual framework for discovery is developed through the composition of key questions raised in the literature review. The following table lists those questions and how they relate to the objectives of the literature review:

Table 2: Qualitative Content Analysis links between the Conceptual Framework and the Literature Review

Question	Link to Literature
What location factors does the industrial land identification initiative measure?	Literature examines the location factors that are considered important to industrial business.
What level of business decision making does the industrial land identification initiative target?	Literature examines the decision making process used by business to select land for its operations.
What agency collects information?	Literature examines the differences in objectives and abilities of information providers.
What methodology does the initiative use to collect information?	Literature examines the diversity of techniques used to identify industrial land.
How is the information presented?	Literature examines the differences in how information is interpreted by businesses.
How often is the information updated?	Literature examines how land use and relationships between its users and managers can change over time.

Qualitative content analysis was chosen as a method because it is a superior way of answering these questions, particularly given the data sources. The data sources are public facing

documents from British Columbia and four other comparable jurisdictions (Alberta, Ontario, Washington State, Oregon and Australia). The documents are collected through internet database searches using keyword variants based on “industrial land inventory”, “available industrial land”, “industrial land analysis” and other similar terms. One way the literature review feeds into this research process is by providing insight into the terminology that is used to describe an industrial land identification initiative. The choice to use public facing documents was made for two reasons:

1. Time and resource constraints; and
2. Examination of public documents avoids the “Hawthorne effect” (Webb, Campbell, Schwartz, Sechrest and Groves, 1981) where land identification actions could be influenced through the process of direct observation conducted through interviews. The government’s need is to survey the field prior to engaging meaningfully in the process.

The process of qualitative content analysis involves reviewing the documents listed in the base of evidence, and compiling answers to the questions developed in the conceptual framework. However, this method has a number of potential limitations.

Table 3: Qualitative Content Analysis Limitations

Potential Limitation	Mitigating Strategy
There is no precise meaning in the language used by a development agency. All interpretation of content is influenced by the values, biases and experiences of both its writer and its reader (Miles and Huberman, 1994).	For questions 1 and 2, the documents are read from the perspective of business that is explored in the literature review. Questions 3, 4 and 6 are assumed to have straightforward fact-based answers reported in the document. Question 5 starts from the basis explored in the literature review that information can be presented for internal or external purposes, and then looks to extend from that idea that a document will express its presentation style through a purpose statement.
Interpretation of any content even by the same person can be different at different points in time, again influenced by values, biases and experiences of the reader (Miles and Huberman, 1994).	Each document is reviewed twice at two distinct points in time, and two recordings are compared and combined once disagreements in recording are resolved upon a third reading.
Public facing documents may not be reflective of “true” intent or thinking (Krippendorff, 1980).	Assuming for this phase of the research that public facing documents are honest and upfront.
Public facing documents may not contain answers to all the questions (Krippendorff, 1980).	A large sample is collected for each jurisdiction to maximize the chances of finding informative documents.

The collection of a large sample creates its own challenges, as the larger the sample, the more difficult it is to report the results. Therefore, the recorded answers will be recoded to make them more amenable to reporting through summary statistics and analysis to assist in discovering the most common industrial land identification practices. Once again, the literature review provides guidance for condensing content into easily digestible categories.

The risk of transforming the content into data that is easily summarized, the content may be stripped of some of its important meaning, and any assumptions made may over-simplify the agencies initiative. The risks related to condensing and simplifying the data are reported in the analysis section.

LITERATURE REVIEW

This project is oriented towards assisting the provincial government in finding large sites for major industrial operations associated with manufacturing and resource operations, however this literature review canvasses materials with a broader view. Industrial land identification theory describes a process that engages businesses, government and many other agencies. Government is an agency in this case, however, is not the prime actor as the firm makes the final decisions where or even if industrial operations should exist. Therefore a theoretical examination of industrial land identification begins with an inquiry of why industrial businesses need land and choose to locate where they do.[1]

Location Theory in Economics

Location theory is founded upon the basic idea of economics that firms choose to operate in areas where profit is most probable. Johann Heinrich von Thunen (1966) is oft cited as the founder of location theory, when he published his agricultural land model in *Der isolierte Staat* ("The Isolated State"). Von Thunen argued that firms choose locations closest to the market in order to minimize transportation costs, which he assumed would increase with distance. He also assumed all other costs were constant. His ancestors relaxed those assumptions about constant costs. Alfred Weber (1929) added the variable cost of labour to the variable cost of transportation for raw materials. Distortions in labour cost could induce firms to locate further away from raw materials, or to gravitate towards common regions to tap into a common labour supply. Von Thunen and Weber were followed by other theorists who believed profit is maximized by minimizing costs. The cost-minimization approach adopted different assumptions: for example, Edgar M. Hoover (1937) included land pricing, different transportation methods and climate as considerations in location decisions, and Leon Moses (1958) observed substitutability of input factors and concluded there are multiple optimal places for business location. Another school of location theory contemplated the effect of increasing demand and revenue on profit maximization rather than cost minimization alone. August Losch (1954) argued that demand for products was highest in central locations, and therefore firms would locate closest to these markets because transportation costs limited the range of potential locations.

Melvin Greenhut (1956) was the first to argue that the profit maximization goal at the centre of location theory relied on the simultaneous optimization of revenue and cost. This is now the basis for modern business location theory in economics, and theorists continue to expand the model to introduce increasingly sophisticated variables that recognize the changing economy. The economy is becoming more globalized, and firms are less constrained in picking locations, and consider location criteria such as labour skills and external economies with rival and complementary industries (Rawstron, 1958). Rapid technological advances have dramatically changed communications and transportation, and how firms value those as location criteria (Karaska & Bramhall, 1969). Individual attitudes have changed, making it important for firms to

[1] The frameworks of Burdina, 2004 and Badri, 2007 were used as guidance in developing the structure of this literature review.

locate in areas with community amenities in order to attract labour (Storper & Walker, 1989). Urbanization and population growth have reduced the supply of available land, so firms consider existing infrastructure and other physical attributes of land (Norcliffe, 1975; Weber, 2011). Other studies have introduced time as a factor in location decisions, where unexpected shifts in input costs or demand change a business' evaluation of its location factors (Hunter, 1955; Auty, 1975; Watts, 1991). The flight from existing locations leaves the legacies of their previous operations, and affects future opportunities and uses (Goudie, 2006). Some firms may incorporate time as a factor and consider benefits and costs to the business over a longer time scale (Whitmore, 1981). Overall, academics and practitioners agree that businesses make location decisions based on a number of factors they associate with the land, but disagree about what is specifically important.

The full extent of location factors considered by business cannot be summarized in the text. There is too much source material and too many criteria to give a fair hearing. Appendix A contains the results of the literature scan. For the purpose of the qualitative content analysis, a typology is necessary for easy categorization and summarization. Masood Badri's *Dimensions of Industrial Location Factors* (2007) provides a typology which is validated by empirical analysis. He found that location factors could be separated into ten discrete categories: transportation, labour, raw materials, markets, industrial site status, utilities, government attitude, tax structure, climate and community. Broadly, these criteria are valued across many if not most industries, but the determination of the most important specific location factors relies upon contextual factors like the firm's industry, size and the geographic field of search (Karakaya & Canel, 1998). The implication for industrial land identification policy is that:

> *Locational policy should be carefully selective in its application to different industries. No locational policy can be intelligently implemented unless its effects on different types of industry are taken into account in advance. Different industries vary widely in their locational responsiveness to possible controls and in the leverage they exert by passing on the effects of locational change to still other industries. (Hoover, 1948, p. 246)*

In short, the list of location factors from the literature cannot provide direction to the Province on what should be valued because their analyses do not consider the context of British Columbia. However, they can provide guidance on the possibilities of measurement.

Location Theory and Business Decision Making

However, classical economics modelling is criticized for portraying the decision making process in an oversimplified and unrealistic manner (Yaseen, 1960; Smith, 1981; Wheat, 1973). Melvin Greenhut (1956) was the first to argue that considerations other than profit entered into location decisions, but did not find a way to include it in the model. Economic geographer Allan Pred gave form to the difficulty of accounting for personal considerations when he stated:

> *"Every locational decision is viewed as occurring under conditions of varying information and ability, ranged, at least theoretically, from null to perfect knowledge of all alternatives, and as being governed by the varying abilities (as well as objectives) of the decision-maker(s)" (Pred, 1967, p. 24)*

The behavioural approach followed from the conclusions of Greenhut and Pred. This approach expands upon the work of location theory by affirming the importance of location factors but places them within the context of a multi-stage decision making process (Townroe, 1969; Stafford, 1969; Rees, 1972; Nishioka & Krumme, 1973). This process is modelled in terms of organizational stages (Lloyd & Dicken, 1977) and narrowing geographic choices. The geographic component is most relevant for government looking to support businesses make location decisions. Theorists generally believe businesses select a location based on the most favourable factors, considering all viable and likely locations (Townroe, 1971; Cooper, 1975; Schmenner, 1982; Ritter, 1990), but in reality the search process varies by the abilities and objectives of decision makers. The following examples demonstrate the complexity of modelling business decision making:

- Some firms employ rigorous analytical techniques, while others are more intuitive (Hayter, 1978).
- Larger firms may consider a larger base of potential locations with more narrow criteria (Walker, 1975). Small businesses may locate closer to the home of the founding entrepreneur (Gudgin, 1978).
- Firms in general tend to gravitate towards known solutions (Simon, 1959; Webber, 1972).

James H. Thompson's (1961) model simplified the complexity by measuring location factors in terms of primary, secondary and tertiary factors. Primary factors help firms choose a broad area or state. Secondary factors help firms choose among a selection of regions or communities. Tertiary factors help firms choose the specific site. This approach reflected the business process of drafting a list and rounding down options. Location factors are not necessarily unique to any of the levels: different levels of detail about a single factor can influence decisions at each level (Burdina, 2004). Challenges notwithstanding, this approach is validated by its use in modern corporate strategy (Cohen, 2000).

Role of Government

The government's role in industrial land identification was minimized in the preceding sections by design, to affirm the paramount importance of the firm and its consideration of location factors in the industrial land identification process. However, the government makes the industrial land identification process more complex in many ways. A brief discussion follows, summarizing government's motives for being involved in the industrial land identification process and how its current approach has evolved.

The basic idea of government in liberal democratic theory is the desire to act in the public interest (Mill, 1999)**.** The meaning of the term public interest is contested (Box, 2007); this sentiment will not be fully explored, but is important to note because it reflects the larger issue of conflict in the government's role in industrial land identification. And the role of government has become increasingly important in industrial land identification theory, whereas it was invisible in the first hundred years of location theory (Cannon, 1975). The prevailing wisdom in capitalist societies was that the government's primary role in land management should be the protection of property rights, because the primary threat to individual land use was encroachment by others (Rapaczynski, 1996). Following the Great Depression and World Wars, interest and support for government economic intervention increased (Chapman & Walker, 1981). In the latter part of the 20th century, awareness increased of the social and environmental impacts and externalities of economic activity, an issue for which only the government has the ability and authority to regulate (Chapman & Walker, 1981). Academic debates continue about these ideas that the government faces competing demands to be an intervener or controller of economic activity.

Interventionist policies involve the government using its position to stimulate the economy. Academics believe the public interest rationale for this strategy is to improve the present welfare of a region (Cannon, 1975). As land is important for prospective businesses, government-supported industrial land identification improves a community's welfare through economic development. Societal factors that motivated the government to adopt this position include: community awareness about relative economic weaknesses, recognition of the relationship between investment and job creation, the rise of regional governance, the increasing complexity of policy, macroeconomic changes, the dichotomy between urban and rural areas and increased importance of education and skills training (Moriarty & Cowen, 1980). Academics argue that controlling policies are opposite interventionist policies because the government acts to restrict economic development to protect certain values. The public interest rationale for this strategy is to protect the welfare of future generations by preserving those values (United Nations, 1987). The literature provides no consensus on what values should be protected – some include ensuring a supply of agriculture land with usable soil, preserving clean water and air, preventing the exhaustion of resources, protecting biodiversity, halting inefficient and inequitable land use patterns, and mitigating other externalities (Platt, 2004; Van Kooten, 1993). The number of values has continued to multiply, creating a challenging environment to identify prospective industrial land (Parsons Brinckerhoff, 2007).

However, the characterization of the role of the state as a division between interventionist and controlling interests is too simplistic. Economic geographer David M. Smith summarizes:

> *The role of the state in contemporary society is, in fact, much more complex than simplistic notions of intervention and control might suggest. Alternative perspectives compete with one another. Some view the modern state under capitalism as guardian of the public interest; some see it as a tool of the ruling class; others recognize a highly sophisticated role in ensuring the reproduction of the labor force and reconciling the interest of competing factions of capital, in the*

general pursuit of the perpetuation of the capitalist mode of production. (Smith, 1981, p. 64)

For the purposes of this literature review, it is not important to examine the full breadth of perspectives on the role of the state that Smith references. The most important implications for industrial land identification stem from the concepts of the role of the state held by different components of government. Multiple levels of government may share interest and jurisdiction on a policy issue such as economic development, but conflict because they have different ideas on how it may be achieved (Bakvis, Baier & Brown, 2009; Moriarty & Cowen, 1980; Wolman & Spitzley, 1996). This occurs even at the same level of government, as Feiock (2001) found that differences in bureaucratic organization in local government influence how economic development policies are structured, and Agrinoff & McGuire (1998) found low institutional capacity to be a further obstacle to policy development. Further complicating the intervention versus control dynamic is the interrelationship between interventionist and control-oriented policies (Kim, 2011)**.** Planners have the most challenging role, as they balance the activist role in influencing location decision and the evaluation role in ensuring that the chosen location maximizes a community's welfare (Moriarty & Cowen, 1980). The nature of relationships and roles cannot be fully surveyed in this paper because they are context specific, but the analysis of industrial land identification practices must recognize that the disagreement exists.

Tools of Government

Government has many tools at its disposal to enact policy. There are many typologies to describe these tools, but for simplicity's sake, these tools may be sorted into "carrots", "sticks" and "sermons" (Rist, Vedung & Bemelmens-Videc, 1998). In other words: incentives, regulations and information. Depending on implementation, regulatory policy options such as comprehensive land use planning and zoning may be the end product of the industrial land identification process by reserving specific parcels of land for economic development (Dabney, 1991). Incentives such as grants, loans and tax credits may reflect the end product of the industrial land identification process by promoting specific parcels of land (Hoover & Giarratini, 1984).

Academics and practitioners concur that the regulatory and incentive-based approaches have been inadequately supported by comprehensive industrial land identification and did not adequately represent the interests of business. With respect to regulatory approaches, although "a careful comparison between alternative locations should help in the selection of those with the greatest potential for growth and … impact on the surrounding areas" (Smith, 1981, p. 405), researchers have found that zones established for industrial activity did not possess location factors desirable enough to business (Dabney, 1991). Studies have shown that businesses relocate over time, acting opposite the concentrating and densifying objectives of regulatory policies (Hoover, 1948; Alonso, 1968). The implication for land allocation policies is the prospect of abandonment and legacy impacts of previous operations.

The more common approach of government-involved industrial land identification is the use of incentives to attract investment to particular areas. Academics and practitioners criticize this practice because it can be insensitive to context (Hoover, 1948), unfairly distort the economy (Cannon, 1975) and fail to attract or retain businesses at the state or local level (Moriarty and Cowen, 1980). The legacy of incentive and regulatory approaches highlight the importance of business decision making as no amount of policy making can force a business to start or remain in a specific location. They also demonstrate the lack of foundational knowledge about industrial land. The informational approach is therefore the necessary cornerstone of industrial land identification.

The provision of information is increasingly popular in modern policy making because it is comparatively cheaper (Nilsen, 2010) and satisfies political and economic ideals that the government should limit its intervention to resolving market failures (Bartik, 1990). Academics argue that increasing available information contributes to economically rational behaviour, but may also increase the chances of short-term opportunists exploiting government support (Hayter, 1997). Information can be both an input and an output in policy making (Stewart & Abbass, 2010). The overview of incentive and regulatory based tools demonstrated that providing land information underpins their approaches. This is among the reasons why the ILI is seeking research on how organizations and governments collect and present industrial land information.

Information and Industrial Land Identification Practice

In the context of industrial land identification, the provision of information may be known as, or comprise part of: land administration systems, cadastres, land inventories, land demand and supply analyses, and economic opportunities reports, to name a few. Academics and practitioners have identified an array of social and technical issues that affect implementation. This section summarizes the literature regarding the challenges and opportunities.

Informational policy tools are complex because they can learn and adapt at a faster pace than other policy tools (Stewart & Abbass, 2010), which necessitates asking deeper questions about implementation subtleties than for regulatory and incentive-based approaches. Godschalk et al. (1986) describe some of the questions that face informational initiatives as:

- What information is collected? The following provides a sample of what this includes:

> *information is needed about vacant or underutilized land, zoning and other development regulations, planned use, assessments, and the timing and nature of public service availability. Beyond that, there is debate over whether market data, such as land price and availability for development, should be included in government systems or provided by compatible private systems. There is also debate about the feasibility of including information on environmental characteristics, such as slope and soils, since this is typically maintained in different form than parcel data and requires*

an overlay mapping capability to combine with parcel data (Godschalk et al., 1986, p. 25-26).

Of course, informational initiatives can collect information on a variety of other factors, as described throughout the literature review. Some other information may include data on the wider political and social context such as active stakeholders and historical use of land, and how it shapes data collection, information which is important for the balancing of government priorities than the attracting of investment (Mukherjee, n.d.).

- What are the pitfalls of providing information? Some legal pitfalls may include: "liability for supplying inaccurate information, inadequate definition of regulated area, not protecting confidentiality and failing to ensure access to public records" (Godschalk et al., 1986, p. 26).

- How is the information presented? Presentation of information affects how it is received, and how useful it can be. For instance, Wallace, Williamson, Rajabifard and Bennett (2006) argued, "spatial enablement of information offers solutions to otherwise intractable problems about organizing information and permits more equitable and effective administration of land and resources" (p. 82). However, some location factors are difficult to spatially represent (Hayter, 1997; Bennett, Wallace & Williamson, 2008). On a social level, how information is framed and advertised is important to how well it is used (Entman, 1993).

- How often is the information updated? Market transactions depend on up-to-date information, but the tradeoff to providing information in a timely manner is the cost of data collection (Godschalk, et al., 1986).

- How is compatibility ensured between information sources? "There are three levels of concern here: 1) hardware compatibility, 2) software and file compatibility, and 3) geographic identifier compatibility" (Godschalk et al., 1986, p. 29). The question of responsibility for entering information is important to this question as well, as centralization of data entry better facilitates compatibility. On a social level, although data is collected by a variety of parties (Wallace et al., 2006), coordination is necessary to ensure effectiveness (Bennett, Rajabifard, Williamson & Wallace, 2012).

- How is the collection of information initiated? This question concerns the demand for data and the politics of the jurisdiction (Godschalk et al., 1986).

Answering these questions is made complex by the nature of relationships between government and the private sector. As discussed earlier, the private sector and different components of government have different interests. The effectiveness of industrial land identification informational tools relies on the private sector using the information, and using it in the way that the provider intends. This challenge is consistent with what academics call the

principal-agent problem. The principal-agent problem states that agents deviate from the course proposed by principals because their interests differ, and the principal cannot ensure that the agent follows their wishes and possesses incomplete information about the agent's preferences (Rees, 1985). In this relationship, the principal is the government, and the agent is a land-seeking business. With the proactive provision of information, the government cannot know exactly what a prospective business needs or ensure that their multiple interests are met. Ensuring government's interests are met is further complicated by the number of actors involved in and interested in the products of land identification. Some of the actors include elected officials, planners, tax assessors, engineers, realtors, developers, lenders, non-governmental agencies, and community groups, and each has different demands for information (Godschalk, Bollens, Hekman & Miles, 1986; Dawes & Helbig, 2010). As an example of how this can affect industrial land identification, a study of industrial land use studies across the United States found that the industrial land identification initiatives produced by planners were isolated from business decision making criteria (Dempwolf, 2010).

Another source of complexity is the meaning of information and its effect on measurement. As argued by Wallace et al. (2006), "land information concerns people and their relations with spaces, areas and activities related to land. It changes rapidly and its meaning and significance are variable according to the perspective of viewers." (p. 87) Conflict in this area occurs at every level of measurement, from the broad to the specific. At a broad level, some researchers believe planners make unwarranted assumptions about industrial mobility and the ability to influence choice, while theorists ignore real world problems (Smith, 1981), and their world view affects the choices they make in methodology and measurement. At a specific level, vacant land can be defined differently: the dimensions of measurement may lead the land identification initiatives to underestimate or overestimate the supply (Godschalk et al., 1986). As an extreme example of measurement conflict, practitioners may disagree about the precise definition of a parcel of land (Dawes, Cook and Helbig, 2006). The extent of agreement about information is that all interested parties have been found to value consistency, accuracy and timeliness (Dawes and Helbig, 2010).

Cost of implementation and the ability to detect viable land are key criteria to consider for policy makers. Remote sensing (i.e. GIS analysis), site inspections (i.e. "ground truthing"), and analysis of government records (i.e. secondary qualitative data research) are the main methods for collecting data (Kaiser, Godschalk and Chapin, 1995). Site inspections are most likely to capture the most accurate data, but they are prohibitively expensive (Knaap and Moore, 2000). Remote sensing can depict the differences between developed and undeveloped land, but it alone cannot inform about a site's opportunities and constraints because certain qualities cannot be depicted visually (Heikkonen and Varfis, 1998; Kent, Jones and Weaver, 1993). The use of government records can vary. The use of secondary qualitative data research is the least costly method, but is the most likely to bear the challenge of undetectable errors. For example, the analysis of tax assessment records to determine available industrial land may underestimate availability because the records conceptualize vacant land in a manner that ignores underutilization (Knaap and Moore, 2000). The effectiveness and cost of secondary qualitative data research also varies with the methodological sophistication, with more

sophisticated statistical methods considering more variables – such as employment and market trends - and therefore being able to estimate vacant land better (Otak Inc. & ECONorthwest, 2002).

To summarize this literature review in a single sentence, it is that the practice of industrial land identification is incredibly complex. Williamson (2001) argued that this complexity means there can be no best practices, when he stated, “land administration ‘best practice’ evolves over time and varies from place to place and country to country in response to national and global drivers” (p. 299). From an assessment of the evolution of land administration, Williamson concluded the only common best practices underpinning all systems are a clear vision and a wide acceptance of the objectives.

QUALITATIVE CONTENT ANALYSIS

Conceptual Framework

A conceptual framework is necessary to embark upon the qualitative content analysis of industrial land identification initiatives. The general approach of this paper is to learn about practices and make recommendations to the Province. To this end, this paper adopts the "smart practices" approach of Eugene Bardach (2012). Bardach's approach aims to manage expectations about the applicability of practices in different contexts, an important consideration given the conclusion of Williamson about the potential for identifying best practices in land administration. In its most basic form, it observes the mechanisms for achieving the policy objective for each practice, supportive features, generic vulnerabilities and assessing relative contexts to determine if the practice can be applied in the home jurisdiction. A set of six questions was derived throughout which may be applied as a practical framework of analysis to assess the industrial land identification initiatives. They are:

- What location factors does the industrial land identification initiative measure?
- What level of business decision making does the industrial land identification initiative target? (Thompson, 1961)
- What agency collects information? (Godschalk et al., 1986)
- What methodology does the initiative use to collect information? (Godschalk et al., 1986)
- How is the information presented? (Godschalk et al., 1986)
- How often is the information updated? (Godschalk et al., 1986)

Evidence Base

The analysis includes industrial land identification initiatives from British Columbia, Alberta, Ontario, Washington State, Oregon and Australia. The sample includes 50 initiatives from British Columbia, and 20 each from the other five jurisdictions. British Columbian initiatives are included for the Province to learn about what is already done. The other five jurisdictions were selected because their industrial land identification practices may be applicable to British Columbia, as they undertake such practices for similar reasons.

Alberta, Ontario, Washington State, Oregon and Australia are roughly comparable jurisdictions because they have similar economic environments. Oregon (Ledoux, 2012) and Washington State (Heim, 2011) directly compete with British Columbia in Asia Pacific trade as they all are located on the Pacific coast. Alberta and Ontario coincide with British Columbia because they are the Canadian provinces that mutually reap the most benefit from resource development (Honarvar, Rozhon, Millington, Walden, Murillo & Walden, 2011). Furthermore, British Columbia is the intermediary for Alberta and Ontario products to access the significant and growing Asian market. Australia shares the economic drivers of Asia Pacific trade and natural resources development - most significantly LNG (Ball, 2005) – and the challenge of resolving Aboriginal title (Trenwith, 2011).

Findings and Analysis

The results of the qualitative content analysis can be found in the attached spreadsheet entitled Appendix B. Findings are summarized here and analyzed according to the conceptual framework.

Total Sample

1) What location factors does the industrial land identification initiative measure?

The qualitative content analysis yielded 70 location factors within the 10 categories listed by Badri (2007). A table listing all location factors by category can be found in Appendix C. The top ten most common location factors are:

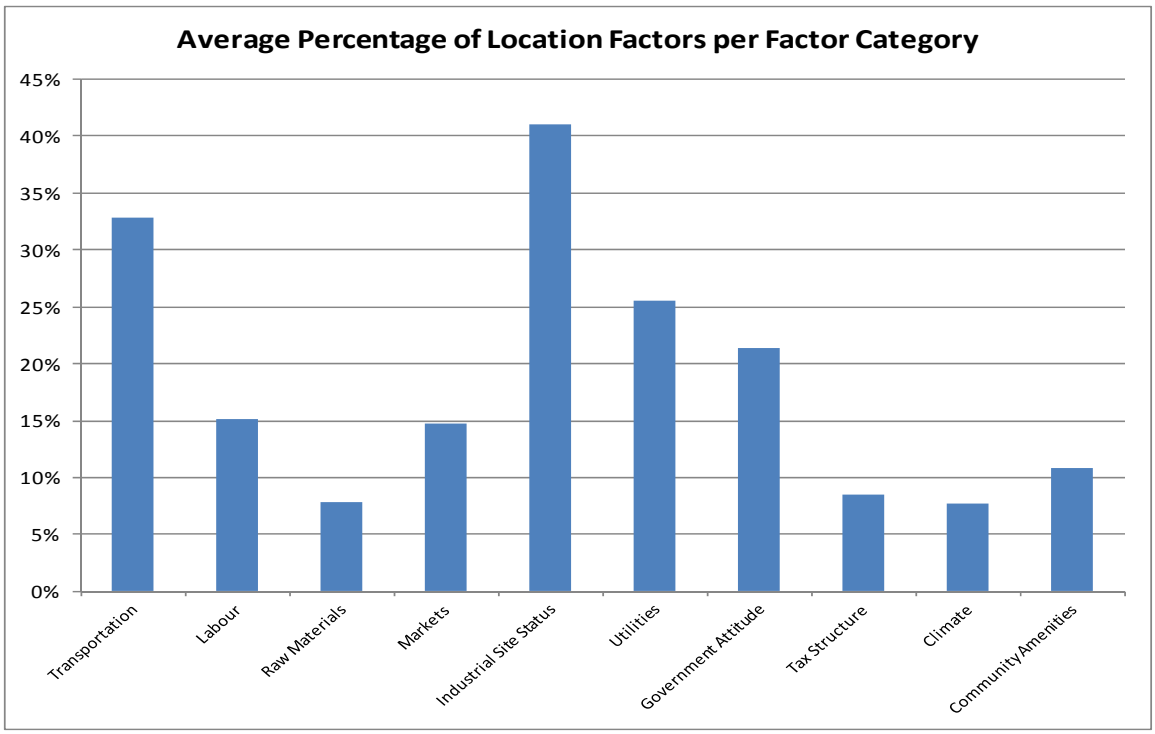
Table 4: Most Common Location Factors, All Initiatives

Location Factor	Count
Land area	138
Zoning	100
Road access	97
Land use planning policy	92
Location	74
Constraints (environment, man-made)	74
Rail access	64
Water Services	58
Waste Water Services	58
Current uses	54

None of the factors can truly be considered common to all jurisdictions, because 64 of the location factors are observed in less than half of the collected sample. The only factor that is observed in over two thirds of the sample is land area. However, this location factor is theoretically a prerequisite to the idea of industrial land identification, and therefore its exclusion should be interpreted as an anomaly of the sample rather than a practice worth considering.

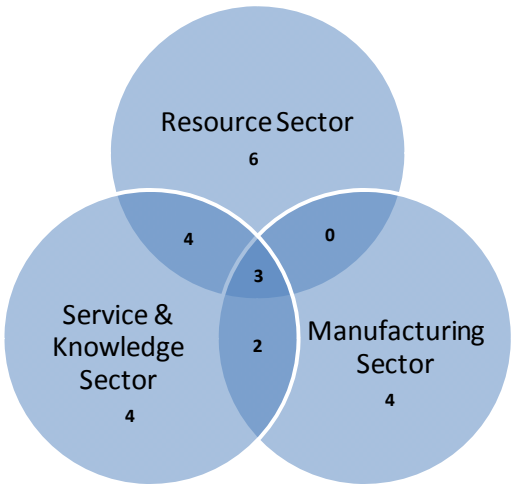
Determining the average number of location factors measured by category affirms the patterns observed in the counts above (see chart below). The most numerous location factors in all industrial land identification initiatives are associated with the industrial site status, transportation and utility categories. On average, an industrial land identification initiative measures 41% of all industrial site status factors, 32.8% of all transportation factors and 25.6% of all utility factors. The least common factors are associated with the raw materials (7.8%), tax structure (8.4%), climate (7.7%) and community amenities (10.9%) categories.

Figure 1: Average Percentage of Location Factors per Factor Category



A key driver of this paper is discovering desirable location factors for industrial sectors in which British Columbia has a competitive advantage. The literature review affirmed the importance of particular location factors for specific industries. However, with few exceptions, few industrial land identification initiatives in this sample identified land or location factors for specific industries. To the extent that industrial land identification initiatives do show preference for one industry or another, they demonstrate it by measuring market trends for that sector. These are reflected in the 'market trends – resource sector', 'market trends – manufacturing sector' and 'market trends – knowledge sector' location factors in the qualitative content analysis. Only 23 of the studied initiatives measured any of these 3 location factors. In many cases, industrial land identification initiatives measure more than one of these sector-specific market trend factors at the same time (see chart below). The most common market emphasized is the resource sector, measured in 13 out of 23 initiatives, either alone (i.e. Tasmania's Major Industrial Sites) or in combination with other sectors (i.e. Bulkley Nechako Regional District's Industrial Land Use Inventory). The lack of measurement of any of the sector-specific market-trends indicates reticence of government to publicly support one industry over another. This is likely to be an issue if ILI chooses to make its own industrial land identification practices public. The measurement of multiple sector-specific market trend location factors demonstrates an interest in having a diversified economy, which is an issue ILI must consider in shaping its own industrial land identification initiative.

Figure 2: Count of Industrial Land Identification Initiatives Measuring One or More Sector-Specific Market Trend Location Factors



Some of the industrial land identification initiatives surveyed local business owners about the location factors that are most relevant to particular sectors. The surveys conducted for the Central Oregon Economic Partnership, the Ontario Peel Region and B.C.'s District of Mission are most informative, and are reported in full in Appendix C. They broadly demonstrate:

- Transportation access is important to everyone, but more so for resource and manufacturing development.
- Labour and quality of life factors are more important for the service and knowledge sector.
- Utility location factors are more sensitive to specific sector needs. For example, clean tech research and call centres are both broadly service and knowledge sector-based, but clean tech developments require more water, natural gas and electricity services.
- Government incentives and assistance are secondary concerns at best in location decisions in any sector.

A key observation about the frequency of location factors is that there is no common practice for how the location factor is measured or communicated. For instance, a location factor such as rail access may provide detailed information including length of sidings or state simply that a site or region has rail access. This has implications for the practice of industrial land identification, but cannot be adequately addressed using the qualitative content analysis methodology. It is important to provide particular location factors to be useful, but their effectiveness is potentially limited by not providing enough information, or in an inconsistent

manner that prevents businesses from comparing information from different areas within a region.

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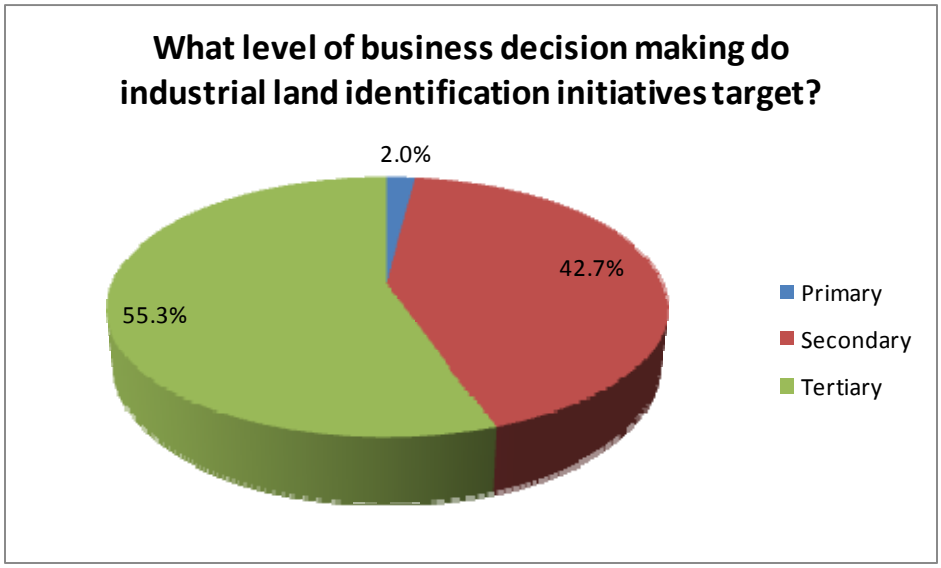
2) **What level of business decision making does the industrial land identification initiative target?**

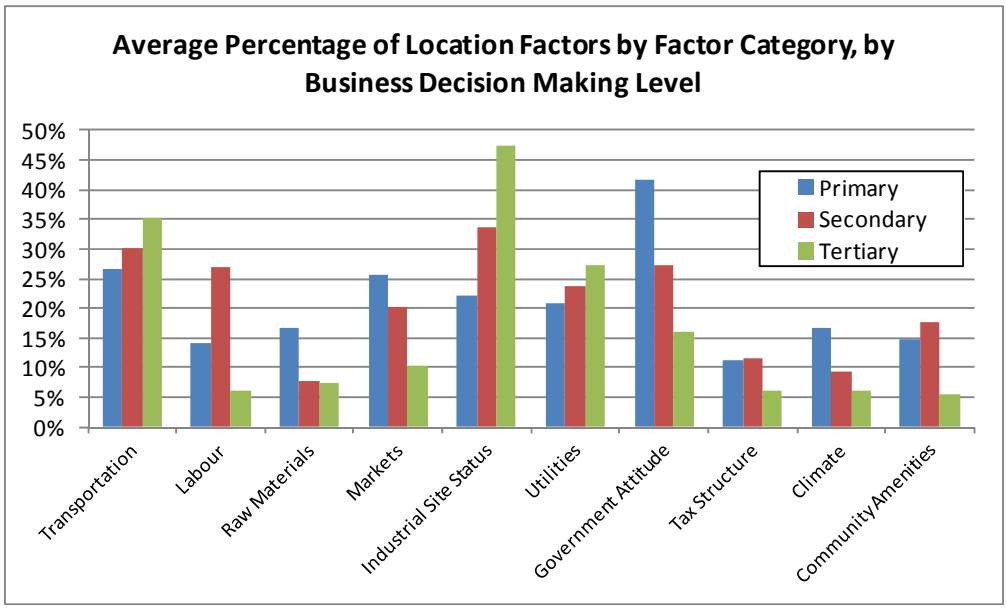
Industrial land initiatives can focus on attracting businesses to specific sites (tertiary), or highlight characteristics of a region compared to other local regions (secondary) or other countries (primary) (see chart below). In the collected sample, very few initiatives highlighted their advantages relative to other countries. A small majority (55.3%) of initiatives identified specific sites over those who highlighted characteristics of the local region (42.7%). This is an indicator of the challenge of employing effective industrial land identification techniques even in comparable jurisdictions. Even though targeting of tertiary decision making more clearly defines what industrial land is available, there is no consensus in practice about which level of decision making to target.

Figure 3: What level of business decision making do industrial land identification initiatives target?



The choice of location factors to present is linked to the level of business decision making targeted (see chart below). When the industrial land identification initiative is promoting specific sites, it emphasizes transportation, utilities and site status, at the expense of providing information about labour, surrounding markets and community amenities. When the identification initiative sees the competition for provision of land as other countries, there is more emphasis on promoting markets, government attitudes and climate. Initiatives that target the secondary level of business decision making strike a balance between the two extremes. In the more comprehensive tertiary-level initiatives, it was discovered that some were extensions of previous secondary-level work. This is suggestive of the general need for comprehensive scoping of land before specific sites can be identified.

Figure 4: Average Percentage of Location Factors by Factor Category, by Business Decision Making Level



3) What agency collects information?

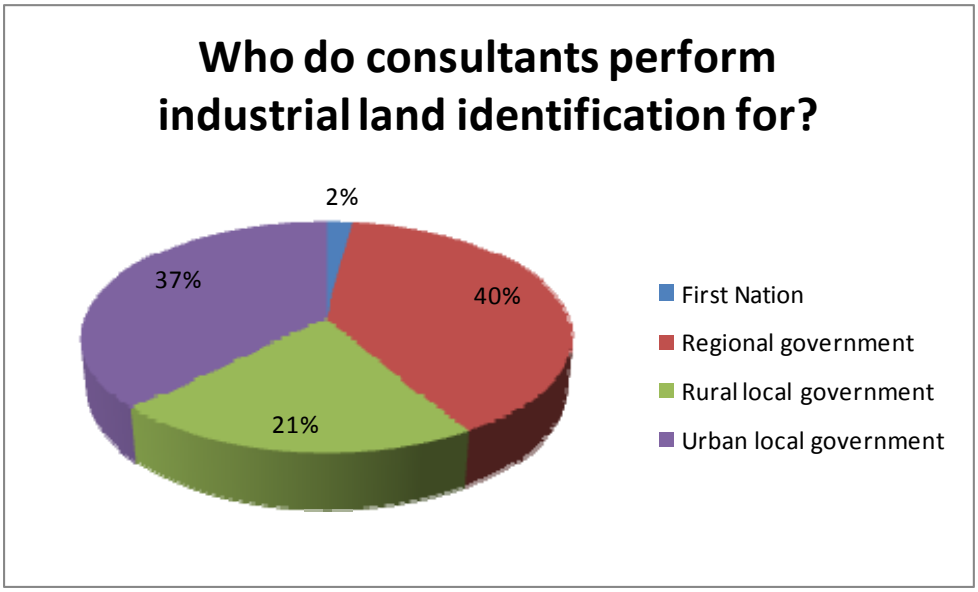
The following table provides the counts of industrial land identification initiatives by the identified lead agency in collection. In reality, multiple levels of government and private sector actors collaborate in most industrial land identification initiatives. Knowing the lead agency is the most important, because they have specific biases, values and interests that are most evident in the initiative's presentation because they are the lead authors. Knowing the lead agency may also suggest the relative capacities of organizations within the region.

Table 5: Lead Agencies of Identification Initiatives

Lead agency in collection	Total Number
Consultant	48
Regional government planners	23
Local government economic development officers	22
Local government planners	19
Provincial government	12
Regional government economic development officers	9
Independent agency	8
Private	6
First Nation	1
Local government collaboration	1
Real estate boards	1

Nearly all of the industrial land identification initiatives were performed by or on behalf of government agencies but nearly a third of the sample was drafted by consultants. This work is performed exclusively on behalf of government, and for a variety of different agencies (see chart below). Some of the most common consultants were Urban Metrics and Miller Dickinson Blais throughout Canada, Otak Incorporated and ECONorthwest in Washington and Oregon, and Parsons Brinckerhoff and Colliers International around the world. Over two-thirds of initiatives performed by consultants are done on behalf of regional governments or urban local governments. This is likely an access issue: public sector consultants choose to locate their offices to closer to levels of government that have a greater need for their services, more ability to articulate their needs and provide data support and a greater ability to pay (Dobes, 2006). However, if the Province is to adopt the practice of hiring consultants to identify industrial land, it is important to note the effect of their areas of expertise and their distance from day-to-day government operations. The relationships between consultant and client were mostly unclear in the sample documents, but consultants' expertise varied from economic development to marketing and land use planning.

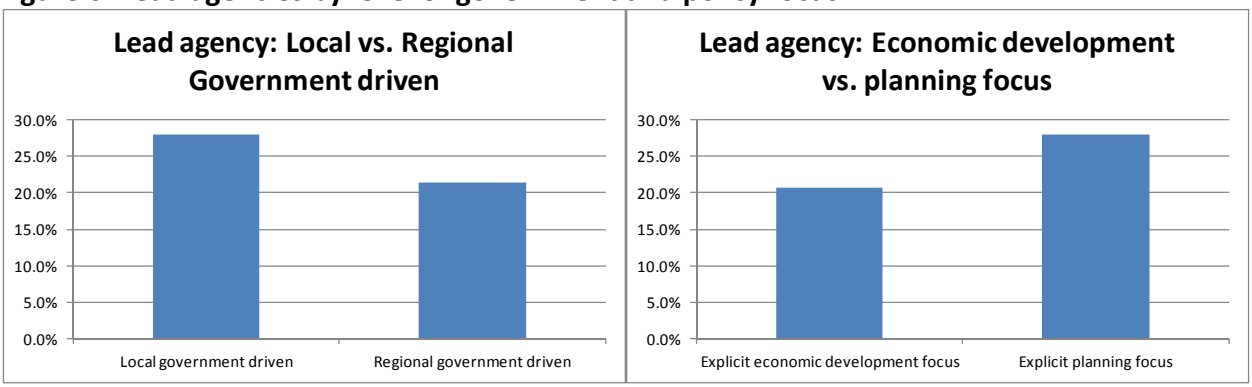
Figure 5: Who do consultants perform industrial land identification for?



The following chart clarifies the question of agency by focusing on the level and direction of the lead government agency (see charts below). The literature review revealed that the position of an industrial land identification initiative's lead author within government has influence on its implementation, in particular that local governments have less authority to implement their objectives (Wolman & Spitzley, 1996), and that planning focused initiatives ignore business location decision making criteria (Dempwolf, 2010). Local government driven initiatives slightly outnumber regional government driven initiatives (28.0% to 21.3%) and planning department initiatives slightly outnumber economic development agency initiatives (28.0% to 20.7%). This illustrates that existing initiatives have not developed common practices regarding who should lead industrial land identification initiatives. This is an important implication for ILI if it chooses

to move forward with its own industrial land identification initiative, because consensus is likely to be more difficult to achieve when engaging the interests of other agencies.

Figure 6: Lead agencies by level of government and policy focus



The considerations for British Columbia's identification of industrial land are:

- Local governments have less authority and resources to achieve their objectives. In the industrial land identification context, they only have authority over the land designated by higher levels of government as their territory (Bakvis, Baier & Brown, 2009; Moriarty & Cowen, 1980; Wolman & Spitzley, 1996).
- The effectiveness of industrial land identification initiatives is reduced by being led by planning departments, as was argued by Dempwolf (2010). Planning departments generally consider the priorities of businesses to be less important.

Another observation about the lead agencies is that multiple agencies can conduct an industrial land identification initiative in a single jurisdiction. For example, the Robson Canoe Valleys Economic Opportunities Plan, the Robson Valley Industrial Lands Study and the North Peace Heavy Industrial Lands Study all cover similar parcels of land, but are all compiled by different agencies. ILI must consider this duplication of efforts if it moves forward with its own industrial land identification initiative.

4) What methodology does the initiative use to collect information?

The qualitative content analysis demonstrates there is little consensus on methods for identifying industrial land (see table below). Proponents frequently use a combination of primary and secondary methods including qualitative research, GIS analysis, remote sensing, survey of community members and ground truthing.

Table 6: Key Methodologies, All Initiatives

Methodology	Total
Qualitative data research	53.3%
GIS, qualitative	15.3%
Qualitative - by submission	12.7%
GIS, qualitative, ground truthing	4.7%

GIS – passive	4.0%
Employment based	2.7%
Ground truthing	2.7%
Qualitative surveys	2.0%
Remote sensing, ground truthing	1.3%
GIS	0.7%
Qualitative, ground truthing	0.7%

The most common method is secondary qualitative data research –over half of the sample used this method exclusively. This implies that there are resource constraints that prevent proponents from doing their own primary research, a finding which is consistent with the literature review's discussion of the trade-off between specification and initiative cost (Knaap and Moore, 2000). As an example, the most recent version of the Snohomish County Buildable Lands Report was forced to use a less labour intensive methodology because of budget cutbacks.

The challenge of resource constraints is further reflected in the choices of primary research methods. Nearly a quarter of the sample used GIS analysis as part of its methodology, while only 6.7% of the sample used ground truthing. The literature review found that ground truthing was a more effective practice in identifying land, but acknowledged that it was the most expensive of the methods.

Initiatives that used ground truthing measured more location factors on average, particularly in the key factor categories identified by resource and manufacturing sectors (transportation, utilities and industrial site status) (see table below). The literature review argued that a more effective industrial land identification initiative will measure as many location factors as possible to maximize usefulness to businesses in different industries (Banton, 1993). The table demonstrates that ground truthing methods reveal the most about the key industrial factors. For example, the City of Kamloops' initiative provides some of the most extensive detail about its presented location factors. When industrial site information is submitted voluntarily, a high number of location factors are also measured. For example, the Northern Ontario Investment Readiness Test measures the third highest number of location factors. This demonstrates the validity of engaging non-governmental organizations to facilitate industrial land identification: owners may possess more information about their property, and are motivated to expend more resources to fill information gaps when they have a stake in the matter.

Table 7: Average Number of Industrial Location Factors Per Methodology

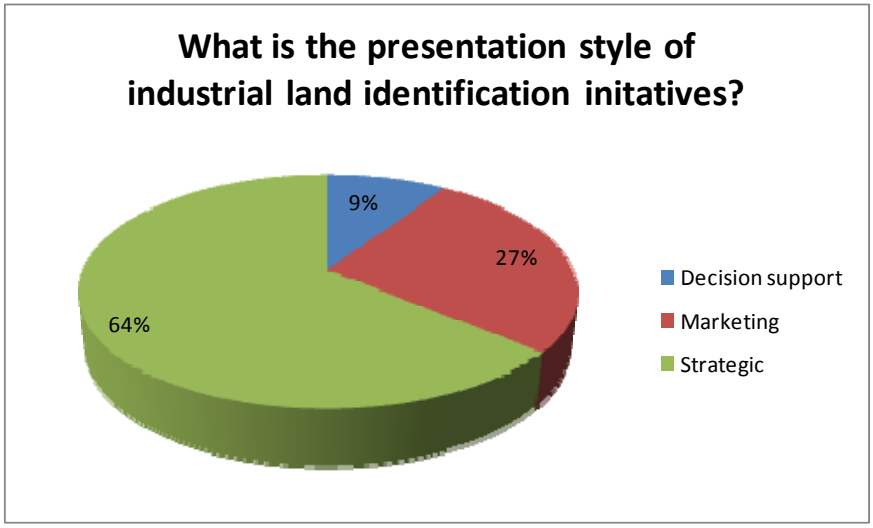
Methodology	Average of Transportation	Average of Industrial Site Status	Average of Utilities	Average of All
Employment based	20.0%	33.3%	15.6%	11.3%
GIS	40.0%	44.4%	12.5%	8.9%
GIS - passive	16.7%	40.7%	10.4%	12.7%

GIS, business licenses, ground truthing	40.0%	33.3%	12.5%	18.1%
GIS, qualitative	19.1%	36.7%	13.0%	17.1%
GIS, qualitative, ground truthing	23.3%	50.0%	22.9%	20.4%
Ground truthing	25.0%	38.9%	12.5%	18.5%
Qualitative - by submission	42.1%	49.7%	38.8%	21.8%
Qualitative data research	37.8%	40.0%	29.5%	10.8%
Qualitative surveys	13.3%	22.2%	8.3%	32.4%
Qualitative, ground truthing	40.0%	66.7%	75.0%	19.7%
Remote sensing, ground truthing	40.0%	61.1%	0.0%	19.7%
Grand Total	32.8%	41.0%	25.6%	19.7%

5) How is the information presented?

Nearly two-thirds of industrial land identification initiatives are presented to serve the strategic purposes of government (see chart below). The strategic presentation style means the initiative identifies land within the context of its other non-industrial development priorities. The remaining initiatives either exist solely to market industrial sites (27%) or provide relevant information without providing direction (9%).

Figure 7: What is the presentation style of industrial land identification initiatives?



There are clear relationships between the presentation style, the level of targeted decision making and the lead agency. Over 90% of initiatives presented for strategic purposes are targeted towards the secondary level of business decision making. Sixty percent of all initiatives presented for marketing purposes are drafted by an organization with an explicit economic development focus. Over three quarters of strategically presented initiatives are compiled

internally by a planning department or by a consultant[2]. The involvement of consultants in strategic formulation suggests several things:

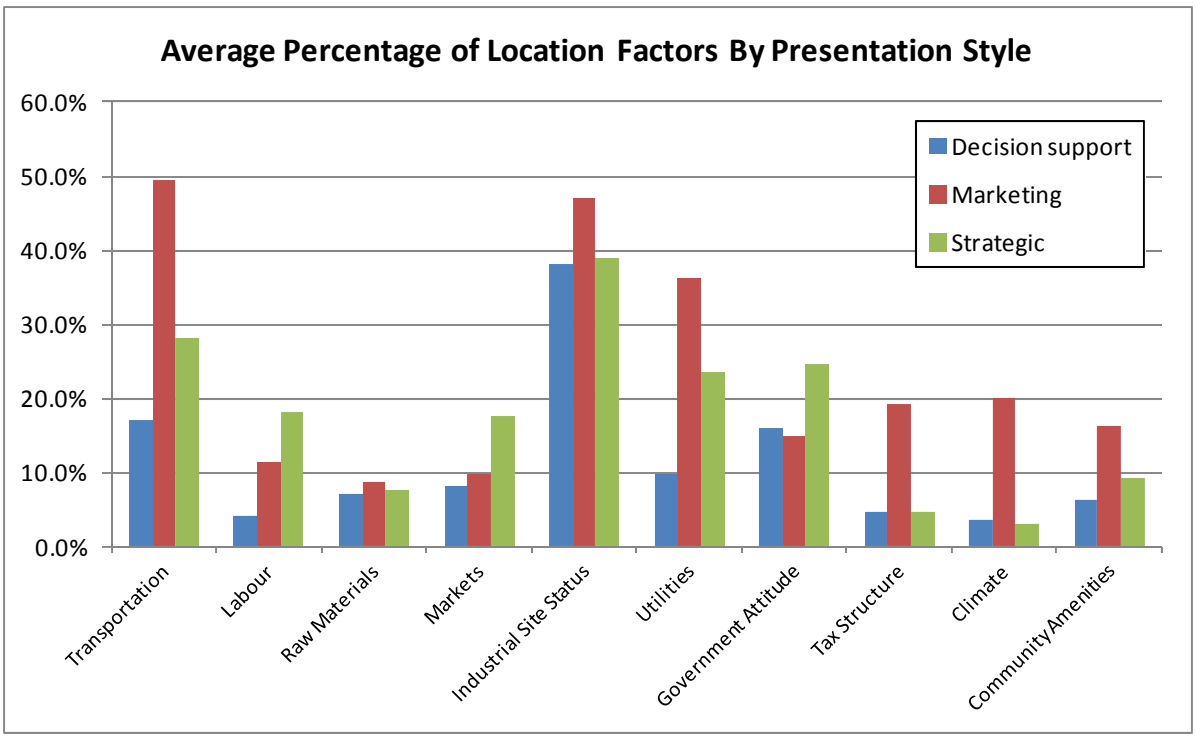
- Consultants may be preferred because internal staff time cannot be allocated to new strategic initiatives of this scope.
- Consultants may be preferred because they have specific skill sets not held within government.
- Governments may hire consultants because they believe they need a fresh perspective on land identification that is not pre-formed by the day-to-day activities of internal departments.

Only six industrial land identification initiatives are strategic documents compiled by economic development agencies, and they are only in Ontario and Oregon. For example, the Ontario Region of Waterloo (2006) compiled an industrial and business park vacant land inventory and demand analysis. Although these initiatives are led by regional and local governments, their formulation may hold lessons for ILI as it uses its economic development focused world view in the future to potentially identify industrial land itself.

Marketing-focused initiatives present data on the most location factors. Marketing initiatives measure the most location factors from the transportation, utilities, industrial site status, tax structure, climate and community amenities categories (see chart below). For example, Business Oregon's Industrial Site Certification program measures the most industrial site status location factors, the seventh most utility location factors, the thirteenth most climate factors and the twentieth most transportation factors. This affirms that these factors are most commonly associated with the perception of what information is needed most by resource and manufacturing businesses to make land decisions. Strategic-focused initiatives present more data on location factors on average for the labour, markets and government attitudes categories. Five of the key location factors for strategic initiatives are land use planning policy, environmental and man-made constraints, current uses, population forecast and employment forecast. These factors indicate that strategically-focused initiatives are concerned with discovery of the contours of available industrial land, and providing the case for why or why not it might be necessary, affirming the idea that strategic work is necessary before identifying specific sites for business.

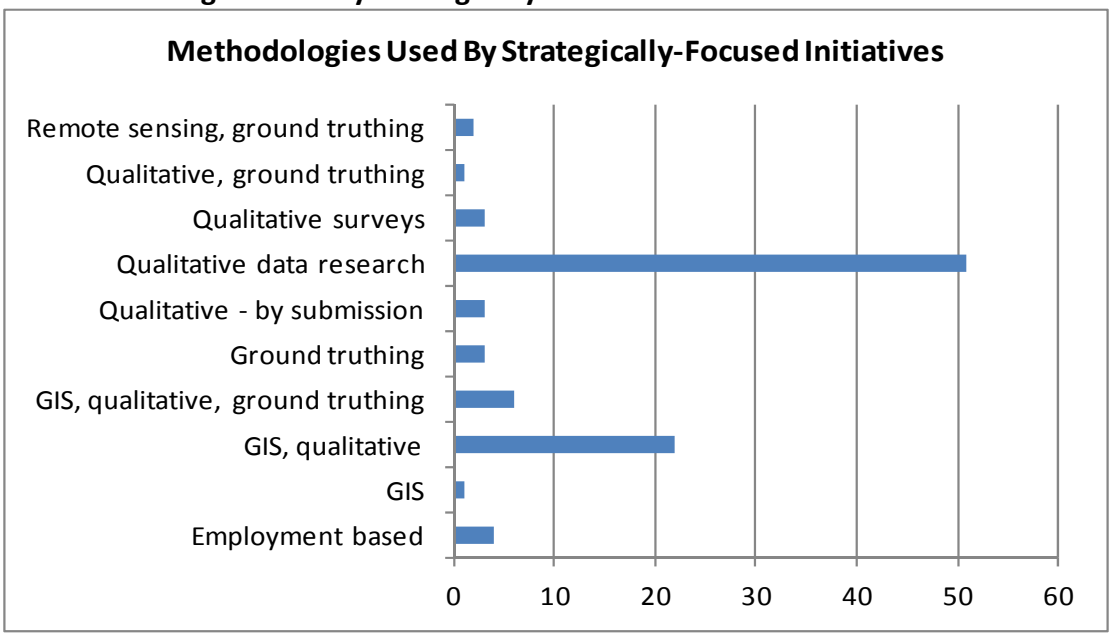
Figure 8: Average Percentage of Location Factors By Presentation Style

[2] Over 90% of consultant-drafted industrial land identification initiatives are presented as strategic documents



The differences in methodologies used for the different presentation styles are pronounced. Nearly all marketing initiatives are either compiled via secondary qualitative data research or qualitative data submission. The lack of consensus regarding preferable methodology is most evident among strategically-focused initiatives (see chart below). The primary method used is secondary qualitative data research, sometimes in combination with GIS analysis.

Figure 9: Methodologies Used By Strategically-Focused Initiatives

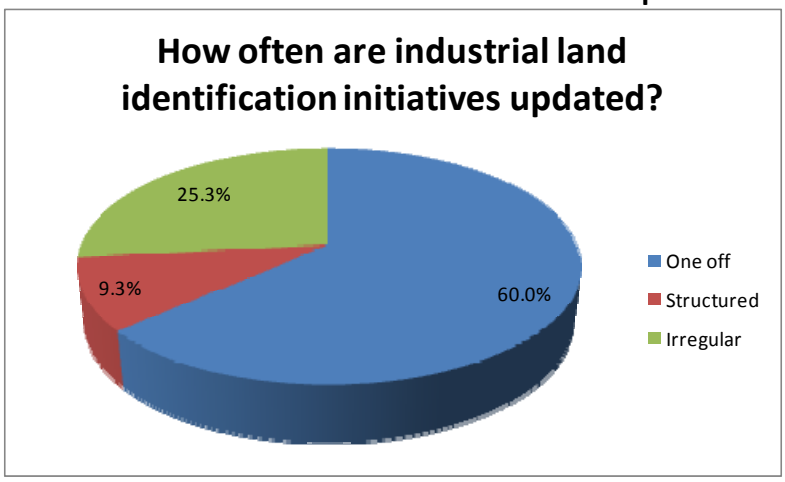


These observations further suggest that strategically-focused industrial land inventories are a pre-requisite to identifying specific parcels of industrial land that could be marketed. Therefore, an effective industrial land strategy is to strategically determine approximately where available land could be, and then focus the analysis. But to ensure consistency, a common methodology should be selected.

6) How often is the information updated?

Because land information is so dynamic, an effective industrial land identification initiative should be at least occasionally updated (Godschalk et al., 1986), but the qualitative content analysis revealed this is not the case (see chart below). Less than 10% are updated according to regular timelines, a quarter is updated whenever possible, and nearly two-thirds are single initiatives with no evidence of repeating.

Figure 10: How often are industrial land identification initiatives updated?



Many of those "one off" initiatives are strategic (see table below). As discussed in the purpose, ILI is interested in industrial land identification initiatives for long-term strategic reasons, and for that reason, the high number of one-off initiatives is concerning. In this sample, some of the strategic industrial land identification initiatives were single occurrences because they satisfied a short term strategic objective. For example, the Commercial & Industrial Lands Study was commissioned by the Municipality of North Cowichan to identify sites for re-designation for the latest version of the Official Community Plan. However, initiatives like the Industrial Land Use Inventory drafted for the Bulkley Nechako Regional District are notable for espousing long-term strategic objectives like "creation of a detailed parcel-based inventory of industrial lands that are – or may be in the future – potentially suitable for industrial development" (Miller Dickenson Blais, 2010a, p. 3) but provided no evidence of updating. One possible explanation for this is the lack of regional government capacity to sustain the project (Agrinoff & McGuire, 1998), but it cannot be proved or disproved without consulting the initiative proponents themselves.

Table 8: Frequency of updates by presentation style

	Decision support	Marketing	Strategic
One off	4	18	68
Structured	4	0	10
Irregular	5	20	13

The City of Kamloops Industrial Land Review is a positive example of how strategic industrial land identification initiatives can be sustained over time. The initiative is motivated by the goal of refreshing the community plan as North Cowichan's initiative is, but updates every five years. The initiative document does not reference any legislation or bylaws that compel them to complete a regular update. One can conclude that Kamloops manages to sustain its efforts by not only setting aside enough resources to consult the community and inspect sites, but also the sustained leadership and prioritization of Development and Engineering Services Department management. This is an educated observation supported by acknowledged good practices in industrial land identification (Metro Vancouver, 2012), although the initiative proponent should be consulted to prove or disprove this explanation before ILI adopts their practices.

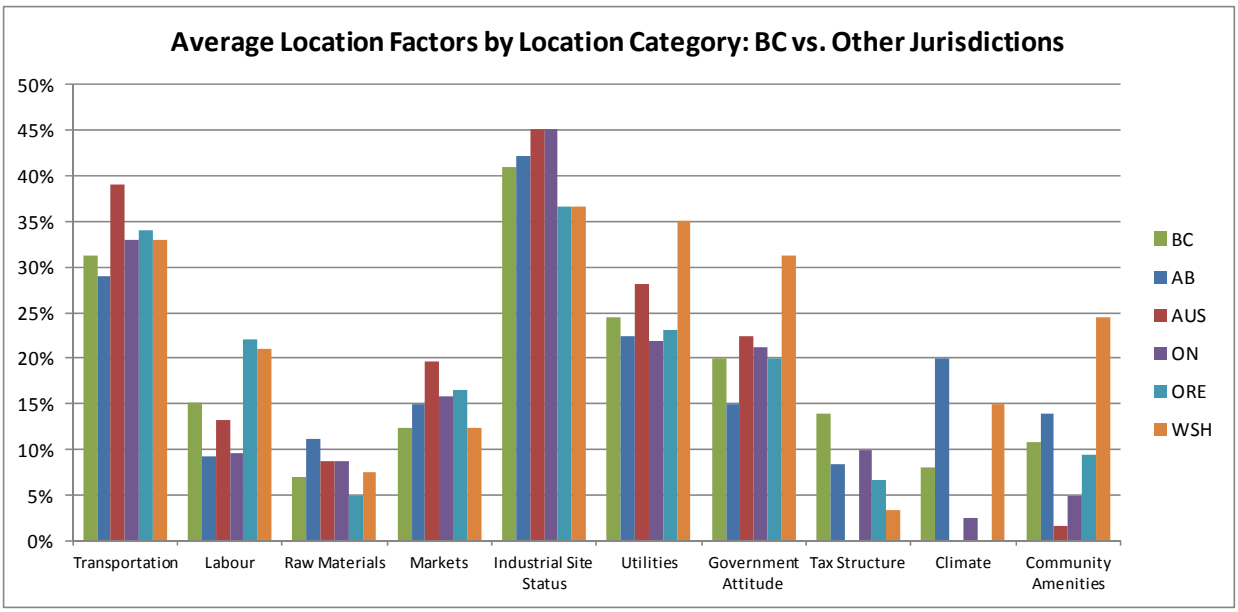
Furthermore, studied marketing-focused initiatives are also updated infrequently, which is equally problematic. None of the marketing initiatives have a structured updating schedule, and nearly half of them reflect availability at a single point in time. The lack of updating of marketing documents inhibits the effectiveness of industrial land identification initiatives, and further demonstrates the challenges of resource constraints in not only creating but maintaining them.

Jurisdictional Comparison

1) What location factors does the industrial land identification initiative measure?

British Columbia industrial land identifications lag behind the other jurisdictions in measuring location factors (see chart below). The only category in which British Columbia measures more factors than any other is tax structure, which is because the Northern Development Initiative Trust-led Community Investment Readiness profiles use a template that includes taxes. In the other factor categories, British Columbia measurement practices trail other jurisdictions on average.

Figure 11: Average Location Factors by Location Category: BC vs. Other Jurisdictions



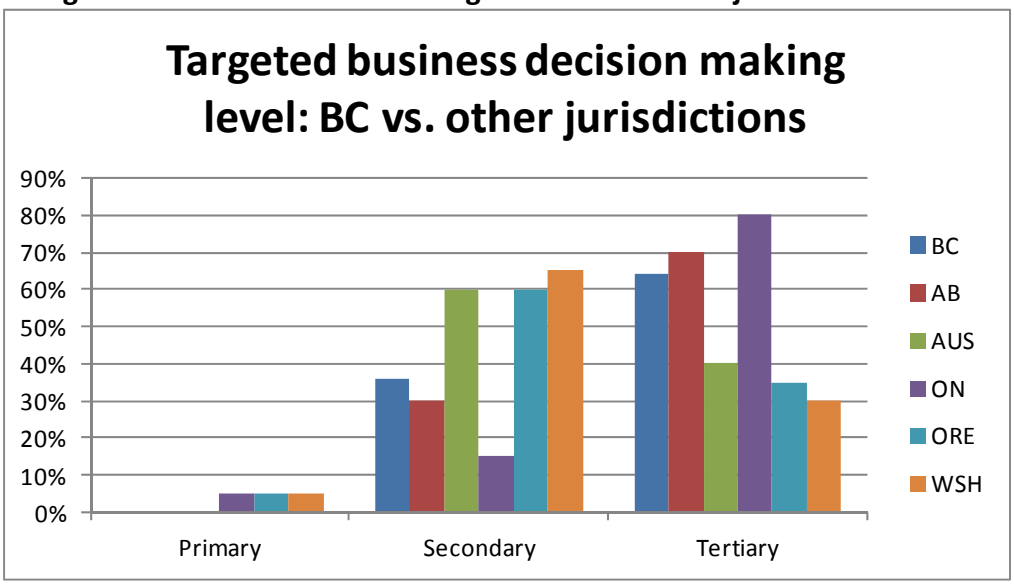
The dominant practices of other jurisdictions provide some lessons on how British Columbia's practices could be reformed. Primarily, Washington provides a potential case study in legislation of industrial land identification in the use of the Buildable Lands Program, industrial land banks and authorized port districts. The Buildable Lands program was adopted as part of the *Growth Management Act* to study the ability of six western Washington counties to satisfy their industrial, commercial and residential land needs. Also emerging from the *Growth Management Act* is the industrial land bank, which may be created to reserve land for industrial purposes following the completion of those reports. Thirdly, legislation also allows the state to designate certain areas as port districts which grant them greater control over land under their jurisdiction, even when the property is not near major waterways. For instance, inland sites in Whitman County and Walla Walla are classified as ports. As a result of how practices have been legislated and guided by the state government, they measure more location factors on average (16.45 compared to 13.58 in British Columbia), and led the other jurisdictions in utility, government attitude and community amenities factors on average.

The other jurisdictions also provide some lessons. Australia is a leader in measurement of location factors most important to the resource and manufacturing sectors by measuring the most transportation, industrial site status and market factors on average. The Tasmania and Perth and Peel initiatives stand out among the initiatives in their concern for major industrial development. Alberta initiatives demonstrate how industrial land identification initiatives are tailored to address strengths and weaknesses. On average, Alberta initiatives measure more location factors on average that highlight the province's comparative advantage – raw materials – and addresses concerns with what might be considered a comparative disadvantage – climate. This suggests a framing and resource allocation strategy in which industrial land identification practices in British Columbia that focus on the province's recognized comparative advantages – transportation and raw materials – and comparative disadvantages – knowledge about industrial site status – are the topics in need of greatest emphasis.

2) **What level of business decision making does the industrial land identification initiative target?**

Over half of the industrial land identification initiatives in British Columbia identify specific sites for business by targeting the tertiary level of business decision making (see chart below). However, a higher percentage of initiatives in the other Canadian provinces identify specific sites. There are few industrial land identification initiatives that attempt to attract businesses generally to a nation or province by targeting the primary level of business decision making, which is a logical finding since such an approach is the farthest from identifying industrial land.

Figure 12: Targeted business decision making level: BC vs. other jurisdictions

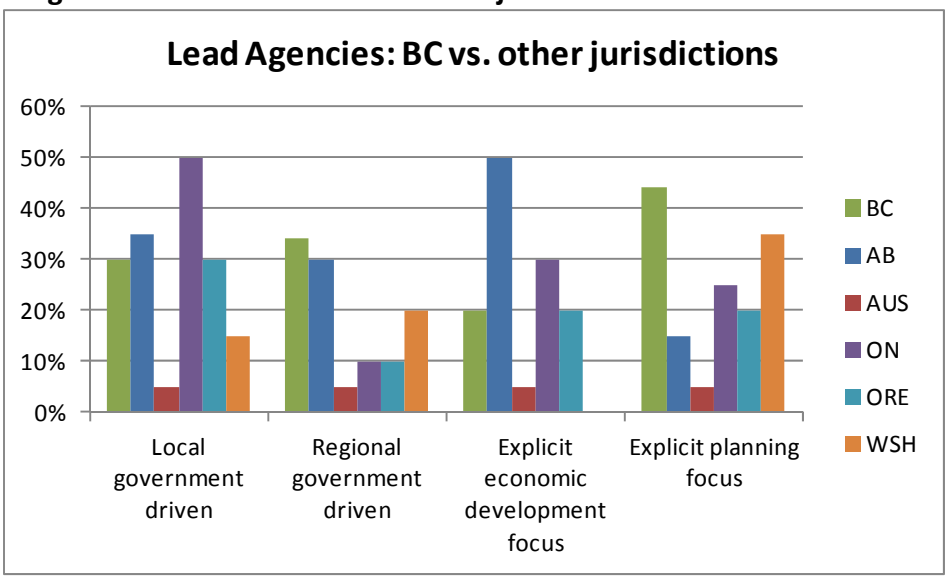


The preponderance of tertiary-level initiatives in British Columbia is unusual: tertiary-level initiatives are preceded by analysis of the broader region that occurs by targeting the secondary level of business decision making, but in the collection of the sample, there was no obvious evidence that this scoping work occurred. It is likely that this work was conducted, but it was not publicly released. Therefore, it is necessary to know more details about how British Columbia initiatives came to be.

3) **What agency collects information?**

British Columbia land identification initiatives are more regionally driven and planning focused than any other jurisdiction (see chart below). This is largely because of the legislated relationship between the Province and sub-provincial governments. The *Local Government Act* mandated the creation of 29 regional districts that are in charge of regional planning and land use management. Although the province has final authority over Crown land, much of the responsibility for planning has been delegated to regional districts (B.C. Ministry of Community, Sport and Cultural Development, n.d.). This is why regional planning agencies are the most common initiators of land identification in British Columbia. A concerted effort to identify more industrial land in British Columbia would need to scope their involvement in more detail.

Figure 13: Lead agencies in collection: BC vs. other jurisdictions

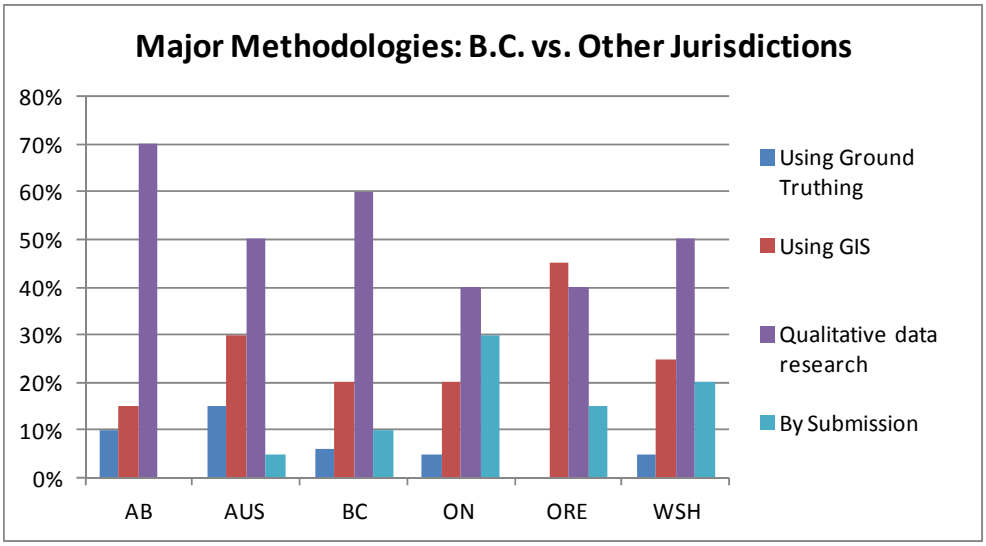


British Columbia may learn some lessons about reforming industrial land identification from some of the other jurisdictions though. Alberta has the highest incidence of economic development-led identification of land, and because ILI is a branch that uses an economic development lens, more of their practices could be transplanted if ILI leads identification of land. Australian initiatives are notably absent from this chart, because they are largely done by state governments. The structure of their coordinating role may provide lessons for the Province.

4) What methodology does the initiative use to collect information?

The leading method used to collect land information in British Columbia is secondary qualitative research (see chart below). The document review revealed that mostly these sources constituted Statistics Canada, the census, and most importantly, information already known to planners. This is a key observation, because it affirms the idea that supporting land identification work has been done, but has not been released publicly. This emphasizes the importance of engaging regional and local governments to learn more about their initiatives.

Figure 14: Major Methodologies: B.C. vs. Other Jurisdictions

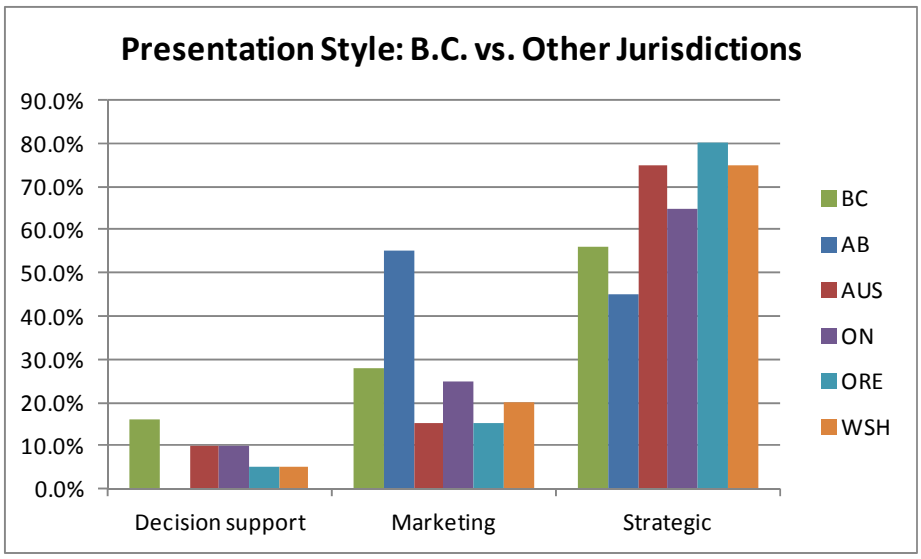


Three of the key methods on the forefront of industrial land identification initiatives are GIS analysis, ground truthing and reliance on the private sector via submission. British Columbia fails to leverage any of these methods. On a percentage basis, British Columbia has the second fewest initiatives using GIS and third fewest initiatives relying on user submissions. British Columbian initiatives are comparatively on the forefront of using the ground truthing method, although this method is used sparingly across the world with the exception of Australia. Opportunities B.C. (B.C. Ministry of Jobs, Tourism and Skills Training, n.d.) represents an initial step in leveraging the resources of the private sector by relying on land information submissions, though it may learn lessons from initiatives led by Business Oregon and the Ontario Ministry of Northern Development and Mines Investment Readiness Test.

5) How is the information presented?

The presentation style of British Columbian industrial land identification initiatives is notable given the patterns in decision support and strategic styles (see chart below). British Columbia is the jurisdiction with the most industrial land identification initiatives presented for decision support, meaning that it provides information without thought to how business may use it or if they will use it.

Figure 15: Presentation Style: B.C. vs. Other Jurisdictions



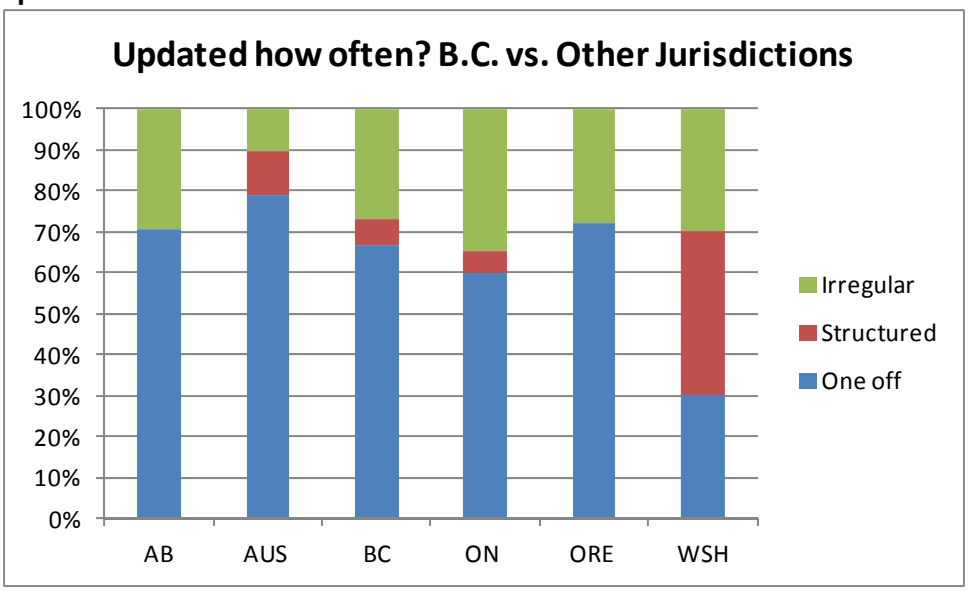
A majority of British Columbia's initiatives are presented as strategic documents, although every other jurisdiction besides Alberta has a higher proportion of strategically focused initiatives. As a result of Alberta having the fewest industrial land identification initiatives presented as strategic documents, they have the highest number of marketing focused initiatives. A major reason why Alberta is able to emphasize marketing is because the provincial government initiated the Land Information Inventory project which surveyed the collection of land information across the province and determined where there were gaps and overlapping components.

In the other non-British Columbian jurisdictions, the strategic focus is usually motivated by government leadership. Washington has its Buildable Lands program. Oregon mandates in Goal 9 of its statewide planning goals and guidelines that comprehensive plans for urban areas include ensuring land supply for a variety of industrial and commercial uses. Ontario's *Provincial Policy Statement* requires a comprehensive land review whenever conversion of lands is proposed (Ontario Ministry of Municipal Affairs and Housing, 2005). Australian land identification initiatives are primarily led by state governments. British Columbian strategic documents differ in that they are led by local and regional governments, and therefore employ an uncoordinated approach, each serving an individual strategic direction rather than a provincial direction.

6) How often is the information updated?

The frequency of updating industrial land identification initiatives in British Columbia is comparable to other jurisdictions (see chart below). Like all jurisdictions but Washington, nearly two thirds of the sample is one-off industrial land identification initiatives.

Figure 16: Updated how often? B.C. vs. Other Jurisdictions



The major anomalies are in Washington and Ontario. Almost half of Washington's initiatives have structured timelines for updating, and Ontario has the highest percentage of irregularly scheduled updates. Both of these are the result of legislative incentives. Washington's legislation mandates the Buildable Lands reports be updated every 5 years, and Ontario's legislation requires that industrial land identification exercises be conducted every time a jurisdiction needs more land. In spite of the City of Kamloops apparently initiating its own regular industrial land identification processes, the lesson for British Columbia is that jurisdictions do not ordinarily update industrial land identification initiatives voluntarily, because governments have to balance multiple priorities and resource constraints. Even the Integrated Cadastral Information Society, a voluntary organization that combines local government land information, maintains its commitment to regular updates by making it a condition of membership. In order to ensure regular updating, proponents of industrial land identification in British Columbia would likely need sustained determination and available resources.

CONCLUSIONS

This research provides a high level overview of how industrial land is identified in theory, and in British Columbia, Alberta, Ontario, Washington, Oregon and Australia. This contributes to ILI's understanding of the issue.

The literature review affirmed that businesses making location decisions are a cornerstone of industrial land identification. Overall, academics and practitioners agree that businesses make location decisions based on a number of factors they associate with the land, but disagree about what is specifically important. Badri (2007) found that location factors could be separated into ten discrete categories: transportation, labour, raw materials, markets, industrial site status, utilities, government attitude, tax structure, climate and community. Broadly, these criteria are valued across many if not most industries, but the determination of the most important specific location factors relies upon contextual factors like the firm's industry, size and the geographic field of search, necessitating an examination of the context of British Columbia to provide direction to the Province. Businesses consider these location factors within the context of a multi-stage decision making process that involves narrowing geographic choices from the national to the site-specific.

The government makes the industrial land identification process more complex in many ways. The meaning of the term public interest is contested, which reflects the issue of conflict within and among governments considering a role in industrial land identification. Historical government involvement in industrial land identification – in the form of regulatory and incentive-based approaches – was ineffective and failed to recognize the importance of business decision making. The informational approach is the necessary cornerstone of industrial land identification as an input and output.

Industrial land identification informational initiatives are adaptable, and therefore their implementation must consider questions including how the process is initiated, what data is collected, how it is presented, how often it is updated and what are the consequences of public disclosure. They also face challenges of ensuring governments interests are served when businesses use information, adopting a common understanding of information and possessing adequate resources. The extent of agreement about information is that all interested parties have been found to value consistency, accuracy and timeliness. The literature review concluded the process is complex, and the only common best practices underpinning all systems are a clear vision and a wide acceptance of the objectives.

The qualitative content analysis highlighted the following findings, in parts divergent from the findings of the literature review:

- The answers to who, what, where, how and why industrial land is identified varies from place to place.
- Industrial land identification initiatives are led or drafted on behalf of all levels of government and private organizations. Each has their own perspective and scope of possible land to identify.

- Industrial land identification initiatives tend to measure more transportation, utilities and industrial site status location factors.
- In practice, few publicly-focused industrial land identification initiatives target investment in specific industrial sectors.
- The methods used for identifying industrial land are more a function of ability and resources. Ground truthing is better for identifying specific characteristics of sites, but because it is resource intensive it is under-utilized. A majority of industrial land identification initiatives therefore rely on secondary qualitative data research, suggesting the importance of collaboration.
- Industrial land identification is an iterative process best served by strategically understanding the whole of a region before pinpointing particular sites for marketing.
- A majority of industrial land identification initiatives are completed only once. Budgetary constraints, the challenge of balancing of multiple priorities and the absence of sustained leadership are among the reasons why this occurs.
- Consultants are often engaged to resolve the issue of competing priorities, though they are only engaged for single reports.
- In the absence of sustained leadership, legislation is one method used to ensure that industrial land identification is a dynamic process that is not forgotten after the initial product is delivered.
- Although most industrial land identification initiatives attempt to bring together cross-functional teams, the economic development perspective is traditionally overshadowed in the industrial land identification process by the planning perspective.
- Many organizations are replicating the efforts of others: fully understanding the overlap points facilitates a transition from industrial land identification to industrial land promotion.
- British Columbia industrial land identification initiatives comparatively measure fewer location factors and are led mostly by regional government planners during the process of amending Regional Growth Strategies and Official Community Plans.

RECOMMENDATIONS

This paper's research question is: *What are the industrial land identification practices the BC Government may consider adopting?* The literature review and qualitative content analysis demonstrated that the practice of collaboration between industry, agencies and governments is a necessary component to identifying industrial land. The Industrial and Land Initiatives group therefore may add value to the process by taking a lead role in drawing together existing threads of information in the creation of an Industrial Land Inventory. Following from the analysis, the following practices are recommended for ILI to consider adopting.

Recommendation 1: Developing a consistent vision and framework for identifying industrial land and classifying location factors.

The analysis identified the contribution a consistent vision and framework for identifying industrial land and classifying location factors can make to achieve an industrial land identification initiative's objectives and helping businesses and other interested parties absorb information. ILI's vision is broadly defined as facilitating industrial and manufacturing business investment, so this recommendation is oriented towards ILI developing a clear vision statement that sets direction and plants the seeds of sustained leadership. Key objectives are determining who the Industrial Land Inventory is servicing, and developing a consistent framework in partnership with those primary utilisers of information so that common understanding can be formed and information can be updated more easily. This framework cannot be proscribed in advance based on the analysis because it needs to be grounded within current context. At the very least, it is best grounded in transportation, utilities and industrial site status location factors to support industrial and manufacturing investment.

Recommendation 2: Engaging the existing identifiers of industrial land to refine the framework.

The analysis identified the importance of adopting the practice of collaboration in developing the inputs of an industrial land identification initiative. ILI may extend its involvement with external partners beyond other branches of the Ministry of Jobs, Tourism and Skills Training, and connect with private organizations, local governments and regional governments studied in this paper, as well as land development consultants and other government departments that currently conduct their land identification activities under the cover of confidentiality. The planning perspective should be engaged in this process as well as the economic development perspective, to ensure the framework best balances and supports the multiple dimensions of public value, and leverage the identification methods that interested parties are best able to use. The development of relationships through engagement may also better equip ILI to draw together threads of information.

Recommendation 3: Examining where existing industrial land identification initiatives are duplicating efforts.

The analysis identified that multiple jurisdictions are duplicating efforts in the same area, which could be making British Columbia less attractive for industrial and manufacturing investment. The industrial land identification process in Alberta points to a case where provincial effort to study the duplication between industrial land identification initiatives is followed by jurisdictions turning their industrial land identification practices into action by focusing on marketing. Examination of duplicated efforts also contributes to the achievement of the second recommendation, and encourages two-way sharing of information between jurisdictions and branches that may not normally communicate. Another by-product of this examination is the discovery of where gaps in understanding of land may exist, at which point ILI can leverage its relationships with other industrial land identifiers to fill those gaps.

Recommendation 4: Building a list of sites for potential industrial investment according to the consistent framework.

The analysis discovered that businesses make decisions about industrial and manufacturing investment on land based on preferred location factors. Therefore, the B.C. government may adopt the practice of creating a database of properties that could potentially support investment, based on the framework and collected secondary data developed through previous recommendations. A database could empower economic development agencies to provide a list of options to potential investors, without distorting the economy as tax incentives do. The structure of the database depends on its purpose, developed in Recommendation 1.

Recommendation 5: Designing a mechanism that ensures information collection is sustained.

The analysis identified the need to regularly refresh information about land because its use changes over time. The processes described in the previous recommendations are extensive and are likely to be implemented over the course of a year or more. After that process is completed, ILI should implement a mechanism to ensure momentum is not lost to other priorities. Some potential options are:

1. Capacity building support for local and regional governments through development of an industrial land identification handbook based on the framework, with its principles to be reaffirmed through contact between Regional Economic Operations officials and local governments, and Union of British Columbia Municipalities workshops.
2. Working with the Ministry of Community, Sport and Cultural Development to reform the *Local Government Act* to mandate more consistent industrial land identification practices based on the framework.

NEXT STEPS

Although this research contributes to ILI's understanding of the issue and suggests practices for adoption, the next step should be to initiate deeper research. The objective of this study was chiefly emphasizing key types of industrial land initiatives used in attracting investment from industrial and manufacturing businesses. The literature search and document review have explored the common industrial land identification practices, but cannot evaluate their effectiveness. A second major limitation was the use of public-facing documents, and assuming they communicated the whole story. Therefore, deeper research is required to determine the outcomes of these strategies, and ascertain details that are not disclosed in public-facing documents. These details could include the challenges and process of implementation, and the influence of political, social and economic contexts in which the industrial land identification practices were chosen and formed. An outcome of deeper research is improving ILI's implementation of the recommendations. For example, ILI may learn more about the implementation of the Land Information Inventory project in Alberta as a means to implement a similar initiative to achieve the recommendation of examining duplication of efforts.

Some initiatives that are recommended for deeper study are:

- In British Columbia: the Bulkley Nechako Regional District, the City of Kamloops and the Regional District of Fraser-Fort George.
- In Alberta: The Land Information Inventory project.
- In Ontario: The Northern Ontario Investment Readiness Test, Peel Region and the Region of Waterloo.
- In Washington: The industrial land bank and authorized port district policies.
- In Oregon: The industrial site certification program and Deschutes County's large lot industrial land need analysis.
- In Australia: Perth and Peel and Tasmania.

APPENDIX A: LITERATURE REVIEW LOCATION FACTORS

Sources are cited in temporal order. Because each source examines different industries in different regions, each may measure any number of location factors within the category.
Sources were collected through key word searches and adaptation of sources from literature reviews including Stevens & Brackett, 1967; Chapman & Walker, 1981; Hayter, 1997; Karakaya & Canel, 1998; Badri, 2007; Thumawongchai & Huang, 2011.

Category	Location Factors	Sources (Theoretical, Empirical, Case Study)
Transportation	Pipeline facilities. Airway facilities. Highway facilities. Railroad facilities. Trucking services. Waterway transportation. Shipping cost of raw material. Cost of finished goods transportation. Availability of postal services. Warehousing and storage facilities. Availability of wholesale outlets. Commuting distances. Access to distribution channels.	Hoover, 1937; Forth, 1951; Neuhoff, 1952; Losch, 1954; Greenhut, 1956; Katona & Morgan, 1957; Alexander et al., 1959; Fulton and Hoch, 1959; Chinitz & Vernon, 1960; Malinoski & Kinnard Jr., 1961; McMillan, 1965; Beckmann, 1968; Logan, 1970; Chisholm, 1971; Fulton, 1971; Fales and Moses, 1972; Nelson, 1973; Nishioka & Krumme, 1973; Lowe and Moryadas, 1975; Foster, 1977; Bater and Walker, 1977; Schmenner, 1979, 1982; Brown, 1979; Moriarty and Cowen, 1980; Hoyle et al., 1981; Whitmore, 1981; McKinnon, 1983, 1989; Blair and Premus, 1987; Schemenner et al., 1987; Christy & Ironside, 1987; Watts, 1987; Karakaya and Stahl, 1989; Bathelt & Hecht, 1990; Haitani and Marquis, 1990; Gold, 1991; Pietlock, 1992; De Noble and Galbraith, 1992; Hekman, 1992; Artikis, 1993; Stonebraker and Leong, 1994; Thisse et al., 1996; Hayter, 1997; Ferdows, 1997; Yang and Lee, 1997; Murray et al., 1999; Cohen, 2000; Goetschalckx et al., 2002; Vereecke & Van Dierdonck, 2002; Bhutta et al., 2003; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Burdina, 2004; Oum and Park, 2004; Kim, 2005; Bergeron, 2005; Galan et al., 2007; Julka et al., 2007; Turhan et al., 2007; Chou et al., 2008; Demirel et al., 2010; Feng et al., 2010; Kayikci, 2010; Lee and Wilhelm, 2010; Farahani et al., 2010; Fuchs et al., 2011; Kuo and Liang, 2011; Liu et al., 2011; Mataloni Jr., 2011; Weber, 2011; IEDC, n.d.
Labour	Low cost labour. Attitude of workers. Managerial labour.	Neuhoff, 1952; Hunter, 1955; Greenhut, 1956; Katona & Morgan, 1957; Thompson and Mattila, 1959; Chinitz & Vernon, 1960; McMillan,

	Skilled labor. Unskilled labour. Wage rates. Unions. Educational level of labour. Dependability of labour. Availability of male labour. Availability of female labour. Cost of living. Worker stability. Productivity.	1965; Townroe, 1969; Logan, 1970; Olson, 1971; Fulton, 1971; Carnoy, 1972; Rees, 1972, 1983; Norcliffe, 1975; Sant, 1975; Keeble, 1976; Friedman, 1977; Pred, 1977; Foster, 1977; Dicken and Lloyd, 1978; Gudgin, 1978; Brown, 1979; Moriarty and Cowen, 1980; Whitmore, 1981; Cobb, 1982; Massey and Meegan, 1982; Schmenner, 1979, 1982; Dorfman, 1983; Malecki, 1984; Massey, 1984; Noyelle and Stanback, 1984; Grundwald and Flamm, 1985; Saxenian, 1985; Dicken, 1986; Lund, 1986; Watts, 1987; Ballance, 1987; Schemenner et al., 1987; Blair and Premus, 1987; Christy & Ironside, 1987; Hanson, 1988; Schoenberger, 1988; Galbraith and De Noble, 1988; Storper and Walker, 1989; Bathelt & Hecht, 1990; Haitani and Marquis, 1990; Coughlin et al., 1990, 1991; Gold, 1991; Pietlock, 1992; Wheeler and Mody, 1992; De Noble and Galbraith, 1992; Stonebraker and Leong, 1994; Hayter, 1997; Ferdows, 1997; Yang and Lee, 1997; Murray et al., 1999; Cohen, 2000; Vereecke & Van Dierdonck, 2002; Cuervo and Pheng, 2003; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Oum and Park, 2004; Kim, 2005; Bergeron, 2005; Galan et al., 2007; Julka et al., 2007; Turhan et al., 2007; Wu et al., 2007; Chou et al., 2008; Chen and Moore, 2010; Demirel et al., 2010; Feng et al., 2010; Riedl, 2010; Fuchs et al., 2011; Liu et al., 2011; Mataloni Jr., 2011; Weber, 2011; IEDC, n.d.
Raw materials	Proximity to supplies. Availability of raw materials. Cost of construction. Nearness to component parts. Availability of storage facilities for raw materials and components. Location of suppliers. Freight cost.	Weber, 1929; Neuhoff, 1952; Hunter, 1955; Greenhut, 1956; Katona & Morgan, 1957; McMillan, 1965; Logan, 1970; Nishioka & Krumme, 1973; Auty, 1975; Foster, 1977; Miller, 1977; Moriarty, 1980; Whitmore, 1981; Schmenner, 1982; Storper, 1985; Schemenner et al., 1987; Blair and Premus, 1987; Watts, 1987; Christy & Ironside, 1987; Karakaya and Stahl, 1989; Wheeler and Mody, 1992; Hekman, 1992; Artikis, 1993; Stonebraker and Leong., 1994; Ferdows, 1997; Yang and Lee, 1997; Murray et al., 1999; Goetschalckx et al., 2002; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Oum and Park, 2004; Kim, 2005; Bergeron, 2005; Turhan et al., 2007; Chou et al.,

		2008; Demirel et al., 2010; Feng et al., 2010; Kayikci, 2010; Lee and Wilhelm, 2010; Farahani et al., 2010; Fuchs et al., 2011; Kuo and Liang, 2011; Liu et al., 2011; IEDC, n.d.
Markets	Existing consumer market. Existing producer market. Potential consumer market. Anticipation of growth of markets. Shipping costs to market areas. Marketing services. Favorable competitive position. Income trends. Population trends. Population density. Consumer characteristics. Location of competitors. Future expansion opportunities. Size of market. Nearness to related industries. Global competitiveness in terms of material, labour and capital. Proximity to international markets. International market opportunities. Standard of living. Per capita income. Strength of currency against US dollar. Balance of payment status. Government aids. Cost advantages of incumbents.	Von Thunen, 1875; Fetter, 1924; Hotteling, 1929; Hoover, 1948; Neuhoff, 1952; Losch, 1954; Hunter, 1955; Greenhut, 1956; Katona & Morgan, 1957; Thompson and Mattila, 1959; McMillan, 1965; Logan, 1970; Chisholm, 1971; Olson, 1971; Fulton, 1971; Carnoy, 1972; Nishioka & Krumme, 1973; Beyers, 1974; Foust, 1975; Foster, 1977; Miller, 1977; Friedman, 1977; Pred, 1977; Dicken and Llloyd, 1978; Ballance, 1978; Dorward, 1979; Moriarty and Cowen, 1980; Schmenner, 1979, 1982; Whitmore, 1981; Dorfman, 1983; Hudson, 1983, 1988; Gough, 1984; Walters and Wheeler, 1984; Hack 1984; Grundwald and Flamm, 1985; Saxenian, 1985; Galbraith, 1985, 1990; Lund, 1986; Blair and Premus, 1987; Schemenner et al., 1987; Watts, 1987; Christy & Ironside, 1987; Tosh et al., 1988; Schoenberger, 1988; Galbraith and De Noble, 1988; McKinnon, 1989; Karakaya and Stahl, 1989; Bathelt & Hecht, 1990; Haitani and Marquis, 1990; Coughlin et al., 1990, 1991; Pietlock, 1992; Simons, 1992; Hekman, 1992; Wheeler and Mody, 1992; Artikis, 1993; Stonebraker and Leong, 1994; Ferdows, 1997; Yang and Lee, 1997; Murray et al., 1999; Cohen, 2000; Goetschalckx et al., 2002; Vereecke & Van Dierdonck, 2002; Bhutta et al., 2003; Cuervo and Pheng, 2003; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Archambault, 2004; Oum and Park, 2004; Kim, 2005; Bergeron, 2005; Galan et al., 2007; Julka et al., 2007; Turhan et al., 2007; Wu et al., 2007; Chou et al., 2008; Chen and Moore, 2010; Demirel et al., 2010; Feng et al., 2010; Kayikci, 2010; Lee and Wilhelm, 2010; Farahani et al., 2010; Riedl, 2010; Kuo and Liang, 2011; Liu et al., 2011; Mataloni Jr., 2011; IEDC, n.d.
Industrial site status	Accessibility of land. Cost of industrial land. Developed industrial park. Developed	Hoover, 1948; Neuhoff, 1952; Greenhut, 1956; Eversley, 1965; McMillan, 1965; Chisholm, 1971; Fulton, 1971; Nishioka & Krumme, 1973; Spooner, 1974; Bater and Walker, 1977; Gudgin, 1978; Lipietz,

	infrastructure. Space for future expansion. Insurance rates. Availability of lending institutions. Closeness to other industries. Community industrial development projects. Attitude of financing agents.	1980; Smith, 1981; Moriarty and Cowen, 1980; Whitmore, 1981; Sable, 1982; Schmenner, 1982; Lloyd and Mason, 1984; Norcliffe, 1984; Brusco, 1985; Grundwald and Flamm, 1985; Hall, 1985a, 1985b; Mason and Harrison, 1985; Mason, 1987; Blair and Premus, 1987; Watts, 1987; Christy & Ironside, 1987; Hudson, 1988; Galbraith and De Noble, 1988; Coughlin et al., 1990, 1991; McConnell and Schwab, 1990; Bathelt & Hecht, 1990; Wheeler and Mody, 1992; Hekman, 1992; Artikis, 1993; Stonebraker and Leong, 1994; Yang and Lee, 1997; Murray et al., 1999; Cohen, 2000; Goetschalckx et al., 2002; Cuervo and Pheng, 2003; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Archambault, 2004; Oum and Park, 2004; Kim, 2005; Bergeron, 2005; Galan et al., 2007; Turhan et al., 2007; Wu et al., 2007; Chou et al., 2008; Demirel et al., 2010; Feng et al., 2010; Kayikci, 2010; Lee and Wilhelm, 2010; Fuchs et al., 2011; Weber, 2011; IEDC, n.d.
Utilities	Attitude of utility agents. Water supply, cost and quality. Disposable facilities of industrial waste. Availability of fuels. Cost of fuels. Availability of electric power. Cost of electric power. Availability of gas. Adequacy of sewage facilities. Availability of coal and nuclear facilities.	Forth, 1951; Neuhoff, 1952; Greenhut, 1956; Katona & Morgan, 1957; McMillan, 1965; Fulton, 1971; Nishioka & Krumme, 1973; Bater and Walker, 1977; Foster, 1977; Heckman, 1978; Moriarty and Cown, 1980; Schmenner, 1982; Walters and Wheeler, 1984; Schemenner et al., 1987; Watts, 1987; Galbraith and De Noble, 1988; McConnell and Schwab, 1990; Gold, 1991; Pietlock, 1992; De Noble and Gailbraith, 1992; Hekman, 1992; Rex, 1993; Stonebraker and Leong, 1994; Murray et al., 1999; Cohen, 2000; IEDC, n.d.
Government attitude	Local - Building ordinances. Zoning codes. Compensation laws. Insurance laws. Safety inspections. Nuisance and stream pollution laws. Environmental regulations. Cost of municipal services.	Neuhoff, 1952; Greenhut, 1956; McMillan, 1965; Fulton, 1971; Carnoy, 1972; Foster, 1977; Dicken and Lloyd, 1978; Schmenner, 1979, 1982; Anell and Nygren, 1980; Hughes and Ohlin, 1980; Rees, 1983; Ballance, 1987; Schemenner et al., 1987; Christy & Ironside, 1987; Watts, 1987; Galbraith and De Noble, 1988; Hudson, 1988; Tosh et al., 1988; Coughlin et al., 1990, 1991; Wheeler and Mody, 1992; Artikis, 1993; Stonebraker and Leong, 1994; Young, 1994; Ferdows, 1997; Yang and

	International - Relations with the west. History of country. Stability of regime. Protection against expropriation. Treaties and pacts. Attitude in the United Nations. Type of military alliances. Attitude toward foreign capital.	Lee, 1997; Murray et al., 1999; Goetschalckx et al., 2002; Vereecke & Van Dierdonck, 2002; Cuervo and Pheng, 2003; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Archambault, 2004; Oum and Park, 2004; Bergeron, 2005; Galan et al., 2007; Julka et al., 2007; Turhan et al., 2007; Wu et al., 2007; Chou et al., 2008; Chen and Moore, 2010; Demirel et al., 2010; Feng et al., 2010; Kayikci, 2010; Lee and Wilhelm, 2010; Farahani et al., 2010; Riedl, 2010; Fuchs et al., 2011; Liu et al., 2011; IEDC, n.d.
Tax structure	Tax assessment basis. Industrial property tax rates. State corporate tax structure. Tax free operations. Tax incentives. State sales tax. Clarity of corporate investment laws. Regulations concerning joint ventures and mergers. Regulations on transfer of earnings out of country. Taxation of foreign owned companies. Foreign ownership laws. Requirements on what percentage of employees may be foreign. Prevalence of bureaucratic red tape. Regulations concerning price controls. Requirements for setting up local corporations.	Neuhoff, 1952; Hunter, 1955; Greenhut, 1956; Katona & Morgan, 1957; McMillan, 1965; Fulton, 1971; Erickson & Wasylenko, 1980; Moriarty and Cowen, 1980; Anell and Nyrgren, 1980; Whitmore, 1981; Schmenner, 1982; Ward, 1982; Hudson, 1983; Rees, 1983; Blair and Premus, 1987; Schemenner et al., 1987; Christy & Ironside, 1987; Watts, 1987; Galbraith and De Noble, 1988; Tosh et al., 1988; Haitani and Marquis, 1990; Coughlin et al., 1990, 1991; Wheeler and Mody, 1992; De Noble and Galbraith, 1992; Young, 1994; Luce, 1994; Stonebraker and Leong, 1994; Fleischman, 1995; Yang and Lee, 1997; Murray et al., 1999; Goetschalckx et al., 2002; Vereecke & Van Dierdonck, 2002; Bhutta et al., 2003; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Archambault, 2004; Oum and Park, 2004; Kim, 2005; Bergeron, 2005; Galan et al., 2007; Julka et al., 2007; Chen and Moore, 2010; Demirel et al., 2010; Feng et al., 2010; Kayikci, 2010; Lee and Wilhelm, 2010; Riedl, 2010; IEDC, n.d.
Climate	Amount snow fall. Percent rain fall. Living conditions. Relative humidity. Monthly average temperature. Air pollution.	Ullman, 1954; Greenhut, 1956; McMillan, 1965; Dean, 1972; Spooner, 1974; Moriarty and Cowen, 1980; Schmenner, 1982; Schemenner et al., 1987; Christy & Ironside, 1987; Haitani and Marquis, 1990; McConnell and Schwab, 1990, Stonebraker and Leong, 1994; IEDC, n.d.

Community amenities	Colleges and research institutions. Attitude of community residents. Quality of schools. Religious facilities. Library facilities. Recreational facilities. Attitude of community leaders. Medical facilities. Shopping centers. Hotels and motels. Restaurants and night life. Banks and credit institutions. Community position of future expansion. Social and cultural climate. Quality of life. Low population density. Residential housing. Fire services. Police services. Incidence of crime and substance abuse. Personal preferences of business owner.	Ullman, 1954; Greenhut, 1956; Katona & Morgan, 1957; Eversley, 1965; McMillan, 1965; Logan, 1970; Fulton, 1971; Dean, 1972; Spooner, 1974; Bater and Walker, 1977; Mason and Harrison, 1977; Foster, 1977; Gudgin, 1978; Massey, 1979, 1984; Moriarty and Cowen, 1980; Schmenner, 1982; Rees, 1983; Grundwald and Flamm, 1984; Hack, 1984; Lloyd and Mason, 1984; Malecki, 1984; Hall, 1985; Galbraith, 1985, 1990; Dicken, 1986; Ballance, 1987; Watts, 1987; Mason, 1987; Blair and Premus, 1987; Christy & Ironside, 1987; Galbraith and De Noble, 1988; Haitani and Marquis, 1990; Bathelt & Hecht, 1990; McConnell and Schwab, 1990; Simons, 1992; De Noble and Galbraith, 1992; Hekman, 1992; Rex, 1993; Artikis, 1993; Stonebraker and Leong, 1994; Ferdows, 1997; Yang and Lee, 1997; Murray et al., 1999; Cohen, 2000; Goetschalckx et al., 2002; Vereecke & Van Dierdonck, 2002; MacCarthy and Atthirawong, 2003; Stirm and St. Pierre, 2003; Oum and Park, 2004; Galan et al., 2007; Turhan et al., 2007; Chou et al., 2008; Feng et al., 2010; Weber, 2011; IEDC, n.d.

APPENDIX B: QUALITATIVE CONTENT ANALYSIS RESULTS

Please consult attached Excel spreadsheet.

APPENDIX C: QUALITATIVE CONTENT ANALYSIS LOCATION FACTORS

Source: Region of Peel, 2010, p.14

Table 2.3 - Relative Ranking of Organizational Attributes affecting Location Requirements

		HR	Logistic				Operating Envirc				Cost						Others		
	Considerations within Sector	Labour availability	Proximity to Supply	Proximity to Customer	Proximity to Existing Facility	Land Availability	Building configuration	Transportation Infrastructure	Transportation Congestion	Extraordinary Utility Requirements	Capital - Land	Capital - Building	Capital - Development Charges	Operating - Taxes, Utilities, etc	Operating - Rent	Tax Rebates and Incentives	Government assistance	Quality of Life	
	Type of Activity																		
	Production	2	1		1	1	1			1	2	2	2	2	2	2	2	2	1 Prerequisite
	Distribution and Warehousing	2		2	2	1	1	1	1	2	2	2	2	2	2	2	2	2	
	Corporate and Administrative	1			2	2	2				2	2	2	2	1			1	2 Secondary Concern
	Sales and Marketing	1		2	2	2	2				2	2	2	2	1			1	
	Reason for Facility																		
	Start-up	1		1		1	1	2			1	1			1	1	1		
	Expansion	2		2	1	2	1	2					1	1		1	2		
	Relocation	2	2	1		1	1	2			1					1	2		

Source: Compiled findings of site selection surveys, as reported in a variety of industry literature; MKI interviews with firms located in the GGH.

Source: District of Mission, 2010

Table 3-2: Site Location Factors for Manufacturers

Site Selection Factor	% Citing as Important		% Citing as Important
Highway accessibility	91.5	Cost of land	75.7
Availability of skilled labour	88.0	Low union profile	75.0
Occupancy or construction costs	85.7	Nearness to suppliers	65.3
Labour costs	84.8	Right-to-work state	65.0
Availability of telecommunication	82.0	Availability of long-term financing	60.0
Availability of land	81.1	Accessibility to major airport	59.6
State and local incentives	80.9	Availability of unskilled labour	55.8
Energy availability and costs	78.9	Worker/technical programs	54.4
Environmental regulations	78.6	Raw materials availability	53.4
Tax exemptions	77.9	Near technical university	32.7
Nearness to major markets	76.9	Railroad service	26.1
		Waterway/ocean port accessibility	16.8

Source: Area Development, 1998 Corporate Survey

Source: Deschutes County, 2012, p. 53

FIGURE 24: INDUSTRIAL DEVELOPMENT PROFILE MATRIX[7]

	General Site	Clean Tech Campus		Heavy Industrial/ Manufacturing	General Manufacturing	Food Processing	High-Tech Manufacturing Processes	Campus Industrial/ Electronic	Warehouse/ Distribution	Call Center/ Business Services
		Regional	Global							
Physical Site Characteristics										
Net Contiguous Developable Area										
50-100 acres	x	x		x	x	x	x	x	x	x
101-200 acres	x	x	x	x	x	x	x	x	x	x
200+ acres	x	x	x	x	x	x	x	x	x	x
Maximum Slope	5%	5%	5%	5%	5%	5%	7%	10%	5%	12%
Infrastructure										
Transportation										
Auto/Truck	Req	Req	Req	Req	Req	Req	Req	Req	Req	Req
Interstate - Miles	10	15	10	10	20	30	15	10	5	NA
Trip Generation - ADT/Acre	65-192	76-106	76-106	42-58	76-106	76-106	76-106	76-106	65-86	144-192
Rail	Pref	Pref	Pref	Pref	Pref	Pref	NR	NR	Pref	NR
Marine	NA	Pref	Pref	Pref	Pref	Pref	NR	NR	Pref	NR
Airport - Regional Commercial	Pref	Pref	Pref	Pref	Pref	Pref	Pref	Pref	Pref	Pref
Max Distance - Miles	30	60	30	60	60	60	30	30	60	60
Airport - International	Pref	Pref	Pref	Pref	Pref	Pref	Pref	Pref	Pref	Pref
Distance - Miles	300	100	100	300	300	300	100	100	300	300
Water		x	x	x	x	x	x	x	x	x
Min. Domestic Line Size/inches	8	10	8	8	8	10	10	10	4	4
Min. Fire Line Size/inches	10	10	10	10	10	10	10	8	10	8
High Pressure Supply	Pref	Pref	Pref	Pref	Pref	Pref	Pref	Pref	NR	NR
Flow/GPD	50-75,000	74,300	74,300	36,100	17,000	24,900	65,300	74,300	11,700	4,600
Sanitary Sewer	Req	Req	Req	Req	Req	Req	Req	Req	Req	Req
Min. Size/inches	8-10	10	10	8	8	10	10	8	4	4
Natural Gas/Preferred Min./inches		6	6	6	4	6	6	2	2	2
Electricity		x	x	x	x	x	x	x	x	x
Min. Service Demand/kva	30-100 kva	50	100	30	30	30	30	30	10	30
Proximity to Substation	Pref	Req	Req	Pref	Pref	NR	Pref	Pref	NR	Pref
Secondary System Dependency	Pref	Req	Req	Req	NR	NR	Req			
Telecommunications										
High Capacity	Req	Req	Req	Pref	Pref	Pref	Req	Req	Pref	Req
Route Diversity	Pref	Req	Req	NR	NR	NR	Req	Pref	NR	Req
Fiber Optics	Req	Req	Req	Pref	Pref	Pref	Req	Req	Pref	Req
Location										
Workforce/50 Mile Radius	20,000-50,000	50,000	300,000	30,000	30,000	20,000	50,000	50,000	20,000	25,000
Executive & Workforce Housing	Pref									

Req Required
Pref Preferred
NR Not Required
NA Not Applicable

[7] Business Oregon and Johnson Reid

List of Location Factors Discovered in Qualitative Content Analysis

Category	Location Factor	Category	Location Factor	Category	Location Factor	Category	Location Factor
	General transportation		Construction Value		Land area		Land use planning policy
	Road access		Storage facilities		Location		Government structure
	Airport access	Raw Materials	Availability of raw materials		Ownership		Economic development policy
	Rail access		Proximity to markets		Current uses	Government attitude	Incentives
Transportation	Port access		Major projects		Land Value		Emergency Services
	Available Labour		Major employers		Zoning		Educational Institutions
	Population		Market trends - regional		Constraints (environment, man-made)		Recreation/cultural amenities
	Population Forecast		Market trends - resource sector		Developed Infrastructure		Public transit
	Employment by industry		Market trends - manufacturing sector	Industrial site status	Room for expansion		Crime rate
	Employment by occupation		Market trends - service & knowledge sector		General Utilities		Housing stock
Labour	Employment	Markets	Business	Utilities	Water Services	Community amenities	Housing forecast

	forecast		formation				
	Unemployment		Business support organizations		Storm Water Services		Housing value
	Income/wages		Community attitudes		Waste Water Services		Financial institutions
	Age		Land sale history		Electricity Services		
	Gender		Land forecast		Waste Services		
	Education attainment		Surrounding land uses		Natural Gas Services		
	Migration		Municipal taxes		Telecommunications services		
	Ethnicity		Payroll taxes		Temperature		
	Commuting distances	Tax Structure	Corporate taxes	Climate	Precipitation		

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Region	Sub-Region	Initiative Name	Targeted Business Decision Making Level?	Lead agency in collection?	Methodology?	Presentation purpose?	Updated?
BC	Chilliwack	Online map	Tertiary	Local government planners	GIS - passive	Decision support	As information comes in
BC	CLSLink	British Columbia Commercial Real Estate Search	Tertiary	Private	Qualitative - by submission	Marketing	As information comes in
BC	Integrated Cadastral Information Society	Cadastre	Tertiary	Independent agency	GIS - passive	Decision support	Every week
BC	McElhanney	GeoWorks	Tertiary	Private	Ground truthing	Decision support	As information comes in
BC	Landcor	Solutions for real estate and marketing professionals	Tertiary	Private	Qualitative data research	Decision support	As information comes in
BC	Comox Valley Regional District	iMap	Tertiary	Regional government planners	GIS - passive	Decision support	As information comes in
BC	Okanagan Similkameen Regional District	Public Parcels Interactive Mapping	Tertiary	Regional government planners	GIS - passive	Decision support	As information comes in
BC	Kootenay Boundary Regional District	Employment Lands Inventory project	Tertiary	Provincial government	GIS - passive	Decision support	Incomplete
BC	B.C. all	Opportunities B.C.	Tertiary	Provincial government	Qualitative - by submission	Marketing	As information comes in
BC	Northern Development initiative Trust	Invest North West/Invest North Central/Invest North East	Tertiary	Local government economic development officers	Qualitative - by submission	Marketing	As information comes in
BC	Powell River	Available Land	Tertiary	Local government economic development officers	Qualitative data research	Marketing	As information comes in
BC	Vernon	Community Profile	Secondary	Local government economic development officers	Qualitative data research	Marketing	2012 one off
BC	Quesnel	Investment Ready Community Profile	Secondary	Regional government economic development officers	Qualitative data research	Marketing	One off
BC	Surrey	Office and Industrial Land Inventory	Tertiary	Local government economic development officers	Qualitative - by submission	Marketing	Periodically (last Q3 2010)
BC	Prince Rupert	Commercial Property Inventory	Tertiary	Local government economic development officers	Qualitative data research	Marketing	2011 one off
BC	Abbotsford	City in the Country Industrial Lands	Tertiary	Local government planners	Qualitative data research	Marketing	One off
BC	Summerland	Bentley Road Industrial Area Planning Study	Tertiary	Local government planners	Qualitative data research	Strategic	Incomplete
BC	Salmon Arm	Real Estate Inventory Overview	Tertiary	Local government economic development officers	Qualitative data research	Decision support	2000 one off
BC	Coquitlam	Industrial Land Strategy	Secondary	Local government planners	Qualitative data research	Strategic	2007 one off
BC	Bulkley Nechako Regional District	Industrial Land Use Inventory	Tertiary	Consultant	Qualitative data research	Strategic	2010 one off
BC	Kamloops	Industrial Land Review	Tertiary	Local government planners	GIS, qualitative, ground truthing	Strategic	Every five years
BC	West Kelowna	Industrial Land Study	Secondary	Local government planners	Qualitative data research	Strategic	2012 one off
BC	McBride	Industrial Lands Study	Tertiary	Regional government planners	Qualitative data research	Marketing	2012 one off
BC	Robson-Canoe Valleys	Economic Opportunities Plan	Secondary	Consultant	Qualitative data research	Strategic	2010 one off
BC	New Westminster	Industrial Land Strategy	Secondary	Consultant	Remote sensing, ground truthing	Strategic	2007 one off
BC	Nanaimo	Land Inventory & Residential Capacity Analysis	Secondary	Consultant	GIS, qualitative	Strategic	Periodically (2007, 2001, 1997)
BC	Central Okanagan RD	Economic Profile	Secondary	Consultant	Qualitative data research	Marketing	Periodically (2012, 2010)
BC	Richmond	Industrial Strategy	Secondary	Local government planners	Qualitative data research	Strategic	One off
BC	North Cowichan	Commercial/Industrial Lands Needs Analysis	Tertiary	Consultant	Remote sensing, ground truthing	Strategic	2008 one off
BC	Bowen Island	Vacant Crown Land Profiles	Tertiary	Regional government planners	Qualitative data research	Strategic	2008 one off
BC	Cranbrook	Economic Development Strategy Technical Background Report	Tertiary	Consultant	Ground truthing	Strategic	2009 one off
BC	Maple Ridge	Industrial Land Use Study	Secondary	Consultant	Qualitative data research	Strategic	2003 one off
BC	Logan Lake	Industrial and Commercial Land Inventory	Tertiary	Local government economic development officers	Qualitative - by submission	Marketing	2011 one off
BC	Capital Regional District	Industrial Land Use Inventory and Assessment	Secondary	Regional government planners	GIS, qualitative	Strategic	Periodically (2009, 1983)
BC	Tsawwassen First Nation	Industrial Lands Master Plan	Tertiary	Consultant	Qualitative data research	Strategic	2009 one off
BC	Surrey	Employment Lands Strategy	Secondary	Consultant	Qualitative data research	Strategic	2008 one off
BC	Mission	Employment Lands Strategy	Secondary	Local government planners	GIS, qualitative	Strategic	2010 one off
BC	Princeton	Industrial Estates Marketing Strategy	Tertiary	Consultant	Qualitative data research	Strategic	2010 one off
BC	Prince Rupert & Port Edward	Investment Ready Community Profile	Secondary	Regional government economic development officers	Qualitative data research	Marketing	One off
BC	Williams Lake	Investment Ready Community Profile	Secondary	Regional government economic development officers	Qualitative data research	Marketing	One off
BC	Metro Vancouver	Industrial Lands Inventory	Secondary	Regional government planners	GIS, qualitative	Strategic	Every five years
BC	Squamish	Retail, Commercial and Industrial Trade and Marketing Strategy	Secondary	Consultant	Qualitative surveys	Strategic	2005 one off
BC	North Peace	Heavy Industrial Lands Study	Secondary	Regional government planners	Qualitative data research	Strategic	2012 one off
BC	Salt Spring Island	Industrial Task Force Final Report	Tertiary	Regional government planners	Qualitative data research	Strategic	2009 one off
BC	Galiano Island	Vacant Crown Land Profiles	Tertiary	Regional government planners	Qualitative data research	Strategic	2006 one off
BC	Denman Island	Vacant Crown Land Profiles	Tertiary	Regional government planners	Qualitative data research	Strategic	2004 one off
BC	Valdes Island	Vacant Crown Land Profiles	Tertiary	Regional government planners	Qualitative data research	Strategic	2011 one off
BC	Lasqueti Island	Vacant Crown Land Profiles	Tertiary	Regional government planners	Qualitative data research	Strategic	2005 one off
BC	Mayne Island	Vacant Crown Land Profiles	Tertiary	Regional government planners	Qualitative data research	Strategic	2000 one off
BC	Hornby Island	Vacant Crown Land Profiles	Tertiary	Regional government planners	Qualitative data research	Strategic	2006 one off
AB	Edmonton	Industrial Land Supply and Demand Study	Secondary	Consultant	GIS, qualitative, ground truthing	Strategic	2011 one off

		Transportation					Labour													
Sub-Region	Initiative Name	General transportation	Road access	Airport access	Rail access	Port access	Available Labour	Population	Population Forecast	Employment by industry	Employment by occupation	Employment forecast	Unemployment	Income/wages	Age	Gender	Education attainment	Migration	Ethnicity	Commuting distances
Chilliwack	Online map		Y	Y	Y															
CLSLink	British Columbia Commercial Real Estate Search		Y	Y	Y															
Integrated Cadastral Information Society	Cadastre	Y																		
McElhanney	GeoWorks	Y																		
Landcor	Solutions for real estate and marketing professionals																			
Comox Valley Regional District	iMap		Y																	
Okanagan Similkameen Regional District	Public Parcels Interactive Mapping																			
Kootenay Boundary Regional District	Employment Lands Inventory project																			
B.C. all	Opportunities B.C.		Y	Y	Y	Y	Y													
Northern Development initiative Trust	Invest North West/Invest North Central/Invest North East		Y	Y	Y	Y														
Powell River	Available Land																			
Vernon	Community Profile		Y	Y	Y	Y		Y	Y	Y	Y		Y	Y	Y	Y	Y		Y	Y
Quesnel	Investment Ready Community Profile		Y	Y	Y	Y		Y		Y	Y		Y	Y	Y	Y	Y		Y	
Surrey	Office and Industrial Land Inventory		Y																	
Prince Rupert	Commercial Property Inventory																			
Abbotsford	City in the Country Industrial Lands		Y	Y	Y															
Summerland	Bentley Road Industrial Area Planning Study		Y	Y				Y		Y										
Salmon Arm	Real Estate Inventory Overview																			
Coquitlam	Industrial Land Strategy		Y				Y			Y										
Bulkley Nechako Regional District	Industrial Land Use Inventory		Y	Y	Y	Y		Y		Y	Y			Y	Y		Y			
Kamloops	Industrial Land Review		Y	Y	Y															
West Kelowna	Industrial Land Study							Y	Y											
McBride	Industrial Lands Study		Y	Y	Y															
Robson-Canoe Valleys	Economic Opportunities Plan		Y	Y				Y		Y	Y		Y	Y	Y		Y			
New Westminster	Industrial Land Strategy		Y																	
Nanaimo	Land Inventory & Residential Capacity Analysis							Y	Y											
Central Okanagan RD	Economic Profile		Y	Y	Y			Y	Y	Y	Y		Y	Y	Y	Y	Y	Y	Y	
Richmond	Industrial Strategy																			
North Cowichan	Commercial/Industrial Lands Needs Analysis		Y		Y	Y		Y	Y	Y										
Bowen Island	Vacant Crown Land Profiles		Y																	
Cranbrook	Economic Development Strategy Technical Background Report		Y	Y	Y			Y		Y	Y		Y	Y	Y		Y	Y		
Maple Ridge	Industrial Land Use Study							Y		Y										
Logan Lake	Industrial and Commercial Land Inventory																			
Capital Regional District	Industrial Land Use Inventory and Assessment		Y				Y					Y								
Tsawwassen First Nation	Industrial Lands Master Plan		Y		Y	Y														
Surrey	Employment Lands Strategy		Y	Y	Y			Y	Y	Y	Y	Y								
Mission	Employment Lands Strategy							Y	Y	Y		Y			Y	Y	Y			
Princeton	Industrial Estates Marketing Strategy		Y					Y	Y	Y			Y	Y						
Prince Rupert & Port Edward	Investment Ready Community Profile		Y	Y	Y	Y		Y		Y	Y		Y	Y	Y		Y		Y	Y
Williams Lake	Investment Ready Community Profile		Y	Y	Y	Y		Y		Y	Y		Y	Y	Y		Y		Y	Y
Metro Vancouver	Industrial Lands Inventory																			
Squamish	Retail, Commercial and Industrial Trade and Marketing Strategy	Y								Y		Y								Y
North Peace	Heavy Industrial Lands Study		Y																	
Salt Spring Island	Industrial Task Force Final Report		Y																	
Galiano Island	Vacant Crown Land Profiles		Y																	
Denman Island	Vacant Crown Land Profiles		Y																	
Valdes Island	Vacant Crown Land Profiles		Y																	
Lasqueti Island	Vacant Crown Land Profiles		Y																	
Mayne Island	Vacant Crown Land Profiles																			
Hornby Island	Vacant Crown Land Profiles																			
Edmonton	Industrial Land Supply and Demand Study							Y	Y	Y		Y								

		Raw Materials			Markets												
Sub-Region	Initiative Name	Construction Value	Storage facilities	Availability of raw materials	Proximity to markets	Major projects	Major employers	Market trends - regional	Market trends - resource sector	Market trends - manufacturing sector	Market trends - service & knowledge sector	Business formaion	Business support organizations	Community attitudes	Land sale history	Land forecast	Surrounding land uses
Chilliwack	Online map																
CLSLink	British Columbia Commercial Real Estate Search																
Integrated Cadastral Information Society	Cadastre																
McElhanney	GeoWorks								Y								
Landcor	Solutions for real estate and marketing professionals														Y		
Comox Valley Regional District	iMap																
Okanagan Similkameen Regional District	Public Parcels Interactive Mapping																
Kootenay Boundary Regional District	Employment Lands Inventory project																
B.C. all	Opportunities B.C.				Y												Y
Northern Development initiative Trust	Invest North West/Invest North Central/Invest North East																Y
Powell River	Available Land																
Vernon	Community Profile	Y	Y		Y		Y						Y				
Quesnel	Investment Ready Community Profile												Y				Y
Surrey	Office and Industrial Land Inventory																
Prince Rupert	Commercial Property Inventory																Y
Abbotsford	City in the Country Industrial Lands																
Summerland	Bentley Road Industrial Area Planning Study													Y			Y
Salmon Arm	Real Estate Inventory Overview	Y															
Coquitlam	Industrial Land Strategy							Y						Y			Y
Bulkley Nechako Regional District	Industrial Land Use Inventory					Y			Y		Y					Y	
Kamloops	Industrial Land Review							Y						Y			
West Kelowna	Industrial Land Study							Y						Y			Y
McBride	Industrial Lands Study																
Robson-Canoe Valleys	Economic Opportunities Plan	Y			Y				Y		Y		Y	Y			
New Westminster	Industrial Land Strategy						Y										
Nanaimo	Land Inventory & Residential Capacity Analysis																
Central Okanagan RD	Economic Profile	Y			Y	Y			Y		Y	Y	Y				
Richmond	Industrial Strategy																
North Cowichan	Commercial/Industrial Lands Needs Analysis	Y				Y		Y						Y			Y
Bowen Island	Vacant Crown Land Profiles			Y													
Cranbrook	Economic Development Strategy Technical Background Report	Y					Y		Y	Y	Y			Y			
Maple Ridge	Industrial Land Use Study		Y					Y	Y			Y					Y
Logan Lake	Industrial and Commercial Land Inventory																
Capital Regional District	Industrial Land Use Inventory and Assessment							Y				Y		Y		Y	
Tsawwassen First Nation	Industrial Lands Master Plan							Y									
Surrey	Employment Lands Strategy						Y	Y						Y		Y	Y
Mission	Employment Lands Strategy										Y			Y			
Princeton	Industrial Estates Marketing Strategy	Y			Y			Y				Y		Y			
Prince Rupert & Port Edward	Investment Ready Community Profile						Y						Y				
Williams Lake	Investment Ready Community Profile						Y						Y				
Metro Vancouver	Industrial Lands Inventory																
Squamish	Retail, Commercial and Industrial Trade and Marketing Strategy					Y			Y	Y	Y		Y	Y		Y	
North Peace	Heavy Industrial Lands Study																
Salt Spring Island	Industrial Task Force Final Report				Y									Y			
Galiano Island	Vacant Crown Land Profiles			Y													
Denman Island	Vacant Crown Land Profiles			Y													
Valdes Island	Vacant Crown Land Profiles			Y													
Lasqueti Island	Vacant Crown Land Profiles			Y													
Mayne Island	Vacant Crown Land Profiles															Y	
Hornby Island	Vacant Crown Land Profiles													Y			
Edmonton	Industrial Land Supply and Demand Study	Y						Y	Y							Y	Y

		Industrial site status									Utilities							
Sub-Region	Initiative Name	Land area	Location	Ownership	Current uses	Land Value	Zoning	Constraints	Developed Infrastructure	Room for expansion	General Utilities	Water Services	Storm Water Services	Waste Water Services	Electricity Services	Waste Services	Natural Gas Services	Telecommunications services
Chilliwack	Online map	Y	Y		Y	Y	Y	Y				Y	Y	Y				
CLSLink	British Columbia Commercial Real Estate Search	Y	Y		Y	Y	Y	Y	Y						Y			
Integrated Cadastral Information Society	Cadastre		Y	Y		Y	Y	Y			Y							
McElhanney	GeoWorks		Y					Y										
Landcor	Solutions for real estate and marketing professionals	Y	Y		Y	Y			Y					Y				
Comox Valley Regional District	iMap	Y	Y				Y	Y										
Okanagan Similkameen Regional District	Public Parcels Interactive Mapping	Y	Y			Y	Y	Y								Y		
Kootenay Boundary Regional District	Employment Lands Inventory project																	
B.C. all	Opportunities B.C.	Y	Y			Y	Y		Y			Y		Y	Y		Y	Y
Northern Development initiative Trust	Invest North West/Invest North Central/Invest North East	Y	Y	Y		Y	Y					Y		Y	Y		Y	Y
Powell River	Available Land	Y	Y	Y		Y	Y	Y				Y	Y	Y	Y		Y	
Vernon	Community Profile											Y		Y	Y		Y	Y
Quesnel	Investment Ready Community Profile	Y					Y					Y		Y	Y		Y	Y
Surrey	Office and Industrial Land Inventory	Y	Y	Y		Y	Y		Y		Y							
Prince Rupert	Commercial Property Inventory	Y	Y	Y	Y	Y	Y				Y							
Abbotsford	City in the Country Industrial Lands	Y	Y				Y				Y							
Summerland	Bentley Road Industrial Area Planning Study	Y	Y		Y	Y		Y				Y	Y	Y	Y			Y
Salmon Arm	Real Estate Inventory Overview	Y				Y												
Coquitlam	Industrial Land Strategy	Y					Y											
Bulkley Nechako Regional District	Industrial Land Use Inventory	Y		Y	Y		Y	Y	Y						Y		Y	Y
Kamloops	Industrial Land Review	Y			Y		Y	Y	Y	Y		Y	Y	Y	Y			
West Kelowna	Industrial Land Study	Y					Y											
McBride	Industrial Lands Study	Y	Y	Y				Y		Y		Y		Y	Y		Y	Y
Robson-Canoe Valleys	Economic Opportunities Plan	Y					Y								Y			Y
New Westminster	Industrial Land Strategy	Y	Y	Y	Y		Y			Y								
Nanaimo	Land Inventory & Residential Capacity Analysis	Y					Y	Y										
Central Okanagan RD	Economic Profile	Y													Y	Y		
Richmond	Industrial Strategy	Y					Y											
North Cowichan	Commercial/Industrial Lands Needs Analysis	Y			Y		Y	Y	Y									
Bowen Island	Vacant Crown Land Profiles	Y	Y		Y				Y			Y		Y				Y
Cranbrook	Economic Development Strategy Technical Background Report	Y	Y	Y		Y												
Maple Ridge	Industrial Land Use Study	Y			Y	Y	Y			Y	Y							
Logan Lake	Industrial and Commercial Land Inventory	Y	Y			Y	Y		Y						Y		Y	
Capital Regional District	Industrial Land Use Inventory and Assessment	Y					Y	Y										
Tsawwassen First Nation	Industrial Lands Master Plan	Y	Y					Y										
Surrey	Employment Lands Strategy	Y				Y	Y											
Mission	Employment Lands Strategy	Y				Y	Y											
Princeton	Industrial Estates Marketing Strategy	Y				Y	Y				Y							
Prince Rupert & Port Edward	Investment Ready Community Profile	Y			Y							Y	Y	Y	Y		Y	Y
Williams Lake	Investment Ready Community Profile	Y					Y					Y	Y	Y	Y	Y	Y	Y
Metro Vancouver	Industrial Lands Inventory	Y					Y	Y										
Squamish	Retail, Commercial and Industrial Trade and Marketing Strategy	Y													Y			Y
North Peace	Heavy Industrial Lands Study	Y					Y					Y		Y	Y		Y	
Salt Spring Island	Industrial Task Force Final Report	Y	Y	Y			Y	Y				Y		Y	Y			
Galiano Island	Vacant Crown Land Profiles	Y	Y		Y			Y				Y		Y				Y
Denman Island	Vacant Crown Land Profiles	Y	Y		Y			Y				Y		Y				Y
Valdes Island	Vacant Crown Land Profiles	Y	Y		Y			Y				Y		Y				Y
Lasqueti Island	Vacant Crown Land Profiles	Y	Y		Y			Y				Y		Y				Y
Mayne Island	Vacant Crown Land Profiles	Y			Y		Y									Y		
Hornby Island	Vacant Crown Land Profiles	Y			Y			Y										
Edmonton	Industrial Land Supply and Demand Study	Y					Y	Y		Y	Y							

		Government attitude				Tax Structure			Climate		Community amenities								
Sub-Region	Initiative Name	Land use planning policy	Government structure	Economic development policy	Incentives	Municipal taxes	Payroll taxes	Corporate taxes	Temperature	Precipitation	Emergency Services	Educational Institutions	Recreation/cultural amenities	Public transit	Crime rate	Housing stock	Housing forecast	Housing value	Financial institutions
Chilliwack	Online map	Y									Y	Y							
CLSLink	British Columbia Commercial Real Estate Search												Y	Y					
Integrated Cadastral Information Society	Cadastre																		
McElhanney	GeoWorks																		
Landcor	Solutions for real estate and marketing professionals													Y					
Comox Valley Regional District	iMap	Y																	
Okanagan Similkameen Regional District	Public Parcels Interactive Mapping												Y						
Kootenay Boundary Regional District	Employment Lands Inventory project																		
B.C. all	Opportunities B.C.												Y						
Northern Development initiative Trust	Invest North West/Invest North Central/Invest North East	Y				Y													
Powell River	Available Land										Y								
Vernon	Community Profile		Y			Y	Y	Y	Y	Y	Y	Y	Y		Y	Y		Y	
Quesnel	Investment Ready Community Profile	Y	Y			Y	Y	Y				Y				Y		Y	Y
Surrey	Office and Industrial Land Inventory																		
Prince Rupert	Commercial Property Inventory					Y								Y					
Abbotsford	City in the Country Industrial Lands			Y	Y	Y													
Summerland	Bentley Road Industrial Area Planning Study	Y										Y							
Salmon Arm	Real Estate Inventory Overview					Y													
Coquitlam	Industrial Land Strategy	Y																	
Bulkley Nechako Regional District	Industrial Land Use Inventory	Y		Y															
Kamloops	Industrial Land Review																		
West Kelowna	Industrial Land Study																		
McBride	Industrial Lands Study	Y									Y								
Robson-Canoe Valleys	Economic Opportunities Plan	Y		Y		Y					Y		Y		Y			Y	
New Westminster	Industrial Land Strategy	Y													Y				
Nanaimo	Land Inventory & Residential Capacity Analysis	Y														Y	Y		
Central Okanagan RD	Economic Profile		Y			Y	Y		Y	Y	Y	Y	Y		Y	Y		Y	
Richmond	Industrial Strategy	Y																	
North Cowichan	Commercial/Industrial Lands Needs Analysis	Y		Y															
Bowen Island	Vacant Crown Land Profiles	Y																	
Cranbrook	Economic Development Strategy Technical Background Report																		
Maple Ridge	Industrial Land Use Study	Y																	
Logan Lake	Industrial and Commercial Land Inventory					Y													
Capital Regional District	Industrial Land Use Inventory and Assessment	Y																	
Tsawwassen First Nation	Industrial Lands Master Plan																		
Surrey	Employment Lands Strategy	Y												Y					
Mission	Employment Lands Strategy																		
Princeton	Industrial Estates Marketing Strategy					Y													
Prince Rupert & Port Edward	Investment Ready Community Profile	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y			Y		Y	Y
Williams Lake	Investment Ready Community Profile	Y	Y			Y	Y	Y	Y	Y	Y	Y	Y			Y		Y	Y
Metro Vancouver	Industrial Lands Inventory	Y																	
Squamish	Retail, Commercial and Industrial Trade and Marketing Strategy	Y		Y								Y							
North Peace	Heavy Industrial Lands Study	Y									Y								
Salt Spring Island	Industrial Task Force Final Report	Y																	
Galiano Island	Vacant Crown Land Profiles	Y																	
Denman Island	Vacant Crown Land Profiles	Y																	
Valdes Island	Vacant Crown Land Profiles	Y																	
Lasqueti Island	Vacant Crown Land Profiles	Y																	
Mayne Island	Vacant Crown Land Profiles	Y																	
Hornby Island	Vacant Crown Land Profiles	Y																	
Edmonton	Industrial Land Supply and Demand Study																Y		

AB	Wood Buffalo	Commercial and Industrial Land Use Study	Secondary	Consultant	Ground truthing	Strategic	Periodically (2011, 2007)	Y						Y	Y	Y		Y								Y		Y				Y				Y		Y		Y	Y	Y		Y	Y		Y	Y				Y		Y	Y		Y		Y														
AB	Fort Saskatchewan	Industrial Opportunities Package	Tertiary	Local government economic development officers	Qualitative data research	Marketing	2013 one off	Y																													Y				Y	Y	Y			Y	Y	Y			Y								Y														
AB	Cypress County	Commercial & Industrial Land Inventory	Tertiary	Regional government economic development officers	Qualitative data research	Marketing	2009 one off		Y		Y					Y				Y						Y					Y											Y	Y	Y		Y	Y				Y												Y	Y	Y	Y		Y		Y		Y	
AB	Bow Island	Commercial & Industrial Land Inventory	Tertiary	Regional government economic development officers	Qualitative data research	Marketing	2009 one off		Y	Y	Y					Y				Y						Y					Y											Y	Y	Y		Y	Y				Y												Y	Y	Y	Y		Y		Y		Y	
AB	Calgary	Land Supply	Tertiary	Local government planners	Qualitative surveys	Strategic	Incomplete																																		Y	Y				Y																										
AB	Olds	Industrial Land Opportunity	Tertiary	Real estate boards	Qualitative data research	Marketing	2010 one off		Y		Y																	Y	Y	Y											Y	Y	Y			Y					Y								Y		Y						Y						
AB	Foothills	Site Selection Guide	Tertiary	Regional government economic development officers	Qualitative data research	Marketing	As information comes in		Y	Y	Y					Y	Y			Y	Y		Y			Y			Y			Y				Y	Y				Y	Y	Y	Y								Y		Y	Y		Y	Y					Y	Y	Y	Y	Y	Y	Y	Y		Y	Y
AB	Grande Prairie	Vacant Lands Map	Tertiary	Local government economic development officers	GIS - passive	Marketing	As information comes in																																	Y	Y	Y																													
AB	Central Alberta	Undeveloped Industrial Land Opportunity Profile	Tertiary	Regional government economic development officers	Qualitative data research	Marketing	Unknown		Y	Y	Y																	Y			Y										Y	Y			Y																										
AB	Lacombe	Industrial Land for Sale	Tertiary	Local government economic development officers	Qualitative data research	Marketing	As information comes in																																		Y	Y			Y	Y																									
AB	Mile County	Commercial & Industrial Land Inventory	Tertiary	Regional government economic development officers	Qualitative data research	Marketing	2009 one off		Y	Y	Y					Y				Y						Y					Y											Y	Y	Y		Y	Y				Y												Y	Y	Y	Y		Y		Y			
AB	Alberta provincial government	Land Information Inventory	Tertiary	Provincial government	Qualitative surveys	Strategic	2007 one off		Y																																				Y		Y																									
AB	St. Albert	Potential Industrial Lands	Tertiary	Local government planners	Qualitative data research	Strategic	2011 one off		Y		Y		Y					Y									Y					Y									Y	Y	Y			Y		Y		Y	Y							Y	Y															
AB	Red Deer	Municipally Owned Industrial Land Info Package	Tertiary	Local government economic development officers	Qualitative data research	Marketing	2013 one off																													Y					Y	Y			Y	Y	Y				Y	Y	Y	Y		Y		Y														
AB	Okotoks	Industrial Lands Marketing Package	Tertiary	Local government economic development officers	Qualitative data research	Marketing	2013 one off		Y	Y				Y															Y													Y	Y			Y	Y				Y								Y														
AB	Slave Lake	2035 Growth Study	Secondary	Consultant	Qualitative data research	Strategic	2007 one off		Y	Y	Y			Y	Y														Y	Y			Y							Y	Y	Y					Y	Y				Y	Y	Y					Y		Y		Y			Y	Y			Y			
AB	Capital Regional Board	Land Use Plan	Secondary	Regional government planners	Qualitative data research	Strategic	Incomplete		Y						Y			Y																			Y					Y									Y		Y	Y		Y		Y										Y				
AB	Banff	Commercial Capacity Study	Secondary	Consultant	GIS, qualitative, ground truthing	Strategic	Periodically (2007, 1996, 1995, 1994, 1992, 1986)																								Y			Y							Y	Y	Y	Y		Y												Y														
AB	Industrial Heartland	Area Structure Plan	Secondary	Consultant	Qualitative data research	Strategic	2007 one off		Y		Y																				Y									Y			Y	Y		Y	Y				Y	Y	Y	Y		Y	Y	Y							Y							
ON	Sault St. Marie	Industrial lands	Tertiary	Local government planners	Qualitative data research	Decision support	2012 one off		Y					Y																Y												Y		Y		Y													Y														
ON	Toronto	Property Search	Tertiary	Independent agency	Qualitative - by submission	Marketing	As information comes in		Y		Y																													Y	Y	Y	Y			Y								Y														Y				
ON	Brantford	Additional Employment Lands	Tertiary	Local government economic development officers	Qualitative data research	Strategic	2012 one off											Y													Y				Y			Y			Y	Y	Y		Y	Y				Y								Y		Y		Y										
ON	Waterloo	Industrial and Business Park Vacant Land Inventory and Demand Analysis	Tertiary	Local government economic development officers	GIS, qualitative	Strategic	2005 one off		Y		Y							Y								Y						Y							Y	Y		Y	Y	Y	Y	Y	Y	Y			Y								Y		Y												
ON	Oxford County	Vacant Lands Study	Secondary	Consultant	GIS, qualitative, ground truthing	Strategic	2009 one off		Y		Y							Y																							Y					Y	Y			Y								Y												Y		
ON	North Grenville	Available Land Inventory	Tertiary	Local government economic development officers	Qualitative - by submission	Marketing	2011 one off		Y																															Y	Y	Y	Y	Y	Y	Y	Y				Y		Y	Y			Y																
ON	Kitchener	Employment Lands Study	Tertiary	Local government collaboration	Qualitative data research	Strategic	2010 one off		Y		Y				Y	Y		Y													Y										Y	Y	Y		Y			Y		Y					Y				Y		Y								Y				
ON	Guelph	Available Employment Land	Tertiary	Private	Qualitative - by submission	Marketing	As information comes in		Y				Y															Y												Y	Y	Y			Y	Y				Y				Y								Y				Y						
ON	Peel Region	Employment and Employment Lands	Secondary	Regional government planners	Qualitative data research	Strategic	2010 one off	Y								Y		Y								Y			Y			Y						Y		Y		Y									Y								Y			Y	Y										
ON	Richmond Hill	Vacant Employment Land Inventory	Tertiary	Local government economic development officers	Qualitative data research	Strategic	2009 one off							Y					Y				Y			Y					Y										Y	Y	Y	Y		Y	Y																Y										
ON	Cramahe	Available Lands and Building Inventory	Tertiary	Local government economic development officers	Qualitative - by submission	Marketing	As information comes in		Y																																Y	Y	Y		Y	Y	Y				Y		Y	Y		Y																	
ON	Hamilton	Focusing efforts on employment lands	Tertiary	Consultant	Qualitative data research	Strategic	Periodically (between 2008 and 2002)		Y	Y	Y							Y								Y				Y		Y								Y	Y	Y			Y		Y								Y				Y														
ON	Collingwood	Industrial Land Strategy	Secondary	Consultant	Employment based	Strategic	2007 one off		Y					Y	Y	Y		Y								Y								Y	Y	Y				Y		Y																Y														
ON	Burlington	Employment Lands Study	Tertiary	Consultant	Employment based	Strategic	Periodically (between 2011 and 2000)		Y							Y		Y																	Y		Y		Y		Y	Y		Y		Y			Y	Y								Y														
ON	Seine River First Nation	Industrial Park Business Plan	Tertiary	First Nation	Qualitative data research	Strategic	2010 one off		Y		Y																	Y				Y									Y	Y			Y					Y	Y	Y	Y	Y			Y		Y			Y			Y							
ON	Welland	Vacant Industrial and Development Lands and Vacant Buildings	Tertiary	Local government economic development officers	Qualitative data research	Marketing	2013 one off		Y	Y	Y	Y																Y												Y	Y	Y		Y		Y		Y		Y							Y				Y											
ON	Sudbury	Industrial Land Infrastructure Strategy	Tertiary	Local government planners	Qualitative - by submission	Strategic	As information comes in		Y																																Y	Y									Y		Y																				
ON	Northern Ontario	Investment Readiness Test	Primary	Provincial government	Qualitative - by submission	Decision support	2013 one off		Y	Y	Y	Y				Y				Y	Y	Y	Y			Y	Y		Y	Y	Y	Y				Y	Y				Y	Y		Y		Y	Y	Y				Y		Y	Y		Y	Y	Y		Y		Y	Y		Y	Y	Y					Y
ON	Ottawa	Inventory of Vacant Industrial and Business Park Lands	Tertiary	Local government planners	GIS	Strategic	Every two years		Y		Y							Y																							Y	Y	Y	Y						Y																						
ON	York Region	Vacant Employment Land Inventory	Tertiary	Regional government planners	GIS, qualitative	Strategic	Periodically (2005, 2002, 2001)		Y		Y							Y																							Y			Y			Y			Y																						
WSH	Lewis County	Industrial Park at Transalta	Tertiary	Consultant	Qualitative data research	Strategic	Periodically (2009, 2005, 1998, 1997)		Y		Y	Y		Y	Y	Y			Y	Y	Y				Y				Y	Y				Y				Y			Y	Y	Y				Y	Y			Y	Y		Y	Y		Y	Y	Y		Y	Y	Y	Y	Y	Y						Y	
WSH	Kitsap County	Buildable Lands Report	Secondary	Consultant	GIS, qualitative	Strategic	Every five years							Y	Y	Y		Y																					Y		Y					Y	Y				Y		Y					Y												Y	Y		
WSH	Port of Kalama	Industrial Properties	Tertiary	Independent agency	Qualitative data research	Marketing	As information comes in		Y	Y	Y	Y															Y		Y													Y	Y									Y			Y		Y	Y				Y											
WSH	Spokane	Certified Sites Program	Tertiary	Independent agency	Qualitative - by submission	Marketing	As information comes in		Y	Y	Y	Y															Y		Y												Y	Y	Y					Y	Y			Y		Y	Y		Y	Y	Y			Y				Y							
WSH	Walla Walla	Available Industrial Sites	Tertiary	Independent agency	Qualitative data research	Marketing	As information comes in		Y	Y	Y																													Y	Y	Y			Y	Y					Y		Y	Y		Y	Y								Y							
WSH	Washington State	Industrial land banks	Tertiary	Provincial government	Qualitative - by submission	Decision support	Every five years	Y						Y					Y										Y													Y																	Y														
WSH	Kirkland	Industrial Zoning	Secondary	Consultant	Ground truthing	Strategic	2005 one off									Y		Y		Y	Y																Y		Y		Y				Y	Y												Y													Y	
WSH	Whatcom County	Columbia Valley Urban Growth Area Proposal	Secondary	Regional government planners	GIS, qualitative	Strategic	2009 one off						Y	Y																										Y					Y	Y				Y		Y					Y							Y	Y						
WSH	Whitman County	Inland & Water Sites	Tertiary	Independent agency	Qualitative - by submission	Marketing	As information comes in		Y	Y	Y	Y															Y															Y	Y		Y									Y	Y		Y	Y	Y														
WSH	Bellingham	Employment Lands Report	Secondary	Local government planners	GIS, qualitative	Strategic	2008 one off							Y		Y		Y													Y					Y				Y		Y					Y																									
WSH	Sunnyside	Comprehensive Plan	Secondary	Local government planners	Qualitative data research	Strategic	2007 one off		Y	Y			Y	Y	Y					Y	Y			Y								Y								Y		Y	Y		Y		Y	Y				Y	Y	Y	Y	Y	Y	Y	Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
WSH	East Wenachee	Comprehensive Plan	Secondary	Local government planners	Qualitative data research	Strategic	Every seven years		Y	Y			Y	Y	Y				Y	Y												Y								Y		Y	Y		Y		Y	Y				Y	Y	Y	Y	Y	Y	Y	Y		Y		Y			Y	Y	Y	Y	Y	Y	Y	
WSH	Snohomish County	Buildable Lands Report	Secondary	Consultant	GIS, qualitative	Strategic	Every five years						Y	Y	Y				Y																						Y			Y			Y												Y												Y			
WSH	Washington State	Buildable Lands Program Evaluation Report	Primary	Provincial government	Qualitative - by submission	Strategic	2003 one off							Y																									Y		Y																	Y														
WSH	Centralia	Comprehensive Plan	Secondary	Consultant	Qualitative data research	Strategic	Every five years		Y	Y		Y	Y	Y	Y					Y											Y	Y								Y			Y		Y		Y	Y				Y	Y	Y	Y	Y	Y	Y	Y		Y			Y	Y	Y	Y	Y	Y	Y	Y	
WSH	Shelton	Comprehensive Plan	Secondary	Consultant	Qualitative data research	Strategic	Periodically (2007, 2005, 2004)		Y	Y		Y	Y	Y	Y				Y																					Y		Y	Y		Y		Y	Y				Y	Y	Y	Y	Y	Y	Y	Y		Y					Y	Y	Y	Y	Y	Y	Y	

WSH	Clark County	Buildable Lands Report	Secondary	Regional government planners	GIS, qualitative, ground truthing	Strategic	Every five years					Y	Y	Y				Y								Y													Y		Y						Y	Y										Y									Y		
WSH	Pierce County	Buildable Lands Report	Secondary	Regional government planners	Qualitative data research	Strategic	Every five years					Y	Y	Y			Y																						Y					Y													Y									Y		
WSH	King County	Buildable Lands Report	Secondary	Regional government planners	Qualitative data research	Strategic	Every five years					Y					Y									Y														Y			Y		Y	Y											Y									Y	Y	
WSH	Seattle	Industrial Lands Survey	Secondary	Consultant	Qualitative data research	Strategic	2007 one off	Y	Y	Y	Y				Y		Y		Y									Y	Y	Y		Y				Y	Y			Y	Y		Y		Y	Y	Y											Y									Y			
ORE	Northwest Oregon	Industrial Lands Database	Tertiary	Independent agency	Qualitative - by submission	Marketing	As information comes in		Y	Y	Y																			Y												Y	Y	Y	Y	Y	Y	Y	Y	Y		Y	Y	Y	Y		Y	Y											
ORE	Medford	Buildable Land Inventory	Secondary	Local government planners	GIS, qualitative	Strategic	Periodically (2008, 2006, 1994, 1993)																																			Y					Y	Y											Y											
ORE	Ashland	Buildable Lands Inventory	Secondary	Local government economic development officers	GIS, qualitative	Strategic	2008 one off						Y	Y						Y																					Y		Y					Y	Y											Y									Y	Y	
ORE	Business Oregon	Application for Industrial Site Certification	Tertiary	Independent agency	Qualitative - by submission	Marketing	As information comes in	Y	Y	Y	Y																															Y	Y	Y		Y	Y	Y	Y			Y		Y	Y		Y	Y	Y		Y			Y						
ORE	Monmouth	Industrial land	Tertiary	Local government economic development officers	Qualitative data research	Marketing	As information comes in	Y																																			Y																										
ORE	Clackamas County	Industrial Lands Inventory	Tertiary	Regional government economic development officers	Qualitative data research	Strategic	2011 one off																																			Y	Y	Y				Y																					
ORE	Wasco County	Buildable Lands Study for Unincorporated Areas	Secondary	Regional government planners	GIS, qualitative	Strategic	2009 one off						Y	Y																													Y					Y	Y											Y						Y				Y	Y	
ORE	Salem Keizer	Regional Economic Opportunities Analysis	Secondary	Consultant	Qualitative data research	Strategic	2011 one off	Y	Y	Y				Y		Y		Y	Y	Y	Y		Y			Y				Y			Y			Y				Y		Y				Y	Y	Y			Y	Y		Y					Y			Y							
ORE	Astoria	Airport Master Plan Update	Tertiary	Consultant	Qualitative data research	Strategic	Unknown	Y	Y																													Y	Y	Y		Y			Y		Y																			
ORE	Bend	Juniper Ridge development plan	Tertiary	Local government planners	Qualitative data research	Strategic	Incomplete																																			Y					Y	Y				Y	Y	Y	Y		Y	Y	Y								Y			
ORE	Central Oregon	Large Lot Industrial Land Need Analysis	Secondary	Consultant	Qualitative data research	Strategic	2012 one off	Y	Y	Y				Y		Y		Y	Y	Y			Y					Y	Y		Y		Y				Y			Y	Y				Y						Y																	
ORE	Wilsonville	Economic Opportunity Analysis Report	Secondary	Consultant	GIS, qualitative	Strategic	2008 one off	Y						Y	Y			Y		Y										Y	Y	Y			Y				Y	Y	Y											Y		Y			Y	Y						Y	Y	Y			
ORE	Eagle Point	Buildable Lands Analysis	Secondary	Local government planners	GIS, qualitative	Strategic	2001 one off	Y						Y	Y	Y		Y		Y	Y	Y	Y		Y					Y	Y		Y							Y			Y					Y	Y				Y		Y				Y	Y									Y	Y	
ORE	Springfield	Commercial and Industrial Buildable Lands Inventory and Economic Opportunities Analysis	Secondary	Consultant	GIS, qualitative	Strategic	2009 one off	Y	Y	Y				Y	Y	Y		Y		Y	Y		Y		Y	Y			Y	Y			Y	Y	Y	Y				Y			Y					Y	Y				Y		Y					Y	Y		Y				Y				
ORE	Eugene	Industrial Land Technical Summaries	Secondary	Local government economic development officers	Qualitative data research	Strategic	2012 one off	Y		Y				Y			Y																					Y		Y			Y		Y																						
ORE	Newport	Commercial and Industrial Buildable Lands Inventory and Economic Opportunities Analysis	Secondary	Consultant	GIS, qualitative	Strategic	2012 one off	Y	Y	Y	Y		Y	Y	Y		Y	Y	Y	Y		Y		Y	Y			Y				Y	Y		Y				Y		Y					Y	Y				Y		Y					Y	Y		Y			Y					
ORE	Portland-Vancouver	Regional Industrial Land Study	Secondary	Consultant	GIS, qualitative	Strategic	1999 one off		Y	Y	Y		Y	Y	Y		Y		Y													Y					Y		Y		Y					Y	Y											Y											
ORE	Portland	Regional Industrial Site Readiness Project	Tertiary	Consultant	GIS, qualitative	Strategic	2012 one off	Y		Y																				Y									Y	Y	Y	Y			Y			Y	Y	Y	Y	Y															
ORE	DLCD	Goal 9 Guidebook	Primary	Provincial government	Qualitative - by submission	Decision support	2005 one off																									Y							Y																			Y	Y										
ORE	Metro Portland	Urban Growth Report	Secondary	Consultant	Qualitative data research	Strategic	Periodically (2010, 2002)	Y		Y		Y			Y		Y		Y												Y					Y		Y		Y					Y	Y											Y			Y					Y	Y	Y
AUS	Southern Australia	Industrial Land Database	Tertiary	Provincial government	GIS, qualitative, ground truthing	Decision support	Every six years																																		Y	Y	Y	Y	Y		Y	Y																		
AUS	Rockhampton	Industrial Land Use Study	Secondary	Consultant	Employment based	Strategic	2010 one off	Y		Y								Y									Y	Y	Y			Y		Y					Y	Y	Y					Y	Y				Y		Y	Y		Y		Y										
AUS	Charles Sturt	Industrial Land Study	Secondary	Private	GIS, qualitative	Strategic	2008 one off	Y		Y						Y															Y	Y					Y			Y	Y		Y	Y	Y	Y	Y	Y											Y	Y									
AUS	Townsville	Industrial Land Use Study	Secondary	Consultant	GIS, qualitative, ground truthing	Strategic	Periodically (2011, 2008)	Y	Y	Y	Y																		Y								Y		Y		Y					Y	Y				Y	Y	Y	Y		Y	Y	Y									
AUS	Landcorp	Industrial Properties	Tertiary	Provincial government	Qualitative data research	Marketing	As information comes in	Y	Y	Y	Y															Y	Y													Y	Y		Y		Y						Y		Y	Y											Y				
AUS	Redland Shire	Industrial Land Analysis	Secondary	Regional government planners	Employment based	Strategic	2002 one off						Y	Y	Y		Y															Y									Y			Y		Y																					
AUS	Provincial Victoria	Audit of Industrial Land	Secondary	Consultant	GIS, qualitative	Strategic	2008 one off	Y				Y	Y																		Y					Y		Y		Y						Y									Y	Y	Y										
AUS	Adelaide	Industrial Land Strategy	Secondary	Consultant	Qualitative data research	Strategic	2007 one off																																			Y																											
AUS	Moreland Council	Industrial Land Use Strategy	Secondary	Consultant	Qualitative data research	Strategic	2004 one off	Y						Y	Y			Y	Y		Y													Y		Y			Y		Y	Y	Y			Y				Y											Y							Y
AUS	Bendigo	Industrial Land Strategy	Tertiary	Consultant	Qualitative, ground truthing	Strategic	2002 one off	Y		Y						Y			Y										Y							Y			Y	Y	Y		Y	Y		Y		Y	Y	Y			Y	Y	Y	Y		Y	Y	Y		Y										
AUS	Toowombarc	Industrial Land Use Study	Secondary	Consultant	Qualitative data research	Strategic	2010 one off	Y		Y				Y	Y	Y		Y	Y													Y						Y			Y	Y	Y	Y		Y		Y	Y	Y			Y		Y				Y	Y									
AUS	Perth and Peel	Economic and Employment Lands Strategy	Tertiary	Provincial government	Qualitative data research	Strategic	2012 one off	Y	Y	Y	Y				Y	Y	Y										Y				Y										Y		Y		Y		Y	Y	Y				Y		Y	Y			Y	Y							Y			
AUS	Property Council of Australia	Draft Industrial Land Strategy	Tertiary	Private	Qualitative - by submission	Strategic	2009 one off	Y		Y																										Y				Y	Y	Y		Y					Y	Y	Y	Y	Y		Y	Y	Y										
AUS	Sydney	Employment Lands Study	Secondary	Consultant	Qualitative data research	Strategic	2012 one off	Y	Y		Y					Y																Y		Y					Y			Y	Y			Y	Y	Y													Y	Y									
AUS	Tasmania	Major Industrial Sites	Tertiary	Provincial government	Qualitative data research	Marketing	2009 one off	Y	Y	Y	Y	Y																Y					Y							Y	Y	Y	Y	Y		Y	Y	Y			Y			Y		Y	Y											
AUS	Melbourne	Industrial Land Supply Study	Tertiary	Consultant	GIS, qualitative	Strategic	2010 one off								Y																	Y	Y		Y	Y	Y	Y			Y		Y		Y		Y													Y	Y									
AUS	Warrnambool	Industrial Land Use Review	Secondary	Consultant	Qualitative data research	Strategic	2012 one off	Y		Y		Y	Y																													Y			Y		Y	Y				Y		Y	Y				Y											
AUS	Geelong	Employment and Land Opportunities	Tertiary	Local government economic development officers	Qualitative data research	Marketing	Unknown		Y	Y	Y																			Y										Y			Y		Y																						
AUS	South East Queensland	Industrial land development activity profile	Secondary	Provincial government	GIS, qualitative	Decision support	Every six months																			Y														Y			Y				Y	Y	Y											Y											
AUS	Young Shire	Industrial and Commercial Lands Review	Secondary	Consultant	Qualitative data research	Strategic	2007 one off	Y	Y	Y				Y	Y	Y		Y		Y	Y	Y		Y									Y					Y			Y	Y			Y			Y					Y		Y	Y				Y											