

**False Creek Flats:  
An Urban Design Framework for a  
Connected Complete Neighbourhood**

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False Creek Flats: An Urban Design Framework for a  
Connected Complete Neighbourhood

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We accept this project as conforming  
to the required standard

.....  
(Maged Senbel)

.....  
(Scot Hein)

THE UNIVERSITY OF BRITISH COLUMBIA

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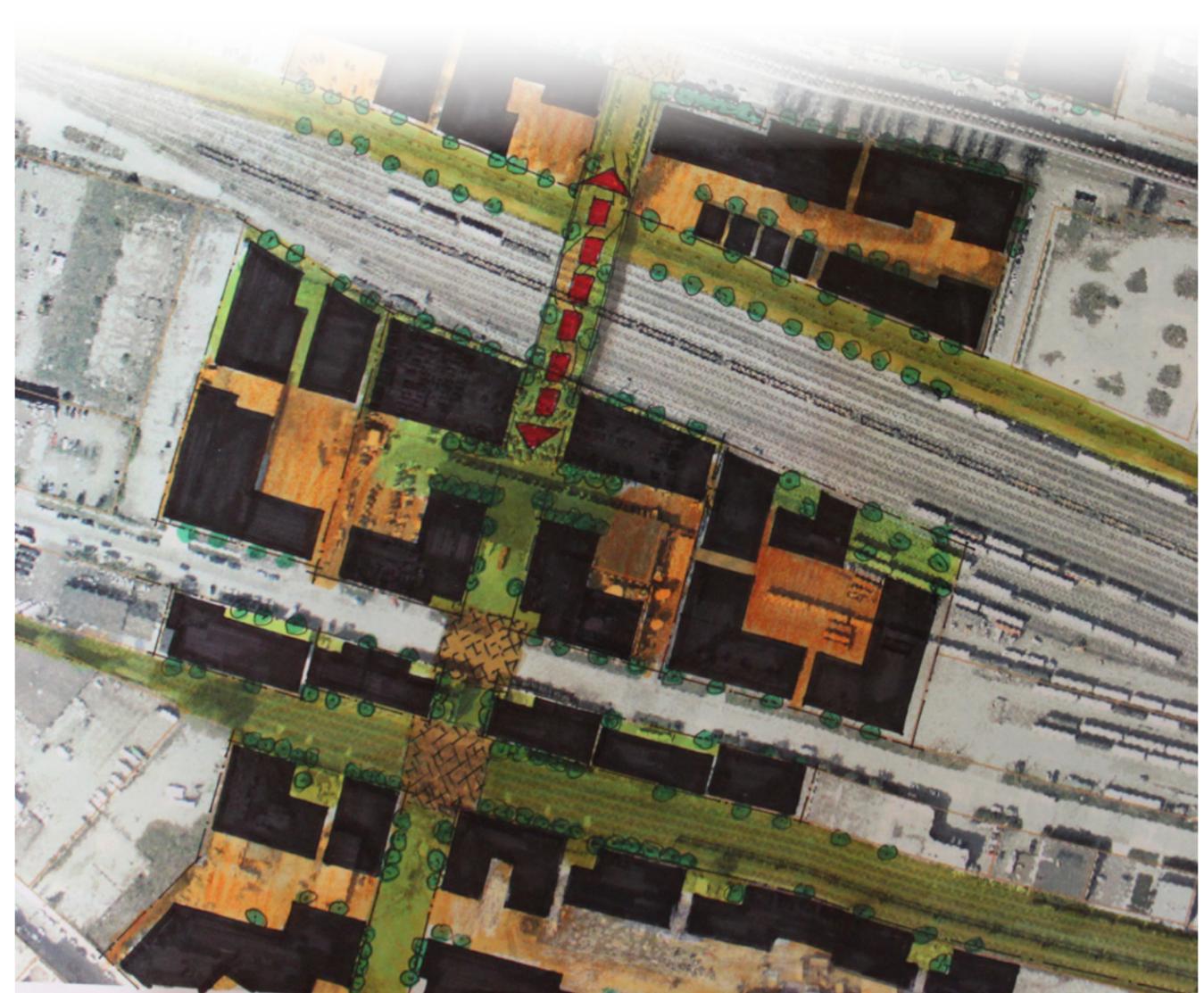
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## 1. Introduction

This chapter describes the project, the principles it adopts the rationales for undertaking this work, the research methods employed and the deliverables to give readers a sense of its scope.

### 1.1. Project Description

The False Creek Flats (hereafter 'The Flats') is currently identified by the City of Vancouver as having an opportunity to further develop high-tech and creative businesses, offices and residences, while retaining affordable industrial lands for warehouses, light manufacturing, wholesalers, food production/distribution and green city-serving uses like recycling depots, composting centres and waste-to-energy operations. Better connections to and within The Flats can help achieve these desired uses.

This project responds to the abovementioned positioning of The Flats. Besides providing affordable industrial lands, it also examines how residential developments, commercial retail spaces and offices can be included to make The Flats a more complete neighbourhood. Four main principles characterise my approach: **CONNECT** it to adjacent neighbourhoods and the wider city context; **ACCOMMODATE** a diversity of uses; **RESPECT** its histories, heritage, character and form, and neighbours; and **RESTORE** ecological functions and well-being.

To articulate these principles, my project presents an urban design framework that includes urban typologies and patterns future planning initiatives may reference. The framework will also include strategies to stitch The Flats with adjacent neighbourhoods, thus making it not only complete by itself, but complete by being *with* its wider context.

The Flats completes other neighbourhoods, and other neighbourhoods complete it.

### 1.2. Key Rationales for Undertaking this Project

Taking on this project initially came from observing how The Flats is currently a 'dead zone' for walking despite being just 1km in breadth and 1.5km in length. The area's lack of diverse programming and connections due to the rail-yards make it uneasy to traverse. The Flats was not 'complete' because it was not well integrated into the surrounding urban fabric physically and programmatically. It is hard for people and businesses to go in to enliven the area. Three related rationales for engaging The Flats follow this question of 'What can make The Flats complete?'

- **Opportunity to create a 'connector' neighbourhood:** Given its location, The Flats can become a nexus between different neighbourhoods of different socio-economic demographics. A connector neighbourhood ties the adjacent neighbourhoods' boundaries by means of reconsidering the edge condition, the functions of the corridors and public realms, typology of buildings, morphological character of blocks, and programming within buildings. Increasing connectivity aligns well with the *Greenest City Action Plan's* aim to create walkable neighbourhoods.<sup>1</sup> Stitching The Flats together with adjacent neighbourhoods makes The Flats complete by being with its wider context.
- **Reduce development pressure in adjacent areas:** By increasing the housing, as well as lands for high-tech/creative industries and offices in The Flats we can possibly reduce some development pressure to radically transform adjacent neighbourhoods like Chinatown, Strathcona and Mount Pleasant. Increasing development and thus employment opportunities in The Flats is in line with *The Greenest City Action Plan* to secure jobs near where workers live. By providing jobs, The Flats completes its adjacent neighbourhoods, and vice versa
- **Opportunity for participatory and co-design strategies:** Given The Flats' current vacant condition, it does not have many of its own residents and communities. But, as it develops and becomes better connected to adjacent neighbourhoods, residents and communities from these neighbourhoods may become interested to participate and co-design The Flats' identity and physical form. Hence, engaging with The Flats is an opportunity to reach out to these neighbourhoods. It is an opportunity for both planners and residents to, collectively, understand, the histories, relations, sensibilities and socio-economic and cultural forces constituting The Flats.

### 1.3. Research Methods

Given the project's short time span (3 months over summer 2011), literature review, personal observations and scheduled meetings with city planners connected to The Flats' current planning program provide the bulk of the information for decision making about the urban design framework being proposed here:

- **Literature review:** Factoring time constraints, information that influence urban design decisions is sourced largely from existing City policy documents and reports, and planning and design literature rather than first-hand engagements with community groups.
- **Personal observations:** Design decisions made are also be partly influenced by personal observations and interpretations of site conditions.
- **Scheduled meetings with city planners:** These scheduled meetings with Scot Hein (senior urban designer) and Karis Hiebert (lead planner for The Flats) are to chart progress and viability of the project's various proposals

### 1.4. Deliverables

The project is presented in three parts:

- First, a **summary of The Flats' context** – its natural, socio-cultural and economic character, as well as its past and current planning initiatives. A key component of this first part is to review the surrounding neighbourhoods' community visions to get a sense of how these neighbourhoods aim to develop, and find ways to make The Flats' future development complementary. This first part will conclude by identifying some limits facing The Flats, and make preliminary recommendations on how to turn these limits into opportunities. The opportunities form the basis for the design principles and strategies in part 2. This part constitutes chapters 1 to 3.
- Second, this being my project's key contribution, is an **urban design framework** that comprises design principles, strategies, typologies and patterns, system diagrams as well as focused studies on 2 areas. This part constitute chapter 4.
- Third, recognising The Flats' future development will impact adjacent neighbourhoods, a **checklist catered to ensure that future public participation processes** can adequately involve locals in the formation of The Flats' identity and physical character, particularly through co-design. This part constitute chapter 5 and chapter 6 which forms the conclusion.

(1) City of Vancouver, *Vancouver 2020: A Bright Green Future*

## 2. Background

This chapter outlines basic contexts and issues facing The Flats. This is done by summarising the planning directions for the area, its changing socio-economic demography, cultural histories, natural ecology and neighbourhood visions.

### 2.1.1 Current Natural Conditions

The Flats is a land infill over the eastern part of False Creek which until the early 20th century was a tidal salt basin that extended east to Clark Drive. The primary reasons for this land reclamation was to provide land for the growth of the Great Northern Railway train tracks and station, and also to provide industrial lands for Vancouver's growing job demands in the 19th and 20th centuries. Adjacent neighbourhoods such as Strathcona, Chinatown, Commercial Drive and Mount Pleasant were also experiencing growth.

While currently there is not much immediate perceived threat of flooding and other forms of disasters striking, studies have shown that the area is flood-prone. In fact, much of the land south of Terminal Avenue is susceptible to flooding. (Fig. 1) Additionally, current hazard studies suggest, as areas become more densely populated, they also become more exposed to hazards. Increasing a localised population density can heighten the probability of even small-scale disasters affecting larger number of people.<sup>2</sup> Future planning for The Flats should consider the resiliency of not just the physical structures, but also the socio-economic welfare of its residents, especially if future residents are lower income groups.<sup>3</sup>

Due to The Flats' physical form, 3 kinds of natural hazards can be identified:

- **Ponding & Flooding:** Even though its current location is more than 300m from False Creek, according to CoV's 2007 *Flood Proofing Policies*, due to the large upstream area tributaries to The Flats, winter storm surges, and major rainfall events, the soil can be over waterlogged which lead to ponding. This impacts soil stability and thus limits underground parking construction and even building heights. The Flood Proofing report also notes that the 3.0m flood construction levels (FCL) previously recommended for The Flats is 0.5m lower than the FCL recommended

to lands on the western side of False Creek. Any new construction should have a FCL of above 3.5m or higher to reduce property and human-life damages.<sup>4</sup>

- **Sea-level rise:** Some recent study suggests that if no actions are taken to further mitigate the impacts of rising sea-levels, with a 5m to 7m rise, The Flats will be submerged. (Fig. 2) The same study also notes the absence of a dyke system around False Creek and puts future residents in those areas at even greater risk.<sup>5</sup>
- **Earthquakes and Liquefaction:** Like much of the region, The Flats is exposed to earthquake related hazards like liquefaction. As a tidal flat, the different layers of sediment have varying degrees of stability. This difference can cause lateral sliding, and due to gravity the capping layer can slide towards lower points in The Flats such as the west side. Buildings, road networks, railways and infrastructure are thus vulnerable to damage.<sup>6</sup> This can have a cascading effect on socio-economic and ecological systems, and the area's businesses and industries.

### 2.1.2. Urban Structure Development

The 308 acres (125 hectares) Flats is bound by Prior Street to the north, Great Northern Way to the south, Main Street to the west and Clark Drive to the east. (Fig. 3) Low development intensity is characteristic there, with one-third of its land dedicated to rail usage and almost two-thirds dedicated to industrial uses ranging from warehouses, to autoshops, to some small pockets of offices and high-tech/creative businesses. Average lot sizes range from around 200' x 150' around Industrial Avenue and Malkin Avenue, to 550' x 250' along Terminal Avenue, to 750' x 900' at the northwest and southeast corners where St. Paul's hospital and the police training centre respectively intend to relocate to. Big-box shops and the Emily Carr University, UBC, SFU and BCIT joint education institution at Great Northern Way are there too.

As of 2006 The Flats accounts for about 20% of Vancouver's industrial lands with approximately 5800 jobs within its boundaries.<sup>7</sup> Its central location makes it a freight-receiving and goods distribution centre as well as a passenger rail depot. Most rail tracks run east-west, thus there are very little north-south connections, except at Main Street and Glen Drive which are 1.5km apart. Many planning initiatives have noted connections problems leading to inaccessibility plays a factor in The Flats' current low development intensity.



Fig.1: Much of the area south of Terminal Avenue, and nearly 50% of the area north of Terminal Avenue are prone to flooding.

Responding to issues of connections and low development intensity, in the past 15 years CoV has produced various plans, reports and district schedules pertaining to more intense development and better transport strategies, especially for the rail tracks. This is a short summary of some planning initiatives:

- **1995: Industrial Lands Strategy** was created to support retention of city-serving industrial, transportation and service lands.
- **1996: The False Creek Flats Preliminary Concept Plan** explored retaining The Flats' industrial character while providing space for high-tech industries and live-work housing. It also suggests some mixed-use areas, for example, along Main Street as a link between The Flats and False Creek to the west.
- **1997: I-2 Light Industrial Zoning District Schedule** was created to better meet the needs of contemporary industry while improving the compatibility of The Flats to nearby residential areas by preventing large scale, high-impact industrial use.
- **1999: CD-1(402) District Schedule** was created for the development of a high-tech campus on the 26 acres Finning site on Great Northern Way, so as to tie in with the overall high-tech developments envisioned for The Flats.

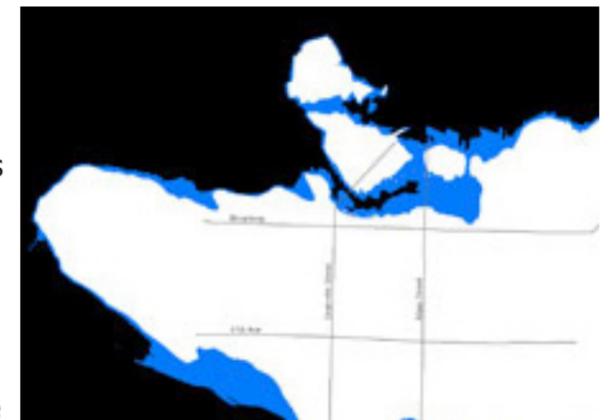


Fig.2: The blue indicates a 7m rise which causes downtown and Stanley Park could become islands. The Flats will be completely submerged.

(2) Denis Mileti, *Disasters by Design: A Reassessment of Natural Hazards in the United States*, Washington, D.C.: Joseph Henry Press, 1999, pp.119-120.

(3) <http://www.straight.com/article-347233/vancouver/vision-transforming-false-creek-flats> (Accessed: March 27th 2011)

(4) <http://vancouver.ca/ctyclerk/cclerk/20070417/documents/p3.pdf> (Accessed: March 27th 2011)

(5) BTAWorks

(6) [http://gsc.nrcan.gc.ca/urbgeo/geomapvan/geomap8\\_e.php](http://gsc.nrcan.gc.ca/urbgeo/geomapvan/geomap8_e.php) (Accessed March 25th 2011)

(7) City of Vancouver, Metro Core Jobs & Economy Land Use Plans

### 2.1.2. Urban Structure Development (con't)

- **1999: I-3 High-Tech Industrial Zoning District Schedule** was created to permit high-tech and creative industries involved in significant amount of research and development activities. The I-3 outrightly limits its usage to high-tech industries such as software manufacturing. A FSR of 3.0 is allowed for manufacturing, transportation, wholesales, utility and storage uses, while a FSR of 1.0 is allowable for other uses. The building height is capped at 18.3m (61').
- **2001: Urban Structure Policy Report** was created to provide a more detailed interpretation of possible urban structure frameworks. This includes looking at how The Flats can be developed in 3 phases to slowly reduce rail usage and incorporate more diverse programs and green spaces. (Fig. 4)
- **2005: False Creek Flats Work Program** was started to give a better understanding of different stakeholders' views, concerns, issues and wishes. Key components of this work program were an explicit identification of heritage sites, a proposal for The Flats to be a district energy precinct and more detailed studies of movement in and around the area while retaining industrial uses.
- **2005: Administrative Report on Strategic Rail Overview and Detailed Operation Study** was prepared by engineering services to note rail movement's importance to Vancouver. The report recognises the rail lines are significant barriers to better connections at The Flat and proposes 4 schemes to deal with this. The schemes are to keep the existing rail footprint, to reconfigure the rail footprint, to increase rail footprint and to decrease rail footprint.
- **2006:** Planning for The Flats took a hiatus due to reassignment of staff to other planning initiatives and programs.
- **2009: Rezoning Policy for "High Tech" sites in the False Creek Flats** was drafted to re-examine high-tech zoning, particularly with the I-3 zone. It reported that since I-3 was created, there has not been a huge market demand for these high-tech spaces. It also report a broader range of non-residential, job space be adopted. The recommendation is to consider more flexible use of space to include offices, albeit a different form of development from that of downtown.
- **2011:** Planning for The Flats restarted in May 2011.

### 2.2.1. Site History and Heritage

Growth in rail and sea transportation contributed to The Flats' major transformation. Historical milestones included:

- **1800s:** The Flats was a tidal basin extending to Clark Drive.
- **1885:** Canadian Pacific Railway's western terminus moved from Port Moody to Coal Harbour and English Bay leading to rail yards construction at The Flats
- **1913:** The Great Northern Way rail way was extended through The Flats to service Vancouver's growing industry and population. It was this development particularly that spurred the major land reclamation.
- **1917:** Reclamation reached to today's Main Street.
- **1920s:** The Flats' rail presence is firmly established, and plans were underway to landfill the remaining portions of east False Creek.
- **1960s:** Surrounding neighbourhoods began to see dramatic residential, retail and commercial growth to support the growing population and economic demands.
- **1980s & 1990s:** CoV began to formalise new policies to better understand The Flats' industrial potential.

Various heritage buildings and sites came from these developments over the past 150 years:

- **CN Railway Station** designed by RB Pratt and Ross in 1919 is a Class 'A' neo-classical building that serves as a civic landmark, and continues to function as the passenger rail/bus depot. (Fig. 5)
- **750 Terminal Avenue** designed by Eric Arthur in 1937 is a Class 'A' Industrial-Moderne building, currently used as a piano retail business.
- **242 Terminal Avenue** built in 1937 is a Class 'B' Industrial-Moderne building, currently used as a mini storage.
- **250 Terminal Avenue** built in 1924 is a city-owned Class 'B' Industrial-Moderne building next to 242 Terminal Avenue that is currently vacant.
- **Thornton Park** built around 1923 is named after Henry Thornton, general manager of CN Rail who contributed greatly to the park's upkeep.

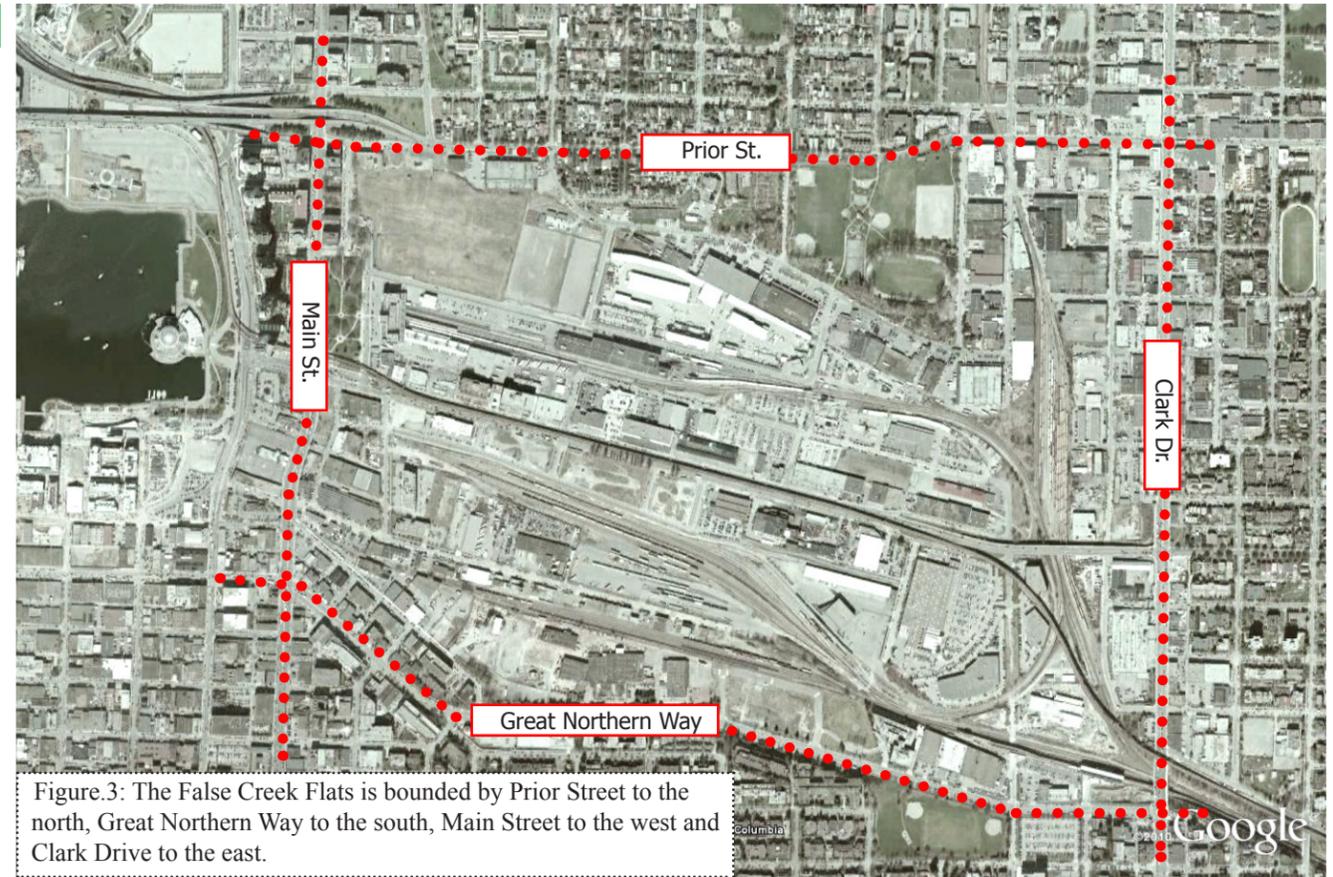


Figure.3: The False Creek Flats is bounded by Prior Street to the north, Great Northern Way to the south, Main Street to the west and Clark Drive to the east.

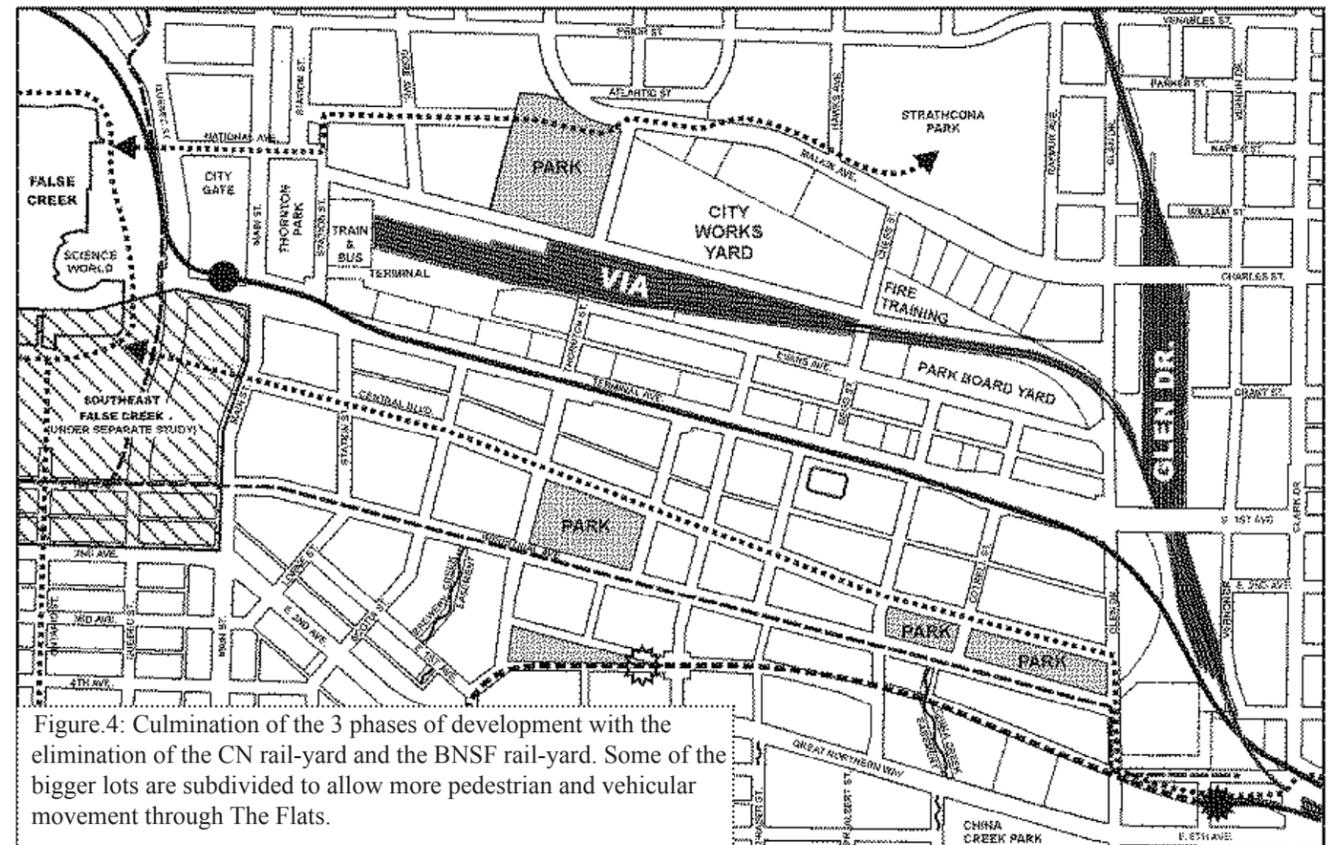


Figure.4: Culmination of the 3 phases of development with the elimination of the CN rail-yard and the BNSF rail-yard. Some of the bigger lots are subdivided to allow more pedestrian and vehicular movement through The Flats.

### 2.2.2. Demographics and Culture

While The Flats itself is not heavily populated its surrounding neighbourhoods are. According to 2006's census, The Flats and immediately adjacent areas are composed of 46% visible minorities, and more than half of those are Chinese.<sup>8</sup> And, about 67% of the population are aged 20 to 59, with more than half of this population being 20 to 39 years old.<sup>9</sup>

Besides a high visible minority population and nearly half of the population being under 40 years old, The Flats and its surrounding neighbourhoods – namely east Vancouver communities – is also home to a vibrant arts and culture scene. For example, the Eastside Culture Crawl is a celebrated event in which artist studios are opened to the public. (Fig. 6) Tertiary art institutions such as The Vancouver Film School and Emily Carr University have both moved into Chinatown and The Flats respectively. The area is also home to several galleries like the Firehall Arts Centre, Gallery Gachet, Artspeak Gallery, Interurban Gallery, the Vancouver Access Artist Run Centre, The VIVO Media Centre, The Western Front and The Elliot Louis Gallery.

Since 2005 CoV is developing plans such as the *Downtown Eastside Strategic Arts and Culture Framework and Investment Plan* to celebrate and finance the eastside's unique history and diversity through public-focused arts and artistic institutions. While government support is the chief funding there lays the possibility for new developments to fund some of these initiatives by means of CACs (in exchange for bonus density).



Figure 5: Pacific Central Train Station currently services the CN Rail, VIA Rail as well as several cross-continental bus-lines.



Figure 6: The annual Eastside Culture Crawl features open studios the public can visit.

(8) <http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-597/P3.cfm?Lang=E&CTCODE=5283&CATYPE=CMA> (Accessed March 27th 2011)

(9) <http://www12.statcan.ca/census-recensement/2006/dp-pd/prof/92-597/P3.cfm?Lang=E&CTCODE=5292&CATYPE=CMA> (Accessed: March 27th, 2011)

### 2.3.1. Negotiating Industrial Lands with Other Uses

Retaining The Flats as primarily industrial as been identified by CoV as necessary due to its affordable land cost and rent within inner-city limits. While retaining industrial lands is a priority, CoV and businesses have expressed interests to increase more office, retail, live-work, and residential opportunities. The I-2 (primarily for city-serving industries like food distribution places on Malkin Avenue, the recycling depot on Industrial Avenue and the firemen and police facilities) and I-3 zones (primarily for high-tech and creative industries) were created to help retain The Flats as primarily industrial, albeit toward a renewed understanding of "industrial".

Despite intentions for I-2 and I-3 to increase high-tech and light industries, and currently there being about 3 million sq ft of job spaces permitted under I-2 and I-3 zoning, the uptake has been slow. There remains a large number of vacant or low-intensity lots there. According to a 2009's *Rezoning Policy for "High Tech" sites in the False Creek Flats* the uptake is slow due to wider global slowing down of high-tech and creative industries when the internet bubble burst in the late 90s. As a result, it has been difficult for further developments at The Flats to proceed due to an inability to secure sufficient high-tech tenants to meet the I-3 zoning requirements. Aside from high-tech industries issues, demands for general office uses in The Flats and housing needs in the Vancouver region have increased in recent years.

2009's *Rezoning Policy for "High Tech" sites in the False Creek Flats* suggests several 'solutions' to bring more non-residential activities to The Flats:

- **Site-specific rezoning** to increase flexibility in the type of job space permitted in I-3 zones.
- **Broaden the usage in I-2 and I-3 zones** to include restaurants and more general office uses. The original intention to limit restaurants and office uses there is to reduce vehicular and customer traffic in the area. But given The Flats' proximity to existing and proposed transit routes, offices and restaurants may thrive.
- **Retain city-serving uses** to keep The Flats' role as a hub which can provide services that other neighbourhoods cannot provide due to other real estate demands.

With regards to residential usage, the I-3 zone as well as the Great Northern Way site does permit some small degree of housing and promotes walkability:

- **I-3 housing allowances** include dwelling for caretakers or watchmen considered to be essential to a business' operation. Residential units integral to an artist studio is also allowed.
- **Great Northern Way housing allowances** include 180000 sq ft of floorspace permitted for live-work situations.
- **Walkability** is actually encouraged by I-3's current streetscape strategies which calls for a neighbourhood accessible by foot and cycling, as opposed to previous zoning requirements which were automobile centric. Design strategies such as continuous sidewalks already caters to a neighbourhood suitable for greater residential density. (Fig. 7)

However, two issues arise with regards to including residential and live-work in The Flats:

- **Land cost:** Future developments must not be weighted so much toward residential and retail that land cost and rent rise and drive out other uses such as light industrial.
- **Rail versus residential conflict:** While CoV is not opposed to including residential and live-work uses, potential conflict can arise when residential and live-work are sited too close to rail.

In summary the question pertains to how to best support industrial lands by keeping the cost reasonable while including other uses.

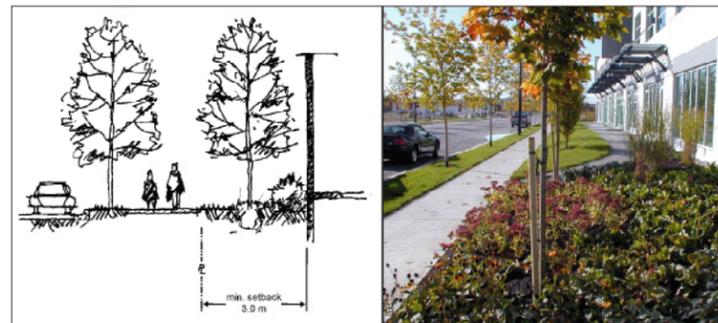


Figure 7: Cross-section and photograph showing possible streetscape treatment at I-3 zones. Much of the streetscape treatment is not too different from ones recommended for residential zones.

### 2.3.2. Negotiating Rail Uses

Strong support exists for retaining rail and even allowing growth for rail service, both freight and passenger. This is partly due to the Burrard Inlet shipping terminals getting busier. In fact, according to 2008's *False Creek Flat Rail Corridor Strategy Report*, the number of containers going through Vancouver can go from around 3 million in 2010 to about 5 million by 2020. To deal with this increase, freight trains have been getting longer to carry more containers and as a result rail yards lengths grow correspondingly. With regards to passenger rail, the report estimates an increase from the current 26 passenger trains per week to 70 per week in 20 years. Currently, there are 4 rail yards at The Flats that support freight and passenger operations:

- **CN Main Yard** is a support yard for container traffic from the south shore shipping terminals.
- **BNSF Yard** generally supports the barge operations at Burrard Inlet.
- **Glen Yard** is used primarily for staging grain and container cars.
- **VIA Yard** is used for passenger arrival and departures.

Despite the importance of the rail yards in supporting Vancouver's growth, there have been discussions to slowly reduce the rail footprint in The Flats. This is in light of the rail yards creating significant barriers for much needed linkages around and through The Flats. In 2005's *Administrative Report on Strategic Rail Overview and Detailed Operation Study*, the following assumptions on the respective rail yards are considered reasonable:

- CN Main Yard will remain the same or increase rail footprint.
- BNSF Yard will remain the same or be eliminated.
- Glen Yard will remain the same or increase rail footprint.
- VIA Yard will increase rail footprint.

3 rail footprint scenarios arise from the above assumptions of the 4 rail yards (Fig. 8):

- **Reconfigured footprint** assumes the BNSF railyard is no longer in service and the equivalent amount of tracks are reconfigured to the CN's Main Yard and/or Glen Yard.
- **Increased footprint** accommodates a larger footprint than today's, with a larger CN Yard and/or Glen yard.
- **Reduced footprint** assumes the BNSF railyard is no longer in service and that enough rail efficiencies

are gained in the CN Main yard, Glen Yard, Waterfront or Grandview yards to accommodate freight rail growth.

Rail footprint changes should also reconsider how blocks and lots can be adequately subdivided to foster more office, retail and residential uses to move in by. However, displacing rail yards totally and relocating them to Surrey or Coquitlam are not feasible due to two main reasons:

- **Relation between rail and industrial lands will suffer if rail yards are relocated.** The Flats' affordable industrial lands for warehouses provide space for goods from the rails to be stored prior to re-distribution. Rail and industrial lands form a synergistic land use pattern.
- **Rail is a sustainable transport choice.** If freight and passenger rail yards are relocated that can translate to more use of fossil-fuel vehicles to transport goods from Surrey or Coquitlam into Vancouver proper. Also, the passenger rails can one day accommodate people coming to heart of Vancouver from surrounding municipalities such Langley, Abbotsford, and even Chilliwack using trains.

2. Background >>>  
Current Land Use

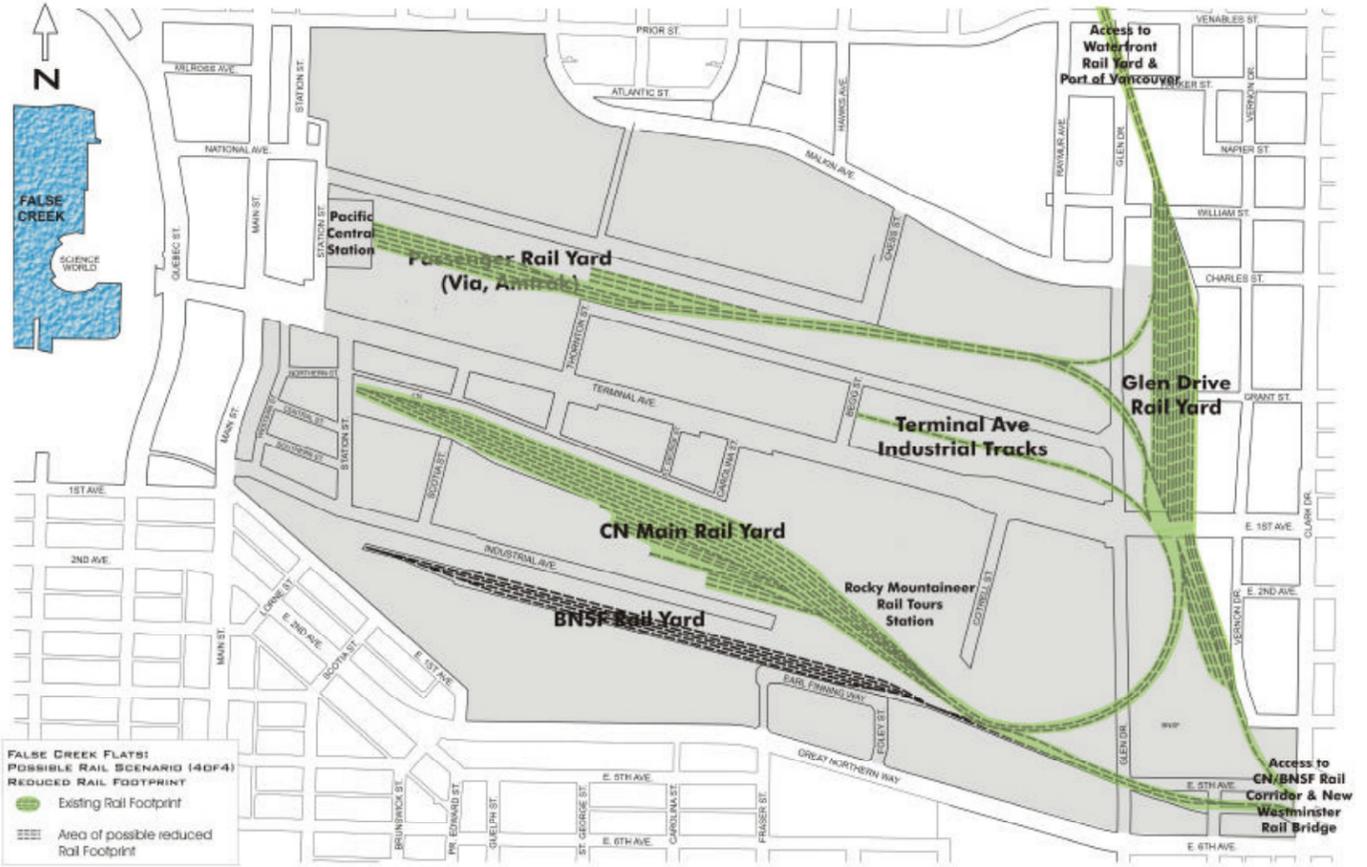
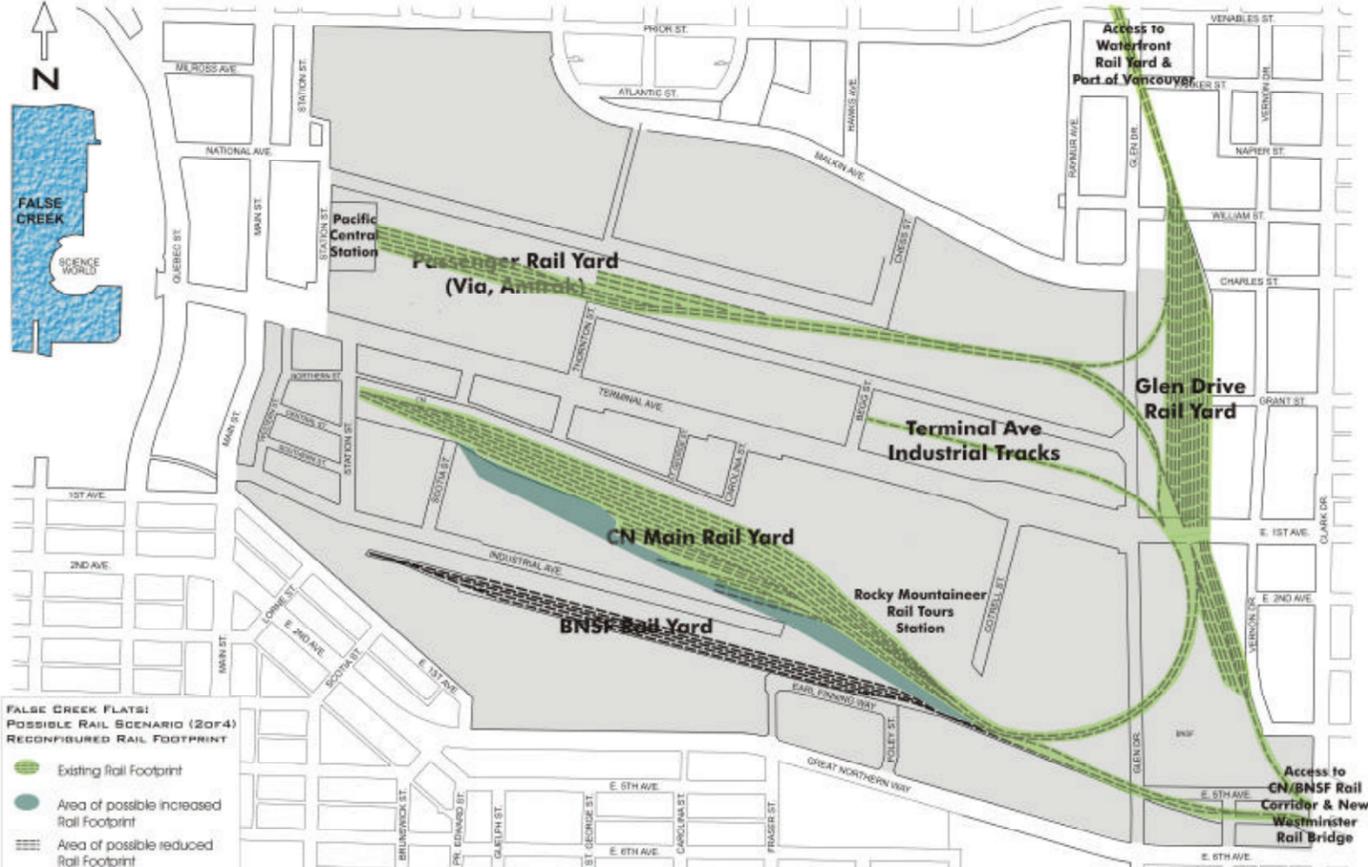


Figure 8: Existing rail footprint (TL); Reconfigured rail footprint (BL); Increased rail footprint (TR); Reduced rail footprint (BR)

2.4.1. Adjacent Neighbourhoods' Visions

Without its own community vision, summarising some aspects of the adjacent neighbourhoods' community plans and visions can help planners better understand how The Flats can be planned and designed should it be better connected to its surrounding urban fabric. Doing so, allows one to get a sense of what The Flats' growth potential, form and character, density and public realm treatment can be like. Knowing the larger context, one may better plan and design the Flats as a 'connector' and 'extension' of these neighbourhoods. The Flats sits amongst key neighbourhoods like (Fig. 9):

- Mount Pleasant to the south
- Grandview Woodlands to the east
- Strathcona to the immediate north
- Southeast False Creek to the west

Summary of neighbourhood visions:

**Mount Pleasant** have yet a community vision but since 2010 it has a draft community plan. Key characteristics and visions for urban form include:

- **Topography** is seen by City staff and community members as integral to creating 'Hilltown'. Urban design wise this entails finding ways to smooth the transition of taller buildings and high-street feel around the key node at Broadway/Main Street to the lower-rise residential fabric along Great Northern Way. (Fig. 10)
- **Low to mid-rise massing** is preferred to respect the human-scale quality of the area. Although taller buildings are possible at select sites.



Figure 11: Heritage building on Main Street

- **Incorporating heritage buildings into new projects** to preserve heritage and to promote architectural innovation. (Fig.11)
- **Diversity in housing and population to ensure liveability** for all types and sizes of families and households. This entails a wide range of affordable housing to include rentals, co-ops, supported housing and artist live-work spaces. At the same time to provide services and facilities to these families and households. Non-market housing should be distributed evenly rather than ghettoised.
- **Public benefits with large site developments** should be pursued. This can come in the form of contributions to heritage retention, improved pedestrian environment, cycling routes, rights-of-way and social housing. Large developments should fit with the area's look and feel.
- **Distributing green spaces** around the area. Green spaces are not only parks but vertical gardens, linear parks, pocket parks, laneway green treatments, semi-private courtyard and rooftops gardens. Food growing should also be considered. (Fig.12)
- **Infill strategies** should be pursued to increase density before choosing high-rise forms. This can be done through laneway housing, redeveloping open carparks and other vacant areas within existing sites. (Fig.13)
- **Laneway development** should be considered by activating the lanes with commercial activities such as artist studios and cafes. Greening the lanes is another strategy.
- **Walking is a priority** when it comes to the overall design and planning of the area's movement routes.
- **Focus on a creative community** is a high priority, especially considering the area's artistic culture such as the Eastside Culture Crawl amongst other events.



Figure 12: Mount Pleasant's green space are not limited to parks but distributed in all forms such as the rain-gardens shown here.

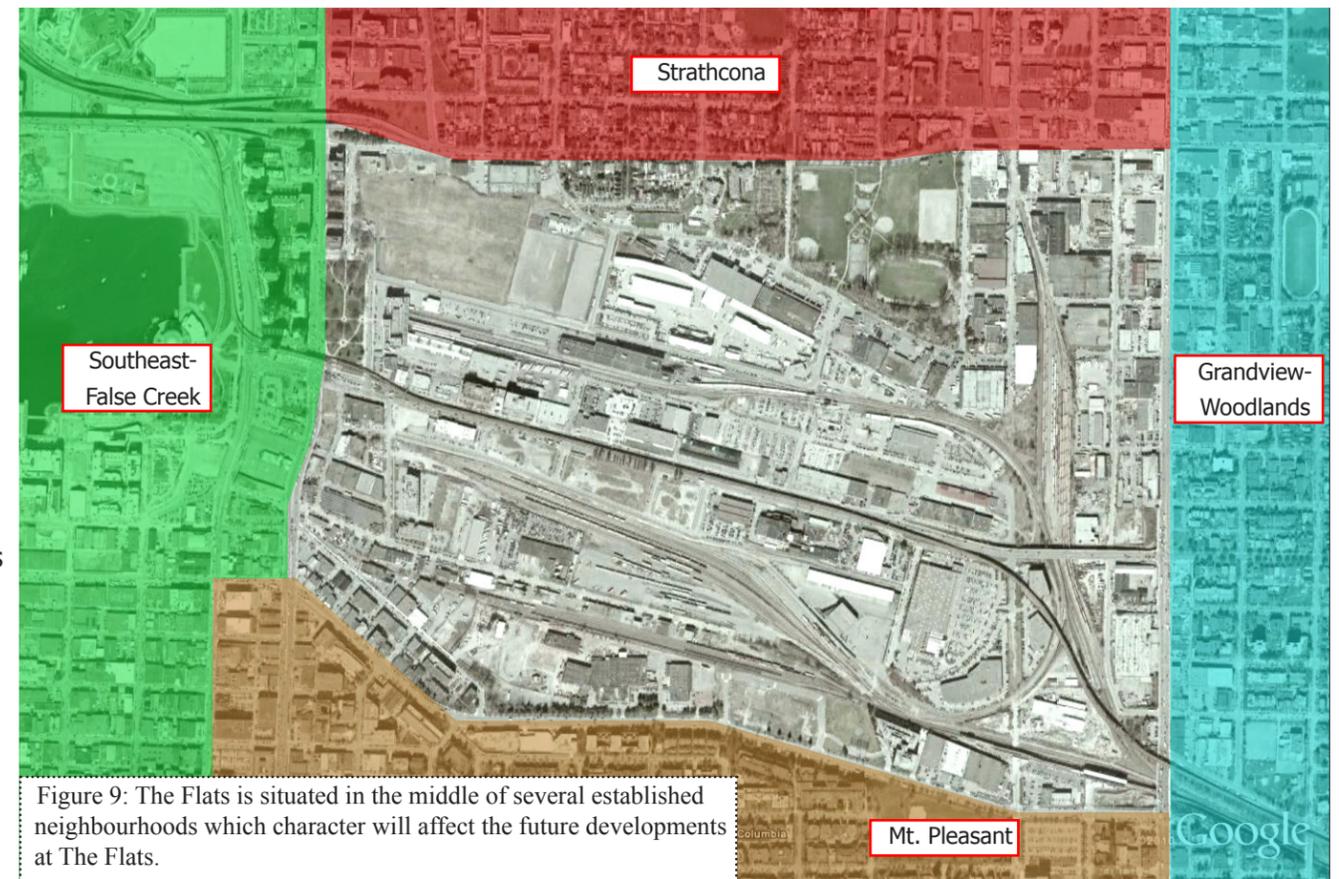


Figure 9: The Flats is situated in the middle of several established neighbourhoods which character will affect the future developments at The Flats.

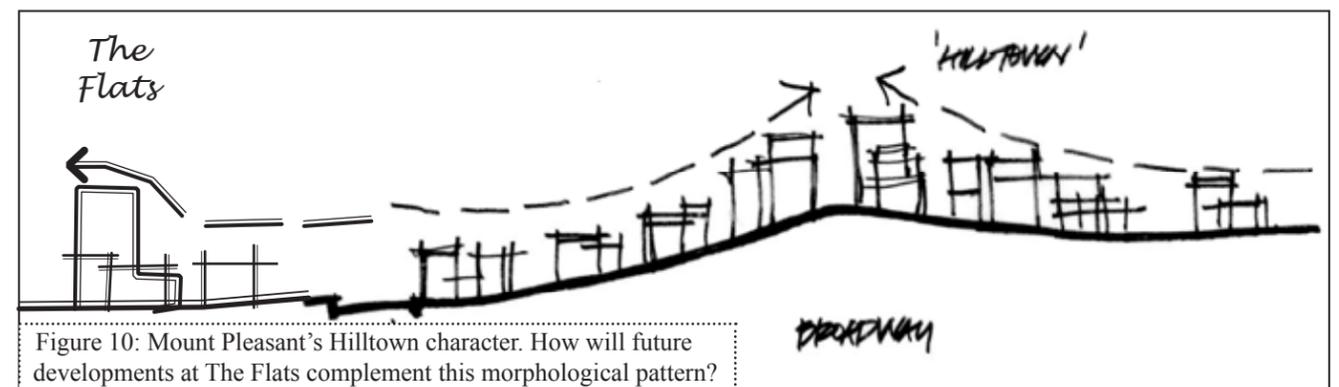


Figure 10: Mount Pleasant's Hilltown character. How will future developments at The Flats complement this morphological pattern?



Figure 13: Laneway-oriented infill housing can be explored in The Flats' future development.

### 2.4.1. Adjacent Neighbourhoods' Visions (Con't)

**Grandview Woodlands** have yet a community vision document. CoV is working on developing one. Grandview Woodlands is a very large area, and the areas closest to The Flats are mostly characterised by RT-3, RT-4 and RT-5 zones. Although a ring of RM-4 zone is at the edge between The Flats and Grandview-Woodlands. Key characteristics and visions for these RT zones:

- **Primarily one-family or two-family dwelling** is permitted. Some provisions for seniors' supportive housing are also permitted.
- **Non-residential uses** may include small clubhouse, neighbourhood house, park, library (if near a community centre), child care facility, church, bed and breakfast as well as farmers' markets and grocery stores (if nearby parking is provided). Commercial zoning exists along some key arterials such as Commercial Drive. (Fig.14)

**Strathcona** have yet a community vision document; however, the Strathcona Revitalisation Committee drafted its own visioning document, *Strathcona: A Clear Vision for Our Community*. Key characteristics and visions include:

- **Preserve industrial land uses** to retain affordability for light industry such as bodyshops and other services. However, there is also the initiative to slowly include more green and clean industries that can better co-exist with housing in these areas.
- **Retain RT-3 zones** to keep the fabric of those areas relatively low intensity. This zoning is also to retain heritage stock and single family home fabric.
- **Reinforce the presence of the artistic community** by re-appropriating some buildings for the use by arts



Figure 14: RT zones in Grandview Woodlands are often immediately next to commercial C-2 and C-3 zones.

community to manufacture, exhibit and sell products of creative imagination. (Fig.15)

- **Respect heritage stock** in the area. By updating and including more buildings in the heritage registry, especially buildings around east Hastings. (Fig. 16)
- **Nurture existing large non-market housing** developments such as housing complexes like MacLean park, Raymur Place and Mau Dan Gardens. The aim is to keep existing residents in the area.
- **Build more market housing** to help support local retail businesses and bring a healthy social presence to the public realm. However, all new housing developments, especially ones along arterials, should consider a sizable proportion of non-market housing. Additionally, large housing developments should contribute to the public amenities of the community by providing green spaces, child and senior care facilities and recreational spaces, as these are short in Strathcona.
- **Revitalise East Hastings as a shopping street**. To do so an increase of housing and people will be needed. There needs to be a requirement for retail at grade to revitalise street life. This also increases local jobs.
- **Green living** characterised by community gardens, farmers' markets and renewable energy are encouraged for new developments. (Fig. 17)
- **Connected greenways and bikeways** are essential in creating a complete community where people can easily bike or walk to work.
- **Appropriate densification** will increase the population while respecting the local urban fabric. Densification is identified by the committee as crucial to dilute the proportions of persons on drugs or who are mentally ill. Appropriate densification will improve the norm for street behaviour, improve conditions for industry and retail, reduce crime and make it easier for people to break the cycles of addiction and poverty.



Figure 15: Chapel Arts on Dun Levy is a repurposed building now used as a gallery, performance space and artists' studios.



Figure 16: Residential heritage buildings in Strathcona.



Figure 17: Strathcona Community Garden incorporates disused concrete blocks to create the garden scape.

**Southeast False Creek** has an official development plan prepared to facilitate the planning and design of the Olympic Village. Of all the neighbourhoods surrounding The Flats it has the densest form of development. Key characteristics and visions for the area's urban form include:

- **Connection to water** is important to bring nature into the urban space. (Fig.18)
- **Create distinct neighbourhoods**, each derived from a particular historic pattern of the adjacent neighbourhoods. The eastern most part of SEFC is to take on rail-yard identity which ties well with programs at The Flats.
- **Connect open spaces** to make walking and cycling easier. Connected open spaces at SEFC can be connected up to The Flats to create a wider walking/cycling network. (Fig.19)
- **Street hierarchy** established through paving patterns and different street width provides convenient and clear access for pedestrians while discouraging thoroughfare vehicular traffic.
- **Integrated transit** is crucial to tie SEFC to other parts of the cities for the purpose of jobs, extra-curricular activities and school.

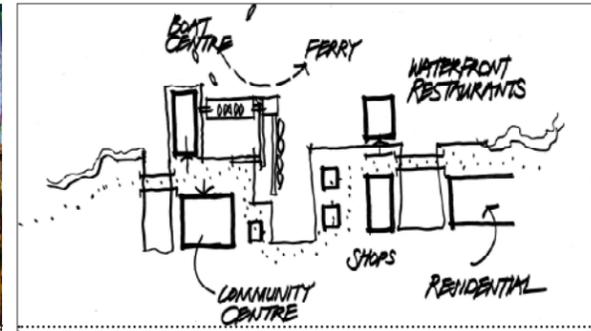


Figure 18: Connection to the waterfront is key

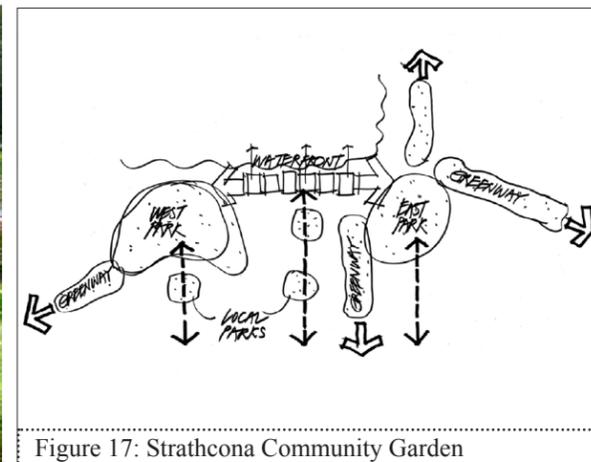


Figure 17: Strathcona Community Garden incorporates disused concrete blocks to create the garden scape.

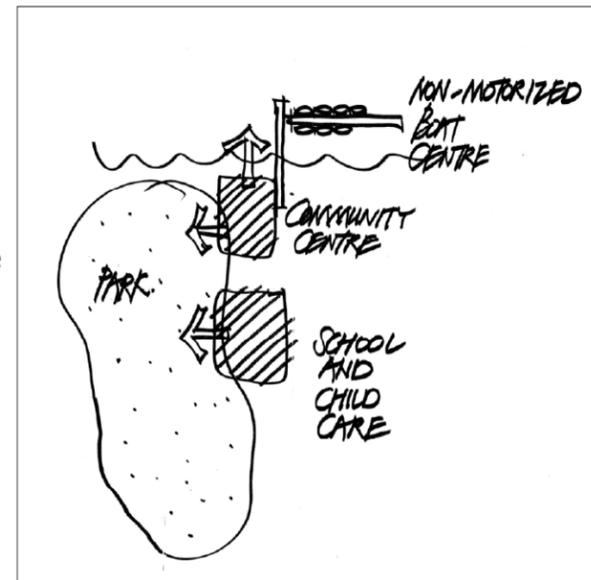


Figure 20: Community services are within close proximity of each other to help form a heart.

### 2.4.1. Adjacent Neighbourhoods' Visions (Con't)

- **Cluster community services** around open spaces that are accessible to all. (Fig.20)
- **Private-public integration** will be achieved through ground plane design and overall building form so that private and public open spaces may be immediately adjacent to each other to create a bigger sense of open spaces.
- **Basin morphology** where taller building masses are sited near 2nd Avenue and slopes down toward the Creek.
- **Incremental development** is achieved by varying the parcel sizes to allow for different forms of development to occur. This is represented by a mix of building types from the low-rise townhouse to 10-storeys terrace apartments. (Fig. 21)
- **Demonstrated sustainability** is achieved by incorporating storm-water managements, urban agriculture and mixed use buildings on the site.

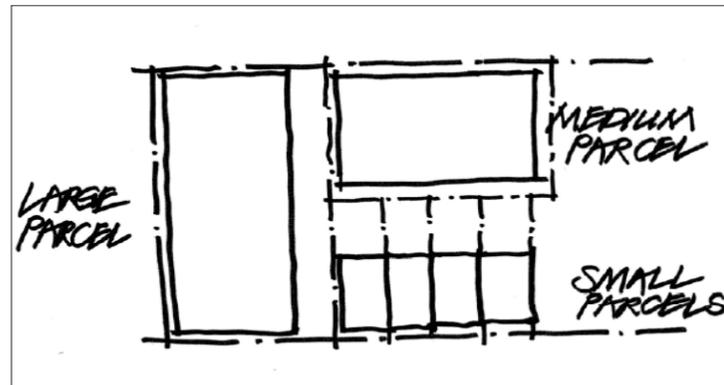


Figure 21: Development is encouraged to create varied lot sizes via parcellisation so as to produce a varied urban morphology.

The following recommendations regarding urban form resulted from the meetings:

- **Retain and strengthen I-2 and I-3 zones** to ensure land cost affordability and employment in The Flats and its surrounds
- **Redefine 'industrial' to include more usage.** One of the suggestions was to add usage such as restaurants during off-hours to draw visitors to The Flats.
- **Access, Greenways and pathways are necessary** if The Flats is going to be more actively engaged as a high-tech/creative zone and possibly for some level of residential uses. Greenways can be used to link open green spaces together.
- **Create a pedestrian-oriented zone** around Main and Terminal by introducing more business opportunities and better public realm treatment.
- **Better transit linkages and connections** to bring future residents and workers to and from The Flats.
- **Support natural systems** by daylighting streams, establishing wildlife spaces, installing green roofs and geothermal energy systems as well as using the former tidal flats as a key design focus.
- **Protect heritage buildings** in area as a reminder of the Flats' history.

### 2.4.2. Community Consultation

During 2005's False Creek Flats work program a two-phase set of meetings were held with the neighbourhoods around The Flats. Phase 1 was a scoping stage and Phase 2 was a visioning stage. Representatives from local resident associations, community centres, BIAs, NGOs and First Nations groups were recruited to envision what The Flats can be. The meetings were designed to meet the following objectives:

- **Provide 'The Story' of The Flats** in terms of current state, in process and possible future plans
- **Explore participants' issues, concerns and ideas** regarding current and future planning.
- **Obtain recommendations** for information exchange, consultation and participation in the ongoing planning process.

### 3. Limits and Opportunities

Reflecting on issues addressed in chapter 2, this chapter points to some of the limits facing The Flats. But, also highlights how these limits can become opportunities that this project can develop in terms of an urban design framework in chapter 4. This chapter explores issues with urban form, connections, industrial uses, energy issues, environmental impact and community consultation issues.

#### 3.1.1 Limits Regarding Urban Form

- **Stated urban design directions:** The various plans, such as 2001's *urban structure plan* and the various rail corridor strategies, have laid out possible land uses, rail strategies and subdivisions. But, they have yet to explicitly focus on suitable building typologies and wider urban morphologies. While the current I-3 district schedule provides some architectural precedents, there is no urban design framework to more succinctly bring The Flats' physical identity into focus. There are also no directions as to how The Flats can tie in with itself and surrounding neighbourhoods through urban form. There are, for example, no directions about how each possible sub-area's character would look like.
- **Significant recent investments:** There are large lots in the area that have been developed in the last 15 years. These lots include the city-owned national yard, the fire training facility, the Evans yard, the police depot as well as major private developments like Home Depot, F/X Wholesalers, Gift Exchange and a pharmaceutical building. Change on these sites may be slow.

#### 3.1.2 Opportunities Regarding Urban Form

- **Connect to adjacent neighbourhoods by 'stitching' edges:** Both Southeast False Creek's ODP and Mount Pleasant's draft community plan call for a transition in urban form and height. In the case of SEFC the strategy is to come down in height as it approaches the creek, and for Mount Pleasant the strategy is to come down in height as it approaches Great Northern Way. Likewise, in areas of Strathcona and Grandview-Woodlands that front onto The Flats there is an expressed desire to retain the RT zone character. The typologies and morphologies at The Flats, especially at its edges, can take the opportunity to respond to these surrounding strategies by having similar fine grain blocks and buildings, mirroring the building forms and character, and/or having complementary programming. Rather than treatment edges as clear

boundaries, edges can become the zone where neighbourhoods meet. (Fig.22)

- **Create distinct sub-areas:** Both the SEFC ODP and Mount Pleasant's community plan suggest treating their respective neighbourhoods as a series of connected but distinct precincts. Distinct precincts may begin inform how The Flats' urban design guidelines may be drafted as it moves from west to east. The potential distinct precincts in The Flats can each have different but mutually complementary building typologies to mark its respective dominant land-use and precinct character. (Fig. 23)



Figure 22: How will The Flats' edge transition from and respond to Mount Pleasant 'Hilltown' character?

- **A series of centres:** The Flats' adjacent neighbourhoods all have a distinguished centre where one knows one has arrived at that particular neighbourhood. Centres in the form of plazas and parks are also places where formal or informal face-to-face communication may occur and ideas about community and self begin.<sup>10</sup> Like SEFC and Mount Pleasant, The Flats' potential centre is one where most of the amenities and services are sited. However, unlike SEFC which has one centre, The Flats being around 5 times bigger may have to have a key centre with smaller centres for each of its potential precincts or sub-areas. The connection between the primary and secondary centres should be legible that one can move between centres without confusion. (Fig.24)
- **Diversify building types within a development:** While The Flats is chiefly going to be industrial, the building typologies can vary especially since high-tech and creative industry businesses do not necessarily need industrial size floorplates to operate. For blocks and lots with depths more than 250' (61m) and substantial frontage, finer grain buildings for commercial retail use, offices and creative businesses can front onto the street while blockier buildings more suited for light industry (i.e. storages, distributors, bodyshops, wholesalers, etc) can be at the back where loading bays can be accessed via lanes. Essentially, this



Figure 23: How are the different future uses at The Flats that can help define different sub-areas? How will developments along Terminal Avenue differ from ones along Industrial Avenue?

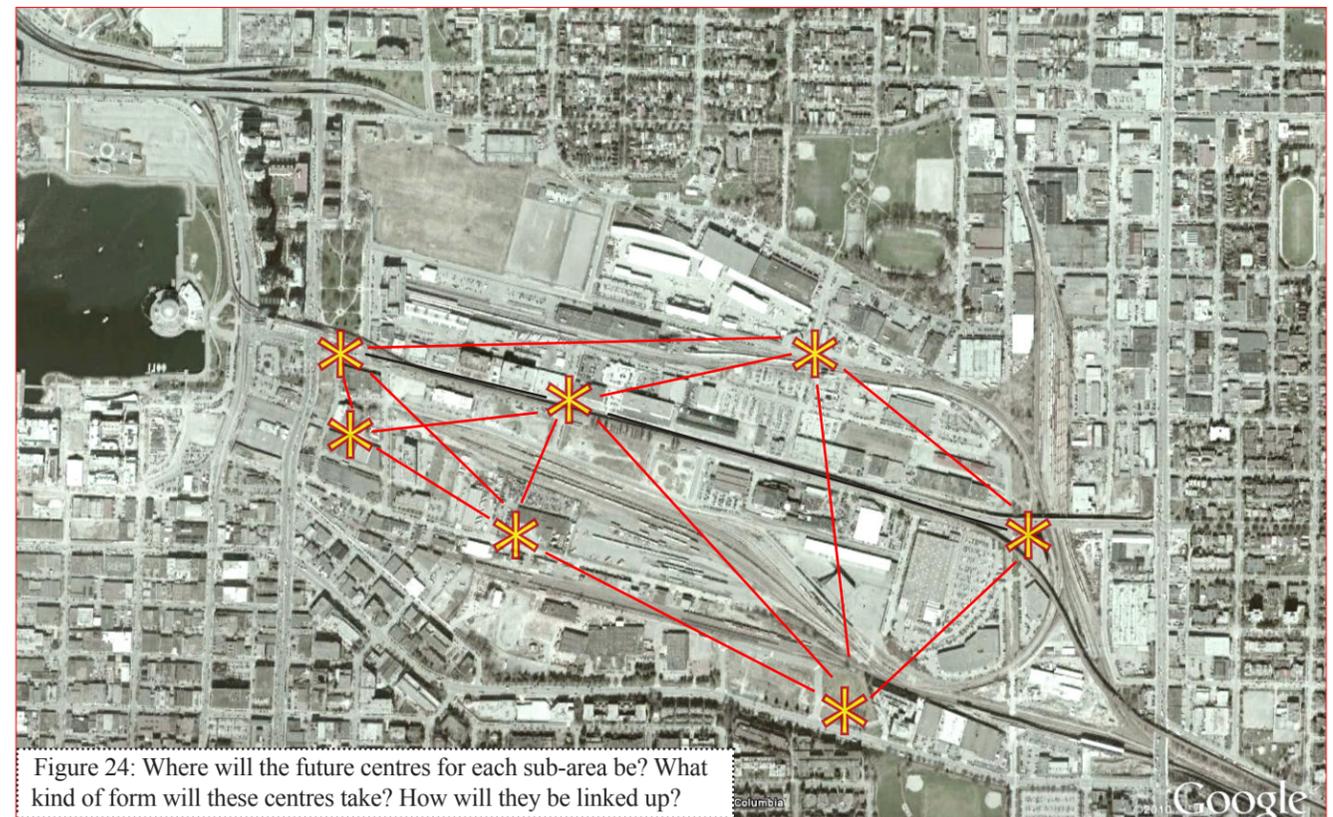


Figure 24: Where will the future centres for each sub-area be? What kind of form will these centres take? How will they be linked up?

(10) Hester, Randolph, Design for Ecological Democracy, Cambridge, MA & London, UK: MIT Press, 2006, pp.23-32.

### 3.1.2. Opportunities Regarding Urban Form (Con't)

would take on a double-fronted block form, which encourages different architectural treatment due to the differences in use and massing requirements.<sup>11</sup> (Fig.25)

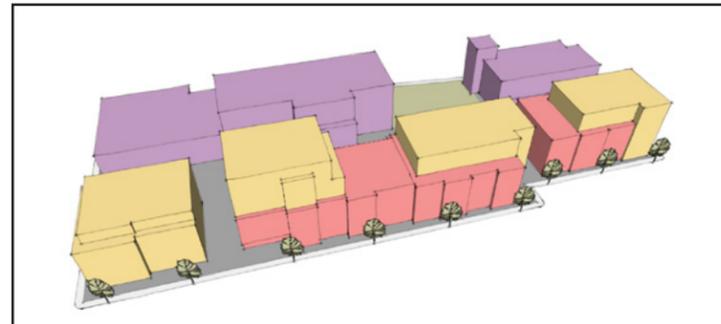


Figure 25: Buildings within larger lots can take on differently massing and architectural articulations to provide visual diversity. Fine grain buildings can take the street-side while blockier buildings suited for industrial use can be at the rear. A landscaped laneway and/or courtyard can separate the two uses.

- **Blend private-public open spaces:** In areas where there are courtyards within a lot, design solutions can be sought to make that courtyard accessible to the public. (Fig.26)
- **Infill strategies to intensify land usage:** Infill strategies can be adopted to existing underdeveloped sites where underutilised car-parks, for example, can be repurposed for the construction of secondary buildings housing small boutique offices, housing and/or live-work studios. (Fig. 27)



Figure 26: A blurred private-public space that combines a public courtyard with the patios of residential units produces an open space that seems larger than its part. The effect of a larger open space can be further enhanced if the courtyard can also serve as a right-of-way.



Figure 27: The vast areas of parking space at The Flats can be developed as infills in the future when car usage to and from The Flats have decreased due to, partly, better public transport to the area.

### 3.2.1. Limits Regarding Connections

- **North-south connections:** Currently, the rail yards are significant barriers to better north-south connections. Proposals have been made to remove or at least reduce the number of rail tracks. However, given the re-emergence of rail as a sustainable means of goods and passenger movement, complete removal may not be a viable option.
- **East-west connections:** East-west connections are poor to due to the lack of diverse programming along Terminal Avenue and Great Northern Way which are over 1km. Visual monotony makes walking less pleasant. The dimension of buildings and the setting of these buildings influences how one perceives time.<sup>12</sup>
- **Psychological barrier:** The 350m distance from 2nd Avenue to Terminal Avenue has a lack of diverse programming and higher development intensity which projects The Flats as a 'blank space' where nothing is happening. This may form a psychological barrier keeping people from entering. Similar observations can be made for Clark Drive and Terminal Avenue.

### 3.2.2. Opportunities Regarding Connections

- **Reconfigured rail footprint:** One of the strategies proposed is to reconfigure the rail tracks bringing the bulk of the lines at BNSF immediately south of Industrial Avenue to the Glen Yards. With the BNSF tracks gone, the VIA passenger and the CN tracks are the only two rail yards left. The reduced number of rail yards cutting across frees up the blocks between Industrial Avenue and Great Northern Way campus for development. More robust development here can intensify Industrial Avenue's streetscape and bring more people into The Flats. With the BNSF rail yard relocated, there

- is the potential to link the eastern end of Industrial Avenue to Great Northern Way thus increase east-west connections.
- **Landscaped pedestrian and bike bridges:** To increase north-south connections by foot and bicycle, landscaped pedestrian and bike bridges straddling across the rail yards can be considered. Given the potential width and thus weight of landscaped bridge they are more likely to go across the VIA rail yard which are around 150' to 180' (46m to 55m) in span, the eastern edge of the CN rail yard at Cottrell Street and/or Glen Drive at Evans Avenue. Most of the CN rail yard is more than 250' (76m). (Fig. 28)



Figure 28: A Landscaped pedestrian and bicycle bridge similar to this one Laurel Street and West 6th Avenue can span across some of the rail-yard to allow more north-south connections.

- **More bike lanes:** With cycling on the rise more bike trails and lanes can be added to the existing on immediately north of the CN Rail yard to increase east-west connections. Designated bike lanes on Industrial Avenue (which will cut through to Great Northern Way) and Terminal Avenue will also improve connectivity. These bike lanes can intersect with the landscaped pedestrian and bike bridges. (Fig. 29)



Figure 29: Can a dedicated bike lane that cuts through to Great Northern Way and/or East 5th Avenue be installed along Industrial Avenue? Additionally, what kinds of more intense programming can go along Industrial Avenue to make a bike-trip more enjoyable?

- **More robust east-west arterials:** More diverse programming at grade and within the individual lots on Terminal Avenue for example could add visual dynamism that can make that 1km walk more pleasant. Terminal can be The Flats' commercial spine. The west side of Terminal can feature unique architectural designs that speak of The Flats' industrial history, its commitment as a green neighbourhood and signal a west-side entry to The Flats. (Fig. 30) 2009's *Rezoning Policy for "High Tech" sites in the False Creek Flats* also suggests that restaurants and retail along Terminal can also make night-time walking and cycling safer. Likewise Industrial Avenue can also be intensified.
- **More robust north-south arterials:** Good connectivity at The Flats is not just cutting through its middle. The 'blank space' at Main St. between 2nd Avenue and Terminal Avenue can be more intensely developed. This translates to more mixed use that includes housing and commercial-retail opportunities to tie into the fabric of SEFC and Mount Pleasant. Developing this area also signals a west entry-point to The Flats.



Figure 30: Terminal Avenue can afford to have greater density and diversity of programs to strengthen its identity as the area's central spine. More iconic building design at the corner of Main and Terminal can signal a west-end entry point.

(11) Lewis, Sally, *Front to Back: A Design Agenda for Urban Housing*, Oxford, UK: Elsevier Architectural Press, 2005, p.56.  
 (12) Bosselmann, Peter, "Images in Motion" in *Urban Design Reader* (Eds. M. Carmona & S. Tiesdell), Oxford, UK: Elsevier Architectural Press, 2007, p.285.

### 3.2.2. Opportunities Regarding Connections (con't)

- **East-side entry-point:** While the Clark Drive side of The Flats should be kept more or less I-2 and suited for warehouses and storages, the public realm treatment could be bettered to demarcate an east entry-point to The Flats. For example, the currently empty lot at Glen and Evan can be better designed as a park to signal to people that they have entered The Flats. Future redevelopments at the blocks at the off-ramp of Terminal Avenue and Cottrell Street can hold more height and have less setback from the front property line and more grade-level retail such as cafes and shops to mark entry into The Flats. One enters a Terminal Avenue that can service not just industrial uses but provide a human-scale experience.<sup>13</sup> (Fig. 31)
- **Connecting green networks:** Both SEFC and Mount Pleasant have directions to connect their green streets, parks and open spaces into a green network. Future development at The Flats should explore how its own green network can extend from SEFC and Mount Pleasant's.
- **Skytrain and tram stations:** There are opportunities to bring a skytrain station to the eastern side of The Flats to service the to-be intensified commercial Terminal Avenue. The skytrain station at the eastern end can be a landmark signalling one's entry into The Flats from the east. And if the station is next to the off-ramp of Terminal Avenue, then the station can be elevated with one of the entries from the off-ramp itself. This is to allow pedestrians who use Terminal Avenue to board the train with greater ease, and to create an uniquely designed station. A tram station at the Great Northern Way campus is also possible to serve not just Flats' residents but also Mount Pleasant residents. (Fig. 32)



Figure 31: While the east-end of The Flats can stay relatively industrial in character, greater density and better building design at the east-end of Terminal Avenue can signal a clearer entry into The Flats.

- **Heritage Necklace:** Mount Pleasant and Strathcona have both expressed desires to retain heritage buildings. This can be an opportunity for The Flats to use its own heritage stock (such as the CN Railway Station) to join Mount Pleasant to Chinatown and Strathcona by creating a north-south 'heritage necklace'. (Fig. 33)



Figure 32: A tram line and stations along Great Northern Way can serve future residents of The Flats as well as Mount Pleasant residents.

### 3.3.1. Limits Regarding Industrial Uses

- **Slow uptake for I-2 and I-3:** The I-2 and I-3 zones were created to better meet the needs of contemporary light and high-tech industries respectively. Unfortunately, the uptake did not grow as anticipated. There have been suggestions by both businesses and CoV to redefine these zones to allow for more market and non-market housing, besides the currently allowed artist live-work spaces, to be developed in these zones. However, the issue of rising land cost due to residential development can drive industries out. Moreover, residential uses may conflict with rail usage.

### 3.3.2. Opportunities Regarding Industrial Uses

- **'Industrial' as a defining character:** There is the opportunity to explore how The Flats' industrial character in both look and program can become an identity. For example, the city-owned industrial lots on the Station Street and Industrial Avenue can host programs like localised composting services, shops that build and sell rainwater tanks, green fashion houses, etc to showcase a new approach to 'industrial'. The buildings can be designed to speak of The Flats' industrial heritage. (Fig. 34)
- **Utilise existing residential allowances:** Besides artist live-work studios, the current I-2 and I-3 zoning allow some degree of residential floorspace for caretakers to live on work premise. Initiatives can be taken to design an arts village at The Flats. The Great Northern Way campus (zoned CD-1) also allows up to 180,000 sq-ft of



Figure 33: The heritage buildings along Main Street can be tied together to showcase the history of this part of the city. Special paving can be used to mark this path that connects at least 3 to 4 neighbourhoods with The Flats in the middle.

live-work space currently. The 180,000 sq-ft live-work space at the GNW campus can include student housing, and services and commercial retail businesses needed to support student populations.

- **Redefine I-3:** 2009's Rezoning Policy for "High Tech" sites in the False Creek Flats expressed interest to redefine I-3's allowable uses. An increased amount of office and other job and retail spaces besides high-tech is proposed to enliven the area. These new office and retail spaces can be sited more toward the Main Street side so as to allow the Glen Drive side to retain a more I-2 character.
- **Redefine 'mixed use':** There is also an opportunity to rethink the definition of 'mixed use'. Typically, mixed use is conceived as vertical mixed use with commercial-retail at grade and residential above. There is the opportunity to think how mixed use can be achieved through site planning. For example, a lot with sufficient depth (250'+) and frontage (300'+) may have more commercial retail (mini-marts, clinics and post-offices) and residential programming on its street- edge, and more I-3 type program with offices and high-tech/creative businesses in the lane- edge. The two 'halves' can be separated by a shared courtyard which with adequate vegetation coverage can provide residents with visual and auditory screening. This lot division will be more toward the west-half of The Flats to allow the east half to retain a more I-2 character. Such close proximity between new/light industrial and residential already exists in Vancouver's IC-1 and IC-2 zones at the Burrard Slopes. There residential uses (as small CD-1 zones) are often above, across from or right next to uses like autoshops, software design firms and catering businesses. The Flats can pursue a similar strategy to create spots of CD-1 for residential uses. (Fig. 35)
- **'Green loops' between industries:** New developments can explore opportunities to work with existing businesses at The Flats to create a 'green loop' between the new and existing businesses. For example, a green loop can emerge if the future park at Thornton and



Figure 34: Instead of treating industrial buildings as derelict objects, they can be repurposed to house other programs with The Flats in the middle.

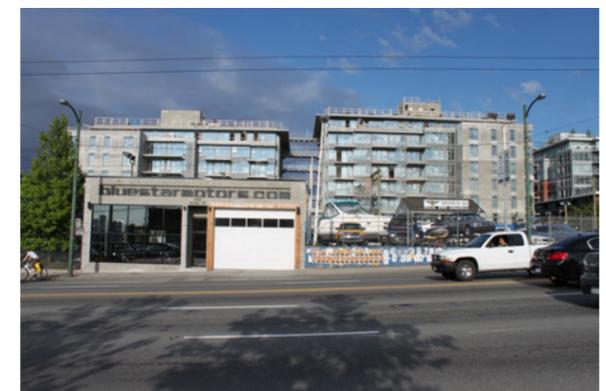


Figure 35: Close proximity of industrial and residential is possible if 'industrial' is cleaner, greener. To moderate the industrial land prices going up, instead of mixing uses on one lot, a lot (especially a larger one) can be subdivided with some smaller portions rezoned as CD-1 and becoming residential.

(13) Ibid.

### 3.3.2. Opportunities Regarding Industrial Uses (con't)

Malkin is allowed to become an urban agricultural site which produce can be distributed at the food distribution places along Malkin. A localised composting business can be sited nearby to turn the waste from the food distributors into product. Likewise, part of the recycled materials from the recycling depot on Industrial Avenue can become the raw materials for artists who might live and work in the future live-work studios along Industrial Avenue and at Great Northern Way campus. (Fig. 36)

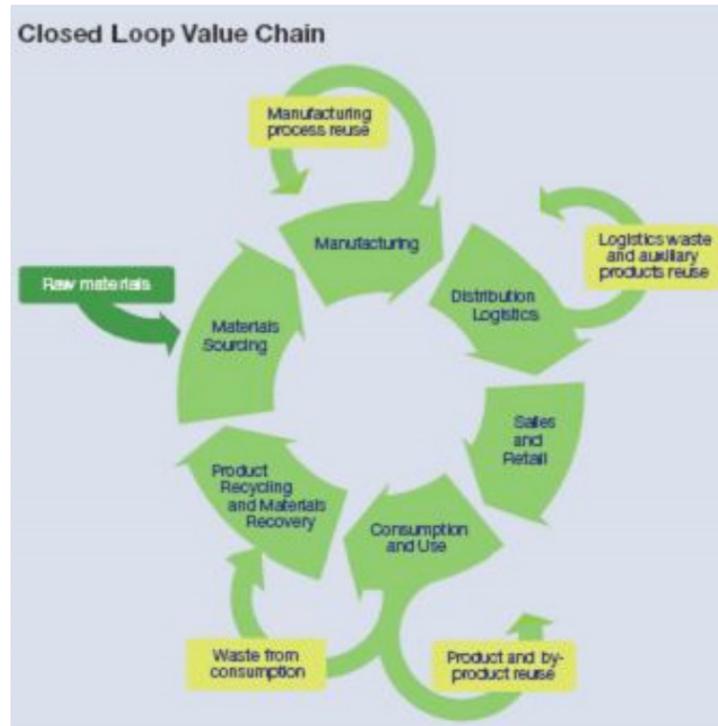


Figure 36: A green loop that explores how the waste of one business can become the construction materials for another can influence how land-use and building design is approached.

### 3.4.1. Limits Regarding Energy

- **Low Energy Production:** Currently, the light-industrial and rail-related activities within The Flats, though not necessarily energy-intensive, only consume energy without the ability to produce their own energy. Generally, a minimum of 50 to 60 dwelling units per hectare is needed to make district energy economically feasible.<sup>14</sup>
- **High Vehicle Kilometres Travelled:** Given the few housing choices and numbers in The Flats, workers usually have to travel in. Very often that trip into The Flats can be by car as there not many transit routes that go through The Flats. If these car-trips are factored in, the embodied energy consumption of The Flats can be even higher.

### 3.4.2. Opportunities Regarding Energy

- **District Energy Precinct:** 2005's working program for The Flats suggested that it along with adjacent neighbourhoods can become an energy precinct. However, for The Flats to do that, it needs to have at least 50 dwelling units per hectare. At 125 hectares, at least 6250 dwelling units must be designed for the area. It is possible to site most of these residential units on the west side of The Flats and supply energy to the east side of The Flats (and adjacent neighbourhoods) which may have much lower dwelling units or the waste output needed for district energy. The areas fronting onto Malkin Avenue, Prior Street and 2nd Avenue can be developed into residential zones to generate enough waste for district energy while most areas along Terminal Avenue can stay industrial. (Fig. 37)



Figure 37: The Flats along with adjacent neighbourhoods can become an energy precinct characterised by district energy systems, solar power amongst other systems.

- **Solar Energy:** Given that many of the industrial buildings have larger roof-plates, placing solar panels on them should help with The Flats producing its own energy. Solar panels can also be placed amidst roof gardens to soften the panels' hard-edge appearance, especially if roof-tops are to become areas for gathering and local food production. (Fig. 38)
- **Biomass energy:** Being well-served by rail, it is possible for The Flats to develop a biomass processing centre where, for example, mulch and wastes from the lumber mills near rail systems can be brought in and processed to produce energy. This is a reason for why some degree of rail service must remain at The Flats. (Fig. 39)
- **Reduced VKT:** By providing housing choices at The Flats, there can be less car-trips needed to The Flats, thereby reducing overall energy consumption.



Figure 38: Solar panels can also be placed amidst roof gardens to soften the panels' hard-edge appearance, especially if roof-tops are to become areas for gathering and local food production.

### 3.5.1. Limits Regarding Environmental Wellness

- **Poor soil quality:** The Flats being reclaimed lands needs soil remediation for new developments. Engineers have also reported that because of the existing soil conditions, higher building forms and underground car-parks may not be structurally and environmentally suitable. The inability to build taller may lower the allowable FSR.
- **Poor potential for urban agriculture:** The substandard soil quality may make it hard for urban agriculture to take place.
- **Ponding and flooding:** The Flats is prone to ponding and flooding because it is currently below flood construction levels.

### 3.5.1. Opportunities Regarding Environmental Wellness

- **Soil Remediation:** Developing The Flats, both residential and industrial, can actually improve the air and soil quality. New developments can be impetuses to remediate the soil, create better drainage/filtration that can prevent flooding, erosion and toxic run-off. To combat flooding and ponding, bioswales and even daylight streams can be designed to allow better drainage and even be used to organised public realm treatment.
- **Environment-responsive architecture:** The inability to construct higher building forms can be an opportunity for developers and architects to invent creative solutions to increase The Flats' population (needed for district energy, etc) while respecting the urban morphology of surrounding neighbourhoods. For example, above-grade parking can be under an eco-deck that provides green amenities to nearby residents and workers. (15) (Fig. 40)
- **Off-ground urban agriculture:** With regards to urban agriculture, if growing edible vegetation is not possible at the ground level, then plots could be placed on building roofs and terraces, and through hydroponics systems, that are nonetheless accessible to the public. (Fig. 41)

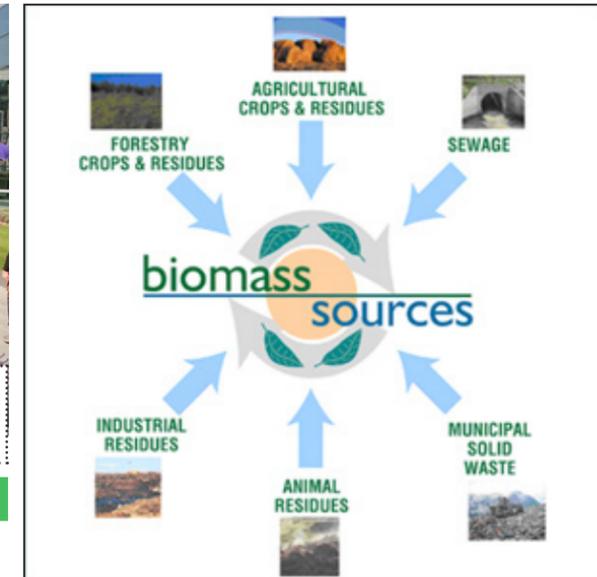


Figure 39: The waste food produces from some of the food distribution centres at The Flats as well as unused mulch and lumber from regional mills can be brought in by rail to be transformed into biomass energy, hence giving The Flats a greater degree of self-reliance in terms of energy production.



Figure 40: The Flats being prone to flooding should have above-grade car-parks. These car-parks, however, can under a landscaped eco-deck that offers open spaces to residents and workers, remediates air quality, reduces run-offs as well as visually screens the car-park itself.

(14) Morris, Pierce, "In the Pipeline: District Energy and Green Building", in *Environmental Building News*, 2007, Vol.16, No.3.

(15) Lewis, Sally, *Front to Back: A Design Agenda for Urban Housing*, Oxford, UK: Elsevier Architectural Press, 2005, p.64

### 3.5.1. Opportunities Regarding Environmental Wellness

- **Greenways:** Disused rail yards (like the BNSF yards which has been suggested to be relocated to the Glen yards) can become greenways. Greenways, having a greater degree of pervious surfacing, can help control run-offs from the adjacent areas. Bioswales and even miniaturised wetlands can feature prominently in these greenways. (Fig. 43)
- **Green-roofs:** New developments can take the opportunity to use green roofs so as to help reduce run-offs, remediate air quality and to reduce the amount of artificial roof insulation needed.<sup>16</sup>



Figure 41: Urban agricultural spaces can serve as both food production sites and community gathering places.



Figure 42: Should the BNSF rail yard be relocated to the Glen Yard site, the BNSF rail yard can become a greenway that features miniaturised wetlands, pedestrian walkways and bike paths. As a wetland, it can help absorb run-offs and remediate the water and soil quality in the area. Connection-wise it offers an east-west passage.

### 3.6.1. Limits on Community Engagement

- **Lack of community feedback on urban form and design:** The community group meetings and stakeholders' workshops held by The City in mid 2005 have articulated several important ideas for what The Flats can be in terms of being better connected to surrounding neighbourhoods and being affordable to new residents. However, due to the hiatus placed on The Flats' planning, these workshops never produced any directions in terms of an urban design framework that discussed the desired form and character of The Flats. At the same time, there is the acknowledgment of the monetary and time expenses for enhanced engagement.

### 3.6.2. Opportunities on Community Engagement

- **Public participation through co-design:** The community consultation done so far is good. But there is still an opportunity here to further explore how citizens can be more actively involved in the physical planning and design of The Flats. Particularly, efforts can be made to utilise co-design methods to get citizens more directly involved in urban form making. (Fig. 43)
- **Engaging growing visible minority:** Given The Flats and its surrounds has nearly 46% minority, there is an opportunity to explore how co-design methods can be tailored to work with visible minorities.
- **Partnerships with education institutes:** The high monetary and financial cost of enhanced public participation such as co-design charrettes and working groups may be minimised if The City can partner with education institutions like Emily Carr (which is moving into The Finning site) and UBC to run some of these co-design events.

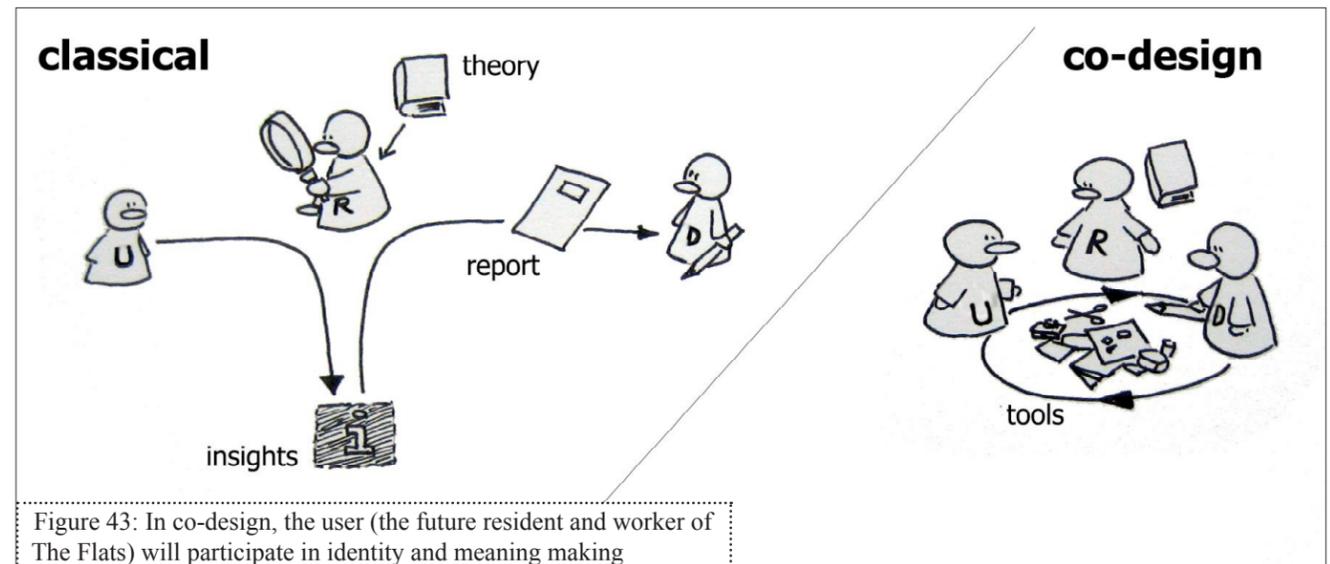


Figure 43: In co-design, the user (the future resident and worker of The Flats) will participate in identity and meaning making

(16) [http://www.roofgreening.ca/living\\_roofs.php](http://www.roofgreening.ca/living_roofs.php) (Accessed: March 10th, 2010)