

COMMUNITY FOOD SECURITY AND THE LANDSCAPE OF CITIES

by

DAVID LEA HOHENSCHAU

B.Sc. Environmental Design, The University of Massachusetts, 2001

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF

Master of Landscape Architecture

in

THE FACULTY OF GRADUATE STUDIES

THE UNIVERSITY OF BRITISH COLUMBIA

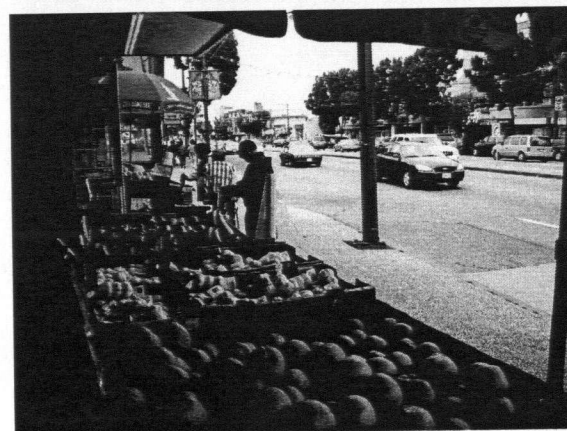
August 2005

© David Lea Hohenschau, 2005

ABSTRACT

Community food security is a framework for community development that engages the sustainability of the local food system and the equitable distribution of food resources. This project suggests a community food design program that optimizes the potential for a sustainable and equitable local food system, and applies it to the Renfrew Collingwood community in Vancouver, British Columbia. The basic principles of the program require equitable access to food distribution and the allocation of land for food production. The applied program is described as a community design plan, and suggests that with minimal changes to the patterns of land use, and significant changes to the use of the public landscape, such a system would support a food sufficiency rate of 5 to 20 percent.

contents



abstract	ii
table of contents	iii
list of figures	iv
acknowledgements	v
1. introduction and context	
1.1 community food security	1-4
1.2 governance and planning	5-7
1.3 design	8-11
1.4 the community food program	12-19
1.5 community food program summary	20-21
2. community analysis	
2.1 physical and demographic context	23-25
2.2 community vision review	26-27
2.3 mapping analysis	28-38
3. design proposal	
3.1 community plan	40-46
3.2 food precinct plan	47-66
3.3 summary	67
conclusions	69-70
references	71-72
appendices	
policy review	74-76
grocery store economics	77
metrics calculations	78-80
residual space analysis	81-84

list of figures and illustrations

Page	Figure	title	Page	Figure	title
2	1.1	Renfrew Collingwood community	42	3.3	network of gardens
4	1.2	food system images	43	3.4	food nodes
8	1.3	Frank Lloyd Wright's Broadacre City	44	3.5	food node images
8	1.4	Village Homes	45	3.6	production centres
9	1.5	Cities Plus Lonsdale diagram	46	3.7	production centre images
9	1.6	CPULs	47	3.8	food precinct
10	1.7	'City-Country Fingers'	48	3.9	Collingwood area
14-19	1.8	food program components, requirements, and examples	49	3.10	park key
20	1.9	community food program summary diagram	50	3.11	park plan
21	1.10	regional program diagram	51	3.11s	park sections
23	2.1	baseline figures	52	3.12	school key
24	2.2	acreative, changing, and historic community	53	3.13	school plan and section
25	2.3	demographic profile maps	54	3.14	clive street key
28	2.4	topographic map	55	3.15	clive street plan and section
29	2.5	aspect map	56	3.16	mchardy key
30	2.6	land use map	57	3.17	mchardy plan and section
31	2.7	open space map	58	3.18	skytrain key
32	2.8	social system map	59	3.19	skytrain plan and section
33	2.9	food assessment map	60	3.20	church key
34	2.10	residual spaces map	61	3.21	church plan and ortho
35	2.11	residual spaces prioritized	62	3.22	Collingwood key
36	2.12	retail and transit map	62	3.23	café section
37	2.13	food access map	63	3.24	roof garden plan and section
40	3.1	community ortho map	64	3.25	roof farm image and key
41	3.2	community plan	65	3.26	lane ortho and images
			66	3.27	lane images and section

for my Dad, who was a dedicated father, a kind man and a thoughtful, well respected architect. He would have been excited to see what I've been up to. Sept 1, 2005.

ACKNOWLEDGEMENTS

My appreciations to:

Cynthia Girling and Doug Paterson who were generous with their advice and schedules and coached me through my own ponderous and muddling process.

Alejandro Rojas and Derek Masselink for providing helpful reviews of my writing and presentations.

Angela Elzinga and the Renfrew-Collingwood Food Security Institute for inspiring and informing my research through their hard work on (and in) the ground.

The City of Vancouver's Social Planning department for so judiciously supporting my exorbitant requests for information.

My good friends for keeping me happy and well-fed even while I was a grumpy b----d: Erika, Dave, Kristen, and Yugi in particular, and of course Claire especially for introducing me to everything that is wonderful and important.

1.1 WHY FOOD?

Food systems include every stage of producing, processing, storing, distributing, and preparing food. They also include all the energy and material requirements and waste produced at each of these stages. Historically these systems have been the foundations of civilizations and cultures, and have also been their failures. A government's ability to provision its cities and citizens with food is a basic measure of its viability, one that is continually challenged by growing populations and shifting economies.

The dominant food system of today provisions the wealthy cities of the world with more food products than ever before, making it possible for many people to eat whatever they want whenever they want it, and often at lower prices. This system has matured over the past century to become a global industry of production and exchange, profiting from efficiencies of scale at every stage of bringing food from the fields to the kitchen tables. The 'global vending machine' (Halweil, 2002), with the support and regulation of governments, has successfully kept pace with population growth and urbanization wherever the citizenry could afford it.

Not everyone benefits, however, from this system, and there are indications that the increasing scale of the food system is leaving larger and larger voids in local communities and at kitchen tables. Competitive economics has forced food producers, distributors, and retailers to cut costs at every corner. Low income neighborhoods don't generate enough revenue per square foot for big supermarket chains, and residents are forced to travel further for their basic needs, with or without the privilege of owning a car. The price of healthy food is rising while economic assistance to families is declining (Cost of Eating, 2003). The use of food banks by families, and especially children, has grown steadily over the past twenty years, even as supply management efficiencies have reduced the surplus that food banks traditionally rely on (Hunger

Count, 2004). Retail food prices have actually tripled, even though net farm incomes have declined, and agricultural lands often yield more houses and golf balls than potatoes (Tait and Qualman, 2004). Developing nations experience 'boom famines' as they shift to export-oriented agriculture, selling cash crops in exchange for basic and often less-than sufficient provisions. The many tons of organic waste generated by cities, which could be used to amend agricultural soils, is more likely decomposing in landfills or polluting downstream waters.

The transportation required for the global food system is also a staggering consumer of energy. BC foods are shipped to processors in Alberta, packaged, and then shipped back to BC. Foods at the grocery store typically have traveled between 2,500 and 4,000 kilometers (Halweil, 2002). A diet based on imported foods can require four times more energy and generates four times more greenhouse gases than the same diet based on local production (Halweil, 2002).

WHERE AND HOW

This project attempts to understand the vision of community food security by developing a community food program and then investigating its implementation through the design of a real place. To support of the efforts of the Renfrew Collingwood Food Security Institute, this project proposes an urban design plan for their community of focus in Vancouver, British Columbia. The Renfrew Collingwood Food Security Institute is a recently formed organization of community leaders who intend to build the community's capacity to grow and share food. The Renfrew Collingwood community is a local area of 45,000 people on Vancouver's east side.

Vancouver has also established a Food Policy Council which describes similar goals for developing a sustainable local food system, so hopefully this project will provide some reference for their efforts as well.

The plan reflects the goals of *community food security* and measures some of the possible outcomes from its implementation, attempting by doing so to ask the following questions:

What would a 'food secure' community look like?
 How much can local food production supplement the diets of residents?
 Where would local food production occur, and what would it look like?
 Are there a need and an opportunity for new distribution outlets?
 How much can a local food system support environmental efforts, such as redirecting waste or managing wastewater?
 What kinds of technology would advance food security and by how much?



figure 1.1: the Renfrew Collingwood community

COMMUNITY FOOD SECURITY

Food plays a central role in the life of people, families, and communities. Cultures emerge from the intimacies that develop between food, people, and the landscapes of particular places. The GARDEN, where food and fibers are produced and recycled, is the prototypical birthing ground of culture. The KITCHEN, where food is transformed by fire from raw ingredients into objects of desire, is the hub of activity in any home. The PANTRY, where memories of summer are kept for cold winter days, provides a sense of security for nations. The TABLE, where food and drink becomes the reason for gathering, nourishes and binds the importance of human events. Taken as a whole, these places and activities are called foodways when bound by culture, foodsheds when bound by geography, or food systems when examined for energy and material efficiency. Food security describes the condition in which *all people at all times have physical and economic access to sufficient, safe and nutritious foods to meet their dietary needs and food preferences for an active healthy life.* (FAO 1996)

Community Food Security (CFS) engages the food system on a local level and directs it towards the multiple social, economic, and environmental benefits that are possible on that scale. CFS redefines food security towards a specific geographic area understood as a community. Community food security, then, *exists when all citizens obtain a safe, personally acceptable, nutritious diet through a sustainable food system that maximizes healthy choices, community self-reliance and equal access for everyone.* (Community Nutritionists Council of BC 2004, from Bellows and Hamm 2002). The Community Food Security Coalition adds the terms 'local' and 'non-emergency' to this condition. (CFSC, 2004)

The CFS framework includes anti-hunger and community development strategies, and considers the entire network of

systems that are required to provision urban places with food (Winne, 2004). The City of Vancouver's Food Policy Council describes this system as the production, processing, distribution and access, consumption, and recycling of food and food wastes (City of Vancouver, 2004).

Proponents of Community Food Security suggest that the dominant food provisioning system, which is following the economic trend towards large-scale specialization and exchange with an absolute reliance on long-distance transportation, is reducing the capacity of local geographic areas to be food secure, and removing the benefits that could be provided by the local production and exchange of food. These benefits include a diversified economy with more internal exchange of goods and services, increased opportunities for civic and social interaction, and reduced environmental impact through the more efficient use of resources (Halweil, 2002. Holland-Barrs, 2002).

Studies also identify many ways that food systems can support or detract from Vancouver's efforts to develop a more sustainable and equitable city:

Economic. Food is an economic opportunity - it is the only resource-based sector in British Columbia (BC) that is growing, employing more people than logging and more than mining and fishing combined, even when labor shortages are the biggest impediment to growth (BC Stats, 2003 and Lawrence, 2002). At the BC average of \$6,800 spent on food per household per year, the retail food sector represents a 4.3 billion dollar market just from Vancouver residents (Statistics Canada). This money, when spent on locally produced food, stays in the community, generating nearly twice as much local income as money spent on imported food (Halweil, 2002). Farmers, who typically earn five cents for every

dollar spent at the grocery store, could receive a better share of each purchase, and provide nutritious foods at lower costs.

Environmental. Local food production can redirect the organic waste that cities produce, turning wastes into resources. Compostable waste, which can be used as a soil amendment, accounts for 25 to 40 percent of municipal waste streams, and often end up emitting methane from landfills (Recycling Council of BC, 2000). Agriculture-based industrial networks can turn organic wastes into food and energy, or treat wastewater for re-use. Local food also reduces transportation requirements and the associated use of energy and production of greenhouse gases: food today might travel hundreds or thousands of miles before it reaches the dinner table (Halweil, 2002).

Social. Local food production and processing can also contribute to the social life of communities. Activities such as community gardening, vocational training, shopping at farmer's markets, or seasonal celebrations such as harvest festivals generate social opportunities that are accessible to a broad demographic. Community gardening creates activity in areas that benefit from the informal surveillance, and from the increased sense of local ownership.

In this context, Vancouver's efforts towards greater sustainability may be enabled or even depend on the development of a local food system. Recognizing this, Vancouver planners have made no small effort to incorporate urban agriculture and food systems into the development of a waterfront brownfield. After an exhaustive study and stakeholder process, the official development plan for Southeast False Creek includes a community learning garden and the possibility of a local composting facility (City of Vancouver SEFC ODP, 2004). In the context of new development, every allocation of land represents dollars lost for developers, and food systems are often represented only by a high-end grocery store.

figure 1.2: food system images



1.2 THE ROLE OF CITIES AND PLANNERS

AUTHORITY

Cities have special authorities that have a broad impact on food security, especially when food access is considered a basic right of its citizens:

Land use planning. Land use planning is a powerful right granted to municipalities. Land use designations influence the location and distribution of food outlets, open spaces, housing, and infrastructure that could influence the viability of local food systems and food security. Most references to food systems and land use exist in regional plans that consider the value of preserving rural farmland and the value of developing peri-urban farmland. Land use planning authority can be used to negotiate for new civic amenities, such as community gardens and kitchens. Land use planning can also encourage the residential densities necessary for a strong transit system and a healthy retail/service node.

Land use and standards regulation. Land uses are often regulated with zoning bylaws. Bylaws can specify the physical requirements of a sanitary food handling operation, and can preclude such activities as keeping bees and livestock. Land use is also regulated by standards that specify structural requirements for buildings and landscaping details - which would include a building's capacity to support a green roof.

Transportation Planning. Public transportation and pedestrian friendly environments play an important role in food access for residents, especially those who either can't afford or choose not to own a car.

Public lands management. Cities often own and manage a significant portion of land, often taken up by roads, institutional buildings, and public open space. Non-market components of the

food system, such as community gardens and community kitchens, often require access to this land in order to exist.

Food safety. Food safety is often a municipal responsibility, involving sanitation and handling standards, inspections, and certifications. The city of Vancouver, for example, requires that eggs sold at farmer's markets be mechanically refrigerated, which is prohibitive for many vendors.

Nutrition education. Public health has been assumed by the province, but nutrition and health education is often delivered in schools and community centres.

Institutional purchasing. Cities are food purchasers too, and often are among the larger purchasers in the area. Policies that encourage the use of locally produced food can have a significant effect in supporting the local food system. BC Ferries, for example, has such a policy and is the province's largest food purchaser.

Senior government advocacy and coordination. Cities can request or coordinate the support of senior governments in developing food security along the entire continuum. Federal policies are increasingly supporting the idea of food security and local food systems with one hand even while supporting massive export oriented agriculture with the other. Local governments can act to find a balance between food for profit and food as a basic human right. Local governments can also coordinate within their region to promote a more holistic food system.

Food related initiatives coordination. The multiple efforts of food organizations can be far more comprehensive and effective when there is a permanent coordinating effort from the city. The emerging model for this support is the Food Policy Council,

which has an advisory role in council and a mandate to promote local food security. Many cities in North America have created a Food Policy Council in the last ten years, and some have managed to create staff positions within social planning or public health departments with the goal of supporting food initiatives.

FOOD POLICY COUNCILS

Many North American cities have created Food Policy Councils which investigate and implement strategies for developing local food security. Hartford (CT), Austin (TX), Los Angeles (CA), St. Paul (MN), Syracuse (NY), Knoxville (TN), Portland (OR), Vancouver and Kamloops (BC); Berkeley (CA); Prince Albert and Saskatoon (SK), have all started a Food Policy Council, the oldest having formed in the early 1990's. Food policy councils generally operate as information monitors and providers, coalition and constituency builders, policy advisors, and project catalysts.

In 1991, the Toronto Board of Health formed a Food Policy Committee that sponsored a series of research papers and successfully promoted a municipal food charter (May 2000), in which the city council endorsed the citizen's right to food access and promised to promote local food systems. Toronto's staffed Food and Hunger Action Committee has been developing food related policy and programs for four years now, and has refined it's original 38 recommendations to the following short list of programs and supporting structures, based on effectiveness and available resources:

- community gardens
- community baking ovens (in parks)
- community kitchens
- farmer's markets
- upgraded community centre kitchens
- an annual food initiative community grant program
- a permanent food security sub-committee in council
- an interdepartmental staff committee

- a full time food security coordinator

Portland (Oregon) created a Food Policy citizen's advisory committee in 2002. This is a subcommittee of the Sustainable Development Commission. With a mandate to advise on land use policy, food accessibility, local production capacity, and institutional purchasing and local food industries, they recommended the following high priority actions:

- identify areas in greatest need, and then work to expand retail options, markets, production options, and federal nutrition and food access programs.
- develop an institutional purchasing policy that favors regionally and sustainably produced food.
- expand a summer food for youth program through the Parks and Rec department.
- promote area farmer's markets on public sites.

In Vancouver, food security issues have been addressed in many small pieces by non-profits and municipal departments for years in the form of food banks, community gardens, and local agricultural projects. Nutritionists in the Vancouver Health Department first recognized that a coordinated approach would be more effective in the early 1990's. Their initiative evolved into a working group called the Vancouver Food Policy Organization in 1993, which carried the initiative forward even as the role of the Health Department was absorbed into the provincial government's larger health district area.

In July 2003, Vancouver initiated a Food Policy Task Force to develop a strategy for creating a 'just and sustainable food system'. A significant outcome of this strategy is the adoption of a 'Food Action Plan', which called for a Food Policy Council and an interim work plan. The Council is a voluntary citizen body coordinated by two full-time city staff positions. The Council is responsible for developing policy and coordinating the various food-related efforts of community groups and municipal departments. A focused

sample of Council initiatives is provided in the Action Plan:

- Production: Creating and promoting community gardens; promoting rooftop gardens; promoting urban agriculture; economic development opportunities linked to sustainable local agriculture; buy local campaigns.
- Processing: Creating a coordinated food processing and distribution centre; studies on local food processing; supporting community kitchens; commercial kitchen incubator projects.
- Distribution and access: Promoting food co-ops and buying clubs; coordinating emergency food systems; creating and supporting local farmers markets; volunteer programs for coordinating emergency food distribution; food sector job skills training for low income people.
- Consumption: Provide assistance to the School Board, when requested, in meeting their established school nutrition goals; public education on food security and insecurity; infant and child nutrition projects; public forums on food security issues.
- Recycling of productive wastes: Promoting food composting; using creative approaches to waste reduction, recycling and composting.
- Policy: Discussion papers on food policy issues; advocacy campaigns.

The Vancouver Food Policy Task Force identified the following actions to generate short-term results for improving food security:

- Conduct a Community Food System Assessment.
- Feasibility Study For The Creation Of Rooftop Gardens.
- Facilitate The Creation Of Community Gardens.
- Facilitate The Creation Of Farmers' Markets.
- Facilitate The Creation Of A Coordinated Food Processing And Distribution Facility For Low Income Citizens.

1.3 THE ROLE OF DESIGNERS

Designers are trained to adjudicate between the physical requirements of human activity, the complications of the regulatory environment, and the opportunities and constraints of a given place. Design is often used as a tool to discover solutions to community planning objectives, and to negotiate those solutions between multiple stakeholders. It is in this capacity that designers can begin to engage the concept of food security and local food systems.

To be sure, food security activities often require more from human resources than physical space. However, if spaces within the city were planned and designed in anticipation of a local food system, then the availability and appropriateness of those spaces could act to leverage rather than impede the social resources invested in animating them.

Designers are also trained to make things work while simultaneously engaging desire. The long term viability of places is often contingent on their perception in the public view - are they wonderful, interesting, and valuable? or, are they an eyesore, an intrusion, and a nuisance? People act unpredictably beyond the bounds of economic practicality, tending to keep either the very durable, very useful, or very delightful things around for a long time... Ford Mustangs still race around while Ford Pintos rust in backyards. Old stone churches are renovated while old shopping malls are demolished.

The designer's challenge then is to make things fit, work, and be wonderful all at once. In this light, it may be valuable to consider adding more qualitative elements to the food security program, such as festival grounds, gathering places, food landmarks and memorials, community dinner bells, and other displays of food culture. A very productive and wonderful lane through a residential block, for example, should be worthy



figure 1.3: Frank Lloyd Wright's Broadacre City would provide enough land for every family to be self-reliant. (image from <http://www.queensu.ca/surp/surp817/flw1.htm>)

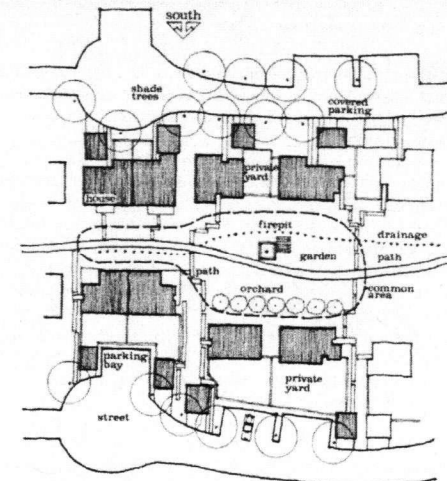


figure 1.4: Village Homes housing is arranged around commonly owned productive landscapes. (image from <http://www.eslarp.uiuc.edu/la/LA338-S01/groups/c/DavisCA.html>)

of some public realm recognition. Such recognition would encourage others to consider how they might also contribute. A simple indicator of the weather and the planting seasons on a downtown street would remind gardeners that they are part of a constituency, and that they should start planting zucchinis.

In the context of food security, designers have long sought to understand the relationships between people and food in the landscape:

In 1898, Ebenezer Howard's Garden Cities were an early proposal to offset the ills of newly industrialized cities. Garden Cities featured productive landscapes, as much as five-sixths of the areas within and around each new town. Each family would have a residential lot slightly smaller than a typical Vancouver one (33x120 feet) which would be sufficient to grow their own food, and allotment gardens would ring the entire town. Many new towns were built according to this model, though none became the self-sufficient unit imagined. (Howe, 2005)

Corbusier and Frank Lloyd Wright followed this model with further visions: Corbusier's a city that would house people in tower apartments, leaving the ground open for orchards and market gardens, and Wright's a dispersed landscape of micro-homesteaders similar in principle to Garden Cities (though more expansive: each family would have one acre). (Howe, 2005)

In the late 1970's, the Corbetts designed and built Village Homes in Davis, California. This successful real estate development dedicated twenty-five percent of the 70 acre parcel to shared agricultural landscapes, including two vineyards, several orchards, and two community gardens. These landscapes are managed by the residents and a dedicated property manager, and provide 25% self sufficiency in fruits and vegetables. (Francis, 2003)

In 2003, the Cities Plus network proposed a 100-year vision for the

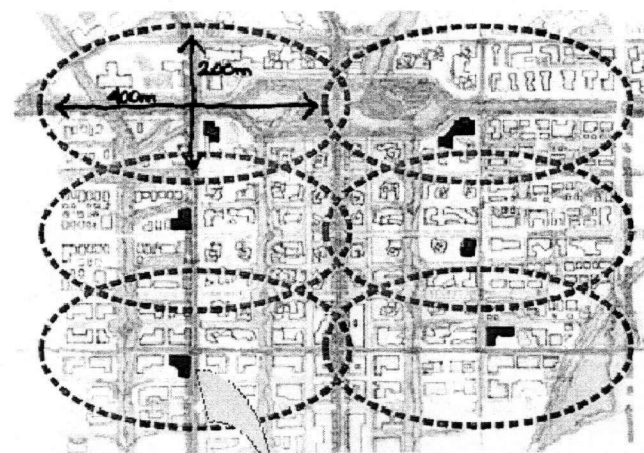


figure 1.5: Cities Plus Lonsdale diagram showing neighborhood cells centered around a common building. (Cities Plus, 2004)

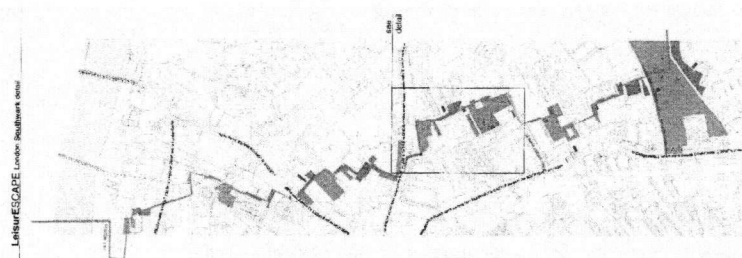


figure 1.6: Viljoen's CPULs connect various food-related activities in a linear system through the city (Viljoen, 2005)

city of Vancouver. This vision describes a sustainable city based on partial self-reliance at the home, the block, the neighborhood, and the city scales. Urban agriculture plays its role in this vision by putting organic and liquid 'wastes' to productive reuse, and by using the excess heat from buildings to warm greenhouses. (Cities Plus, 2004)

Andre Viljoen proposes that cities could incorporate Continuous Productive Urban Landscapes (CPULs) as a productive and sociable type of linear network or greenway, connecting gardens and farms to marketplaces and recreation areas. (Viljoen, 2005)

Similarly, though more extensive, Christopher Alexander suggests that one-mile wide 'fingers' of agricultural land should extend into the centre of every city so that everyone lives within a ten-minute walk of the country. (Alexander, 1977)

Moura Quayle and Karl Linn both propose that the public realm could become a valuable extension of democracy through urban agriculture. In this vision, the public realm is understood as a modern day commons, with small public places distributed throughout neighborhoods. The commons are locally managed by nearby residents who (among other things) build gardens and grow food. (Quayle, 1997 and Linn, 1999)

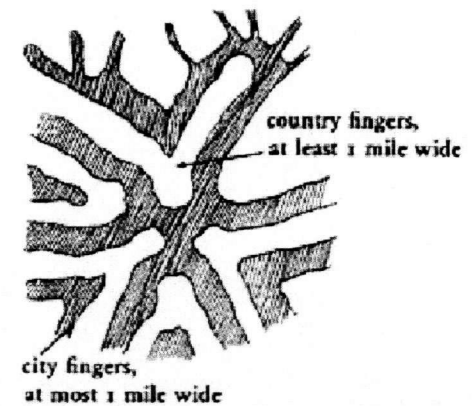


figure 1.7: Alexander's 'City-Country Fingers' show alternating corridors of urban and agricultural lands. (image from <http://www.ahartman.com/apl/patterns/apl003.htm>)

THE ROLE OF LOCAL ORGANIZATIONS

It should be noted that the presence of municipally planned or designed urban food systems is rare and that most examples of local food system programs (in North America) exist from the efforts of residents and community organizations. These groups more often have struggled through the financial and political landscapes of cities, creating real examples for planners and designers to learn from.

The Renfrew Collingwood Food Security Institute (FSI) is a three-year old organization with one part-time coordinator and several committee members. They are promoting 'equal access to affordable, healthy, and culturally appropriate food' by 'building creative, stable and affordable food sharing opportunities in (their) community.' (FSI website) They are advancing their goals by coordinating a community kitchen, food sharing programs, planting fruit trees in parks, and starting gardens on roofs and railways.

On the campus of the University of British Columbia, students and faculty coordinate efforts to develop a local food system based on a student-run farm and collaboration with the campus food service providers.

In Toronto, the Friends of Dufferin Grove Park are building outdoor ovens, kitchens, and gardens. Toronto's FoodShare runs gardens and community kitchens among many other projects.

Similar examples can be found in Nanaimo, Victoria, Berkeley, Boston, New York, Seattle, and hundreds of other cities in Canada and the United States.

1.4 PRINCIPLES AND GOALS

Community food security focuses on developing local resources that increase food access, food production, food-based economic opportunity, and food related social programming (Winne, 2004). The attributes of these resources are defined as sustainable, easily understood and communicated, proximate, participatory, just and equitable, valued and value-based, and healthy and nourishing (Kloppenburg, 2002). The common defining principles of community food security are;

*that food is a basic human right,
that the community is the unit of analysis and action,
that food solutions generate additional community wealth, and,
that food security depends on the long-term sustainability of the food system.*

A background study for the Southeast False Creek development identified nine objectives that would direct community development towards these conditions (from Holland and Barrs, 2002):

1. Maximize the *physical capacity* of the SEFC neighborhood to support the growing of food
2. Optimize the *amount of food grown* in SEFC
3. Increase the *amount of food consumed* in SEFC that is produced locally and sustainably
4. Increase *food-related development* initiatives, including food processing.
5. Increase the capacity of SEFC to provide or *support basic food security* initiatives
6. Use urban agriculture to *manage waste flows*.
7. Increase the *technical capacity, skills and knowledge* of all stakeholders
8. Encourage the *public celebration* of local food
9. Encourage imported food that is *sustainably and ethically produced*

These four goals may clarify the basic ingredients of a community food program:

1. ACCESS: Ensure access to food purchasing and self-provisioning opportunities for all residents.
2. PRODUCTION: Maximize local production and processing of food.
3. AMENITY: Use food related programs to increase and diversify civic, social, and economic opportunities.
4. INFRASTRUCTURE: Use food systems to make productive use of municipal wastes.

SUPPORTING ACTIVITIES

A set of activities supports each goal, which in the case of this study is limited to those activities which require secure physical space in the landscape. Many other programs such as nutrition education, government food subsidies, institutional purchasing policies, and local food marketing campaigns are not included in this program because they will not tend to inform the physical arrangement of the community.

The program outlined here is further described on the following pages with a description of spatial and location requirements, and an example. The requirements are summarized as a diagram which attempts to illustrate a food secure urban community. For explanations regarding these requirements, refer to the appended section on metrics.

1. ACCESS

- retail grocery services
- farmer's markets
- alternatives:
 - farm delivery clubs, food buyer's cooperatives, food exchanges, emergency food distribution
- public transit

2. PRODUCTION

- garden plots (backyards, community gardens)
- fruit trees (individually or orchards)
- learning gardens
- community farms
- commercial farms

3. AMENITY

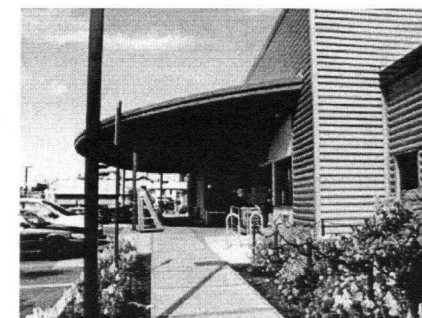
- community kitchens
- community baking ovens
- places to eat and gather (inside and outside)
- food related festivals
- instructive and celebratory landmarks

4. INFRASTRUCTURE

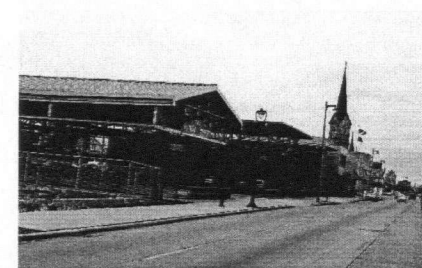
- bin composting
- mid-scale composting systems
- advanced composting systems
- other emerging opportunities to redirect organic wastes:
 - biodiesel plants
 - biofuel combined heat and power (chp) plants
 - solar aquatic systems
 - agricultural eco-parks

figure 1.8: (following pages) food program components, requirements, and examples

ACTIVITY	DIMENSIONS	CRITERIA	EXAMPLE
retail grocery services	<p>Building area: 2,340 sq m(24,000 sq ft) for one large grocery store or a cluster of smaller stores</p> <p>Site area: Same with underground or rooftop parking</p>	<p>within a 5 minute walk or transit ride for every resident, with a priority for residents who are least likely to own a car</p> <p>requires 7,600 people within this radius to meet industry standards for economic viability</p>	<p>City Market Food Coop, Burlington VT: This is one of many examples of successful downtown food cooperatives, or 'Community Owned Groceries', in which customers or employees are voting shareholders of the business. Coops often become the generator of other community-run environmental and social initiatives.</p>
farmer's markets	<p>Widths: One-sided: 12-14 meters Two sided: 22 meters</p> <p>Area: 1,500 to 2,500 sq m plus nearby parking</p>	<p>trade areas of 3-7 miles</p> <p>high visibility to regional traffic, and ample nearby parking</p>	<p>Fondy's Farmers' Market, Milwaukee WI: A 3,500 square meter, partially covered market area is open six days per week, with over 50 vendors distributing 340 tonnes of food per year. Expansion plans include a 2,000 square meter indoor market and a 930 square meter kitchen incubator.</p>
farm delivery clubs, food buyer's cooperatives, food exchanges, emergency food distribution	<p>requires parking stall (6x6 m) and/or storage area (3x6 m)for drop offs</p> <p>can also require regional warehousing (or mid-scale storage facility (25-50 sq m)</p>	<p>points located within areas requiring provisional food distribution</p>	<p>Mobile Market, Oakland CA: Mobile Market is a non-profit food distributor that sells fresh produce at scheduled stops in under served neighborhoods. Stops are in parks, community centres, or on street corners.</p>



http://www.citymarket.coop/html/about_coops.htm



<http://graphics.jsonline.com/graphics/bym/img/apr04/fondybig0426.jpg>



<http://www.peoplesgrocery.org>

ACTIVITY	DIMENSIONS	CRITERIA	EXAMPLE
garden plots	<p>Minimum plot area: 1x2 m</p> <p>minimum community garden area: 18.6 sq m</p>	<p>targeted to areas within walking distance of multifamily housing</p> <p>6.5 plots per 1000 residents minimum</p>	<p>Mole Hill, Vancouver BC: This city-owned housing redevelopment created a neighborhood commons by redesigning the laneway. Parking was redistributed to clustered areas, the paved surface narrowed, and the extra space is used as a community garden area. There are 70 1x2 meter plots.</p>
fruit trees and orchards	<p>high density planting techniques can fit up to 4 trees per 10 square meters, planted only 1/2 meter apart.</p> <p>minimum area width per planting: 3 meters.</p>	<p>in places where organic debris will not be a nuisance (ie private yards or away from streets)</p> <p>clustered for easier maintenance</p>	<p>Danny Wu Gardens, Seattle: A mature apple orchard creates a wonderful, shaded sanctuary and entrance to a community garden.</p>
learning gardens	<p>Minimum area: 10 sq m</p>	<p>In or near schools.</p>	<p>The Edible Schoolyard, Berkeley CA: This one-acre garden and learning kitchen is integrated with the school grounds and provides a full curriculum for 930 students.</p>



http://online.caup.washington.edu/courses/hswdesignbuild/96DannWoo_more.html



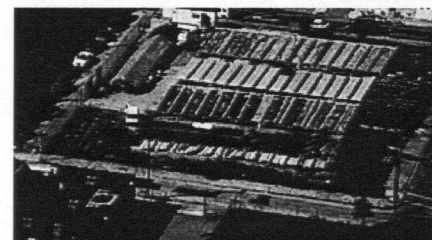
<http://photos.unpythonic.net/64169/>

ACTIVITY	DIMENSIONS	CRITERIA	EXAMPLE
community farms	Minimum area: 300 sq m	transit access and high visibility to the community	The Intervale Community Farms is in the floodplain of a river passing through Burlington Vermont. About 300 acres support 12 small farms and a composting facility. The Intervale projects are producing a new generation of agricultural research and skilled farmers, and hundreds of thousands of pounds of organic foods.



(photo by Claire Tebbs)

commercial farms	wherever feasible	Minimum area: 1200 sq m	Greensgrow Farms in Philadelphia is an interesting model, though not truly commercial since it is a non-profit business. A hydroponic vegetable farm and nursery on a vacant city lot also brokers the produce of outlying farms through a weekly market.
-------------------------	-------------------	----------------------------	---



http://www.greengrow.org/pages_04/faq.html

community kitchens	5-15 square meters per cook avg size: 40-100 sq m	In community centers or private social institutions	The Community Kitchen at the Collingwood Neighborhood House supports several cafeteria style community meals and fits up to 15 cooks.
---------------------------	--	--	---



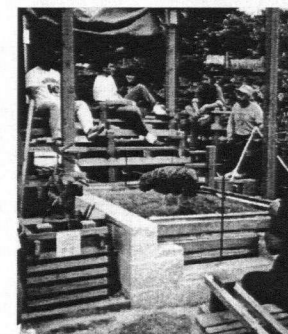
<http://www.communitykitchens.ca/index.php?module=htmlpages&func=display&pid=106>

ACTIVITY	DIMENSIONS	CRITERIA	EXAMPLE
Community baking ovens	2x2 meters	In parks or community centers	Dufferin Grove Park, Toronto: This community bake oven was built by a 'friends of the park' organization and is in constant use for festivals and gatherings of all kinds.



<http://dufferinpark.ca/oven/food.html>

Places to eat and gather	Outdoors in parks or indoors in community centers, social club halls	1-5 square meters per person, a 110 sq m cafeteria sits 80 people	Danny Wu Gardens, Seattle WA: This outdoor roasting spit is the centre of a small gathering area in the community gardens.
---------------------------------	--	---	--

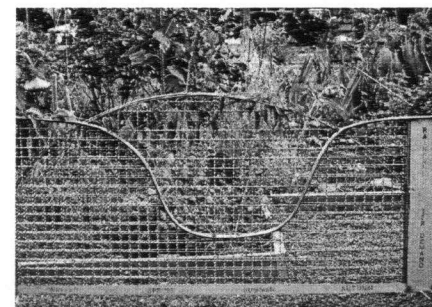


http://online.caup.washington.edu/courses/hswdesignbuild/90DannyWoo_more.html

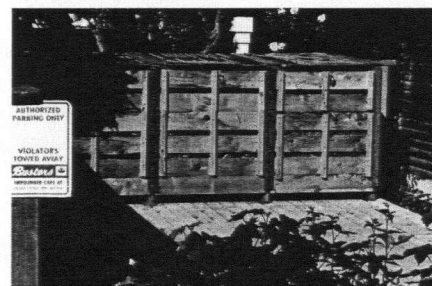
Harvest festivals	Varies	Places of social or other significance with space enough for a large gathering.	Renfrew Collingwood Moon Festival is 3 years old. A harvest fair and parade follows the Renfrew Ravine from Renfrew Park to Slocan Park.
--------------------------	--------	---	--



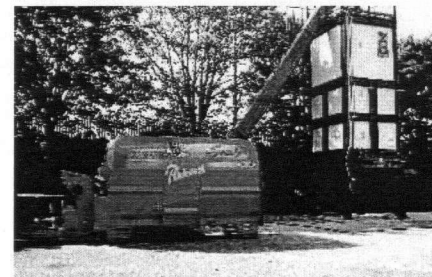
ACTIVITY	DIMENSIONS	CRITERIA	EXAMPLE
instructive and celebratory landmarks	varies	everywhere	garden gate, P-Patch garden, Seattle WA: The rails of this gate represent the amounts of water demand and rainfall over a year in Seattle.
bin composting	1 or several per small community garden 1 or 2 per private yard	1x1m each	The City of Vancouver has been distributing bin composters to residents for over a decade. City Farmer estimates that almost 40% of Vancouver households have taken advantage of this program. (www.cityfarmer.org)
mid-scale composting systems	site areas range from 10 to 300 square meters depending on capacity	as possible within communities, where there is a high volume generated, such as near restaurant/grocery areas or multifamily areas	Fairfield Materials Management, Manchester UK: Uses an on-site vertical composting unit at a green market to process 1200 tonnes per year of commercial and residential kitchen and yard wastes.



PPatch garden gate (photo by author)

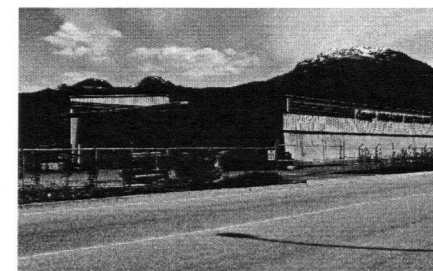


Mole Hill community garden compost bins. (photo by author)

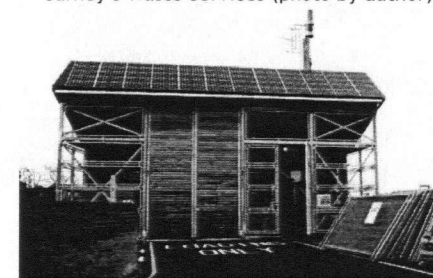


<http://www.communitycompost.org/hotrotters/fmm.htm>

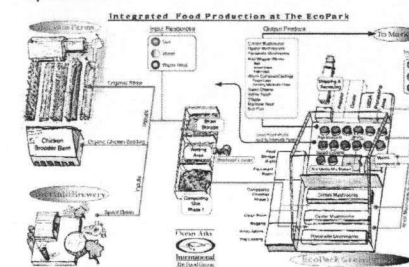
ACTIVITY	DIMENSIONS	CRITERIA	EXAMPLE
advanced composting systems	150-260 sq m	Noise and odor sheltered from residential areas	Carney's Waste Services, Squamish BC: Processes 35-50 tonnes per day of organic waste that is collected from a regional district of over 15,000 residents. They use a blue bin/truck lift collection service to feed a shed-housed, in-vessel composting system on an industrial lot.
other opportunities: biodiesel plants, biofuel chp plants, solar aquatic systems, eco-parks	So far these have only been supported by high-end land developments, one-off demonstration projects, or by the economics of extremely unique or isolated conditions, but may become feasible as energy resources shift. These projects likely represent the future of urban agriculture in North American cities.	BedZED, England: Includes a wood-chip fueled CHP plant embedded in the community centre, and wetland treatment of wastewater. Dockside Green, Victoria: Proposed to include a Biodiesel plant that will recover waste cooking oils from restaurants, and a wood-chip CHP plant. Bear River, Nova Scotia: Town uses a greenhoused constructed wetland to treat sewage.	



Carney's Waste Services (photo by author)



BedZED's Biogas CHP
http://www.bioregional.com/programme_projects/ecohous_prog/bedzed/bz_cpd.htm



Ocean Ark's Agricultural Eco-park
<http://www.oceanarks.org/agriculture/>

1.5 THE COMMUNITY FOOD PROGRAM

The driving measures in this program are based on food access and economic support for grocery stores:

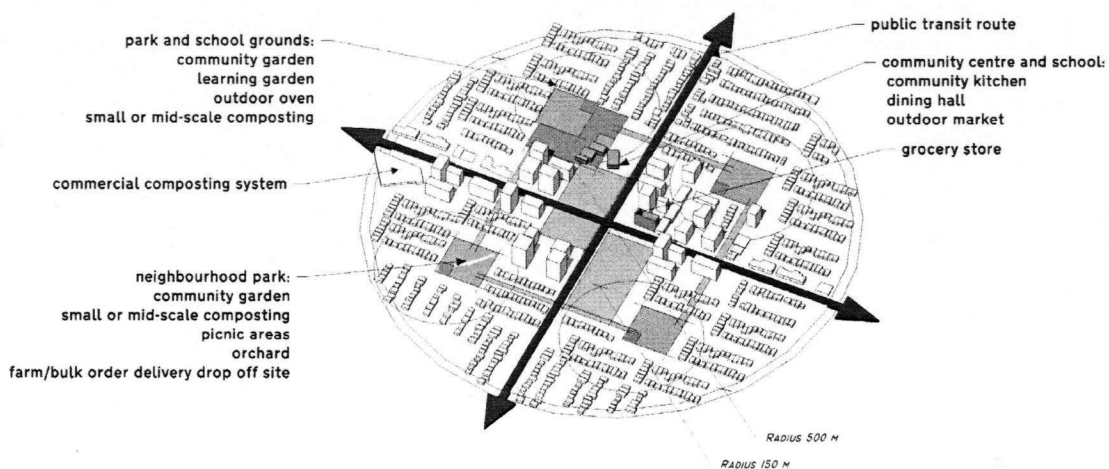
Equitable food access is measured as 'a full range of grocery services within walking distance (500 meters) of every residence'. This indicator is adapted from a community planning measure which calls for all residences to be within a five-minute walk of basic services and public transit (Condon, 2002).

Within this radius, there needs to be at least enough people to financially support one medium sized grocery store or a cluster of specialty stores. Based on a 24,000 square foot gross store area, a trade area sales per person estimate, and a sales per square foot standard, this would suggest a population of 7,600 people within walking distance for the Renfrew Collingwood area. (see appendix: Grocery Store Economics)

Given the number of people and the land area they occupy, areas for park space, community gardens, and other community services can be derived to understand the optimal arrangement for the community food program:

total area	78.5 ha within a 500 m radius
population	7,600
housing	2,500 mixed units
grocery stores total area	24,000 square feet
parks	8.4 ha
community garden plots	50 on 900 square meters
school	2 to 3 ha
community centre	30,000 square feet
composting system	2,000 to 3,000 square feet

figure 1.9: a summary diagram of the community food program showing a central area for basic services surrounded by a distributed system of open spaces.



This program then generates a sketch of the food secure community, and the agglomeration of communities that make up a city. The following sections describe the Renfrew Collingwood community in Vancouver, and propose some modest changes that will move that community along the food security gradient.

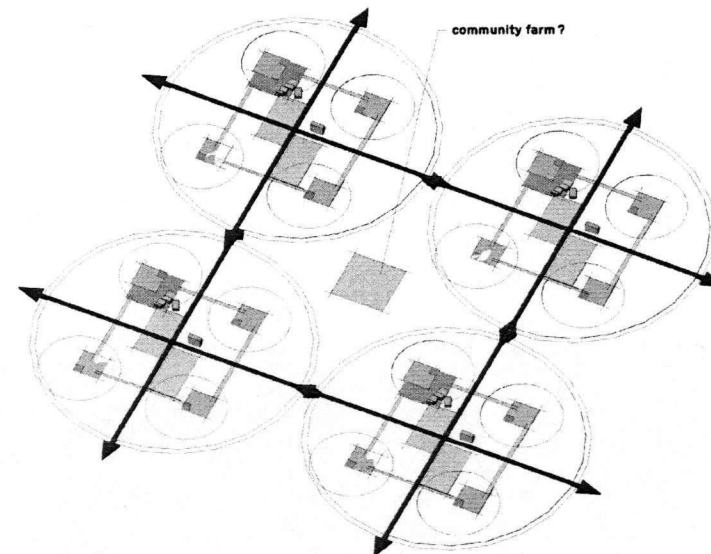
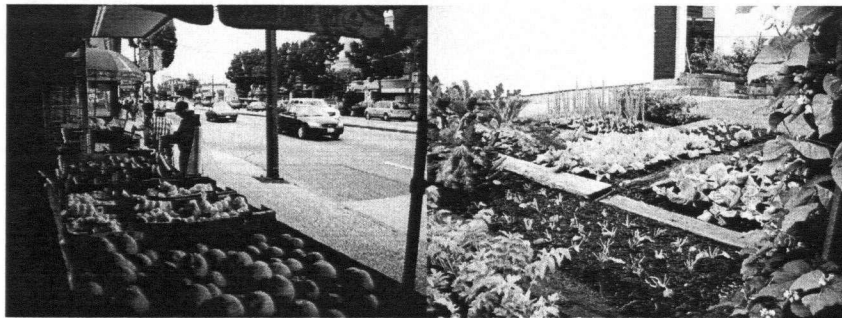


figure 1.10: in a city this pattern would repeat itself regularly along transit corridors



community food assessment



2.1 THE PROJECT AREA: RENFREW COLLINGWOOD

The Renfrew-Collingwood community is located on the eastern edge of the City of Vancouver and defined by Nanaimo, Broadway, Boundary, and 41st streets.

This community is home to over 45,000 people, is composed of eight neighborhoods, and covers almost 900 hectares. The Community Plan for the area, or Community Vision, calls for a network of neighborhood centres with an improved public realm and diversified public programming. The City hopes the area will accommodate up to 4,600 new households in the next 15 years.

FOOD SYSTEM DATA

figure 2.1: baseline figures

quantity	annual base measure	absolute measure
45,000 people	3,900 tonnes of vegetables consumed 4,400 tonnes of organic waste generated	49.5 ha of parks 292 community garden plots required (by 6.5 per 1000 minimum)
12,000 individuals in low-income families	1,044 tonnes of vegetables consumed	
37 restaurants	851 tonnes organic waste generated	
18 grocers	360 tonnes organic waste generated	
7,500 families in attached or multi-family housing		3,000 families who might want to garden (by 40% standard)
7,000 families in detached housing	1,000 tonnes of waste composted 50 tonnes of vegetables produced	2,800 backyard gardens (by 40% standard)

Area

Total area	898.6 ha
Parks	36.6 ha
Residential	433.1 ha
Streets	288.6 ha
Industrial	81 ha
Commercial	21.4 ha
Schools	36.5 ha
Vacant lots	3.57 ha

People

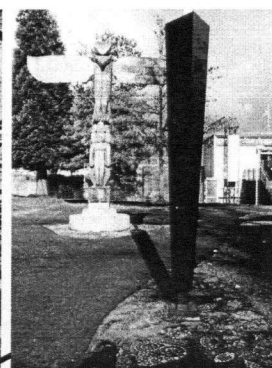
population	44,950
Households	14,655
Avg Household size	3.1
Average Family Income	\$49,706
	(72% of city avg.)
Low income households	4,000
	(27.3%)

Housing

Unit type: apartments high-rise	1,656
Unit type: apartments low-rise	2,360
Unit type: attached	3,708
Unit type: detached	6,917
units built before 1970	5,935 (40.5%)
Tenancy: rented dwellings	6,038 (41.2%)
Non-market housing units	1095
Residential Density (gross)	17.9 uph

Community and Retail Services

Elementary schools	9
High Schools	2
Private Schools	3
Churches	21
Parks	14
Community centres	2
Food Retailers	18
Public/Farmer's Markets	0
Community Gardens	1
School Gardens	0



*figure 2.2: a creative, changing, and historic community:
Slocan Park,
Joyce Street,
Avalon Dairy.*



demographics

A brief demographic portrait of the area indicates both a need and the capacity to implement a community food program. In Renfrew Collingwood;

27% of families are low-income, with the highest incidence in the Joyce Street area,

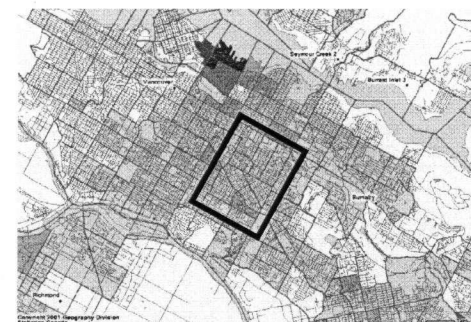
average income is 70% of the Vancouver average,

over half of housing units are multi-family,

almost half of housing units are rented,

there is a relatively high proportion of workers with trade and food related skills.

figure 2.3: demographic profile maps
data source: Statistics Canada



income based on government transfers



incidence of low income families



employed in the trades



employed as chefs or cooks

2.2 COMMUNITY VISION

It's important to point out that public support for a community food program has been indicated in the Community Vision for Renfrew Collingwood:

Increased food distribution access:

18.5 A Range of Shops and Services (referring to Joyce district)

- add a butcher, fish market, Bread Garden ...

19.2, 19.6, 20.7 Adding a Supermarket (referring to Norquay Village, and 'mini-nodes')

Supermarkets are important 'anchors' for neighbourhood shopping areas. The City, in consultation with the neighbourhood, should work with supermarket owners to identify, assemble, and rezone an adequate site for a smaller supermarket (e.g. Capers, Choices, Marketplace), in a mixed use development, with adequate parking provided.

- referring to the Norquay Village area and specifically to the 2400 Motel and Eldorado Hotel Sites, and,
- encourage medium size market at 22nd and Rupert

Gardening and food related events as a means to diversify Park and School Programming:

23.1 Park design, appearance, and activities should be more varied in order to serve a more diverse population. School grounds should be attractive, usable community spaces.

- provide more benches, covered rest areas, picnic tables, and decorated entrance areas
- include more natural features such as gardens, plants, flowers, trees, ...

Additional productive public areas 'borrowed' from streets:

23.2 There should be more parks and other public open spaces in poorly-served areas of Renfrew-Collingwood.

- create mini-parks on street right of ways
- create street-end parks

23.10 Streets should continue to be pleasant green links that connect the neighbourhood should be enhanced by:

- creating more mini-parks on street right of ways.
- plant more corner bulges to identify neighbourhoods, or act as a gateway feature with signs
- plant more 'green' on SkyTrain pillars, columns, and guide ways
- add planter boxes to beautify streets

Gardening as a method to create a more continuous presence in parks:

23.5 Safety concerns should be a more important aspect of park use, design, and maintenance.

Local, volunteer stewardship of the public realm:

23.6 Public involvement in the design and stewardship of parks should be encouraged.

- encourage park partnerships with schools, community groups, and local volunteers
- encourage community events in parks such as clean-up days, multicultural celebrations, and special 'theme' days

Gardens as a place for informal and creative expression:

23.9 There should be more public art in parks and public spaces.

Lanes as an opportunity to add character and beauty:

23.11 ...There should be alternatives to fully paved lanes, to allow for more greenery and more permeability for storm water, and all the alternatives should be offered to home owners when they vote on lane paving.

- provide more opportunities for more 'Country Lanes'
- make lanes beautiful, useful and accessible, not utilitarian

Food programming as a generator of activity, sharing, and

learning:

7.5 Youth crime should be reduced through the coordinated efforts of schools, community organizations, and other groups working with youth. Initiatives could include:

- additional facilities and programs in parks, community centres, schools, churches, neighbourhood houses, etc. to provide alternatives for youth
- youth employment programs
- need more free youth programs related to jobs skills, finding jobs, preparing for life, etc.
- expand youth employment programs, particularly for part-time jobs
- promote youth volunteer programs to promote community involvement (e.g. stewardship program/project)

8.5 Facilities and Programs for Seniors

Facilities for seniors should be improved and expanded in the community centre. Programs should be provided for seniors with a variety of cultural and linguistic backgrounds.

8.6 Programs for Multicultural Diversity

Broad participation of different people and groups in community life should be encouraged by providing more opportunities to meet with neighbours and celebrate multicultural diversity.

- organize multicultural food fairs (raise money and raise awareness of different cultures)

18.3 Improve Joyce SkyTrain Station as a 'Gateway'

Improve the Joyce SkyTrain Station as a 'gateway' to the Kingsway Shopping Area, as well as to the neighbourhood generally, through improvements to station appearance,

- provide murals...(and) fences to funnel pedestrians
- add basic shelter/infrastructure for temporary markets

18.12 A More Attractive, Usable Place

- have festivals and soap-box races down Joyce from Kingsway

- corner bulges on side streets can be mini-parks and viewpoints

Food waste recovery as an essential component of municipal infrastructure:

25.1 Individuals and businesses should take the initiative (with City support) to increase the amount they recycle and reuse materials, reduce waste, and compost.

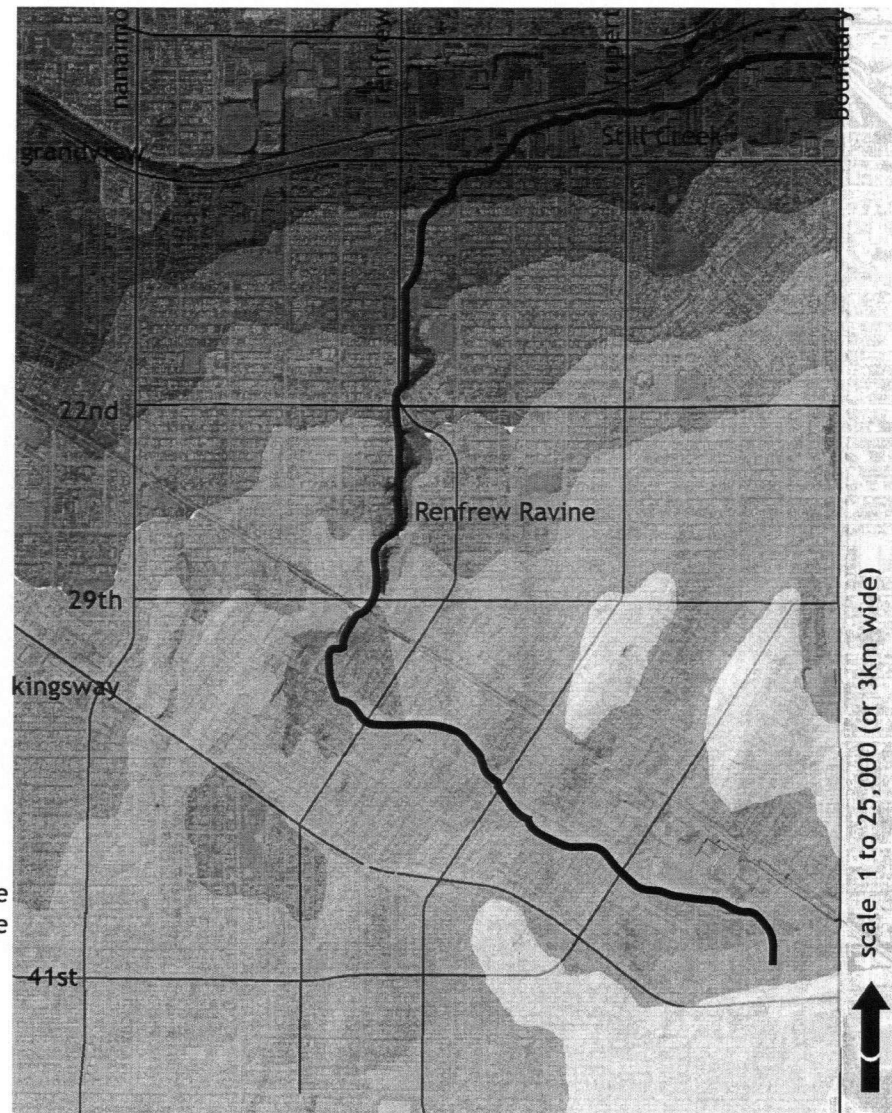
(CityPlan 2005)

2.3 topography

The site is in the upper portion of the Still Creek Watershed, which feeds into Deer Lake and the Fraser River. The creek is buried except in Renfrew Ravine and in some sections along Grandview Highway. The land generally slopes north, with small hills forming a basin in the southeast corner. This basin is the site of a drained lake where the original Collingwood settlement started in the late 1800's. Some older residents recall hiking through wooded creeks to get to school, but the only visible part of the waterway is the ravine at centre and portions of the creek in the northeast.

the darker areas indicate the
lower portions of the site

figure 2.4: data source: City of Vancouver



aspect and production history

The modern community began in the late 1800's as a waystation on the road (Kingsway) between Vancouver and New Westminster, and grew from a semi-rural outpost into a suburban village and then an urban district. The early settlers were farmers, and agricultural activities continued through the first half of the 1900's. Today the Avalon Dairy still operates a processing facility and store here, but the market gardens, orchards, and the door-to-door fish sellers have disappeared. (Collingwood Pioneers, 1995)

Agriculture concentrated in the water-receiving areas that were either flat or had a good southern aspect: the former lake bed in the south-east quarter, and the Still Creek basin in the north. Most of this land is now taken up for housing, commercial, or industrial uses, indicating that commercial farm ventures are unlikely to find any large areas of favorable land for soil-based production.

There are however, a number of industrial rooftops and a large school ground (Vancouver Tech) in the northern area of the community.

reds indicate a southern aspect
blues indicate a northern aspect
flat areas are white

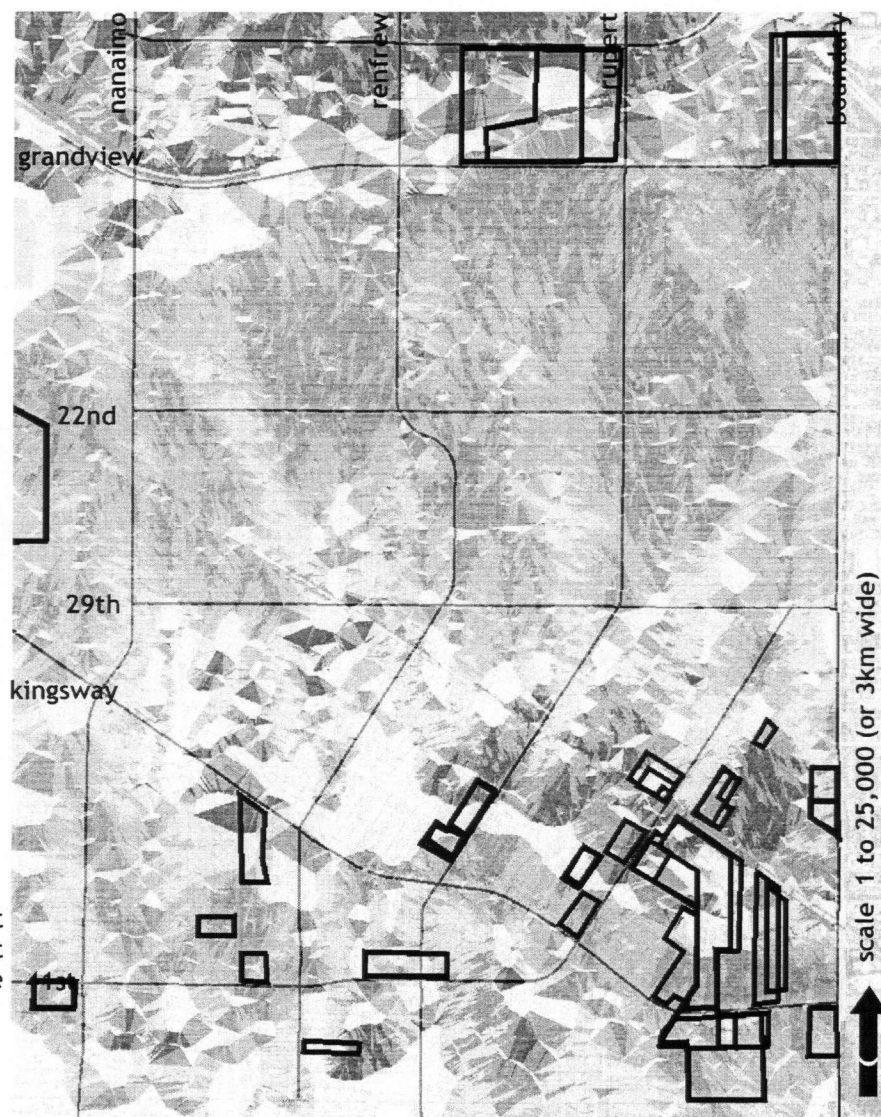


figure 2.5: data sources: City of Vancouver & MacDonald, 1992

land uses

The community is organized by a street grid that is interrupted by Renfrew Ravine, Kingsway (the original street), and two monorail lines. There is a strip of industrial lots to the north along Grandview highway. Single family detached housing dominates the residential areas, with higher densities concentrating around the Joyce Skytrain Station, and along the collector streets such as Boundary, Grandview, and Kingsway.

Kingsway has several sections of small retail services, with an active pedestrian area around Joyce Street and Kingsway, near the Safeway supermarket. Several small retail nodes are dispersed in the neighborhoods, with notable clusters of food related businesses such as at Joyce&Van Ness and at Rupert&22nd.

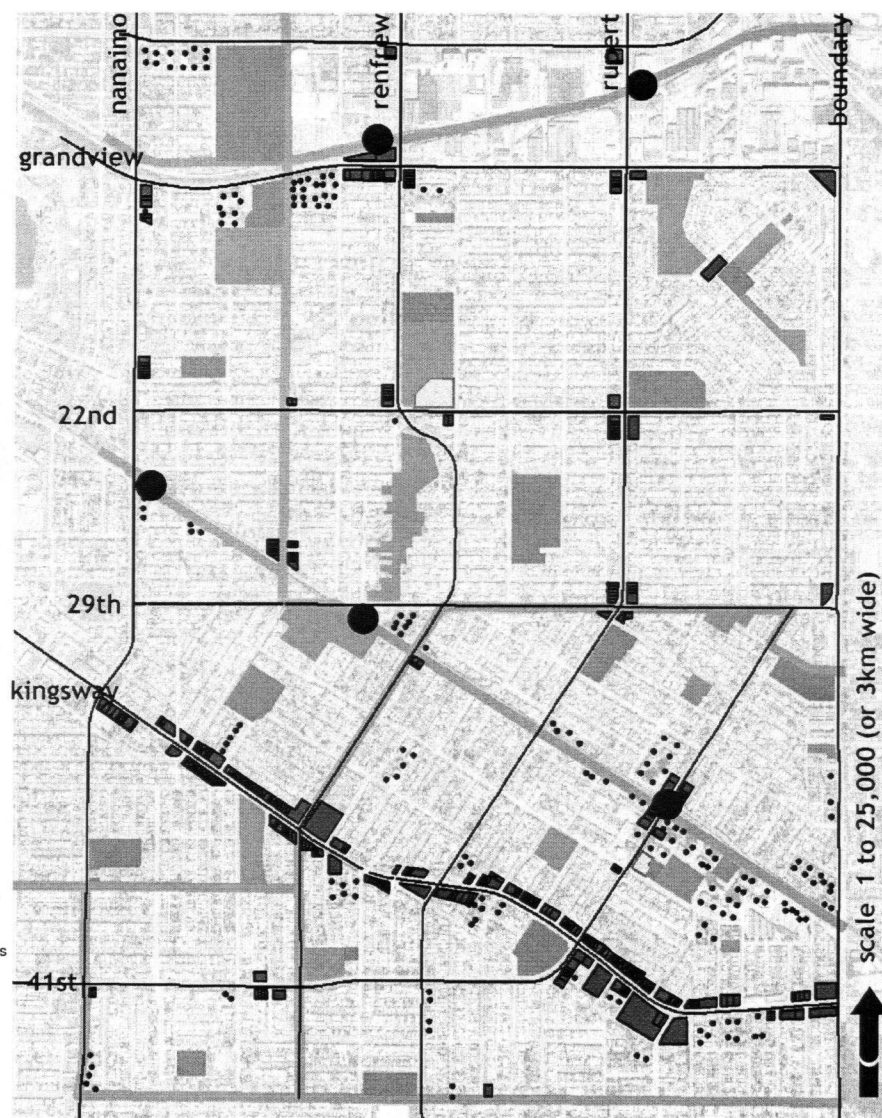
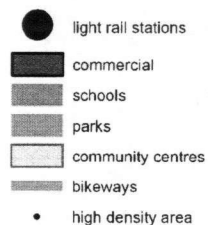
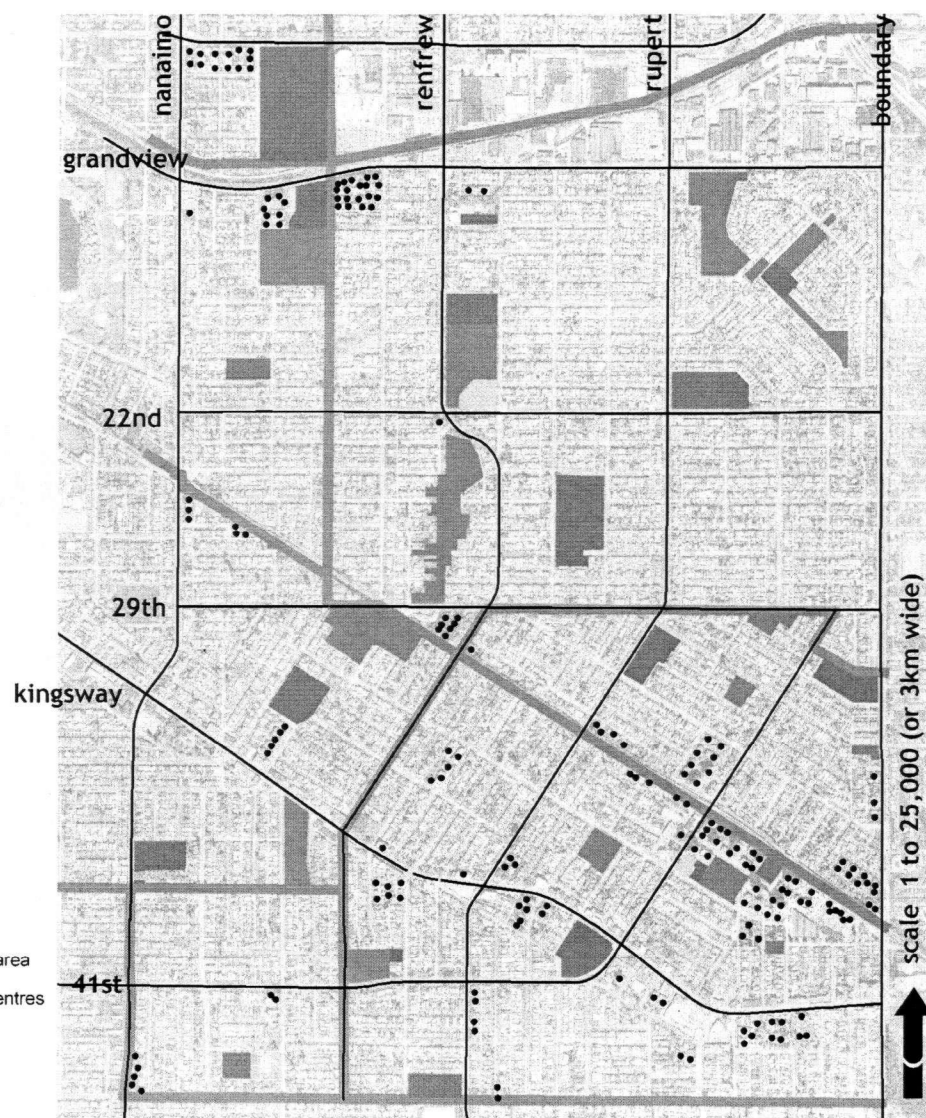


figure 2.6: data source: City of Vancouver

open space system

There are about 70 hectares of parks and schools, and several traffic-controlled bikeways (or plans for them). Most of the green space areas are of the 'mow-and-throw' type: grass and a sports field with trees around the edge. Half of these areas (the schools) are enclosed by ten to twelve foot chain-link fence.



(figure 2.7: data source: City of Vancouver)

social network

Schools, churches, libraries, community policing stations, and community centres are located throughout the area.

There are;

11 public schools serving approximately 7300 students,

2 community centres,

2 libraries,

and 21 churches.

The even distribution of schools over other community services indicates that the school network would provide the most equitable system for distributing information, food, or other supporting materials.

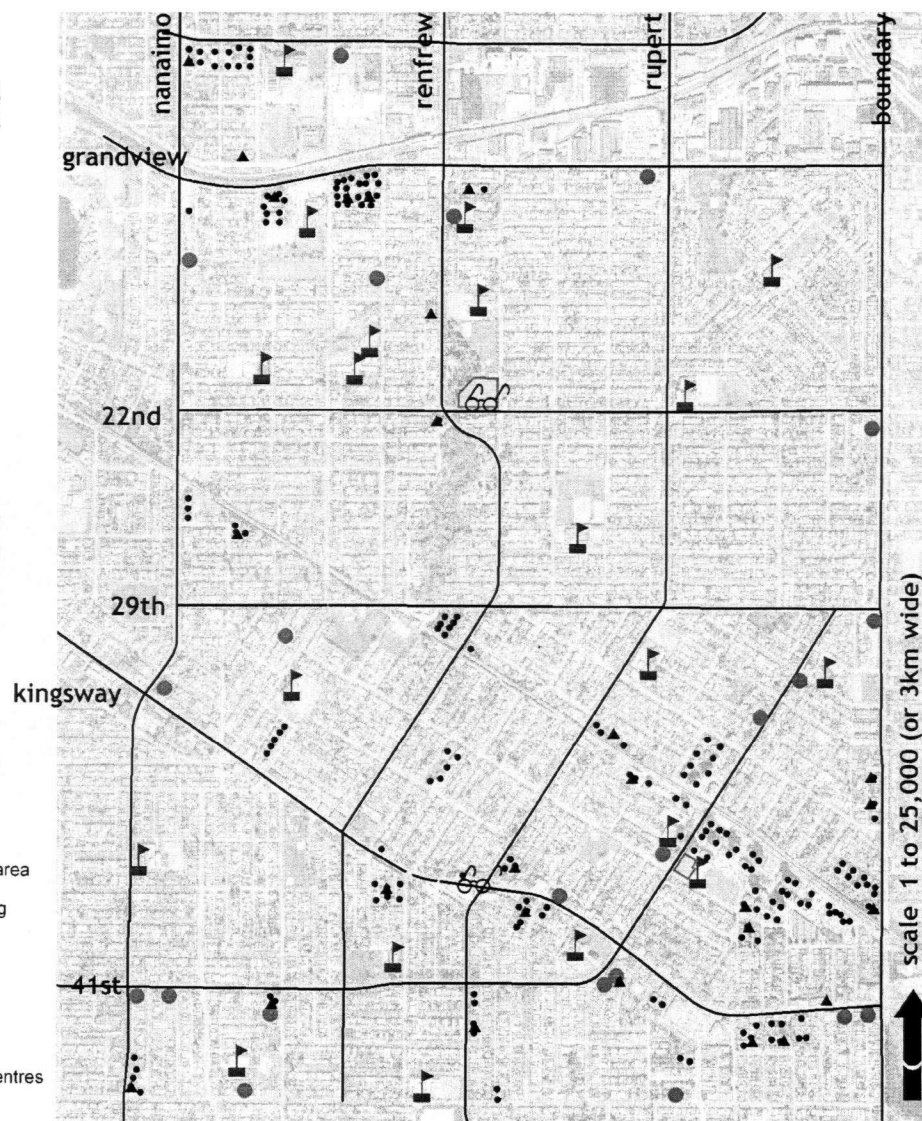
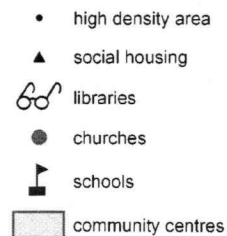
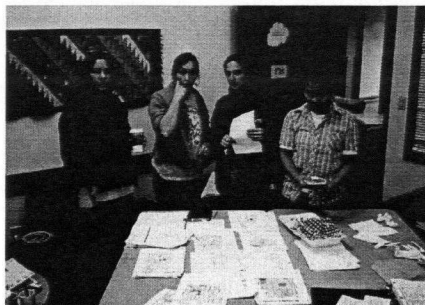


figure 2.8: data source: City of Vancouver

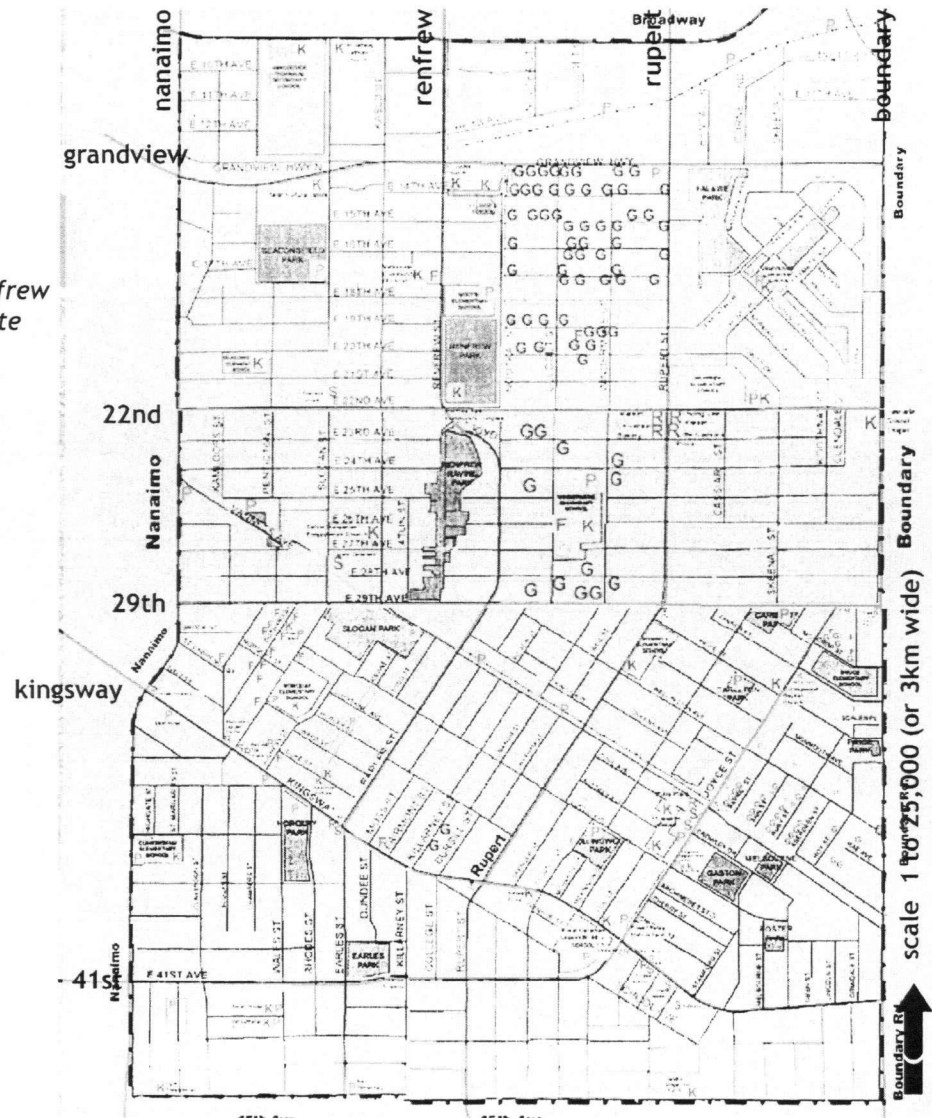
community food resource map

Community volunteers began documenting their food resources by marking the restaurants, grocers, kitchens, fruit trees, and gardens they found in each neighborhood. The following maps will clarify some of the details that have been established here.

figure 2.9 data source: Renfrew
Collingwood Food Security Institute



<http://collingwood.vcn.bc.ca/uploads/images/54/mapping2.JPG>



residual spaces

Residual spaces are identified in black outline and show underutilized areas in both the public and private realms. They add up to nine percent of the total land area. Private residences are not included in this figure.

Selected spaces are unprogrammed areas in the public or institutional realms that would not generate public/private conflicts (such as the street in front of someone's house). Industrial and commercial rooftops are the only areas on completely private lands. Please refer to the appendices for a review of residual spaces.

residual spaces in	total area	percent of area
Streets	30.28 ha	10.5 %
Rooftops	24 ha	
Parks	10.88 ha	30.0 %
Schools	5.32 ha	14.6 %
Vacant Lots	3.14 ha	
Industrial lots	3.03 ha	3.7 %
Private/Inst. Lands	2.66 ha	
Right-of-ways	2.34 ha	
Churches	0.76 ha	
Total	82.41	9.0 %

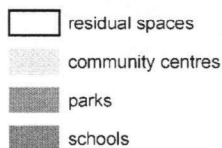
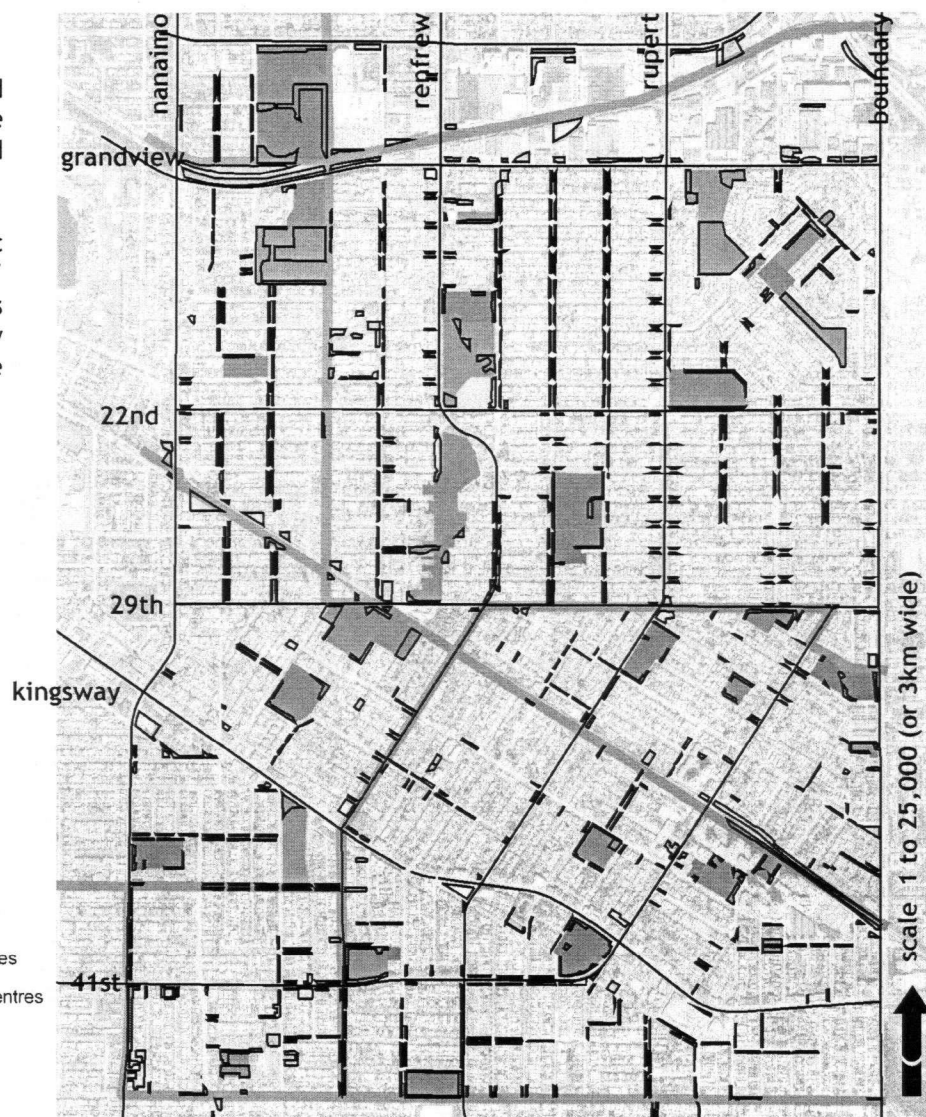


figure 2.10: base data source: City of Vancouver



residual space and proximity to multifamily housing

These residual areas are prioritized for their proximity to multifamily housing, where residents are least likely to have private access to gardening space, and where social housing is concentrated. These spaces are the most likely candidates for community gardens.

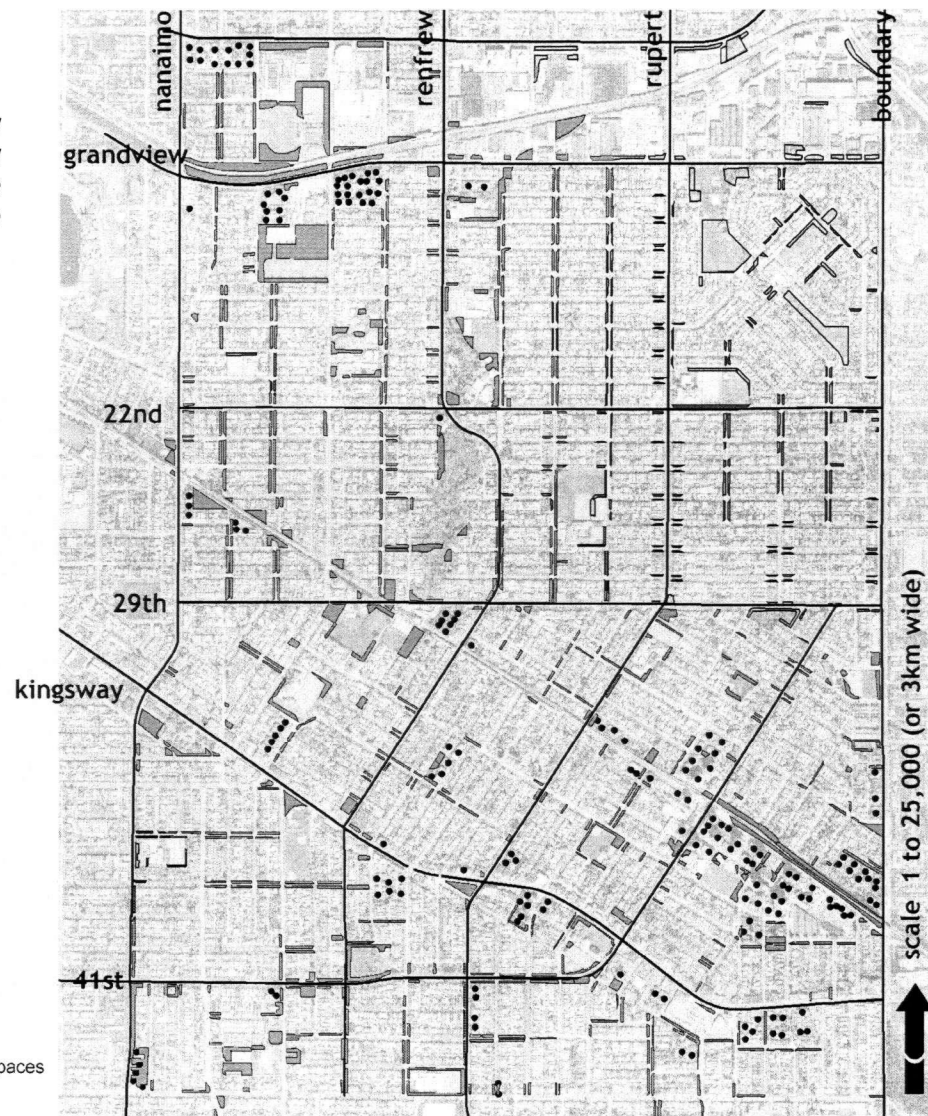


figure 2.11: base data source: City of Vancouver

transit routes and grocery services

Food retailers are generally situated along transit routes, although a full range of food choices are provided only in the Grandview/Rupert, Rupert/22nd, and Joyce/Kingsway areas.

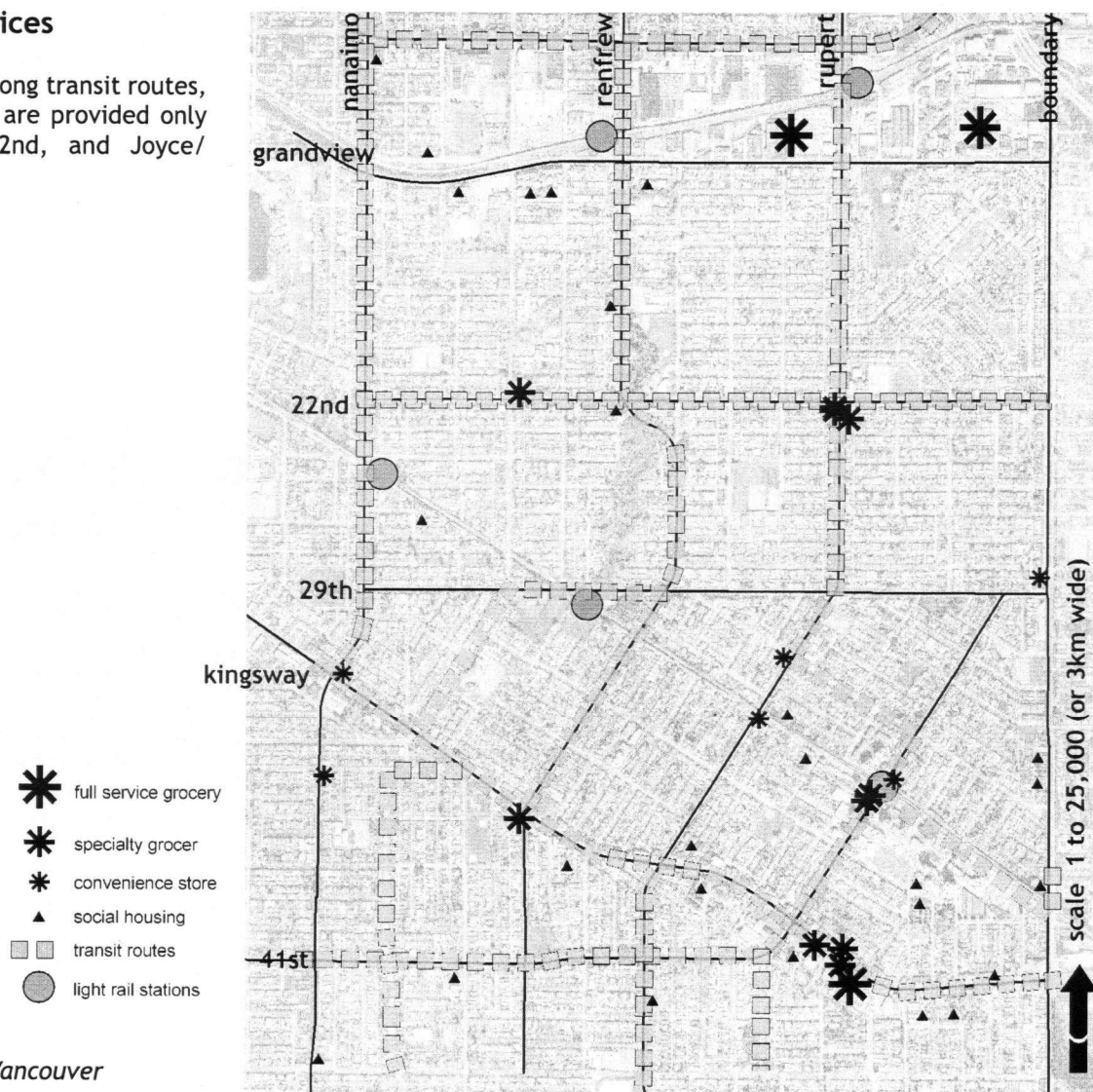


figure 2.12: base data source: City of Vancouver

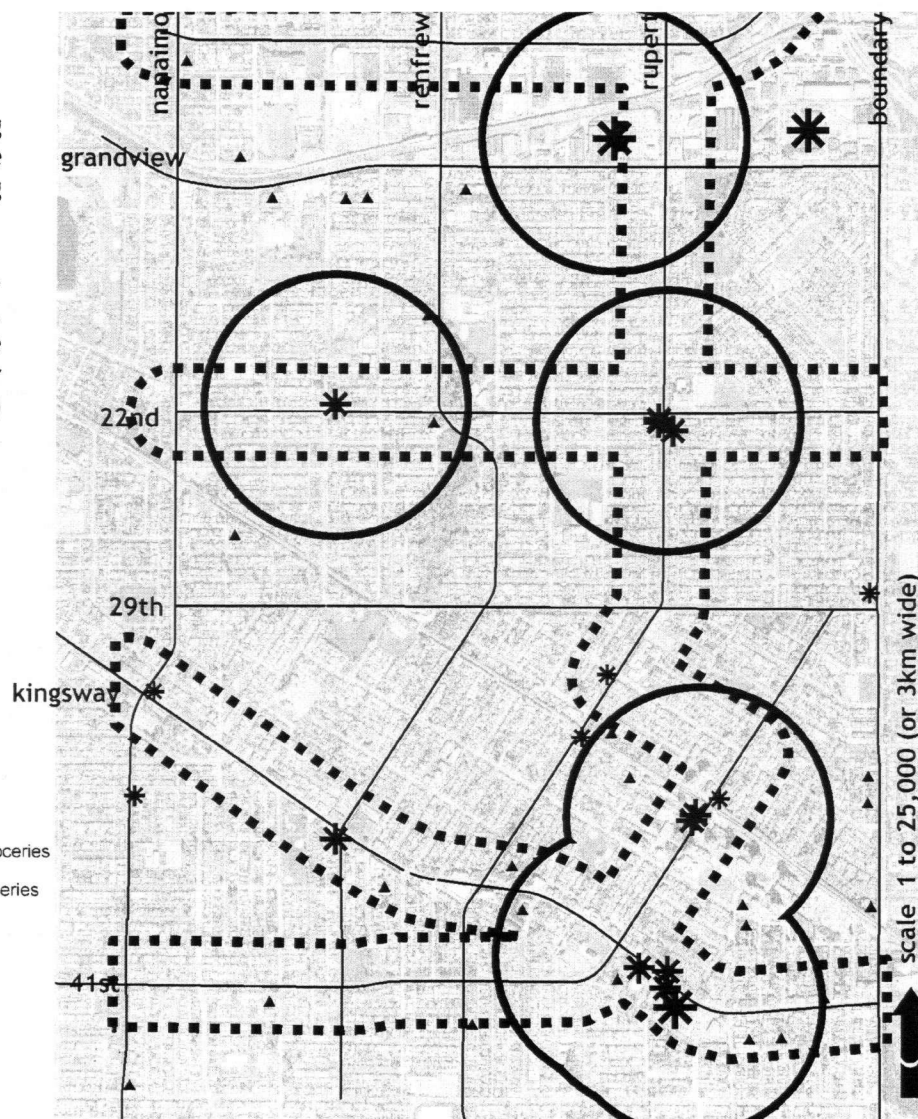
proximity to transit routes and grocery services

Food retail access is further described by walking distance (500m radius in solid black) or by transit route access (150 m distance from a transit route leading directly to grocery services).

Residents without a car in the north-west and south-west areas may find grocery shopping quite a challenge. In the community vision process, residents indicated the need for another full-service grocery along Kingsway near Earles Street. There is a property near there (a motel) that will likely be redeveloped in the near future.

-  walking access to groceries
-  transit access to groceries
-  full service grocery
-  specialty grocer
-  convenience store
-  social housing

figure 2.13: base data source: City of Vancouver



SUMMARY ANALYSIS

This summarizes the physical characteristics of the community that support or detract from food security, and does not attempt to examine the economic context:

ACCESS

Some areas of the community are well served by retail food distributors, particularly the Joyce-Kingsway neighborhood and the Grandview-Rupert area. The smaller retail area at 22nd and Rupert also may be adequate given the additional transit access from there to other services. The west side of the community however is under served and would benefit from additional retail or alternative grocery services, as indicated by residents in the Community Vision. Non-emergency alternatives (farmer's markets) are only available in a nearby community to the north-west, but transit access to this market is limited.

The supply and demand for retail grocery floor area is somewhat balanced, but the planned population growth will increase demand. (see appendices: Grocery Store Economics)

PRODUCTION

Backyard gardening is present throughout the community, although one half of the households have uncertain access to any garden space. Garden plot demand is at a minimum of 300 and is likely much higher. One community garden near the Joyce Skytrain is new this year, there are no community farms or commercial farms. The Vancouver School Board nursery produces non-edible plants for landscaping. Commercial farms on the 24 hectares of industrial roofs in the Grandview area, if viable, would be fascinating given their elevation - most of the roofs are very visible to the houses and streets around them.

AMENITY

Food related programming exists at the Collingwood community kitchen, and a harvest fair has recently been organized for the Renfrew Community Centre. The retail area along Kingsway near Joyce is very animated by restaurants and food shoppers.

Residents have expressed a desire for a more aesthetic and active public realm. Most open spaces are characterized by an undifferentiated landscape and would benefit from the presence of gardens and gardeners. There are also very few outdoor gathering places.

INFRASTRUCTURE

It is likely that most of the backyard gardens (estimated to be 2,800) also have bin composters, and at least a few have rainwater barrels. One or two bin composters are generally capable of handling the kitchen wastes for one family. The city composts yard and street debris at a remote site south of the city.

There is little evidence that any other waste diversion or water reuse occurs here. Since there is a natural drainage pattern leading to the Grandview highway industrial area, rainwater collection or an intermediate sewage treatment system could be located here to recover nutrients and irrigation or industrial quality water from the liquid waste stream. Other options would be to consider similar interventions for the larger institutional buildings. Any of these options are extremely difficult to justify economically since the city has already invested heavily in the existing sanitary and stormwater systems.

Waste vegetable oil from the restaurants could be recovered to produce biodiesel fuel. The number of restaurants would probably require a very small facility for this.

community plan and details

3.1 PURPOSE AND PLACE

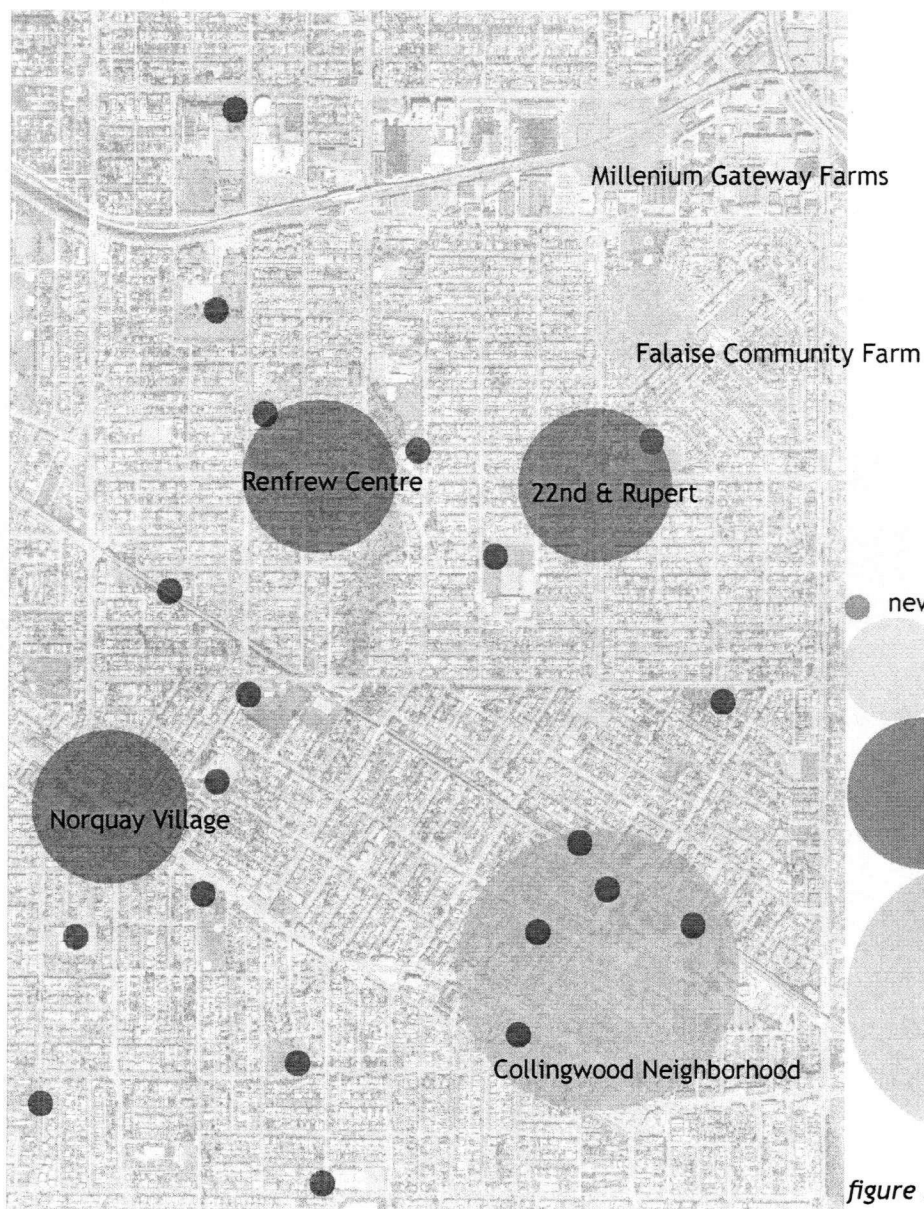
The Renfrew Collingwood study area is defined by the City of Vancouver's local area boundaries: Nanaimo, 41st, Boundary, and Broadway. Two light-rail lines and four roads connect the area to the wider region, mostly to the east and west.

Food and food production has had a significant historic and continuous role in the economy and culture of the area. In the 1880's, many of the first European and Asian settlers were farmers who supported their wayside community along Westminster Road (now Kingsway). Agricultural production declined in the 20th century, but backyard gardens continue to bloom, the Avalon Dairy continues to operate, and an active community continues to grow, share, and celebrate the food in their neighborhoods. With twenty-seven percent low-income households, some neighborhoods having limited retail food access, ten percent of the land under-utilized, and a strong network of community organizers, the area demonstrates both the need and capacity to develop a stronger local food system.

This plan intends to illustrate the specific application of a community food program to the Renfrew Collingwood area over ten or twenty years. It recommends a mix of commercial, municipal, and community enterprises that combine to increase the capacity of the local food system and contribute to the social and environmental quality of the public realm. There is also a mix of achievable short-term projects and remotely possible long-term projects. As interesting as the exercise would have been, the plan does not suggest any major changes in the land use patterns of the community.



figure 3.1: community ortho



HIGHLIGHTS

Key components of the plan are a **network of small gardens** in parks, schools, and backyards; new commercial and community **farms**; **increased food access** through retail development, and a **community food precinct**.

Recommendations are based on the appropriateness of available spaces and the need to ensure food access for all residents, maximize local production, enhance the quality of the neighborhoods, and complement or support municipal services.

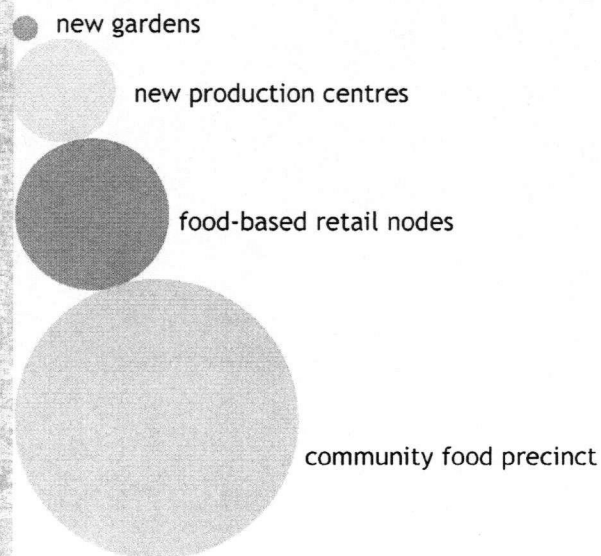
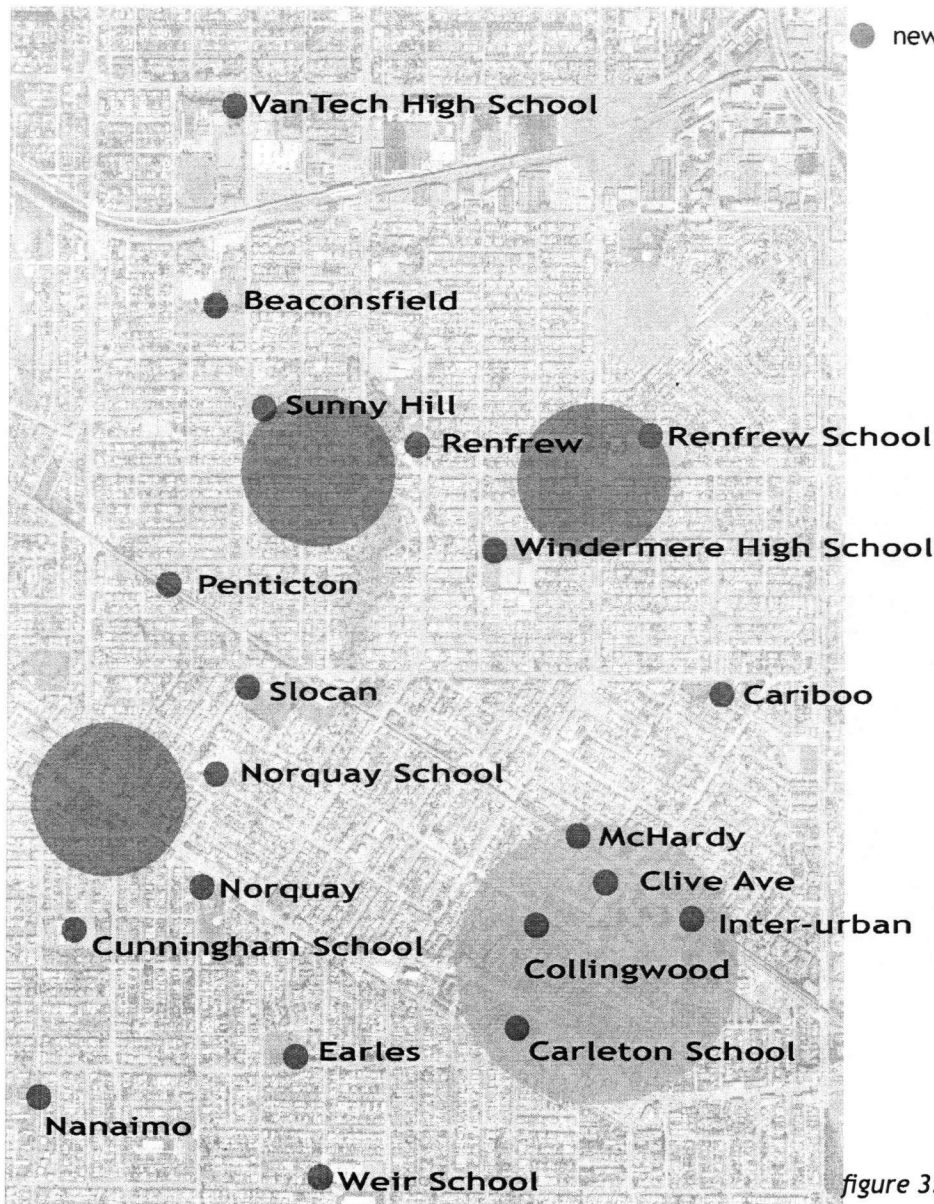


figure 3.2: community plan



GARDENS

A **network of small food gardens** are proposed in parks, schoolyards, institutional properties, and backyards. Gardens in the public or semi-public realm are indicated by a small green circle. All of them are located either at a school or within walking distance of multifamily housing.

Planning and building the gardens would necessarily include local residents. These places would be managed as community or learning gardens by the owner of the property or by public-private partnerships. They would range in size from 10 to 2,000 square meters, averaging 300 or 400 square meters each.

Any gardens in parks or streets would be designed to include the general public: garden areas would support other activities by framing pathways and gathering areas, provide venues for public art displays, compost organic wastes for nearby residents, and provide extra food for community meals and food exchanges. Community baking ovens, picnic shelters, and fruit trees would complement the gardens.

The eleven community gardens would provide about 360 garden plots, or 8 plots per thousand people, and produce up to 11.5 tonnes of vegetables.

They would also create a persistent if not continuous image of a very animated and diverse landscape.

figure 3.3: network of gardens

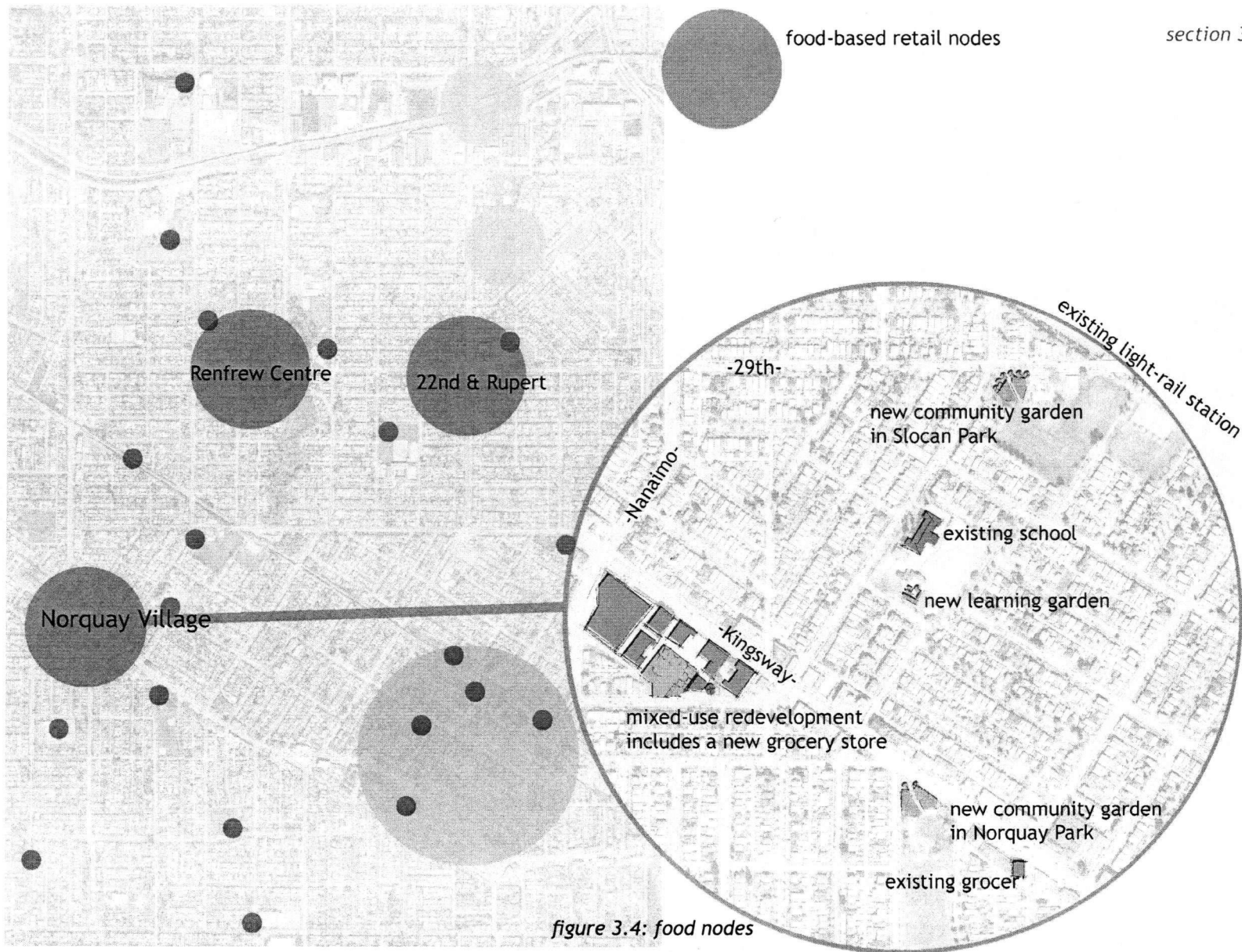


figure 3.4: food nodes

RETAIL NODES

Three small retail nodes increase food access options for residents. They are located on existing transit routes. Renfrew Centre and 22nd&Rupert are existing centres which would benefit from further retail development. Additional food retailers would locate here and would be supported by increased housing density.

Norquay Village is an area identified for development in the Community Vision plan for the area. A mixed-use redevelopment at Nanaimo and Kingsway is anchored by a new medium sized grocery store. Housing density is increased to support further retail development between here and the 29th Avenue Skytrain station. The new grocery store and other mini-nodes fill in the food access gaps in the community.

Renfrew Centre at 22nd&Renfrew has a few shops and a Community Centre



22nd&Rupert has two grocers, a bakery, and a fish market.



The Norquay Village area includes Norquay Park.

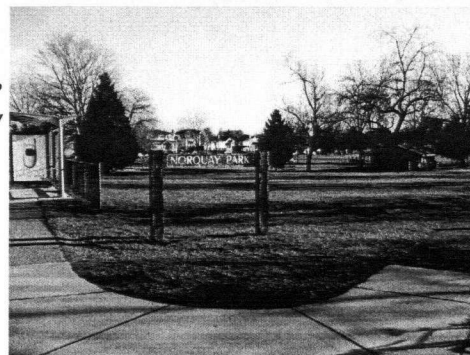


figure 3.5: food node images

new production centres

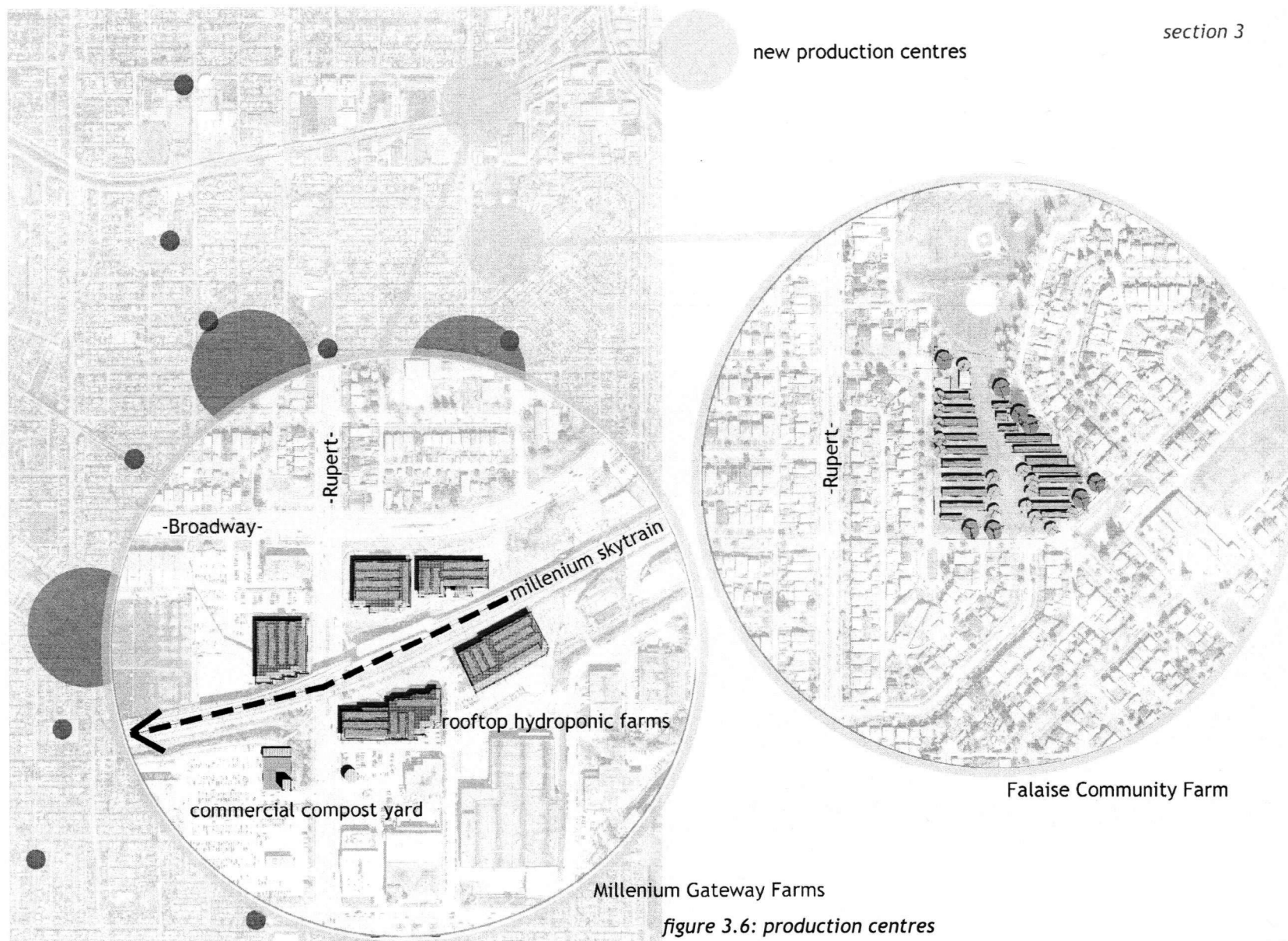


figure 3.6: production centres

PRODUCTION CENTRES

Two new farms provide visual interest and material resources for the community.

Millennium Gateway Farms is located on 1.7 hectares of industrial rooftops surrounding the Rupert Millennium Line station. These roof top 'fields' would be visible from Broadway and by riders on the Skytrain, and would create a unique gateway for those travelers into the city of Vancouver. The hydroponic systems necessary for rooftop agriculture would appear as a fascinating combination of productive agricultural fields and industrial pipes and tanks.

On the ground, the nearby Canadian Superstore would provide a corner of their vast parking lot for a commercial in-vessel composting system, and team up with the Home Depot to manage and sell the compost. The vertical composting unit (VCU) is 8 to 10 meters high, a landmark tower along Grandview Highway that helps to process up to 100% of the organic waste produced in the community.

The rooftop farms could produce 400 to 800 tonnes of vegetables.

The composting system could manage 100 percent of the community's commercial and residential organic wastes.

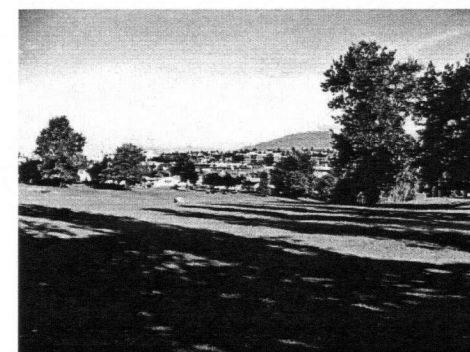
Uphill and to the south, the 2.3 hectare **Falaise Community Farm** is located on a sloping, under used part of Falaise Park. The farm retains existing uses, which according to the Park's Department are 'pleasant walking', 'tree-framed viewing', and sledding (Park's Board web site); and adds 'learning about how to grow and prepare food', 'meeting your neighbors', 'eating together', 'sharing gardening knowledge and resources', and 'composting organic wastes'. The location is the only large under used space in the community and requires some terracing of the hill for better soil management and aspect.

Falaise farm could produce 35.4 tonnes of vegetables.

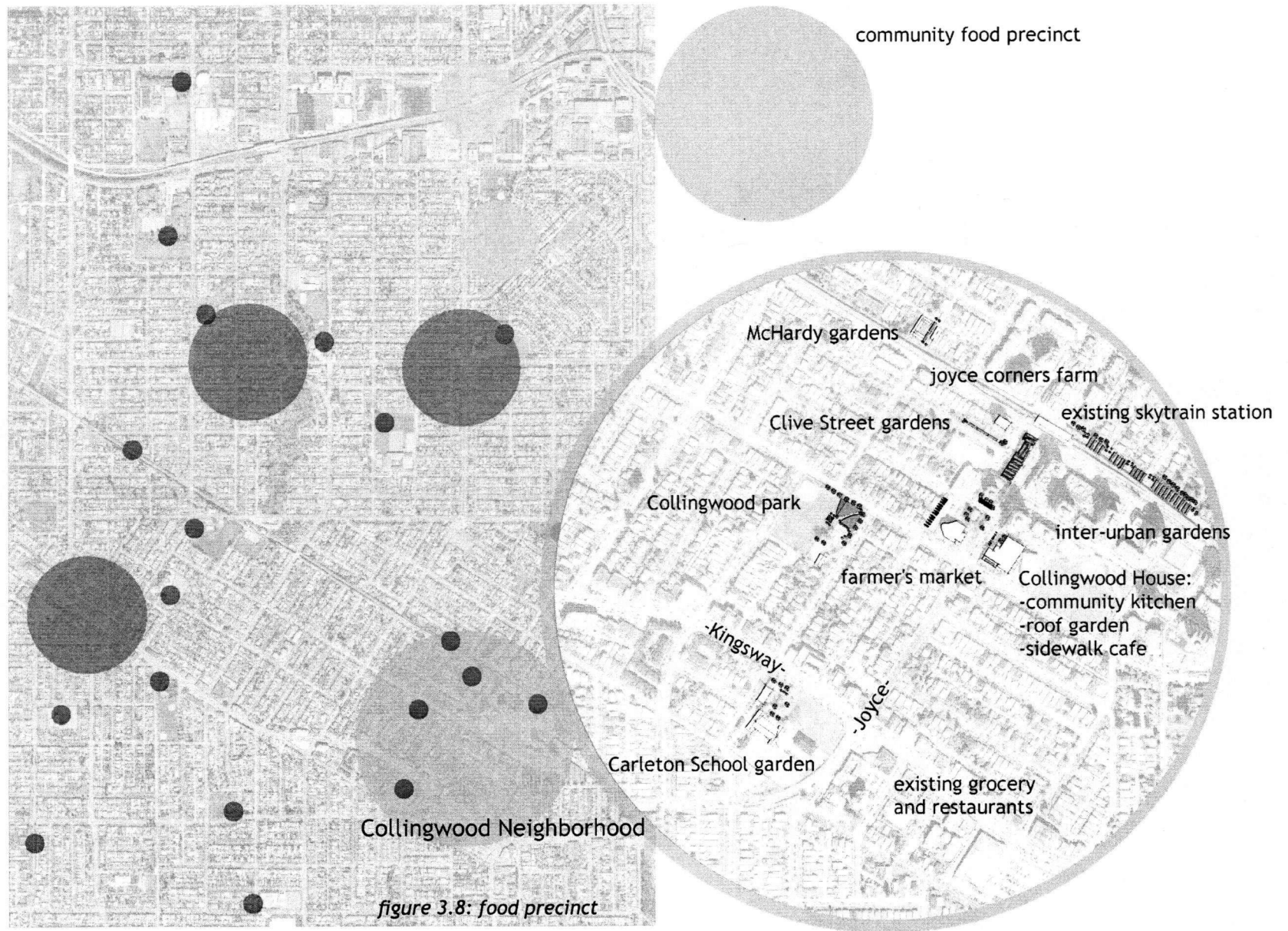
figure3.7: production centre images



The Millennium Line passes through fields of industrial roofs near Rupert Station



Falaise Park could be all this and more.



3.2 FOOD PRECINCT

A community food precinct is proposed for the historic Collingwood area. This area is the current hub of food related programming and contains a high proportion of multifamily and apartment housing. The Joyce Skytrain station and the Kingsway/Joyce retail area create two activity centres which include several grocery stores, restaurants, and a Safeway supermarket. The Collingwood Neighborhood House is a community centre which includes a community kitchen and hosts several meals per week.

The plan adds four community gardens, a learning garden, a rooftop farm, a farmer's market, and a roof garden, and recognizes the contribution of backyard gardeners. Together these create a network of food related activities, adding interest and character to the parks and streets of the neighborhood.

The following illustrations demonstrate how parks and streets could support food activities and how those activities would contribute to the quality of the neighborhood. Please note that the north orientation is consistent with figure 3.9.

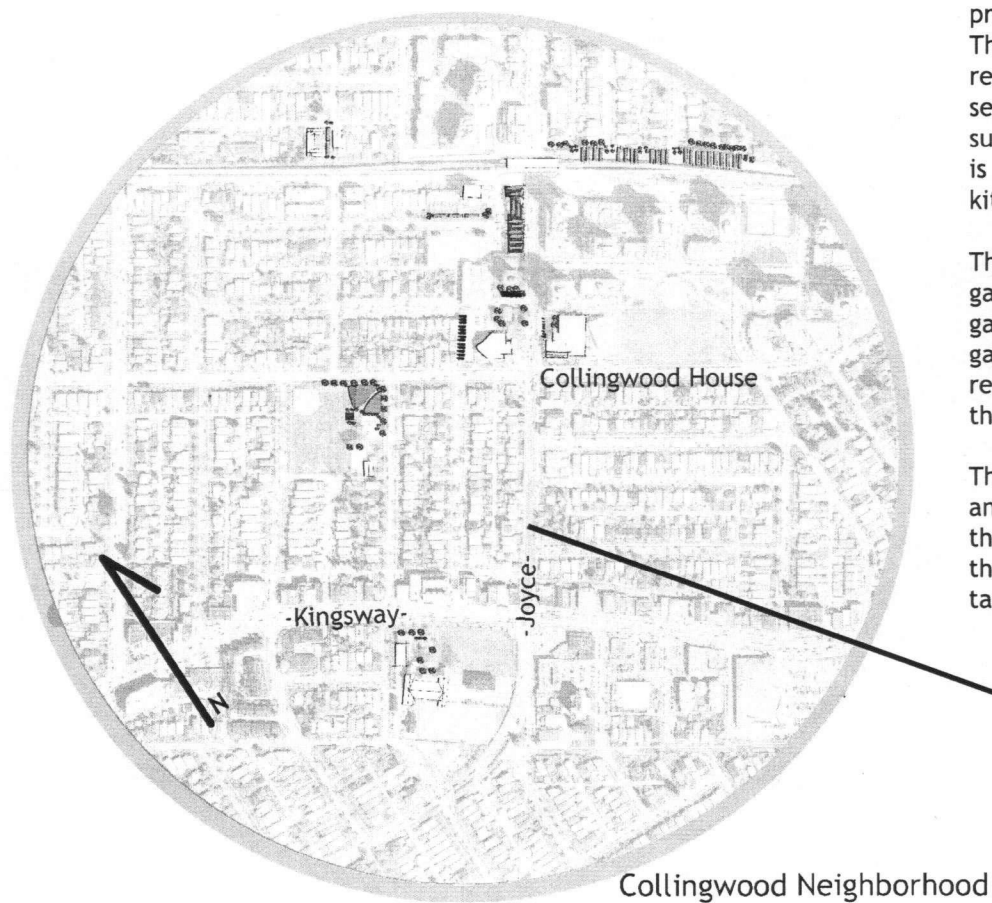


figure 3.9: collingwood food precinct

COLLINGWOOD PARK

This neighborhood park is redesigned to accommodate all existing uses: a sports field, a playground, a basketball court, and washrooms. The northeast corner is redefined as a productive area where community garden plots surround a small entrance, a gathering area, and a picnic shelter.

The entrance gate is an element repeated throughout the district: two posts carry a community or artist-made sign or banner over the path. An exchange table is attached to one side - this includes a bulletin board, a give-away table, and shelves below for leaving extra produce, seeds, or starts.

Informal fences are permitted for each plot - solid fencing is allowed up to 3 feet, and mesh or net fencing up to 5 feet. In the event that vandalism or theft is untenable, a permanent fence would be built around the entire plot area, with through access required along the main path and every 12 metres elsewhere.

The gathering area is about 60 feet in diameter, large enough to accommodate a variety of gatherings and events. It is surrounded by a low seat-wall and has a stage/deck set near the picnic shelter. An outdoor bread oven would make an excellent feature in this space.

The picnic shelter has a shed roof with a short inverted second pitch to act as a gutter. The roof water fills a cistern that is set below the deck of the gathering area. A solar powered pump provides pressure for irrigating the gardens.

There is about 600 square meters of productive area, a composting area, and a tool shed.

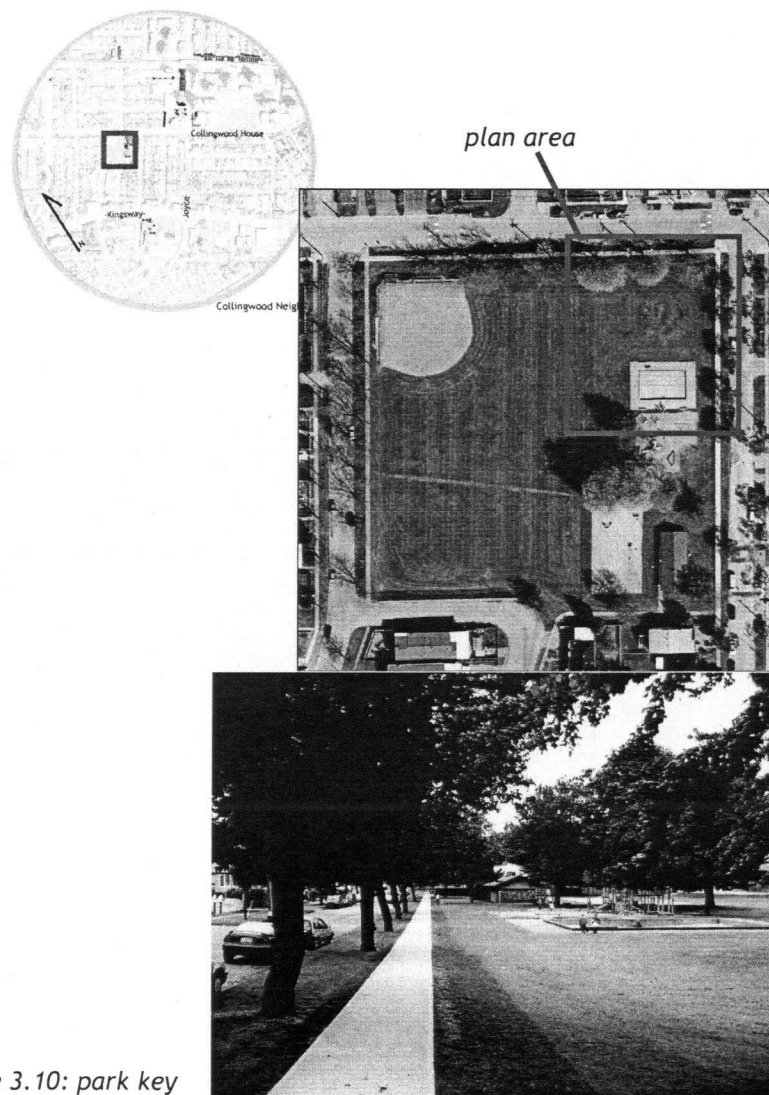
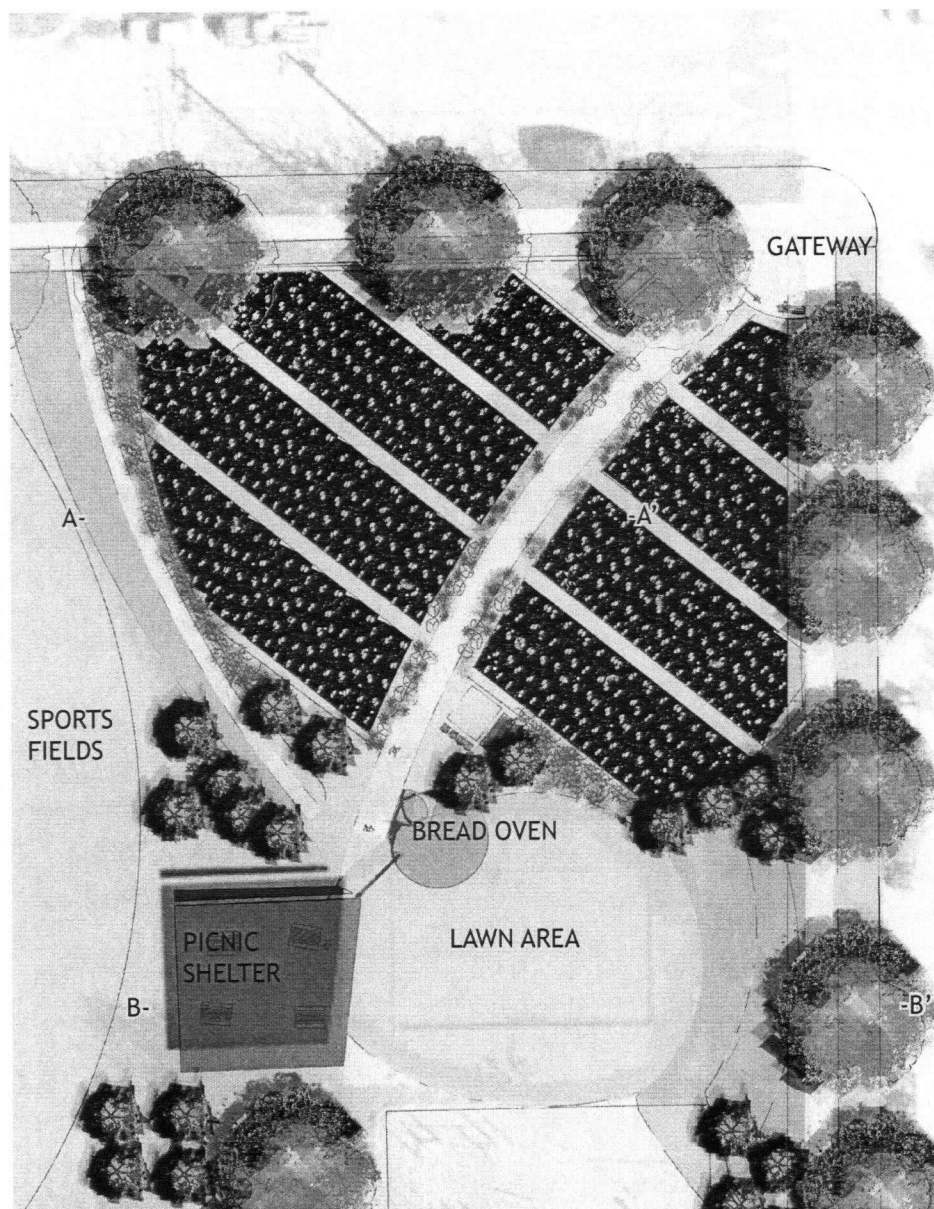


figure 3.10: park key



Parks Board Policy:

If it is determined that park land is the most suitable site for community gardens, the following conditions will apply:

-No barriers to general public access to the site can be erected.

-A community education program is in place which encourages the involvement of schools, youth groups and citizens who do not have an assigned plot in gardening activities.

6x3 meter garden plots:

47

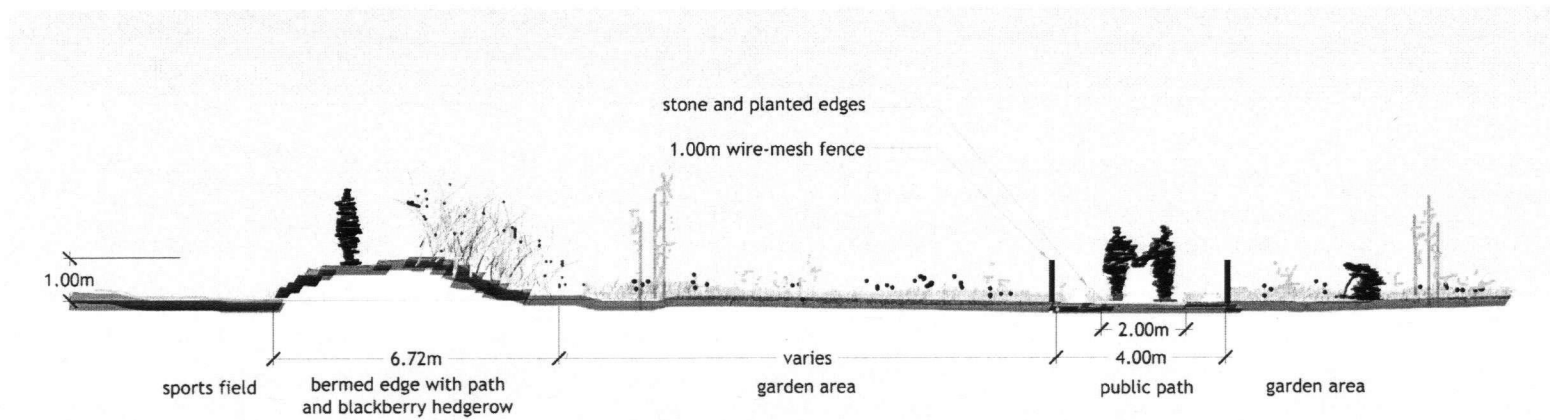
annual production:

1.5 tonnes of vegetables

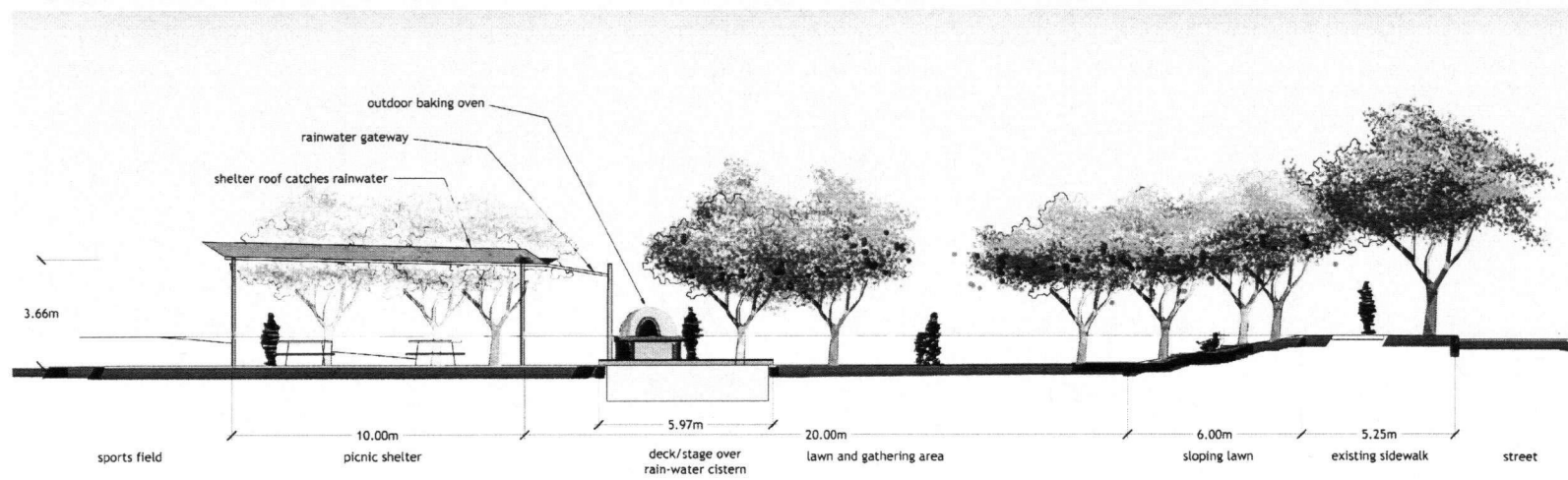
annual waste diversion:

3.9 tonnes

figure 3.11: park plan and sections



SECTION A



SECTION B

CARLETON SCHOOL

Carleton School last had gardens during the 1930's, when students were allowed to have small plots to supplement their family's meals (Nielson, 1990).

Today's school garden creates an outdoor classroom with ten raised beds. As per School Board policy there is a 4 foot wire-mesh fence surrounding the area and a lockable gate at either end. Two fruit trees and a tall water cistern frame the entrance to the garden. The cistern collects rainwater from the school roof, carries it across the path and into the garden.

There is space for 20 to 25 students.

This plan is unfortunately too large according to Vancouver School Board policy:

- the plan size of the garden should have a maximum area of approximately 9 m² (10 ft. by 10 ft.)
- the garden plot must be fenced (with) a chain link fence with a locking gate, and the height of the fence will be a minimum of 1.2 meters (4 feet)
- all materials, including soil, compost, etc., will be kept within the enclosed garden area;

annual production:
60 kg

annual waste diversion:
386 kg

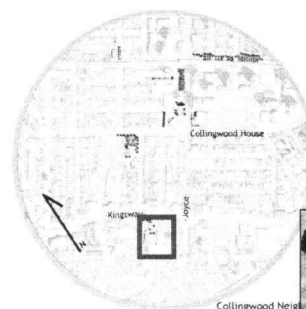
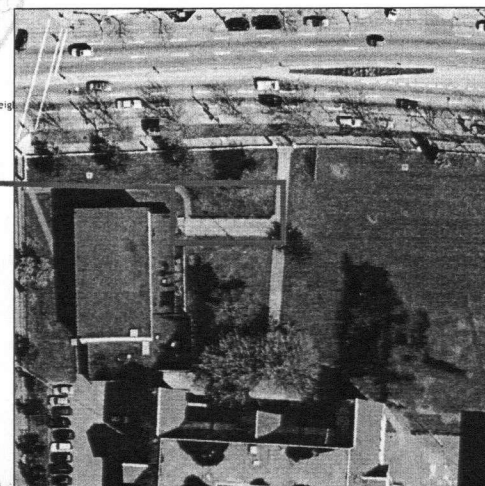


figure 3.12: school key

plan area



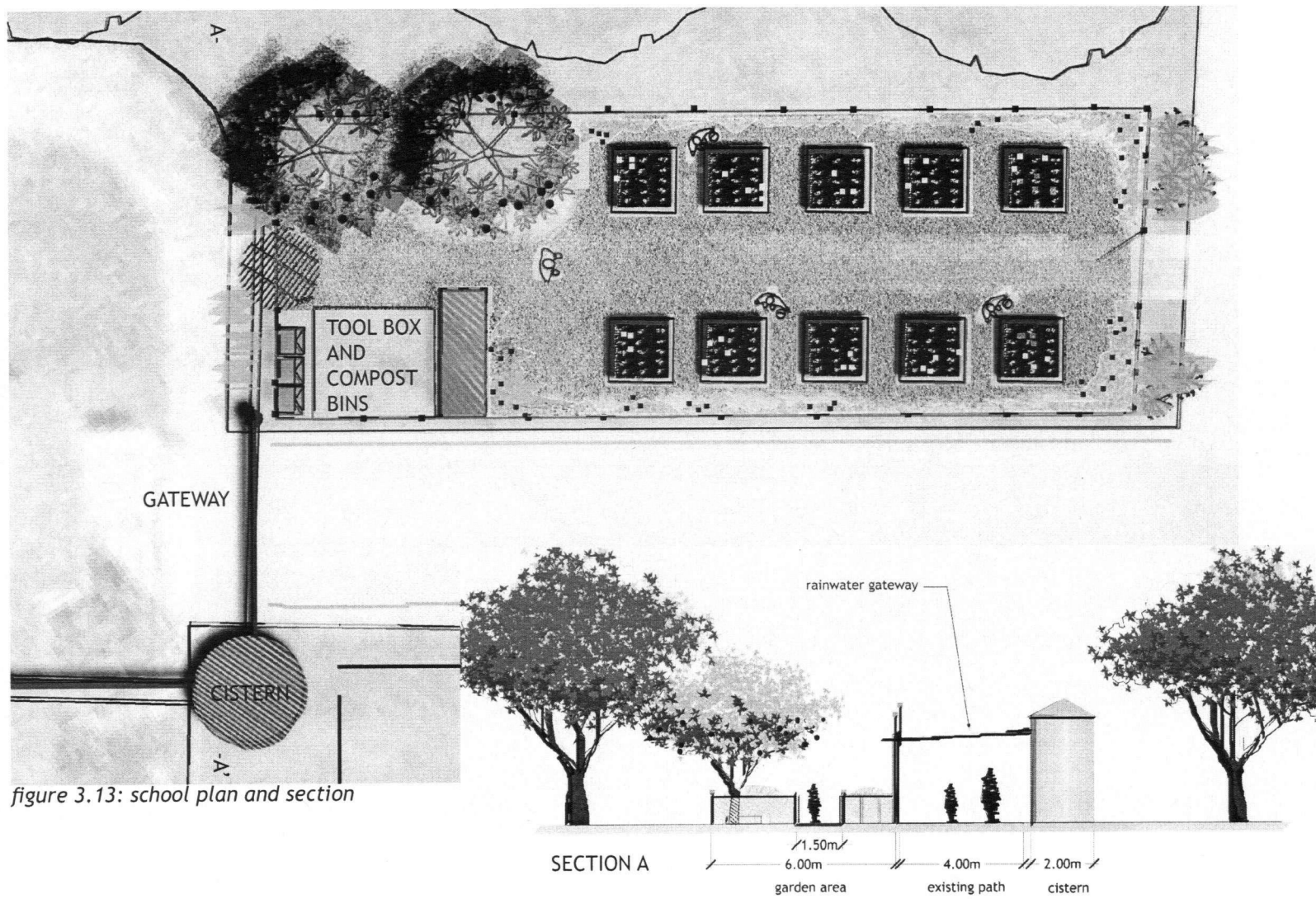


figure 3.13: school plan and section

CLIVE STREET GARDENS

This community garden is mostly within the street right-of-way and partially on private property. The 2 meter grade change between the two creates a perfect buffer between the private spaces of the apartments and the public activity in the gardens. Hedges are also planted along the top of the wall.

The existing terraces are replanted with food gardens, and the gardens are extended towards the street. A 3 1/2-foot fence encourages passers-by to 'lean and look' but discourages them from causing any damage. Composting bins are set up at either end of the row, which the neighbors kindly contribute to. A low shelf is built into the fence at these ends to hold give-away produce, and unclaimed extras are easily pitched into the bins.

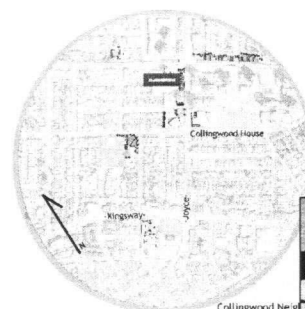
The recently planted street trees are moved to a new location by the city engineering department, and three apple trees are planted together at the northwest end of the garden instead.

This entire section of street is somewhat redundant and could eventually be reconfigured to provide one-lane (4m) vehicle access and an expanded public garden area.

3x5 meter garden plots:
15

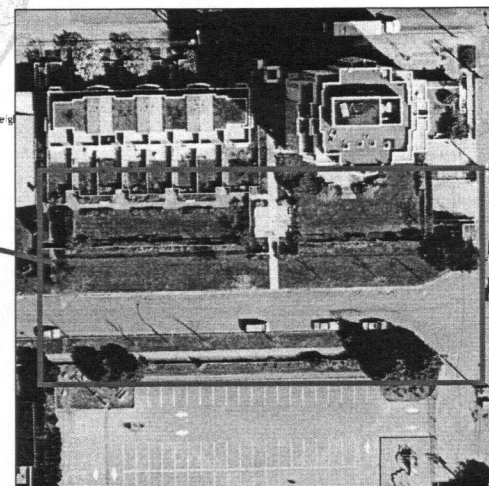
annual production:
400 kg of vegetables

annual waste diversion:
772 kg



plan area

figure 3.14: clive street key



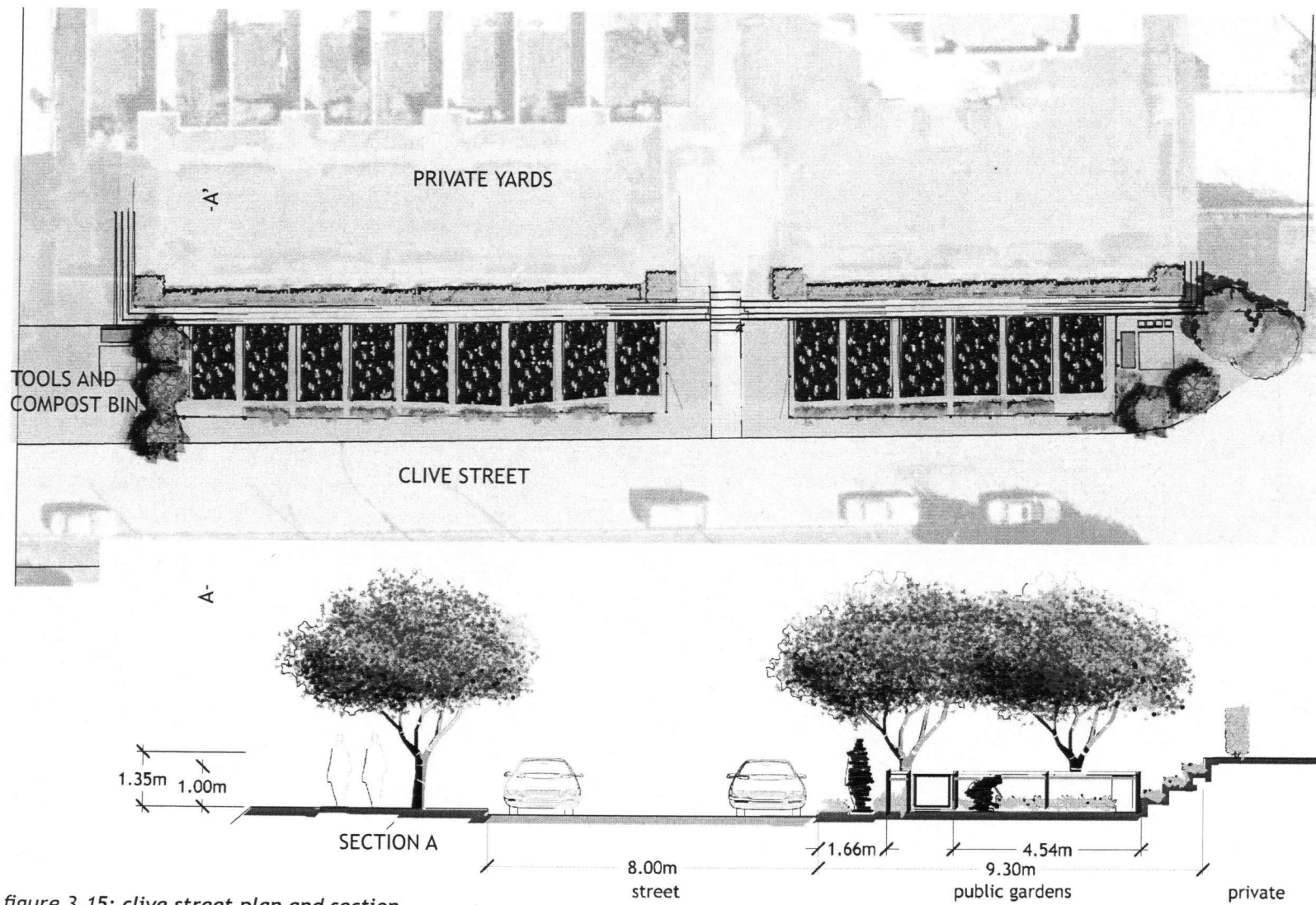


figure 3.15: clive street plan and section

MCHARDY GARDENS

Two vacant lots and street right-of-way about a rail corridor. At this time, and in this location, it seems likely that housing is an appropriate use of the vacant lots. These lots could support 4-6 units without disturbing the single family character here. The density bonus could be tied to the renovation of the right-of-way into a garden path, since a paved street or lane would be unnecessary here.

The 6.5 meter right of way is sectioned into a 1-2 meter path, a 1.5 meter 'setback', and 3 meter deep garden plots. A 6-8 foot slatted fence creates a public/private buffer from the new houses without completely hiding the area from view, and an entrance to the yard passes through midway. A shallow pocket park provides an entrance and gathering area at the neighborhood end of the path. An entrance gateway similar to those described in the park - with a give-away table and notice board, and composting bins are located at both ends of the path.

3x2 meter garden plots:
16

annual production:
170 kg of vegetables

annual waste diversion:
772 kg

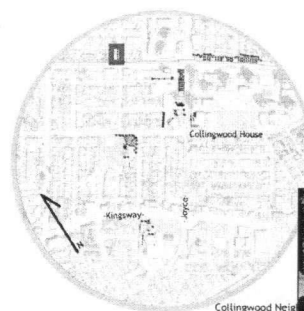


figure 3.16: mchardy key

plan area



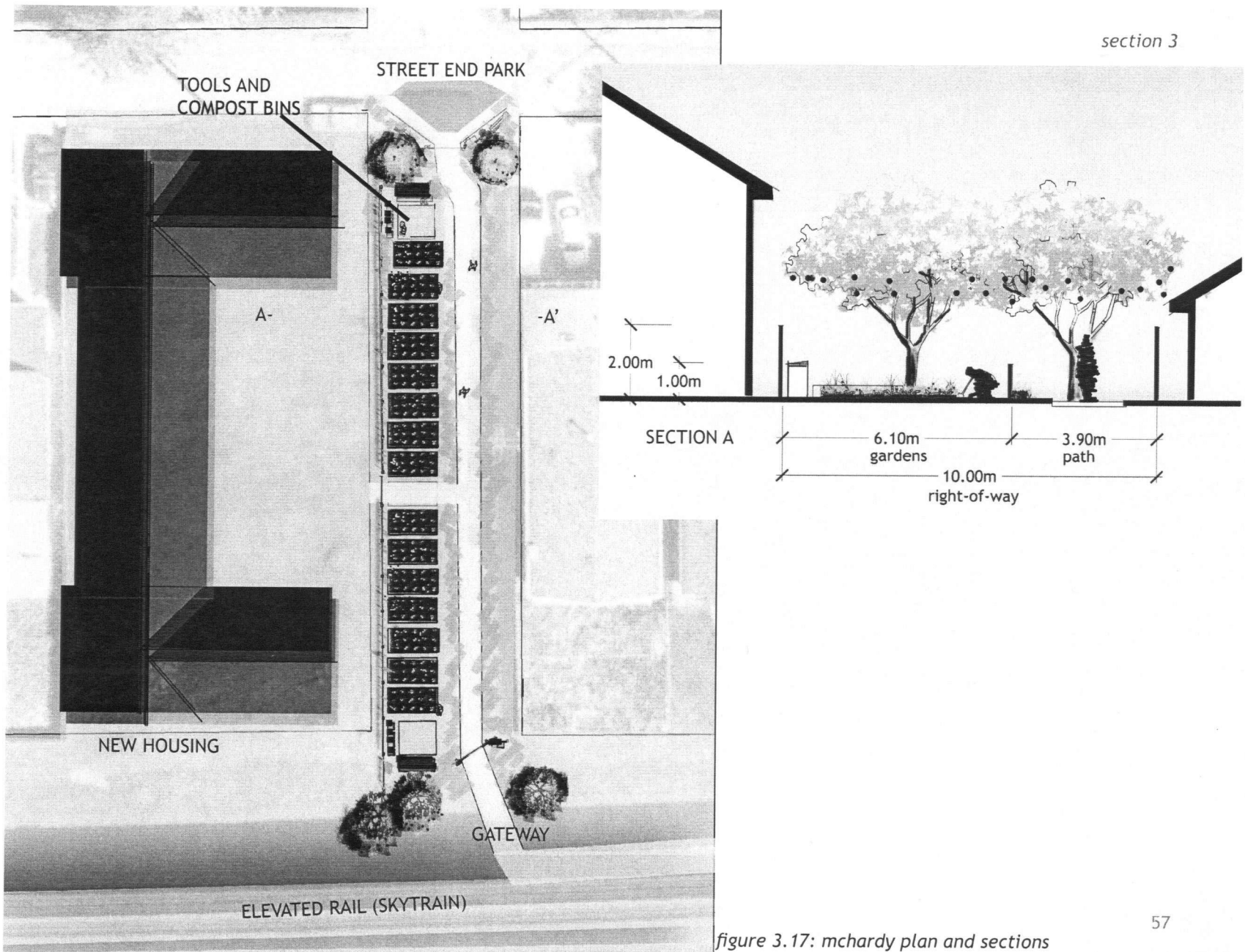


figure 3.17: mchardy plan and sections

INTERURBAN SKYTRAIN GARDENS

Railways have an excellent habit of cutting diagonally through the city grid and leaving behind some unused and very interesting spaces. This elevated rail is set in a right-of-way of up to 45 meters. There is a bikeway and an access lane for rail servicing, and several paths cut across to connect adjacent neighborhoods to the transit station and retail services.

The gardens are designed to accommodate these existing uses and define the paths and trails. Plots are arranged below the tracks between the bikeway and the service road, with 1 meter 'setbacks' from each. A second row of plots are stepped up the hill on the north side of the service road. The existing retaining walls along this hill are repainted with murals.

To discourage vandalism or theft, a 3 1/2 foot frame and wire-mesh fence is built around the plots, with through paths at the end of every adjacent street (about 80 meters spacing). Lockable, 'Job-box' style toolsheds - 20 inch high, 8x4 foot timber boxes with sand-filled bottoms - are too heavy to steal and provide seating for gardeners. A small park with a bench, fruit trees, and compost bins are arranged at the end of every block for neighborhood contributions, and a gate and exchange table are placed at both ends of the gardens. Since the soil here has a long and suspect history, the garden beds are built over a cap of heavy plastic lining and a base of sand/gravel mix.

Several large cisterns near the Skytrain station collect roof runoff and provide irrigation water for the gardens. These shiny, corrugated steel tanks in such a highly visible location become a local landmark. A larger composting system could also be installed across the street next to the bus loop. A vertical composting unit (VCU) would form a dramatic gateway along Joyce Street.

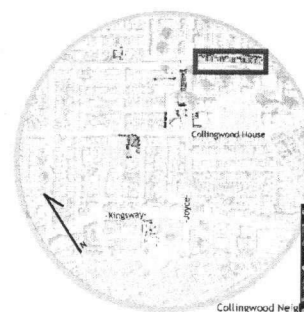
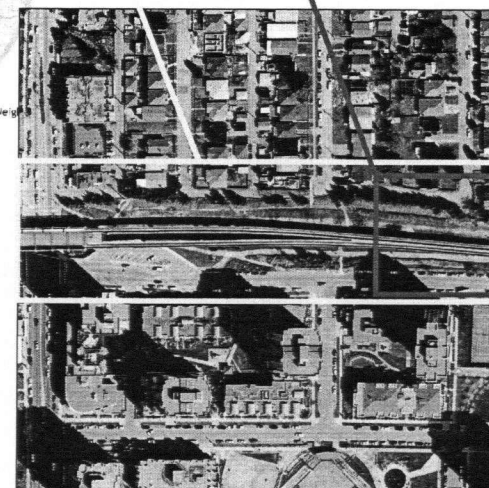
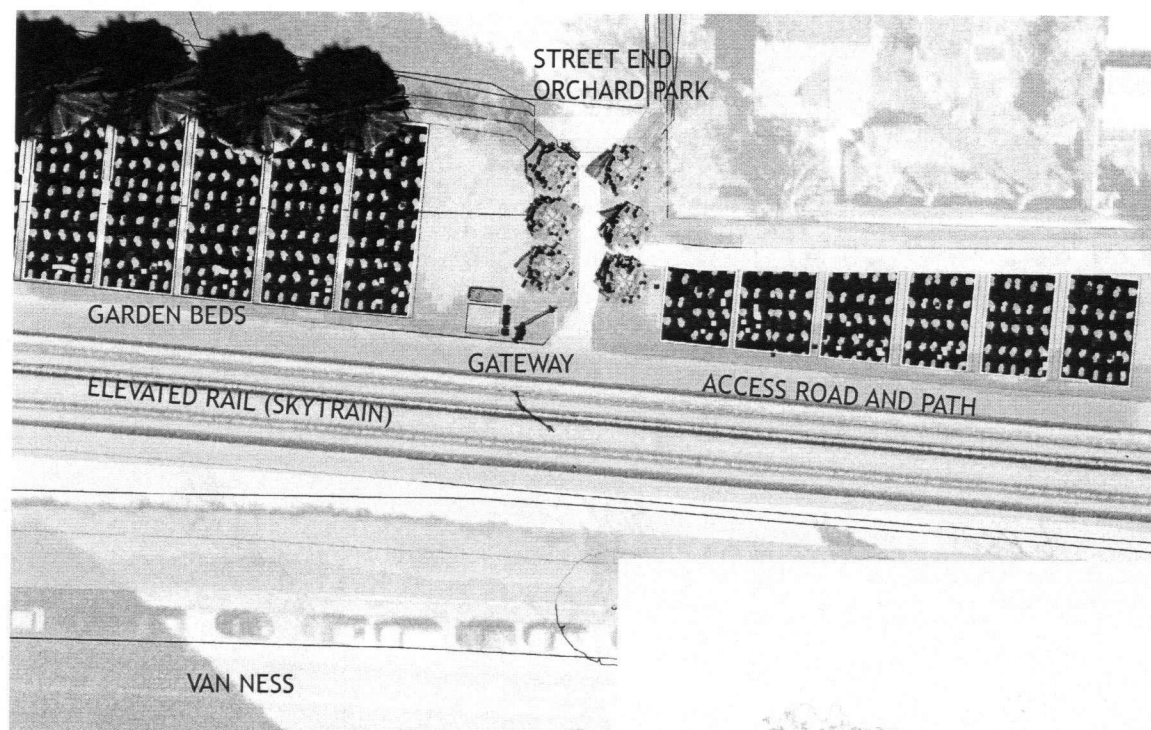


figure 3.18: skytrain key

plan area
garden area





Gateways are set up at either end of the railway gardens.

3x6 meter garden plots:
120 to 150

annual production:
3.8 tonnes of vegetables

annual waste diversion:
3 tonnes in bins
1200 tonnes VCU

At the end of each street
there is a small group of
fruit trees and a couple of
benches.

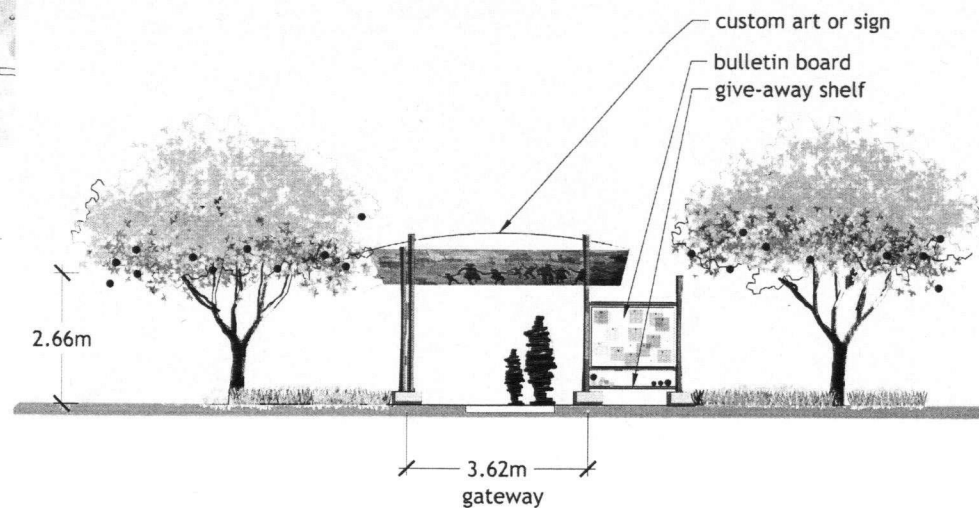


figure 3.19: skytrain plan and section

ST. MARY'S FARMER'S MARKET

Every Saturday a lively market provides fresh foods and produce from nearby farms. Nearby establishments set up sidewalk displays and benefit from the increased activity. A food delivery/customer pick-up van donated by the school runs all day, shuttling food to home-bound customers and returning with customers who are unable to drive. Community supported farms (CSA's) also drop off deliveries for their share-holders.

This church parking lot provides space for 15-20 vendors, a small venue that could be expanded to a nearby lot used by the church's private school. The church considers this a part of its food ministry. It is very well situated within a few blocks of a commercial street, a light-rail station, and is on multiple bus routes. It is also positioned on the edge of new, high density development and older, low density housing.

The community center across the street provides complementary programming and support for the market by running cooking demonstrations, a food donation program, and an outdoor cafe. Each Saturday morning volunteers hang banners across the entrance to the market, at the nearby commercial street, and decorate the sidewalks with chalk murals. During the annual neighborhood festival, the street is closed to create space for vendors and performances.

vendor spaces:
15-20 (10x6 meters each)

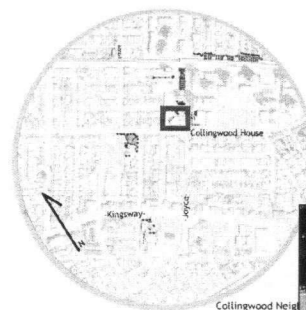


figure 3.20: church key

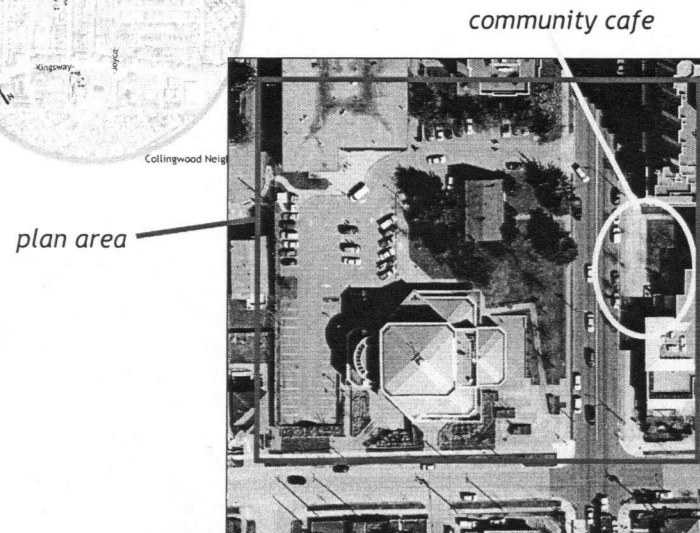


figure 3.21: church plan and ortho

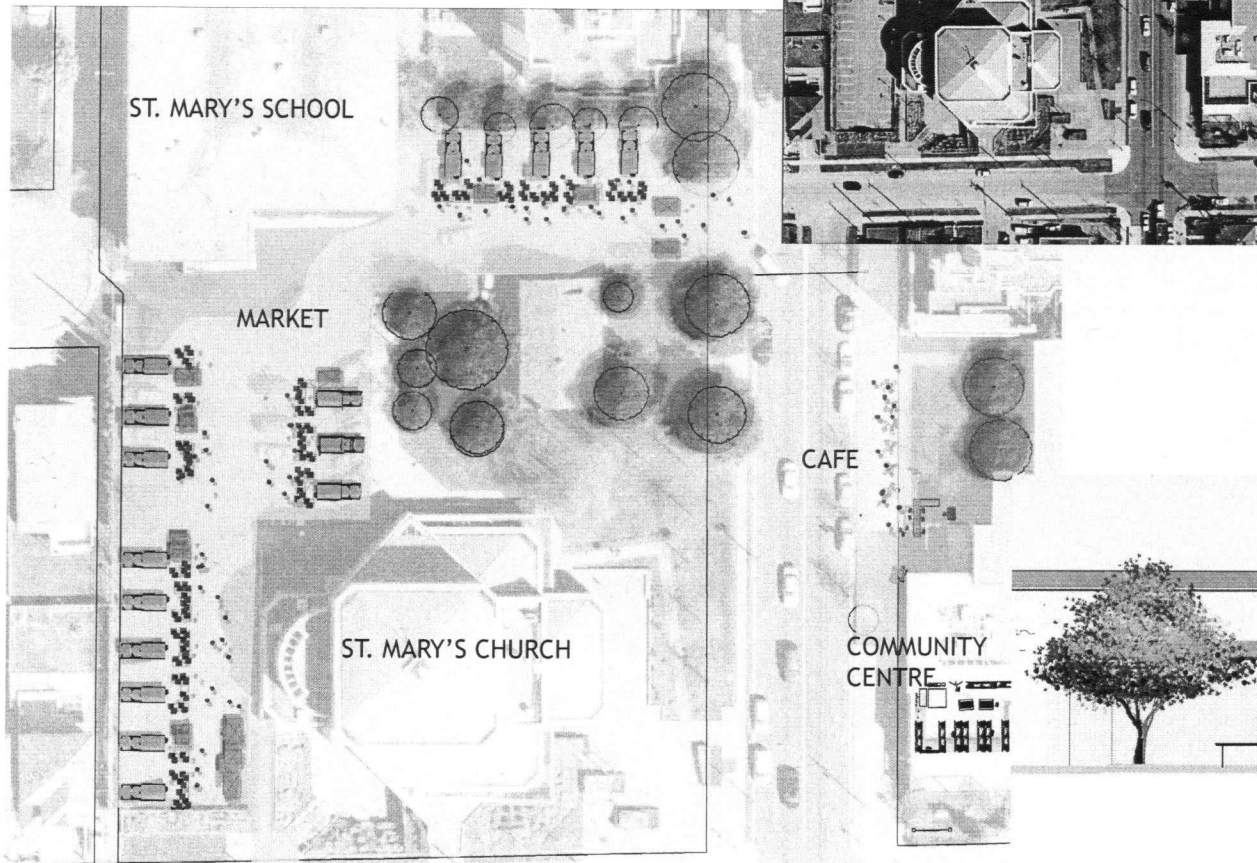
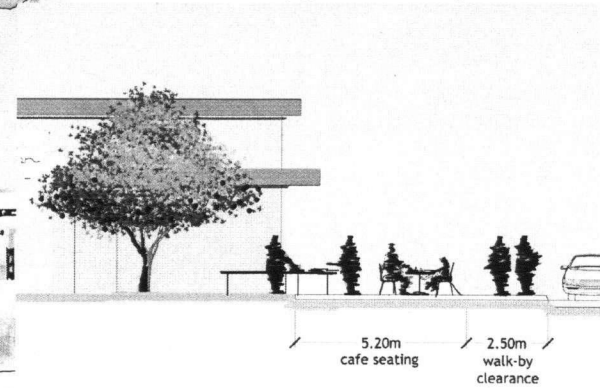


figure 3.23: cafe section



COLLINGWOOD NEIGHBOURHOOD HOUSE

The community centre is the hub of food programming activities. A community kitchen provides the venue for churches and social clubs to serve meals and host events. Seed and starts exchanges are held here in the spring, and surplus donations are either coordinated or collected here.

During the market season, the kitchen is able to support an outdoor cafe across the street from the market. Five or six picnic tables are arranged in the small courtyard, and a kitchen area is set up near the entrance complete with a grill and serving tables. A donation table is also set up with collection bins and a set of scales to weigh produce.

On the balcony above, a rooftop garden is set up as a demonstration area and staff lunch area. A picnic table is set in the central area and a quiet sitting corner is set to the far edge. Garden boxes are built from boards and 5-gallon pails, and climbing stakes covered in string beans form a green edge visible from the street.

A four-foot diameter iron ring is hung within a timber frame stand on the edge of the balcony. Before every community meal it is rung 3 times to mark the half-hour and twice to mark the quarter-hour preceding the meal, and then repeatedly to announce that dinner is served. The sound can be heard up to a few miles away.

roof garden area: 180 square meters
annual production: 40 kg of vegetables
outdoor cafe area: 225 square meters
meals served: 6,000 meals per year

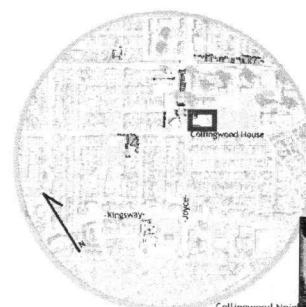
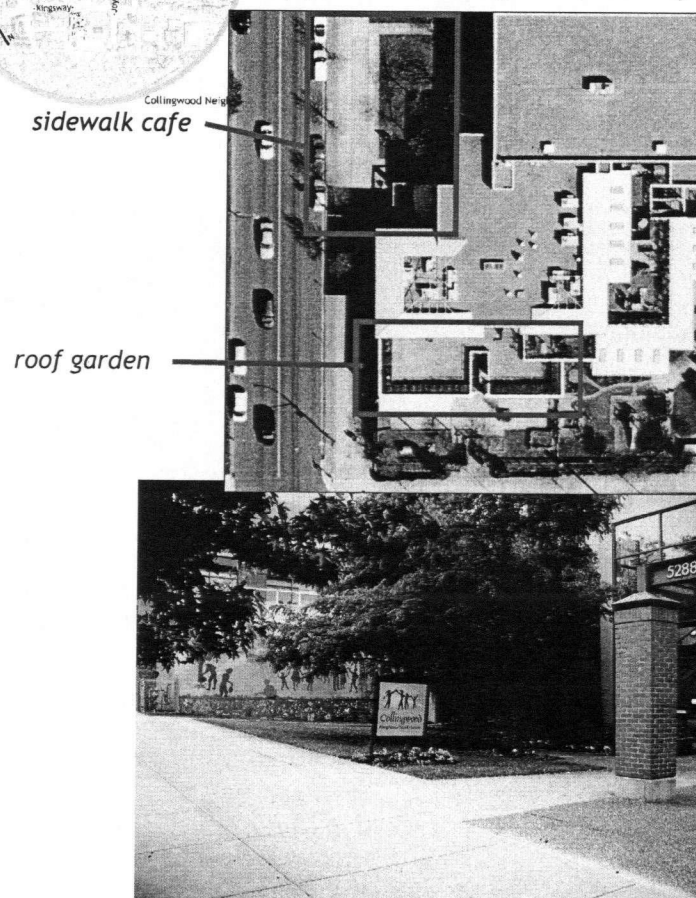


figure 3.22: collingwood house key



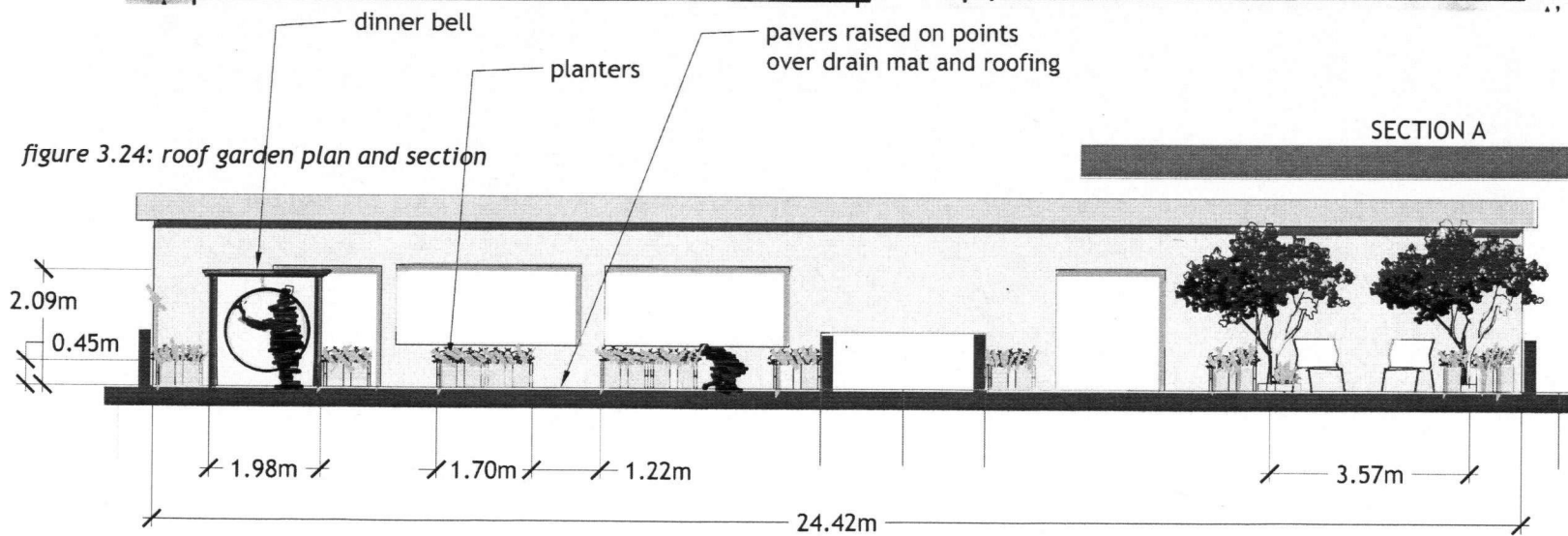
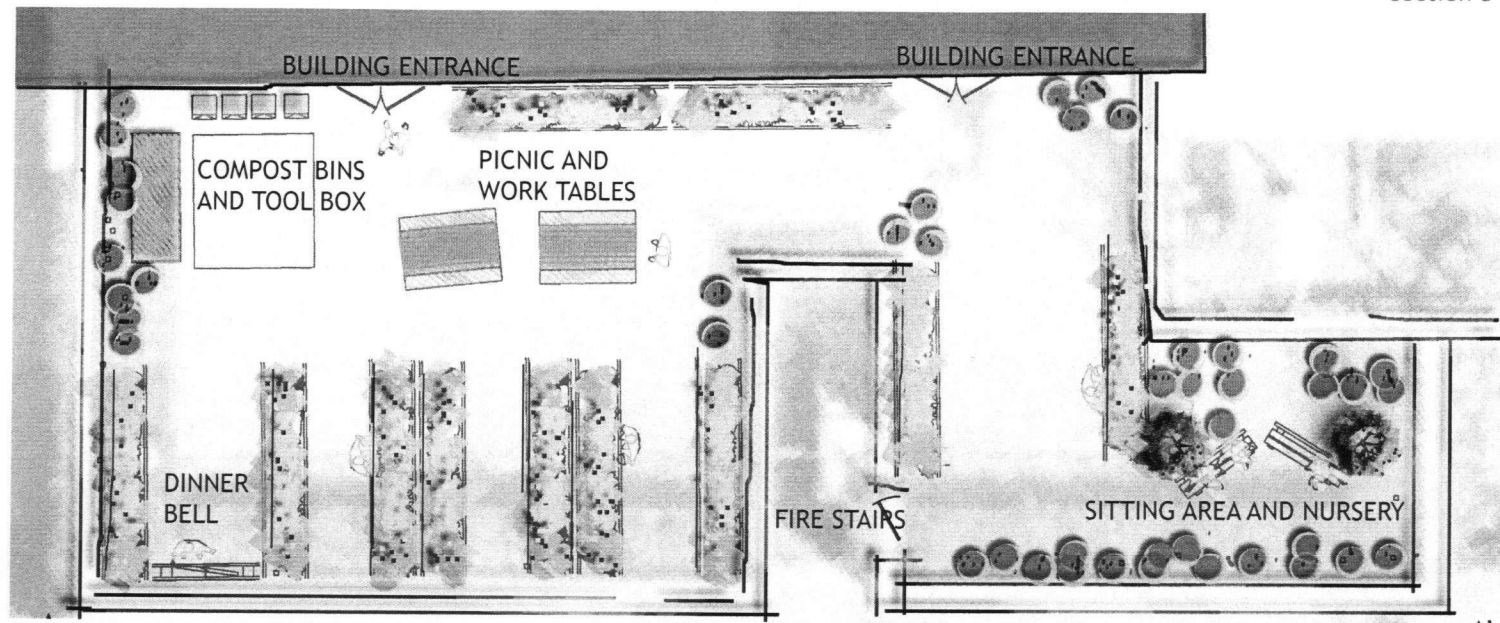


figure 3.24: roof garden plan and section

ROOF FARMS

Several 1-2 story commercial buildings are clustered together to form a continuous roof area of about 1,300 square meters. The vendors below include a cafe and a grocery store. The roof is visible from the rail station platform, and several apartment towers that surround it, giving it a high value for both commercial visibility and aesthetic improvements.

At 30 lbs/sq ft live load capacity, this farm necessarily uses a simple 'floating bin' hydroponic system to grow specialty crops and herbs that are sold to many of the food businesses in the district. The system uses nutrient-enriched water to grow crops without soil. The farm utilizes a very simple hoist to load materials on and off the roof, and the workers gain access through the existing maintenance hatch. This is somewhat of a nuisance, but the cost savings from rent and distribution make it worthwhile.

Most of the roof is covered in rows of pallets and various growing containers, with irrigation hoses snaking from one the other. A loading and working area is set aside near the back corner of one of the buildings. Roof water, which is used for irrigation, is collected in cisterns set on the ground at the corners of each building.

The neighbors and their kids are continually fascinated by the operation, especially the hoisting of produce down to the trucks, and are quick to ask at the cafe if they can have a sandwich made from roof-top veggies.

production area:
1200 square meters
annual production:
20-30 tonnes of vegetables

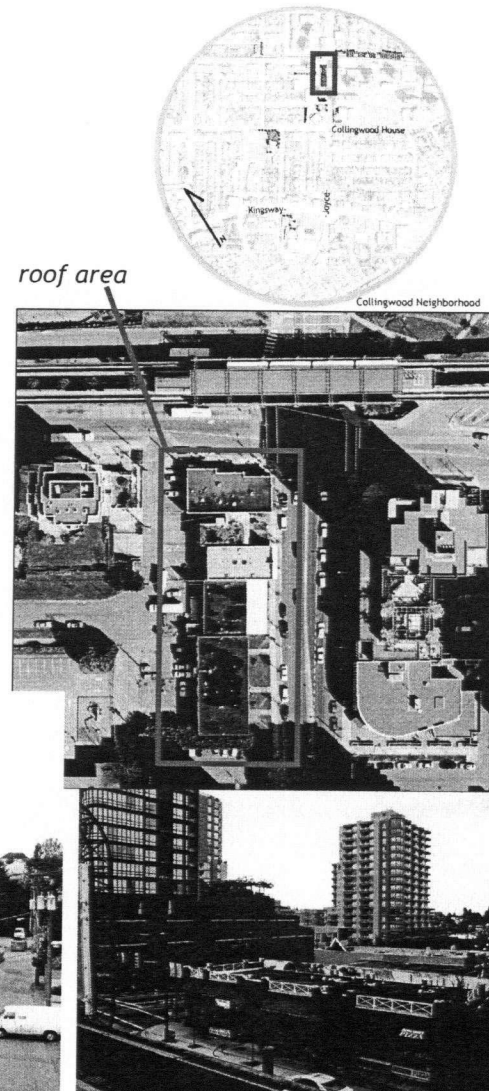


figure 3.25: roof farm image and key

YARDS AND LANEWAYS

Just over 200 of the 500 single family homes in this district have a backyard garden. It's possible that one of them has a front yard garden, but this is very rare. Since the city initiated its 'Bountiful City' program, blocks of gardeners have been teaming up to compete for the various prizes and to have the laneway rebuilt as a 'country lane', which is an existing Vancouver program. In addition to the improvements, the portion of sidewalk at either end is stamped with a sign

"WE GROW FOOD HERE!
BOUNTIFUL CITY AWARD
2005".

Blocks without lanes (there are quite a few around this area) are equally recognized and given the choice to have their street ends rebuilt to include corner bulges with pocket parks.

Each participating neighbor plants their back garden to be beautiful, creative, and productive, and the contest requires that they are quite visible to passers-by. Most solve this easily by replacing the old planks on their fence with 1 inch hardware cloth or chicken wire. Non-gardeners volunteer 2-3 meters of their back yard edge to be adopted by someone more willing or able. Surplus is shared at the community center, and points are awarded for generosity!

3x3 meter garden plots:
220

annual production:
3.5 tonnes

annual waste diversion:
85 tonnes

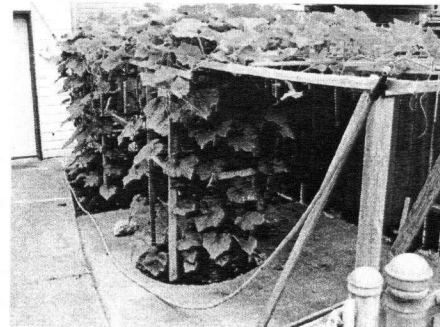
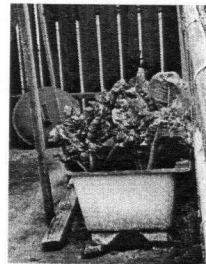


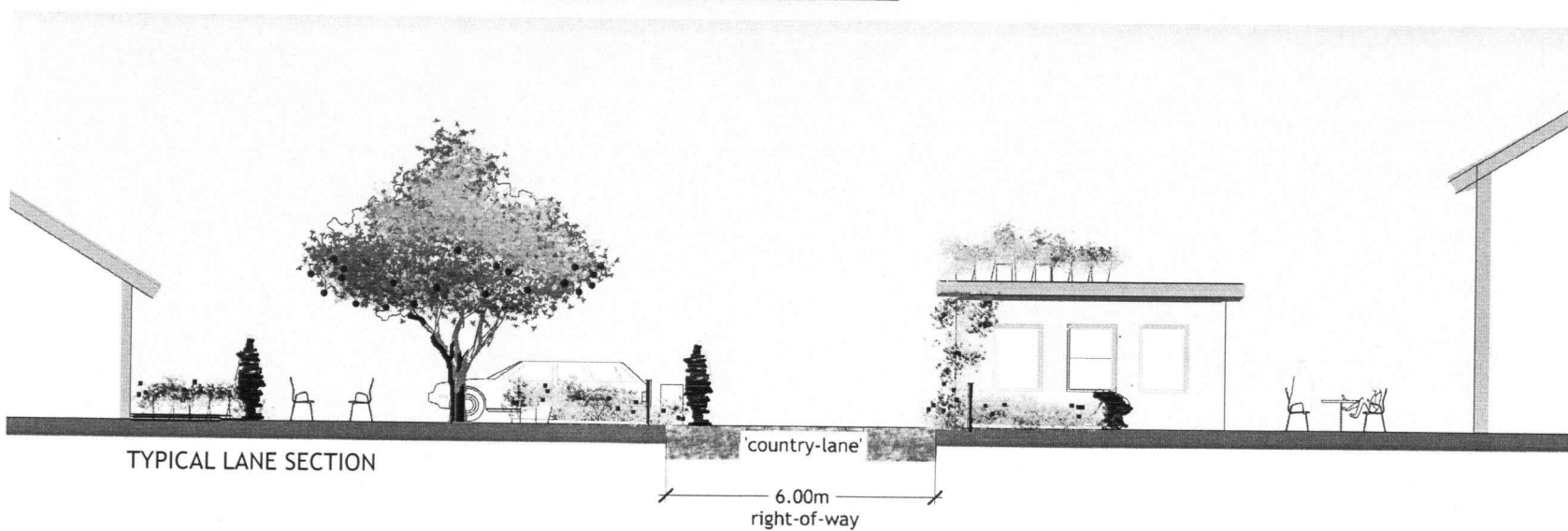
figure 3.26: lane ortho and images



a Vancouver 'Country Lane'



A Collingwood laneway garden



3.3 FOOD PRECINCT SUMMARY

This district of 8 to 10 thousand people now has almost 200 community garden plots and over 200 private garden plots. No existing land uses have been compromised. The community produces almost 10 tonnes of vegetables in gardens and as much as 30 tonnes on a single rooftop farm. Ninety-four tonnes of organic wastes are diverted by simple bin composters, and 1200 tonnes could be diverted from the landfill by a single in-vessel unit.

Public places are active, interesting, and often quite beautiful. Visitors and residents understand this to be a distinct and special place. The neighborhoods, parks, and lanes create the experience of walking through garden after garden, full of creative, home-made public art. The Collingwood community would become known for its unique image and generous spirit.

There are about 20 community garden plots per 1000 people.

Almost 5 percent of vegetable consumption needs are met (including the roof farm).

10 percent of household organic wastes are diverted to bins, and a small in-vessel system could manage all other household and commercial organic waste.

COMMUNITY SUMMARY

The network of gardens, production centres, retail nodes, and food precincts creates the image of a bountiful and beautiful community.

Of the almost four-thousand tonnes of vegetables consumed here, backyard and community gardens provide only 2.5 percent (100 tonnes) and roof-top farms could provide up to 20 percent (400-800 tonnes), but these are valuable as a supplement to the local economy and everyone's diet. The remaining produce, if sourced regionally, would require as much as 200 hectares of farmland, or ten to fifteen average-sized (14 ha - GVRD 2003) GVRD area farms.

Life goes on as usual in Renfrew Collingwood, except that residents and visitors know that these neighborhoods are full of interesting public places and often stroll through the lanes and parks to visit or explore the ever-changing gardens. Picking fruit from a tree and eating a home-grown salad is not so unusual here and neighbors congratulate each other on a well grown tomato. Food becomes a currency of good will, and is shared with those in need.

conclusions

CONCLUSIONS

Community food security frames an important set of ideas and values which can both enhance and be supported by the landscape of the city. This framework would see that every family and resident have equal access to a range of food choices that are appropriate and nutritious; and are procured in a way that generates a net benefit to the economy, the environment, and the community. The scale of application is similar to and therefore should inform the community planning process.

The community food program first assumes that equitable access should not rely on personal ownership of a car, or on the need to leave the neighborhood to find basic goods and services. It also assumes that that personal food production should not be a privilege enjoyed only by the owners of detached homes with yards. These assumptions imply that food access equity requires a walkable community that is centered around multiple modes of food distribution, and that there are enough people in that area (ie appropriate housing density) to economically support those modes. They also imply that the dissociation of private gardening and high-density housing should be recovered by providing gardening opportunities in the public realm.

The example of the Renfrew Collingwood community plan does not suggest any dramatic changes to the existing land use pattern. The most significant recommendation is that community gardening be given a more significant priority in the public realm. The most 'out-there' recommendation is that some rooftops be converted for agricultural use. Implementation would require collaboration between residents, community groups, local businesses and property owners, the Vancouver School Board, and the City of Vancouver's Parks Board, Social Planning Department, and Physical Planning.

The results of the proposed plan are:

ACCESS

The previously established Community Vision for Renfrew Collingwood, by identifying neighborhood 'nodes' and 'mini-nodes' and developing the food retail options there, will increase food access in underserved areas. The retail development plans would be supported by increased density in those areas.

PRODUCTION

The proposed community gardens would use only 1.1 percent of the residual spaces in the community. Backyard gardens and community gardens could provide two to three percent of local consumption needs, probably up to five percent if participation rates increased or if community garden development were expanded. This should not diminish the supplementary contribution to household diets that these gardens would provide. The conversion of less than ten percent of the industrial rooftops for hydroponic farms could contribute another twenty percent to local food sufficiency, and far more of course if every roof were converted. The remaining demand for vegetables could be met by about 200 hectares of local farmland. Demand for other food products has not been explored, but the potential for urban livestock should be examined.

AMENITY

The backyard and community garden network would greatly diversify the landscape of the city and contribute to the experiential value of the public realm. Community kitchens and other food related programming already exists in this community and provides social opportunities that are highly valued.

INFRASTRUCTURE

Bin composting can handle up to twenty-five percent of the total household organic waste stream. In-vessel composting has the potential to manage one-hundred percent of local waste production, including commercial organic wastes. Other waste-recovering systems, such as solar aquatics systems and biogas CHP

plants, were assumed to be more appropriate for consideration on the regional scale.

So what would it really take?

Developing retail nodes with food distributors is a proposal with plenty of local success stories. Vancouver's planning department, with their experience and a mandate from the community, seem well positioned to advance this aspect of the plan.

The three major land 'owners' who control the public realm are the city's Parks Board, Engineering Department, and the Vancouver School Board. Without their enthusiastic support, the *network of gardens* and *community farm* aspect of this plan, and the most significant modification to the landscape, would continue to be the *network of grass and gravel* that it is now. Considering the School Board's 'ten square meters maximum' policy, and the Parks Board's 'not in my backyard' policy' (evidenced by the Food Policy Council's continued use of the phrase *other than park space*), the Engineering Department would really have to step up. This seems more likely since they have extensive experience in modifying streets through their bikeways/greenways and country lane projects. Translink, a fourth land owner, is already quite supportive of community gardens under the SkyTrain tracks.

Commercial food production on rooftops seems somewhat more remote when nearby farms are constantly consolidating in order to make a profit. Aside from the structural requirements of the buildings and arrangements with the property owners, these ventures would need to minimize risk through subsidized start-up costs and pre-arranged purchasing agreements with local food processors and distributors. The single Canadian example of a rooftop farm is in Toronto, where Annex Organics roof farm was supported by a non profit organization.

Local food systems, then, facing the economic stumbling block,

will require the adoption of new organizational models and the development of local markets. As Wendell Berry suggests, a community needs to be protectionist, employing both charity and economics to give every advantage to the local over the distant, in order to preserve its productive capacity (Berry, 2001). Thomas Lyson has noted that systems of 'civic agriculture' are emerging that are founded on the articulation of local production with local demand (Lyson, 2004).

Of course there are many other aspects of a local food system that have not been explored and require less in land than in dedication by groups like the Food Security Institute: food sharing and redistribution schemes, local purchasing policies, food preparation training and nutrition education, and community meals programs for example.

Finally, some advice from the real experts is paraphrased from an ag-discuss list on the internet:

'Don't try to build everything at once, allow yourself some time to get used to things and say "oh, yes, now that that's over there I can see where it would make sense to build this over here." First, arrange the buildings so that things you want to see from the house and things you don't want to see line up ok. Then start with a garden and some chickens. You will be surprised how busy you will be with just that to take care of. Then sloooooowly add livestock. I'd also keep the chicken coop as far away from the other buildings as possible, especially if your gonna free range, as they will always find their way into places you don't want them and crap on everything, in other words the chickens need their OWN place. And I do speak from experience when saying chicken poop will eat the paint right off a tractor fender! Just keep in mind the further your buildings are from your home the further you gotta walk.'

REFERENCES

REFERENCES

- Alexander,C. & S.Ishikawa, M.Silverstein, M.Jacobson, I.Fiksdahl-King, and S.Angel. A Pattern Language: Towns, Buildings, Construction. Oxford University Press. New York 1977.
- Allen,P.1999. "Reweaving the Food Security Safety Net: Mediating Entitlement and Entrepreneurship." *Agirculture and Human Values* 16: 117-129.
- Berry,W. 2001. "The Idea of a Local Economy." *Orion Online Magazine*. Winter 2001.<www.oriononline.org>
- BC Ministry of Agriculture, Fisheries, and Food. Industry Competitiveness Branch. Factsheet: An Overview of the BC Field Vegetable Industry. December 2003.
- BC Stats. Quick Facts About British Columbia. 2003. <www.bcstats.gov.bc.ca>
- British Columbia Department of Agriculture. City and suburban food production, 1918. Tweddle, 1918.
- Canadian Association of Food Banks. Hunger Count 2004. <www.cafb-acba.ca/>
- Canadian Centre for Policy Alternatives. The Farm Crisis, Bigger Farms and the Myths of Competition and Efficiency. by Tait,F. & D.Qualman, 2004. <www.policyalternatives.ca>
- Cities Plus. CitiesPlus Agri-Food Foundation Paper. by Lawrence, A. & R.MacRae, 2002. <www.sheltair.com>
- Cities Plus. A Sustainable Urban System: The Long-term Plan for

Greater Vancouver. 2004. <www.citiesplus.ca>

City of Vancouver. Food Security Policy Report. 2003.<vancouver.ca>

City of Vancouver. Southeast False Creek Urban Agriculture Strategy. by Holland Barrs Planning Group, November 2002.

City of Vancouver, Engineering Department.

City of Vancouver, Social Planning Department.

City of Vancouver, Planning Department, City Plans Division.

Community Food Security Coalition. Community Food Security: Promoting Food Security and Building Healthy Food Systems. by Winne,M. 2004. <www.foodsecurity.org>

Community Food Security Coalition and California Sustainable Working Group. "Getting Food on the Table: An Action Guide to Local Food Policy." by Biehler,D. & A.Fisher, K.Siedenburg, M.Winne, J.Zachary 1999. <www.foodsecurity.org>

Community Food Security Coalition. "Urban Agriculture and Community Food Security in the United States: Farming from the City Center to the Urban Fringe." by Brown, K. & A.Carter, 2003. <www.foodsecurity.org>

Community Nutritionists Council of BC. Making the connection : food security and public health. June 2004.

Dieticians of Canada and Community Nutritionists Council of BC. The Cost of Eating in BC. 2003. <www.dietitians.ca>

Food and Agricultural Organization of the United Nations. Rome declaration on food security and world food summit plan of

action. Rome, Italy.1996.

Francis,M. Village Homes: A Community by Design. Island Press. Washington, DC. 2003.

Greater Vancouver Regional District. 2001 Census Bulletin #2, Greater Vancouver Regional District Policy and Planning Department. February 2003.

Howe, J. & K.Bohn, A.Viljoen. "Food in Time: The History of English Open Urban Space as a European Example." p. 96-107. in Viljoen, A. (ed.) Continuous Productive Urban Landscapes. Elsevier. Oxford 2005.

Kloppenburger, J.Jr. & S.Lezberg, K.De Master, G.W.Stevenson, J.Hendrickson. "Tasting Food, Tasting Sustainability: Defining the Attributes of an Alternative Food System With Competent, Ordinary People." Human Organization 59:2 (July): 177-186. 2000.

Linn,K. "Reclaiming the Sacred Commons." New Village, Issue 1: Community Revitalization. 1999.

Lyson,T. Civic Agriculture: Reconnecting Farm, Food, and Community. Tufts University Press. Massachusetts 2004.

MacDonald,B. Vancouver: a Visual History. Talonbooks. Vancouver 1992.

Meadows,D.H. "Envisioning a Sustainable World." Third Biennial Meeting of the International Society for Ecological Economics. October 24-28, 1994.

Nielson,B. Collingwood pioneers : memories of a Vancouver district. Vancouver 1990.

Quayle M. & van der Lieck T.C.D. "Growing community: A case for

hybrid landscapes." Landscape and Urban Planning 39 (1997) 99-107. 1997.

Recycling Council of BC Organics Working Group. The Dirt on Composting in British Columbia: A Working Paper Addressing the Barriers to Expanded Composting in BC. April 2000.

Statistics Canada. 2003. <www.statcan.ca>

University of California Transportation Center. Working Paper No.336: Homeward Bound: Food-Related Transportation Strategies for Low Income and Transit Dependent Communities. by Gottlieb,R. & A.Fisher, M.Dohan, L.O'Connor, V.Parks. 1996.

Viljoen, A. & K.Bohn, J.Howe. Continuous Productive Urban Landscapes. Elsevier. Oxford 2005.

Worldwatch Paper #147: Reinventing Cities for People and the Planet. by O'Meara,M. 1999.

Worldwatch Paper #163: Home Grown: The Case for Local Food in a Global Market. by Halweil,B. 2002.

appendices

Policy Review

ZONING, BACKYARD AND ROOF GARDENS

A quick look at zoning by-laws shows that some adjustments might be made to support more efficient use of space and greater productive capacity. This language may be found in other zones:

RS-1 District Schedule

2.2 Uses

2.2.A Accessory Buildings customarily ancillary to any of the uses listed in this Schedule, provided that:

(e) roof gardens and sun decks are not located on an accessory building located beyond the permitted building depth as regulated by section 4.16.1 of this Schedule.

Basically means that anyone interested in having a garden on the roof of their garage would be in violation of this bylaw.

Recommendation: remove this restriction, or modify it to allow a roof garden on one-story accessory buildings only.

4.4 Front Yard

4.4.1 A front yard with a minimum depth of 20 percent of the depth of the site shall be provided, (with some exceptions)

Observation suggests that hardly anyone grows food, or in fact does much of anything, in their front yards. This is basically forcing property owners to donate one-fifth of their land for a dubious public good. Most Vancouver streets would be better off with shallower setbacks, and

residents would benefit from a more use-able backyard. Some would benefit by planting bigger gardens.

Recommendation: Allow renovations to expand into the front yard rather than the backyard, reduce front yard set-backs, or allow the back-yard depth to control new build-to lines.

4.7.3 The following shall be excluded in the computation of floor space ratio:

(a) open residential balconies or sun decks, and any other appurtenances which, in the opinion of the Director of Planning, are similar to the foregoing, provided that the total area of all exclusions does not exceed eight percent of the permitted residential floor area;

(b) patios and roof gardens, provided that the Director of Planning first approves the design of sunroofs and walls;

This is a good one that allows builders to add balconies and roof gardens (to the main building) without losing critical square footage.

URBAN LIVESTOCK

CITY OF VANCOUVER HEALTH BY-LAW NO. 6580

4.1 No person shall keep or permit to be harboured any horses, donkeys, cattle, swine, sheep or goats, or any live poultry or fowl, including ducks, geese, turkeys, chickens, pheasants or quail, or operate any apiary or otherwise keep bees for any purpose in the City, except

that this prohibition shall not apply to a licensed pet shop or kennel, zoological park, research laboratory, veterinary hospital or slaughter house within the meaning of or where otherwise permitted by, the Zoning and Development By-law, unless otherwise stated within this By-law.

4.3 No person shall keep or permit to be kept at their residence or on the grounds thereof a greater number than 6 in aggregate of the following: hamsters, guinea pigs, tame mice, chinchillas, cats, rabbits and other small animals, snakes or other reptiles.

4.4 No person shall keep or permit to be kept at their residence or on the grounds thereof a greater number than 12 in the aggregate of registered homing pigeons, canaries, budgerigars, parrots, parakeets and exotic birds of all species; provided however that a person who has obtained the permission of the City Council to keep an aviary may have a greater number of such birds in or about the premises designated in the permit.

Keeping animals in the city is apparently limited to the standard range of pets as well as 'exotic birds of all species', snakes, and 'other reptiles'. However, a few chickens in the backyard can significantly contribute the composting process and the quality of the product, and could provide more than enough eggs for a family. Many other cities support backyard livestock, or have in the past such as in wartime London, where chicken and bee-keeping clubs became quite popular.

Recommendation: Allow at least bees and chickens on single family lots, with regulations similar to this example:

Seattle Municipal Code

Title 23 - Land Use Code

Subtitle IV - Land Use Regulations

Division 2 - Authorized Uses and Development Standards

Chapter 23.44 - Residential, Single-Family

SMC 23.44.048 Keeping of animals.

The keeping of small animals, farm animals, domestic fowl and bees is permitted outright as an accessory use to any principal use permitted outright or to a permitted conditional use subject to the following standards:

A. Small Animals. Up to three (3) small animals per single-family residential structure may be kept in single-family zones; however, no more than one (1) may be a miniature potbelly pig (see subsection B of this section).

Four (4) small animals are permitted on lots of at least twenty thousand (20,000) square feet. One (1) additional small animal is permitted for each five thousand (5,000) square feet of lot area in excess of twenty thousand (20,000) square feet.

Accessory structures, including kennels, for four (4) or more animals must be at least ten (10) feet from any other residentially zoned lot.

B. Miniature Potbelly Pigs. That type of swine commonly known as the Vietnamese, Chinese, or Asian Potbelly Pig (*Sus scrofa bittatus*) may be kept as domestic pets as a small animal, provided that no swine may be kept in the City which is greater than twenty-two (22) inches in height at the shoulder or more than one hundred fifty (150) pounds in weight.

C. Domestic Fowl. Up to three (3) domestic fowl may be kept on any lot in addition to the small animals permitted in the preceding subsection. For each one thousand (1,000)

square feet of lot area in excess of the minimum lot area required for the zone, one (1) additional domestic fowl may be kept.

D. Farm Animals. Cows, horses, sheep and other similar farm animals are permitted only on lots of at least twenty thousand (20,000) square feet. The keeping of swine is prohibited, except for miniature potbelly pigs allowed under subsection B of this section.

1. One (1) farm animal for every ten thousand (10,000) square feet of lot area is permitted.

2. Farm animals and structures housing them must be kept at least fifty (50) feet from any residentially zoned lot.

E. Beekeeping. Beekeeping is permitted outright as an accessory use, when registered with the State Department of Agriculture, provided that:

1. No more than four (4) hives, each with only one (1) swarm, shall be kept on lots of less than ten thousand (10,000) square feet.

2. Hives shall not be located within twenty-five (25) feet of any property line except when situated eight (8) feet or more above the grade immediately adjacent to the grade of the lot on which the hives are located or when situated less than eight (8) feet above the adjacent existing lot grade and behind a solid fence or hedge six (6) feet high parallel to any property line within twenty-five (25) feet of a hive and extending at least twenty (20) feet beyond the hive in both directions.

OTHER HEALTH BYLAWS

CITY OF VANCOUVER HEALTH BY-LAW NO. 6580

*3.55 The operator of a mobile food service unit shall comply with the following conditions and restrictions:
(a) sales shall be limited to popcorn, nuts in the shell, pretzels, pre-packaged foods, hot beverages and precooked frankfurters;*

This one just seems too ironic not to mention: that the health bylaw would require that only snack foods and processed foods be sold under certain circumstances. There must be a way to allow for more healthy food choices to be sold on the street.

Grocery Store Economic Study

Economic Analysis

GVRD reference

GVRD average family income: \$57,926
GVRD family size: 2.6
GVRD Grocery sales per family: \$4,433

Trade Area reference: Renfrew Collingwood Community

RC Average Family Income: \$49,625
RC Family Size: 3.1
Families: 12,285

GVRD to RC comparative measures

Purchasing Potential Index: RC Family Income / GVRD Family Income = .857 *(this is a standard measure of an area's spending potential based on compared average incomes)*

Family Size Index: 3.1 / 2.6 (RC family size/GVRD family size) = 1.19

(this measure I have speciously invented since I couldn't find another method that considers average family size, which is higher in Renfrew Collingwood, and I expected that larger families would tend to buy more food than smaller ones despite lower incomes)

Sale Potentials

Trade Area sales per family (per family sales x PPI): \$3,798

Trade Area sales per family (FSI included): \$4,520

Grocery Sales per family range: \$3,800 - \$4,500

Area potential sales (sales per family x total families): \$46.65 to \$55.53 million

Floorspace Demand (based on \$448/sqft*): 104,000 - 124,000 sq ft

Floorspace supply (includes convenience stores): 125,000 sq ft

Floorspace Demand per family: 8.48 - 10.1 sq ft

Conclusion

Retail area supply and demand appear balanced. Demand will increase with population (14,000 target increase by 2021) by 46,000 sq ft under these conditions.

Reference: Typical Building Sizes

Superstore - 100,000 to 150,000 sq ft

Supermarket - 25,000 to 40,000 sq ft

Upscale market - 12,000 sq ft

Greengrocer - 5,000 to 10,000 sq ft

Convenience - 2,000 sq ft

*Dollars and Cents of Shopping Centers. Urban Land Institute, 2002.

**Statistics Canada 2001 Surveys

Metrics Calculations

parameter	value	calculation	reference
COMMUNITY ALLOCATIONS			
Park/Open Space	1.1 ha/1000 people		City of Vancouver standard
Community garden plots	6.5 plots, 18.5 sqm each, per 1000 people		SEFC Draft ODP, 2004
Optimal community garden size	18.6 sqm minimum for several gardeners		City of Seattle P-Patch guidelines
SOCIAL CAPACITY			
Vancouver Residents growing some food at home	44%		City Farmer
Vancouver Residents composting at home	40%		City farmer
CONSUMPTION			
vegetables	3,922 tonnes for a community of 45,000	87.16 kg per capita vegetables consumed (11.98 kg per capita for fruit)	FastStats, Ag&Food2004, 10 yr average
Household water use	315 L/c/d typical		SEFC Water and Waste Mgmt Plan, 2002
Irrigation Water Demand	26 L/sqm of planted area	Estimated 195 m3/month for a turf area of 30,000 m2 watered from May to August	SEFC Water and Waste Mgmt Plan, 2002
PRODUCTION AND YIELDS			
Soil-based vegetable production	17,738 kg/ha 1.77 kg/sq meter	vegetables sold (115,050,900 kg) mainland harvested area (6486 ha) (cp. to 26,747 tonnes/3,233 acres, a 1918 survey of Vancouver area gardens, shows that yields were very similar and actually slightly higher than 2002 field crop production)	Annual BC Hort.Stats. 2002 -and- Tweddle, 1918 survey
Hydroponic vegetable production	46 kg/sq meter	vegetables sold (92,246,363 kg) mainland harvested area (199 ha)	Annual BC Hort.Stats. 2002
Fruit production	2.12 kg/sq meter	fruit sold (155,017,270 kg) BC harvested area (7,292 ha)	Annual BC Hort.Stats. 2002 FastStats, Ag&Food2004, 10 yr average

WASTE GENERATION			
Residential food waste	53.1 kg/c/year		Food Loss Project, 2004
Residential yard waste	44.8 kg/c/year	916,000 people served by Vancouver landfill 41,000 tonnes of yard waste received	City of Vancouver Annual Waste Report, 2003
All residential organic waste	98 kg/c/year		SEFC Water and Waste Mgmt Plan, 2002
Street tree waste	3,920 kg/ha city wide average	45,000 tonnes tree debris processed at landfill 11,500 ha area served	City of Vancouver Annual Waste Report, 2003
Grocery store organic waste	20,000 kg/store/year		Food Loss Project, 2004
Restaurant organic waste	22,930 kg/rest./year		Food Loss Project, 2004
Waste water	200-320 L/c/d		UBC Waste Treatment Study, 2002 SEFC Water and Waste Mgmt Plan, 2002
WASTE RECOVERY SYSTEMS			
Composting (in-vessel)	Varies: example given is 1000 tonnes per year on an 810 sqm site	810 sq meter site per 1,078 tonnes (or 11,000 people)	SEFC Water and Waste Mgmt Plan, 2002
Mid scale hybrid composting system	260 tonnes/year	5-7 tonnes per week 300 sq meter site	Observed at Strathcona Community Gardens
Composting (backyard bins)	385 kg/year	290 lbs food and 560 lbs yard waste per household per year (Seattle estimate)	BioCycle January 2005, Vol. 46, No. 1, p. 45
Sewage Treatment using Solar Aquatic System (SAS)	0.13 to 0.63 cubic meters/ square meter/day	a proposed 600 sq m plant would treat 378.5 m3/day a proposed 240 sq m plant would treat 32 m3/day	UBC Waste Treatment Study, 2002 SEFC Water and Waste Mgmt Plan, 2002
Biodiesel (energy recovery)	1000 L/20 sqm/week	A 20 sqm plant converts two 500L batches of waste vegetable oil into biodiesel per week	UBC Biodiesel Initiative, 2003

DISTRIBUTION			
Grocery Stores	307 sqm / 1000 people or 3.14 sq ft per person	Families: 12,285 GVRD Grocery sales per family: \$4,433 Family Size: 3.1 Grocery store demand ratio: \$448/sqft	See Appendix: Grocery Store Economics
Grocery Store trade area	4.8 km (3 miles)		(Industry standard)
Farmer's Market trade area	4.8-11.2 km (3-7 miles)		PPS Public Markets Report, 2003

references:

British Columbia Ministry of Agriculture and Lands: www.agf.gov.bc.ca

Annual BC Horticultural Statistics, 2002.

FastStats 2004.

Twedde, 1918. City and suburban food production.

City Farmer, September 2002 poll: www.cityfarmer.org

City of Seattle: www.seattle.gov/neighborhoods

P-Patch guidelines. Department of Neighborhoods.

City of Vancouver: www.city.vancouver.bc.ca

SEFC Draft Official Development Plan. December 13, 2004.

SEFC Water and Waste Management Plan, 2002. (Keen Engineering).

Annual Waste Report, 2003. Transfer and Landfill Operations Annual Report 2002.

Jones, T.W. 2004. Using Contemporary Archaeology and Applied Anthropology to Understand Food Loss in the American Food System.

community compost website: www.communitycompost.org

Public Markets and Community Based Food Systems: Making them work in lower-income neighborhoods, 2003. Project for Public

Spaces: www.pps.org.

Sherman, R. 2005. Backyard Composting Developments. BioCycle January 2005, Vol. 46, No. 1, p. 45.

University of British Columbia: www.ubc.ca

Chou, J. & D. McLeod, M. Pozar, J. Yee, and A. Yeung, 2003. UBC Biodiesel Initiative: Helping Communities to Help Their Future. Unpublished report, UBC.

Grant, M. & G. Hill, C. Holbrook, P. Lymburner, A. McTavish, and A. Sundby, 2002. Water Management and Waste Water Treatment at UBC: A Study for Sustainable Alternatives. Unpublished honours thesis, UBC.

A QUICK NOTE ON FINDING SPACE

appendices

A design study for urban food systems was conducted for Vancouver's South East False Creek, a sustainable brownfield re-development project. These ideas wrangled their way into the Official Development Plan as a community learning garden, and maybe a composting site. Under this condition (of development pressure), every square foot given away for public use represents money lost for the land owner. It is a very tough negotiation.

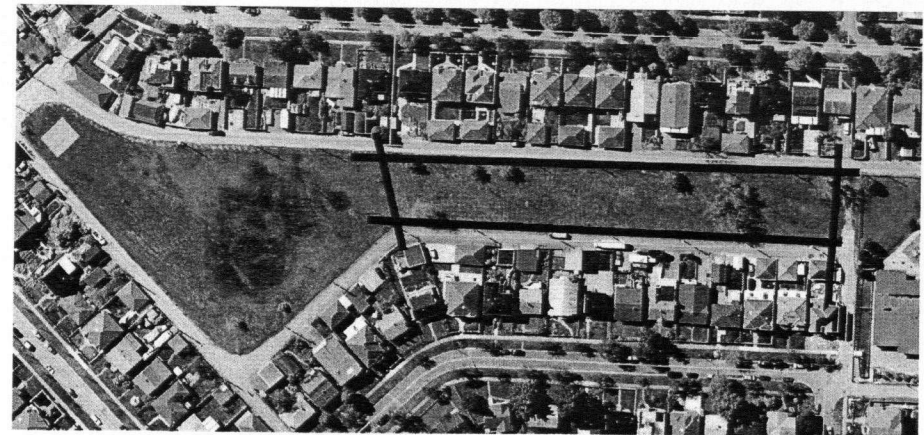
What makes urban food programs really fun, and this study different from that one, is that built-out neighborhoods are full of unused space that will never be on the real estate chopping block:

Block Ends

The public realm relies heavily on its relationship to the private realm. Space in **FRONT** of a house is pretty much too close for comfort for most people to share with a community group. Space **BESIDE** a house, though, can be more negotiable with the thoughtful use of fences and a nod from the neighbor. The extra space at the end of a block could be a could place for a community garden.

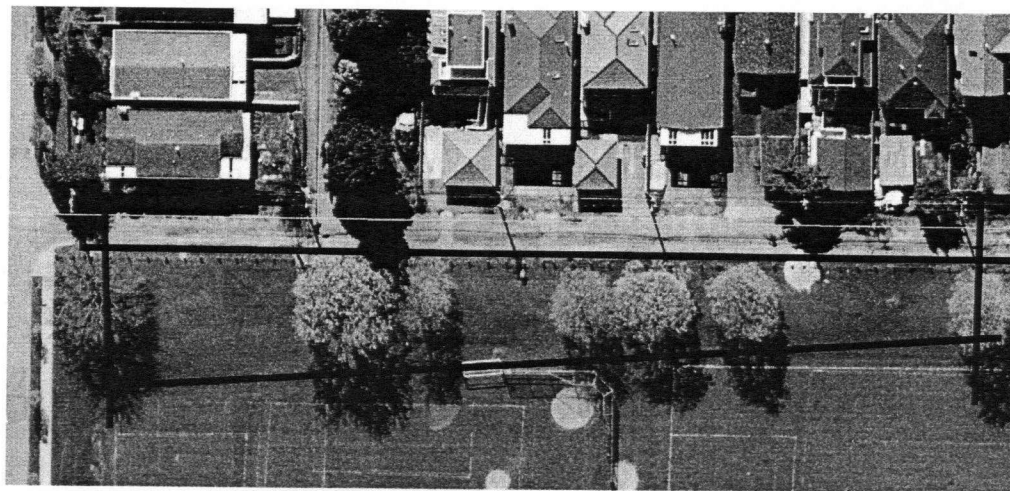
Weird Parks from the 40's and 50's

Similarly, a narrow space that is **BEHIND** a row of houses, and **ACROSS** the lane, and too **SKINNY** to be of much use to anything but a dog chasing sticks, could be a negotiable space.



Edges, Verges, and

The edge spaces in parks are often the leftovers from the lawn-mowing budget, but are well positioned as a place that doesn't necessarily intrude on someone else's private space (roads are good like that). Edges are the uncontested definers of spaces, and the lack of good ones out there in our parks is pretty sad.



Slopes

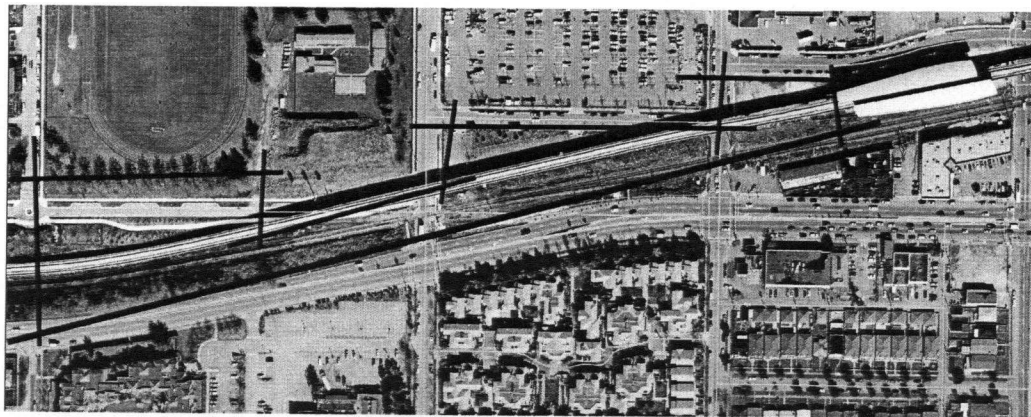
This big area has an eight percent grade that isn't very fun for soccer players. It would take a 16 metre retaining wall to create a sports field in there. In the old days it would take a family about a day to turn this into a terraced farm with space for dancing, and then write a poem about it that evening.



Rail Corridors

These have a knack for slicing across the urban grid and leaving behind tiny, narrow, triangular lots. When they slice through industrial areas, you get a good place for the loud or smelly activities like COMPOSTING. As for production, the soils here are probably suspect, but farmers are pretty ingenious.

This one also happens to be adjacent to Vancouver's Tech school, a bikeway, and a bunch of people who don't have yards.



Institutional properties

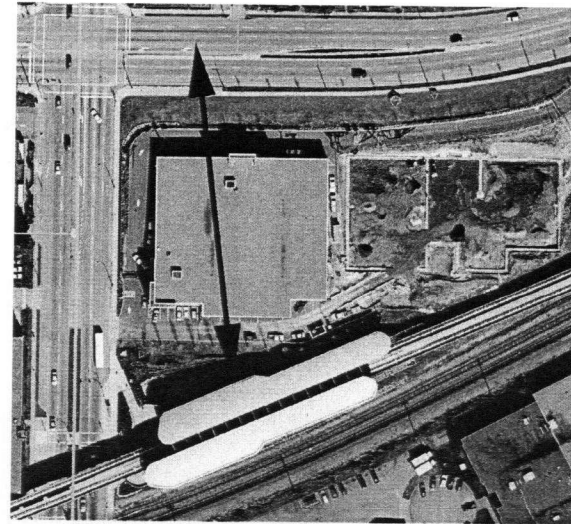
These tend to fill in over years, but in the meanwhile there is lots of room! These properties are valuable moderators between the private and public domains.



Industrial Corridors

Warehouse-sized buildings and big paved loading and parking areas are interspersed by leftover corners, sloped edges (to make up the grade), and by the way huge flat rooftops.

This one would make an amazing rooftop farm, since the roof is level with the street and the train station. Travellers from both sides could look across a field of lavender or salad greens and a monkey puzzle of hoses and hoop houses.



The Vacant Lot vs. the Public Place...

Vacant lots are tantalizingly empty to urban agriculturalists, city planners, and real estate developers alike. In 2005, in Vancouver, these places require a high degree of consideration. Housing supply and affordability relate without question, and transit and retail services are supported by increased densities. On the other hand, a small park on every second or third block would create an incredible network of small, productive, and interactive public spaces.

While some urban food enterprises are most appropriate on private lands, this example at least shows that there is comparable available land areas between the vacant lot and the nearby park.

