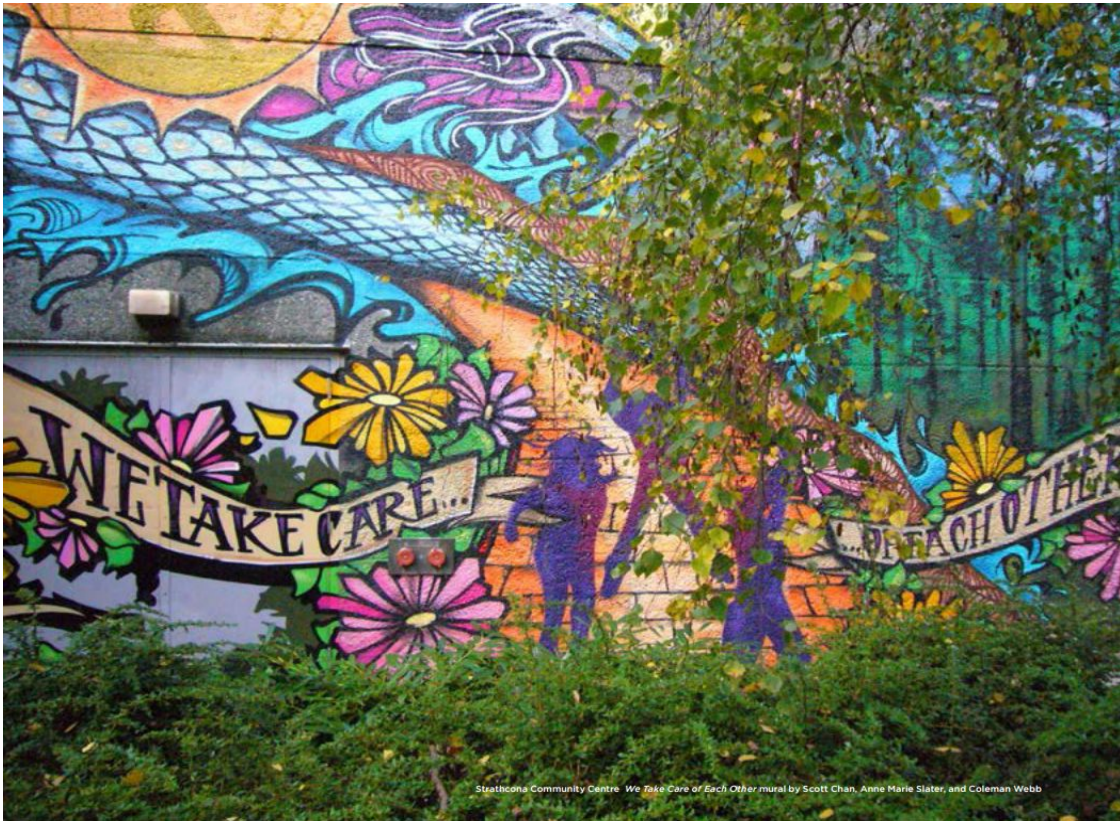


An ArcGIS Analysis of Food Services in the Vancouver Downtown Eastside

April 11, 2017



Sara Banai, Nicole Stevens,
Ruby Pyke & Michele Walter

GEOB 270

Abstract

In 2013, the City of Vancouver created “What Feeds Us: the Vancouver Food Strategy” with the agenda to address and create social, environmental, economic health goals in Vancouver. The main target was to increase city and neighbourhood food assets by 50 percent over 2010 levels by the year 2020. We examined the accessibility, both physical and socioeconomic, of food in the downtown eastside (DTES) through our map which revealed different food providers (e.g. convenience stores, grocery stores, farmer’s markets, soup kitchens) and food-related initiatives (e.g. community gardens) in and around the DTES. The purpose of our analysis was to assess the accessibility that the community of Vancouver’s Downtown Eastside has to different food services. Additionally, our project aimed to analyze how the City of Vancouver and other social services have created resources for this marginalized community to access nutritious and affordable food.

Description of Project, Study Area, and Data

Project & Study Area:

In 2013, the City of Vancouver created “What Feeds Us: the Vancouver Food Strategy” to meet social, environmental, economic health goals by the creation of fair and sustainable food distribution in Vancouver. Their three major goals were (1) support food friendly neighborhoods (2) empowering residents to take action and (3) improve access to healthy, affordable, and culturally diverse food for all residents. The main target was to increase city and neighbourhood food assets by 50 percent over 2010 levels by the year 2020.

Our project examined one neighborhood that had the potential to be positively affected by this strategy. We examined the accessibility, both physical and socioeconomic, of food in the Downtown Eastside (DTES). Our map shows the presence of different food providers (e.g. convenience stores, grocery stores, farmer’s markets, soup kitchens) and food-related initiatives (e.g. community gardens) in and around the DTES. The purpose of our analysis was to assess the accessibility that the community of Vancouver’s Downtown Eastside has to different food services. Additionally, our project aimed to analyze how the City of Vancouver and other social services have created resources for this marginalized community to access nutritious and affordable food.

Data:

The collection of our data was based off of the different food assets determined by the city. Food assets are defined as “resources, facilities, services or spaces that are available to Vancouver residents at the city-wide or neighbourhood scale and are used to support the city’s food system” (City of Vancouver, 2010). We used a variety of data sources that included both the recommended GEOB 270 data sources and those from our online research. Our online research included sources such as addresses from yellow pages and websites that we geocoded and imported to ArcGIS. A full list of our data sources can be found in the appendix.

Methodology of Analysis

Our methodology of analysis can be broken down into five components: data research and conversion, data input and transformation, and data display.

Our first step was **data research and conversion**. We referred to the different food aspects in the City of Vancouver Food Strategy. The collection of our data was based off of the different food assets determined by the city. Food assets are defined as “resources, facilities, services or spaces that are available to Vancouver residents at the city-wide or neighbourhood scale and are used to support the city’s food system” (City of Vancouver, 2010). We used a variety of data sources that included both the recommended GEOB 270 data sources and those from our online research. Our online research included sources such as addresses from Yellow Pages and websites that we geocoded, put into a spreadsheet, and imported to ArcGIS. A full list of our data sources can be found in the appendix.

Our second step was **data input and transformation** into a useable form on ArcGIS. For the basemap, we used the shapefile of Vancouver, but only kept the areas for downtown. We also uploaded a shapefile of the streets in downtown. Then, for the data on food assets, we uploaded all the spreadsheets we had made, and displayed the XY data creating a new layer for each, which we saved to the gdb. Since our geocoding software (geocoder.ca) uses the geographical coordinate system WGS1984, we projected the layers to UTM Zone 10, the projection for our map. We recognize that at such a large scale the projection does not make a significant difference, but we felt it was an important step both to ensure accuracy and as a good habit as GIS users. Finally, we clipped the data to only show points within the downtown area. For the data on income, we uploaded the tabular data for income by census tract as well as a shapefile of the census tracts. We joined them so that the tabular data could be displayed on the map, and we clipped them to only show data for downtown. Then, we used graduated symbology to show the different income brackets. After looking at the histogram, we chose natural breaks with five breaks as the best way to display the data. For the inset, we created a second data frame and copied all the same layers, but just zoomed in on the area for the Downtown Eastside.

Our third step was data display. Once all the layers were added to the table of contents, on top of the downtown Vancouver layer, we created a colour and organizational scheme for the map. We used a gray color scheme for the income levels so that it would fade to the back, since the main focus of our map is the food assets. We used colors with the same shape for the food assets because colors are easier to distinguish than shapes, especially in the case of our map where symbols often overlay on top of each other. We used a moderate value for the colors because it is easier on the eyes, and since we had a gray background the colors still pop.

Discussion and Results

Our ArcGIS analysis of food services in the Downtown Eastside provides an understanding of the correlation between the income of the neighbourhoods and the food services within them. The purpose of our analysis was to assess the accessibility that the community of Vancouver's Downtown Eastside has to various food services. Additionally, our project aimed to analyze how the City of Vancouver and other social services have created resources for this marginalized community to access nutritious and affordable food. Our map shows the location of various food services in the Downtown Vancouver area to compare and contrast the availability and type of food providers in different neighbourhoods, and how this relates to differences in income. We found through our map that there was a prevalence of certain food providers in the Downtown Eastside neighbourhood, and suggest that this may relate to the income level of this area.

Vancouver's Downtown Eastside is one of the poorest neighbourhoods in Canada, known infamously for its drug trade (Boyd, 2008). When moving from East to West across Downtown Vancouver, one moves from the Downtown Eastside to Gastown in just one block. The drastic contrast is evident as Gastown teems with luxurious restaurants, bars and nightclubs, well constructed buildings and is often flooded with tourists. One block east lies the Downtown Eastside, which paints a very different picture - an area with prevalent crime, homelessness, and drug issues. Within this neighbourhood exists deeply rooted, systemic issues of racism, sexism, and economic disparity which have led to a multitude of consequences (Smith, 2002). It is especially stark when compared to neighbouring areas, such as Gastown, which has undergone rapid development in tourism and business in the past few decades (Smith, 2002). Our map highlights

some of the responding consequences to these disparities in terms of food services. Businesses tend to reflect the particular demographic of an area, and this can be in terms of ethnicity, price and type of retail (Walcott, 2009). Our study looks at one particular type of retail - food providers - and how differences between neighbourhoods reflect larger disparities in socio-economic class. We believe it was important to map all of the food services available in one map for comparison between the downtown neighbourhoods, and provide important conclusions not only about the proximity of food services, but the quality and affordability of them. By including all of the data layers of food services in Vancouver, we were able to more fully analyze the condition of food availability and accessibility in the DTES compared to the rest of Downtown Vancouver.

As is shown on our map, we found a high prevalence of convenience stores within the DTES, with seven inside the neighbourhood boundaries. Convenience stores are generally associated with providing less nutritious foods that have often been processed and packaged (Gebauer and Laska, 2011). This would increase accessibility of foods that are mainly carbohydrates and lacking in overall nutritional value to members of the community. Studies suggest that individual dietary patterns are influenced by their geographic context and the accessibility of certain foods (Pearce et al., 2008). This means that what is prevalent in a certain neighbourhood could potentially influence an individual's food intake. Thus a possible consequence to living in the DTES may be more limited access to foods and ensuing effects on health.

Another issue that comes with the limited grocery stores offered in Downtown Vancouver is their prices. Many of the grocery stores available in the downtown neighbourhoods are ones such as Whole Foods, Urban Fare or private specialty grocery stores. These grocers cater to wealthy shoppers who can afford to purchase specialty foods. Although there may be grocery stores in the neighbouring areas of the Downtown Eastside, they are not within the price range of many community members. Therefore, access to affordable food is limited.

Another area of disparity in the DTES is the lack of farmer's markets. Farmer's markets are well known for offering a wide range of local, organic, healthy, and sometimes culturally-appropriate foods (Larsen & Gilliland, 2009). However, they are also often known to be relatively expensive, as local farmers need to charge higher prices than competitive businesses in order to sustain themselves (Lyon, et al., 2009). This makes the food inaccessible to those with lower incomes, further limiting these individuals from accessing diverse and nutritious foods.

It is important to recognize both services which contribute to the food disparity in the DTES (such as a high prevalence of convenience stores, low prevalence of farmer's markets and grocery stores), as well as services that have arisen as solutions. In areas that experience greater poverty and resulting lack of social services, there is often a greater prevalence of services that are created to meet these challenges. One well-cited example of the DTES is In-Site (Wood, et al., 2004), a safe injection site which provides support for drug-users and thus prevents many fatal consequences of drug use. Although these services do not provide long-term solutions to more systemic issues of socio-economic disparity, they are essential in providing immediate help to those experiencing daily challenges.

Our map shows a high proportion of food production (community gardens, urban farms, and community orchards- all termed 'community garden') within the DTES, with 7 found within the neighbourhood boundaries (view map inset) and 14 others spread around the rest of the downtown area (see large-scale map). These areas of food production are created for a multitude of reasons, including increasing access to fresh foods, and "[turning] under-utilized city space into productive green space" (LFS 350, 2015). The

Hastings Urban Farm, for example, was created to increase food access for the neighbourhood (LFS 350, 2015). This urban farm, therefore, represents one feasible solution to the food security crisis in the DTES.

Similarly, we found that there is a high proportion of meal services within the DTES, with four found within the neighbourhood boundaries (see inset), and only two in the rest of the downtown area (see full map). Meal services (i.e. kitchens open to the community, food workshops) are often located in areas where they are most needed; for example, where residents are most at risk of being food insecure (Loopstra and Tarasuk, 2013). Thus we can visually represent the connection, in this particular neighbourhood, between the prevalence of meal services and the low income status of many of its residents. Similar to community gardens, meal services can represent one response to addressing the challenges of food security. In recognizing the limitations of this map in providing information of the individual food assets, however, we question whether these meal services are enough to provide for all those in need, and whether the foods are of high nutritional value.

An interesting connection between housing and food security arises from housing availability in the Downtown Eastside and the ability for residents to cook and prepare meals. The Downtown Eastside is the only neighbourhood in Vancouver that has affordable housing (Roe, 2009). These “affordable and subsidized housing options” (Roe, 2009) were secured by the Downtown Eastside Residents Association (DERA) in the 1970s and 1980s, and many now exist as single room occupancy (SRO) housing (Roe, 2009). In Vancouver, there are over 6,000 single-room occupancy hotel rooms (SRO), of which, 80% are located in the Downtown Eastside (Evans and Strathdee, 2006). Many of these rooms are unsanitary, share water with other residents and are very small (Evans and Strathdee, 2006). SRO housing is often the last resort before homelessness and is one of the only options available for many (Evans and Strathdee, 2006). Miewalk and Ostry (2014) address how single room occupancy (SRO) housing, and similar housing setups, in the Downtown Eastside are not arranged in a way that encourages individuals to prepare meals for themselves. They state how housing and food availability are often treated as separate issues, but how they are inherently related and dependent on each other (Miewalk and Ostry, 2014). Miewalk and Ostry (2014) found that factors such as mental and drug stability as well as availability to cooking facilities changed how one thought of food access strategies. Overall, Miewalk and Ostry (2014) begin an interesting conversation which highlights the importance of considering housing when studying food accessibility. This approach would analyze some underlying issues and barriers to food security in the Downtown Eastside.

Our map gives an insight into one symptom of the problem- access to affordable and nutritious food. However, this is only one aspect of the deeply interconnected issues prevalent in the Downtown Eastside. Underlying systemic socio-economic problems have led many individuals to end up in the DTES. Studying food security with this frame of mind can help explain why certain resources are prevalent or not. However, we are not solely looking at the reasons behind food insecurity in the DTES, but also some community-based initiatives to help address them. Work needs to be done to transform the sensationalist depiction of the DTES as a place of only “poor and sick” (Roe, 2009) people to a neighbourhood of high social inequity and in need of community-based solutions. By including community gardens and meal services, we show initiatives which address one aspect of the social situation of the DTES, and are thereby creating momentum for further change. Our hope is that our map can give insight into the current food situation of the DTES, to give support for more community-based food resources in the future.

Error and Uncertainty

Creating a map on ArcGIS is a visual representation of the world. For obvious reasons, the real world cannot be 100 percent accurate and precise when transformed into a digital representation. There is error and uncertainty in every analysis performed on ArcGIS due to uncertainty and error in the source data, data conversion and human error in displaying and analyzing data. We can account for error and uncertainty in our analysis of food services in the Downtown Eastside (DTES). First, the accuracy of our collected source database had limitations.

To find source data beyond our course database and the City of Vancouver, we were limited to the information we were able to find from online research and the local knowledge two of our group members had about food services in the DTES from growing up in Vancouver. We had to presume that the online information was updated and correct. In addition to creating an accurate database, we were reliant on this same information for the precision of each point on the map. After collecting online data, we converted some of the addresses to latitude and longitude on geocoder.ca. Here, if the correct address was not put in (or stated incorrectly on the website) the accuracy of location would be off. We accounted for this by having two people work on each component at one time. In addition to data about the location of food assets, we also downloaded data about income levels from the University of Toronto census tracts. Here we chose from a number of categories, deciding on the median level for individuals (based on household values). We could not account for the fact that many of the DTES residents do not have permanent addresses and therefore likely do not participate in census data collection. We assumed here that Census Canada (being a reliable and trustworthy resource) had taken this into account in their data collection.

For our data display, we chose to juxtapose the DTES with the rest of downtown as a comparison of the food assets in two areas. This leaves the rest of Vancouver out of the comparison, which could change the way food accessibility is perceived in the rest of Vancouver. On the larger map, it also appears that the DTES has a greater abundance of food assets overall than downtown does. We accounted for this with our map inset, which gave a more precise overview of the food asset data in that area. Overall, each group member went over the work of other group members (four people total) to check each step to minimize the amount of human error within our GIS analysis of food accessibility in the Downtown Eastside.

Further Research/Recommendations (~300 words)

To make our map more available, we could convert it to some kind of open source format that can be accessed by residents of the DTES and Vancouver in general. It could be useful for people who are not aware of the services shown on the map and are in need of them. However, the issue with this is that residents of the Downtown Eastside, given their socio-economic status, may not have access to the luxuries of internet or a computer, and therefore may never see the map. The map may also be helpful for residents of Vancouver to educate themselves about issues of food disparity in their city. It even could influence policy or encourage individuals to take action through grassroots organizing and creating new initiatives or helping to expand existing ones.

For further analysis on the Downtown Eastside, we recommend going more in depth in terms of how

these food assets are actually used in the Downtown Eastside. Other studies could explore how many people use the various convenient stores, meal services, community gardens, etc. They could address topics such as: the price ranges of the food suppliers and do an analysis of how this aligns with the average income, or compare how often residents go to food suppliers that they have to pay for versus food suppliers that provide it as a service. It could be very useful to do an analysis on whether the food production and affordable food initiatives in the Downtown Eastside are enough to fit the demand from residents in that area to show whether there need to be more food services instituted in that area.

Analysis could also be done on food assets in other parts of Vancouver, specifically looking at the relationship between food assets and gentrification. Research could be done on how gentrification affects the affordability of food, looking at the trend in prices of food in an area as it gentrifies. This is a very important issue in the city of Vancouver. The cost of housing in the city is consistently increasing and becoming unaffordable for many. It is important to monitor the cost of living expenses, particularly of necessities like food, as that also can potentially make the city unaffordable. This information could influence policy to help ensure that food stays affordable in Vancouver.

Appendices

Bibliography

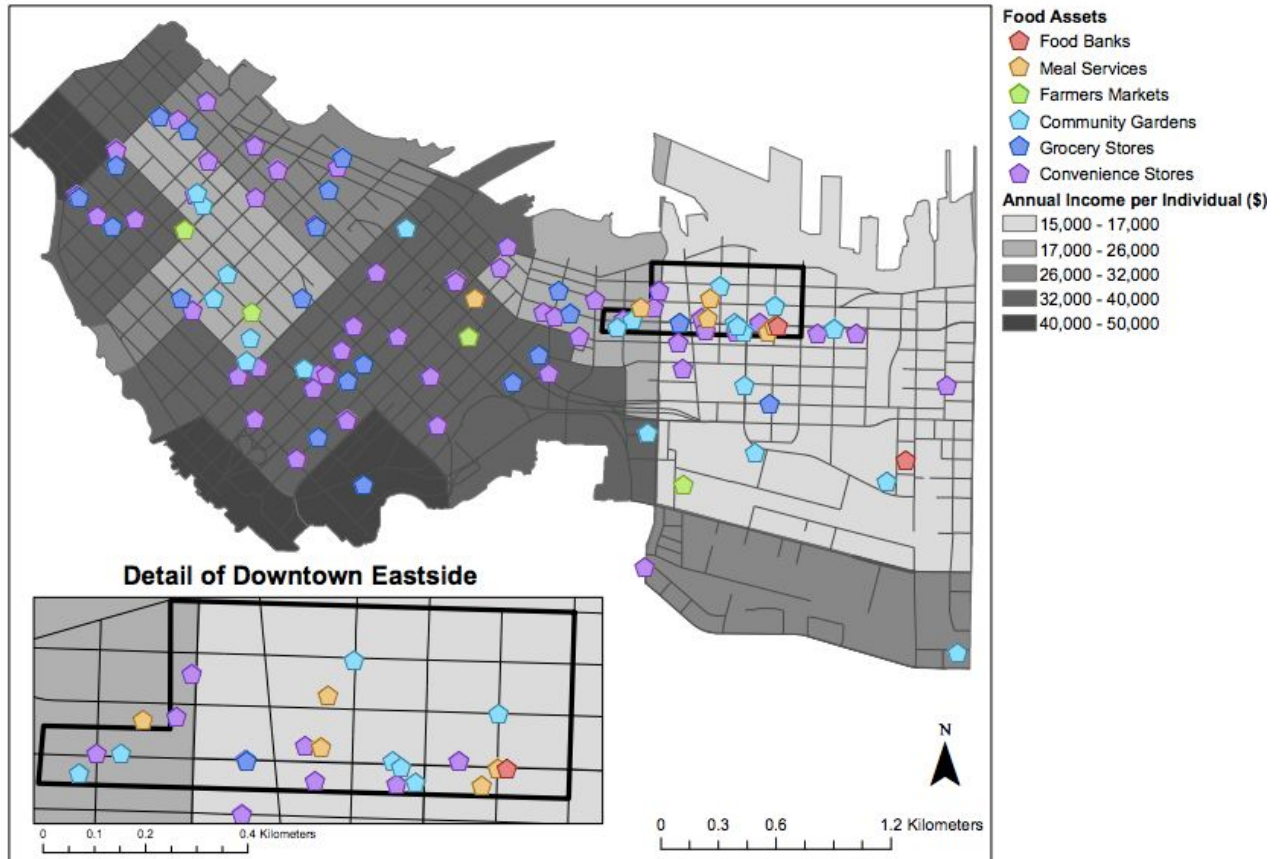
- Boyd, S.C. (2008). Community-based research in the Downtown Eastside of Vancouver. *Resources for Feminist Research*, 33(1/2), 19-43.
- Evans, L., and S.A. Strathdee. (2006). A roof is not enough: unstable housing, vulnerable to HIV infection and the plight of SRO. *International Journal of Drug Policy*, 17(2), 115-117.
- Gebauer, H., & M.N. Laska. (2011). Convenience stores surrounding urban schools: An assessment of healthy food availability, advertising, and product placement. *Journal of Urban Health*, 88(4), 616-622. doi:10.1007/s11524-011-9576-3
- Larsen, K., & Gilliland, J. (2009). A farmers' market in a food desert: Evaluating impacts on the price and availability of healthy food. *Health and Place*, 15(4), 1158-1162. doi:10.1016/j.healthplace.2009.06.007
- LFS 350. (Dec 2016). *Exploring Community Gardens in Vancouver's Downtown Eastside and Strathcona Neighbourhoods*. Retrieved from [://lfs-350a.sites.olt.ubc.ca/files/2015/09/Community-gardens-in-Strathcona-and-the-Downtown-Eastside-pdf](http://lfs-350a.sites.olt.ubc.ca/files/2015/09/Community-gardens-in-Strathcona-and-the-Downtown-Eastside-pdf).
- Loopstra, R., & V. Tarasuk. (2013). Perspectives on community gardens, community kitchens and the good food box program in a community-based sample of low-income families. *Canadian Journal of Public Health-Revue Canadienne De Sante Publique*, 104(1), E55-E59.
- Lyon, P., Collie, V., Kvarnbrink, E., Colquhoun, A., Umeå universitet, Institutionen för kostvetenskap, & Samhällsvetenskapliga fakulteten. (2009). Shopping at the farmers' market: Consumers and their perspectives. *Journal of Foodservice*, 20(1), 21-30. doi:10.1111/j.1748-0159.2008.00119.x
- Miewalk, C., A. Ostry. (2014). A warm meal and a bed: intersection of housing and food security in Vancouver's Downtown Eastside. *Housing Studies*, 29(6), 709-729. Pearce, J., R. Hiscock, T. Blakely, & K. Witten. (2008). The contextual effects of neighbourhood access to supermarkets and convenience stores on individual fruit and vegetable consumption. *Journal of Epidemiology and Community Health*, 62(3), 198-201. doi:10.1136/jech.2006.059196
- Roe, G. W. (2009). Fixed in place: Vancouver's downtown eastside and the community of clients. *BC Studies*, (164), 75.
- Smith, H. A. (2003). Planning, policy and polarisation in vancouver's downtown eastside. *Tijdschrift Voor Economische En Sociale Geografie*, 94(4), 496-509. doi:10.1111/1467-9663.00276
- Walcott, S.M. (2002). Overlapping ethnicities and negotiated space: Atlanta's Buford Highway. *Journal of Cultural Geography*, 20(1), 51-75. DOI: 10.1080/08873630209478281
- Wood, E., Kerr, T., Lloyd-Smith, E., Buchner, C., Marsh, D. C., Montaner, J. S., & Tyndall, M. W. (2004). Methodology for evaluating insite: Canada's first medically supervised safer injection facility for injection drug users. *Harm Reduction Journal*, 1(9). DOI: 10.1186/1477-7517-1-9.

Maps and figures

Final Map

Food Accessibility and Income in Downtown Vancouver

An Examination of Food Assets in the Downtown Eastside



Data Sources: City of Vancouver, DataBC, UofToronto

Project Data Acquisition Table

Layer Name	Attributes/tabular data	Source
1.Base data (Vancouver map)	Local Area boundaries (names of neighbourhoods) City Streets data package (Street name, type of street [ie one way streets, public streets, intersections])	Vancouver City Data
Grocery stores	Names and addresses of grocery stores	Yellow Pages*
Farmer's markets	Number of vendors, all round vs seasonal	Vancouver City Data
Community gardens	Whether it is a community garden, urban farm or community orchard	Vancouver City Data
Food banks	Name of food bank, city located in	Data BC
Meal services	Services provided (ie food kitchen, preparation, and workshops)	Yellow Pages*
Convenience stores	Names of Convenience Stores, addresses	Yellow Pages*
Income	Median after-tax individual income (2011) for all of Canada	University of Toronto

*Note: All addresses from yellow pages were geocoded (geocoder.ca) to acquire x, y (lat, long) coordinates.

Flowchart

