CITIZEN'S COOLKIT
ON CLIMATE CHANGE & URBAN FORESTRY

THE MOST VISUAL AND FUN "DO-IT-YOURSELF" TOOLKIT FOR ENGAGING NEIGHBOURS ON YOUR BLOCK

(DRAFT)

Feb. 8th 2017

www.forestry.ubc.ca

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UBC CALP

CONTENTS:

A do-it-yourself process that gradually ramps up community engagement through several phases:

START A CONVERSATION

Meet your neighbours, test your knowledge

MAP YOUR COMMUNITY

Get to know your block and see it in a new way

RATE YOUR BLOCK

Rate the climate friendliness of your block, and compare with your neighbours

VISIONING YOUR FUTURE

What might your block look like without the street trees?

ACTION ON THE GROUND

Identify priorities, implement strategies

WHY DO WE NEED THE COOLKIT:

Many community members are aware of the urgent need to make changes in their neighbourhoods to improve sustainability and quality of life. Whether you're interested in increasing access to green space, enhancing the aesthetics of your street, or being more resilient to climate change, this guide will help bridge your individual ideas to neighbourhood-wide action.

WHO IS THIS FOR?

- Community members wanting to have meaningful interaction with their neighbours in caring for the places where they live
- High school and other students needing to have structured engagement in their communities
- Practitioners looking to apply their expertise to important local causes

TOOLKIT AT A GLANCE

GRADUALLY RAMP UP **ENGAGEMENT**

SCOPE:

Here is a list of all of the tools and activities that we introduce in this toolkit, organized into 5 steps. A series of hands-on activities are designed to help you see your neighbourhood in a new way, make climate change visible, and re-imagine your future.

WHY BOTHER ABOUT CLIMATE CHANGE?

CLIMATE CHANGE IS HAPPENING

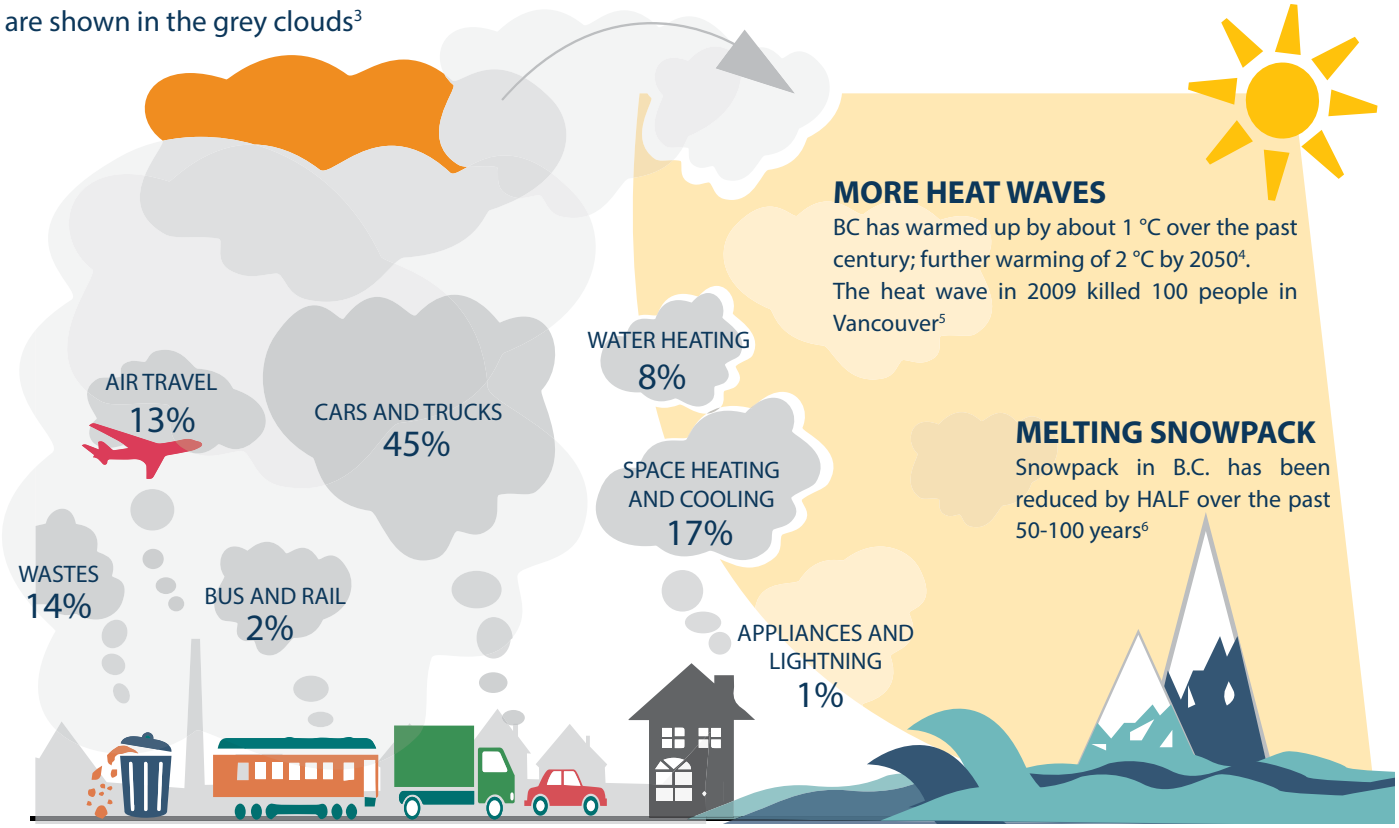
Most scientist agree that the main CAUSE of climate change is the carbon emission from human activities (e.g. driving cars, energy use), which traps heats and warms up the earth's surface. They also suggest to keep global warming well below 2 °C (relative to preindustrial levels)[1].

WHAT WILL HAPPEN IF THE GLOBAL TEMPERATURE RISES BY 2 °C?

All projected impacts (see below for examples) would increase in intensity by 1/3. For example. droughts would be 1/3 longer, storm would be 1/3 stronger.[2]

Want to learn more? Check NASA: http://climate.nasa.gov

Households in B.C. directly account for **30%** of the total greenhouse gas (GHG) emissions[3]. The share of emissions are shown in the grey clouds[3]



MORE HEAT WAVES

BC has warmed up by about 1 °C over the past century; further warming of 2 °C by 2050[4].
The heat wave in 2009 killed 100 people in Vancouver[5]

MELTING SNOWPACK

Snowpack in B.C. has been reduced by HALF over the past 50-100 years[6]

British Columbia has committed to reduce carbon emission by[8]:

33% **below** 2007 levels by 2020

80% **below** 2007 levels by 2050

MORE FLOODS & DROUGHTS

Warmer weather and changing precipitation (e.g. rain and snow) will cause more severe and frequent floods and droughts[6].

RISING SEA LEVEL

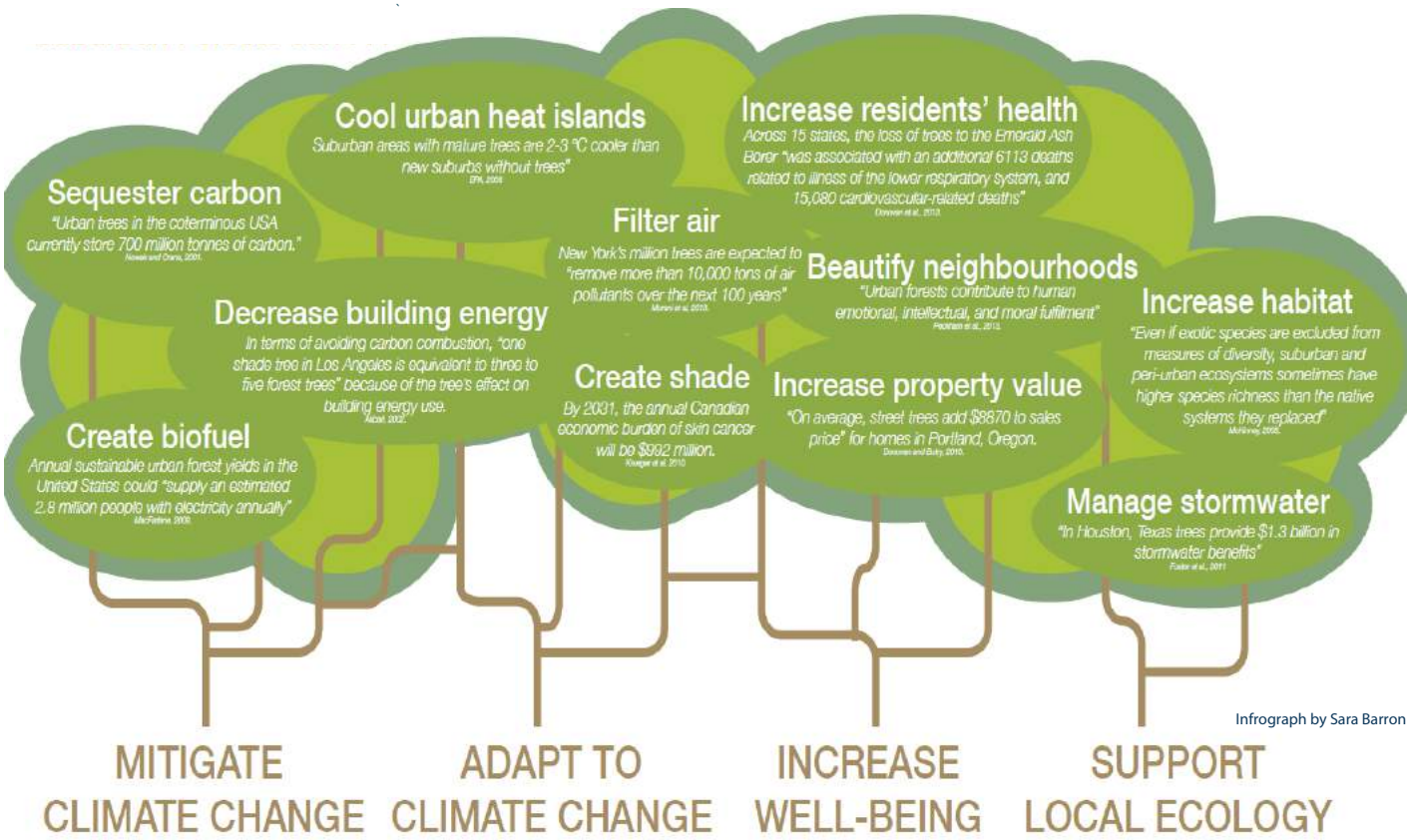
Estimated increase of sea level in coastal B.C. by 2100 80 cm or more[7]. We will lose homes, communities, and ecosystems (an estimated total damage $2.1-7.6 billion by 2050)[7]

HOW CAN URBAN FORESTS HELP?

What is A Urban Forest?

Urban forest is comprised of a variety of vegetation and landscape types such as public parks, streetscapes, natural areas and yards, which together form a complex system of urban greenery. Urban forest will be vital in a hotter future for keeping the elderly and infirm alive during heatwaves, and reducing air conditioning costs.

To learn more, please check: http://forestry.sites.olt.ubc.ca/files/2015/06/CFSreport_Final_Table5Edits_20150605-v7.pdf



Infrograph by Sara Barron

URBAN FOREST IN VANCOUVER TODAY

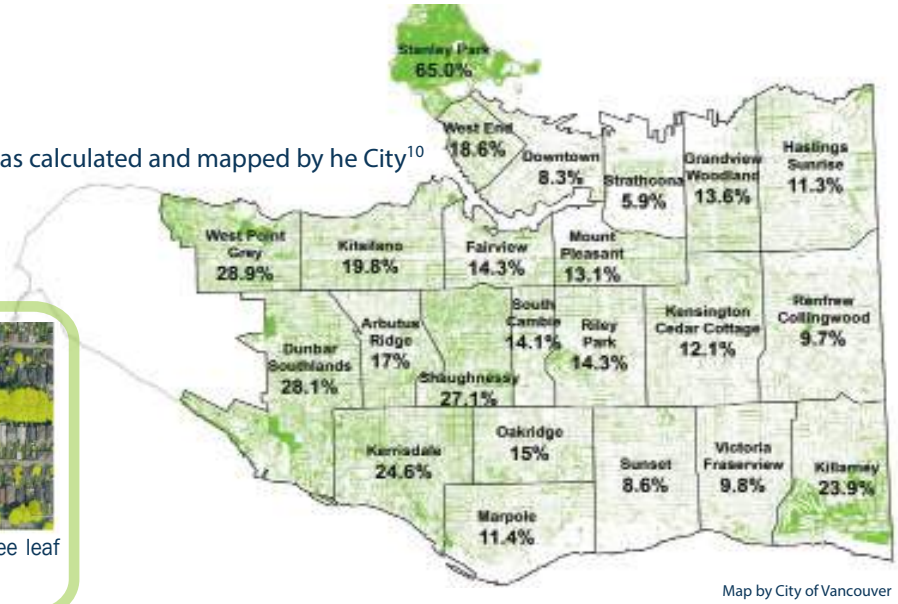
Is made up of [9]

- 140,000 street trees
- 300,000 park trees
- and an unknown number of private trees

18% of Vancouver is covered by tree canopy, as calculated and mapped by he City[10]

- **11%** of canopy on streets
- **27%** of canopy in parks
- **62%** of canopy on private property

Tree canopy cover is the ground area covered by tree leaf canopies as seen from the air[9]



Map by City of Vancouver

HOWEVER , WE ARE LOSING HEALTHY TREES EVERYDAY, MOSTLY ON PRIVATE PROPERTIES

"Over the last two decades, 23,490 healthy, mature trees were removed on private properties (including residential, institutional, commercial and industrial land). In 2013...about 5 healthy, mature trees were removed everyday."

- City of Vancouver

To protect our urban forest and better prepare for future climate changes, Vancouver promises to increase tree canopy from **18% to 22%** by 2055, through better management and replanting 150,000 trees by 2020[10].

2020 PLANTING GOALS:

150,000 NEW TREES

54,000 (36%) TREES ON PRIVATE LAND
45,000 (30%) STREET TREES
45,000 (30%) TREES IN PARKS
6,000 (4%) TREES ON OTHER PUBLIC LAND

by Gurtej Tung

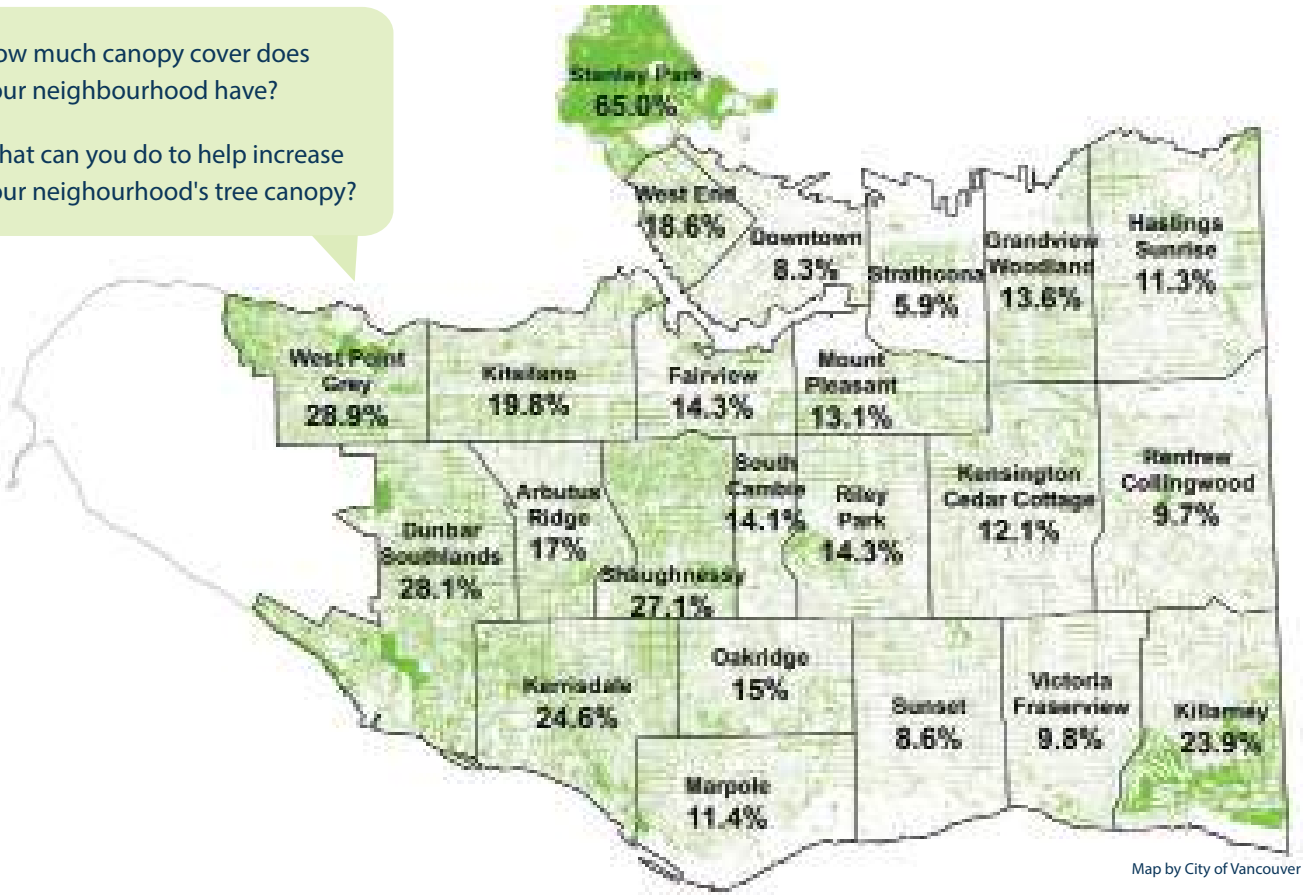
WHAT CAN WE DO?

BC's carbon reduction target and tree planting target is for all of us, we must do our share of keeping to 2 degrees warming. That means all of us must work together to cut our emissions by taking better care of trees in our neighbourhood, switching to renewable energy, reducing our driving or switching to hybrids or EVs, and many other ways...

This Coolkit is to help you climate-proof your neighbourhood while improving the urban forests that surround your home.

How much canopy cover does your neighbourhood have?

What can you do to help increase your neighourhood's tree canopy?



Map by City of Vancouver

STEP 1: START A CONVERSATION

Now you know how much climate change and urban forests matter to us. It is time to share your knowledge with your family, friends, and neighbours. Here we provide some activities to help you start a conversation with others on climate change and urban forests.

1. **COLLECTING STORIES** about changes that have happened on your block in the past
2. **PHOTO GALLERY** to discuss changes on your block
3. **PHOTO QUIZ** to look for CIMA of climate change on your block
4. **NON-TRIVIA QUIZ** to test your knowledge on urban forests and climate change

Most of the activities here are very suitable and fun to do with your family, friends and neighbours through a block parties or informal social gatherings.

BLOCK PARTY

A good place to start the conversation and hold introductory games or exercises with your neighbours.

INFORMAL GATHERING

Over coffee, wine, or supper at your or your neighbour's place, or a pub/coffee house nearby, to discuss further activities.

START A CONVERSATION
STORY COLLECTION

Do you know what changes have happened to your block in the past decade?
Have you spent quality time with your grandparents or parents recently?

By Rhoda Baer

http://res.freestockphotos.biz/pictures/17/17068-a-woman-and-older-man-sitting-at-a-table-pv.jpg

Collect stories of the changes that happened on your block:

More trees or less trees? More houses or less houses? More cars or less cars?

1-2 hours

Grab a pen and a notebook, spend a cozy afternoon with your grandparents or your neighbour(s) who have lived in this area for a while. Record what you hear and what you see.

STORY #1 _____

_____

STORY #2 _____

_____

START A CONVERSATION
PHOTO GALLERY

OPTION 1: A photo gallery

1-1.5 hours

Choose a room or public location (such as a wall in a community centre or an accessible bulletin board) where your team can gather for future toolkit exercises. If easier- your group can simply keep a scrapbook or 3-ring binder of the photos. Portable and easy to store!

Post your photos for all to see, and each person describes them briefly. **What do you all notice?**

OPTION 2: An online album

1-3 hours, depend on how many photos and how often you update

There are several options for making free online photo albums.

Flickr: www.flickr.com is a site for posting photos publicly or only for a group of specific people. It requires a Yahoo email account (free) and a password, both of which would be shared amongst your group.

Facebook: www.facebook.com allows your to create a simple web page that your group can use and upload photos to.

PHOTO GALLERY ASSIGNMENT

Each group member takes a picture of:

1. Your favourite tree on your block
2. A place where there used to be a tree
3. A place on your block where you like to go for walks or where you would like more trees
4. Something on the block that you connect with climate change

HOW TO MAKE A FACEBOOK PAGE FOR MY BLOCK:

Log on to Facebook. At the top-right corner of your personal Facebook page, there is a little upside-down triangle- click on this and select "Create Page" and then "Cause or Community". Follow the setup process from there. The creator of the page is automatically the administrator but this can be adjusted: go to the page (it is now searchable in the search window at the top of the screen), click Settings, go down to Page Roles, and add your group members.

Example: Facebook page of Project Green Bloc in Vancouver

START A CONVERSATION
PHOTO QUIZ

YOUR NAME: _____

30 minutes

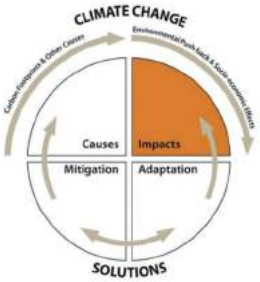
This is a climate change visual literacy test. Here we are looking for "**CIMA**". For each photo, write down which of the following you see:

Causes: things related to high carbon emissions

Impacts: consequences of climate change and vulnerabilities

Mitigation: things related to low carbon emissions

Adaptation: ways to deal with the impacts of climate change



You can use the photos in PHOTO GALLERY for this activity

PHOTO #1

PHOTO #2

PHOTO #3

PHOTO #4

PHOTO #5

INSERT SAMPLE PHOTOS HERE

START A CONVERSATION
NON-TRIVIA QUIZ

YOUR NAME: _____

30 minutes

QUESTION SHEET

These are sample questions to be answered by participants on the the Answer Sheet (pg 6). They are just examples- feel free to come up with your own that best match the interests and issues in your own community.

QUESTION #1

What is B.C.'s 2050 carbon emissions reduction target by 2050?

QUESTION #2

What produces the most carbon emissions from households in B.C.?

QUESTION #3

What is the average carbon footprint of residents in B.C.?

QUESTION #4

How many trees is Vancouver planning to plant from 2010 to 2020?

QUESTION #5

What kind of tree provides the biggest canopy on your street?

QUESTION #6

Are there any trees on your street that are native to your region, for example, coastal B.C.?

START A CONVERSATION
NON-TRIVIA QUIZ

YOUR NAME: _____

30 minutes

ANSWER SHEET

Write down short answers to Questions from page 5. Once complete, discuss the answers with the group.

ANSWER #1

ANSWER #2

ANSWER #3

ANSWER #4

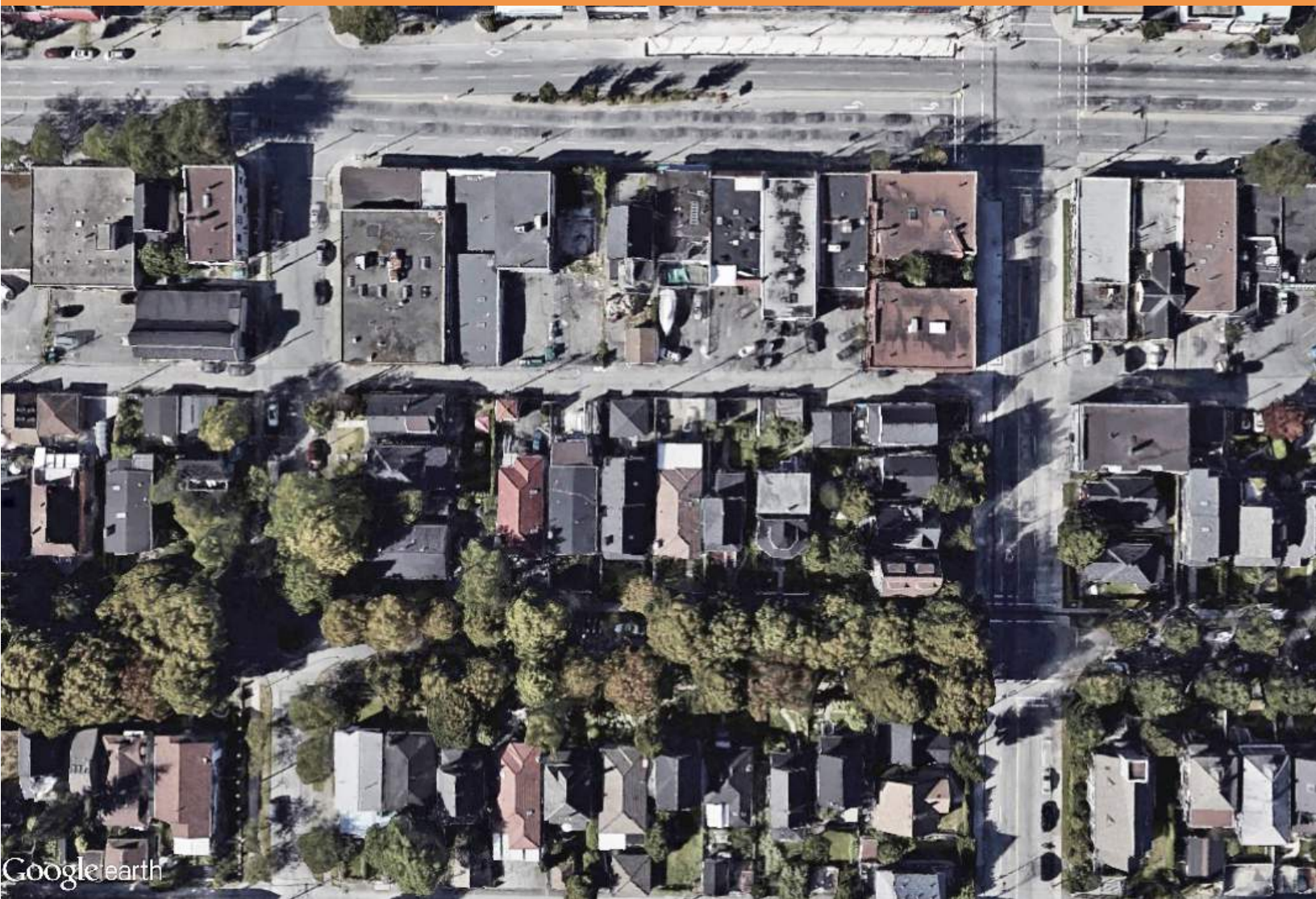
ANSWER #5

ANSWER #6

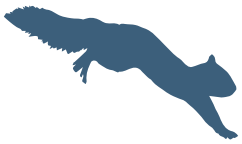
STEP 2: MAP YOUR BLOCK

Do you know much about trees on your block or in your yard? It is time to create an inventory of important things on your block and think about their links with climate change. In this section, you will learn to see your surroundings in a new way, and learn to use some state-of-the-art mapping techniques.

1. **YOUR URBAN FOREST QUEST** to look for squirrel habitats (i.e. trees and canopy) on your block
2. **CLIMATE CHANGE DETECTIVE QUEST** to investigate car habitats and other signs of climate change
3. **MAP DIFFERENT HABITATS** on your block



MAP YOUR BLOCK
URBAN FOREST QUEST



DO YOU KNOW...

How much squirrel habitats is on your block?
How many trees are there on your block?
Why trees are important to us and squirrels?

YOUR NAME/
YOUR TEAM NAME _____

TRY THIS QUEST WITH YOUR KIDS OR NEIGHBOURS!

You will need **30 minutes**

QUESTS

ANSWERS

1.1. How many street trees are on your block?

Street trees are those in the public right-of-way alongside the curb

First, walk down the sidewalk on the north side of the street and count the street trees (number them from first tree at west end of the block).

Then come back along the other (south) side (continue numbering them to the last tree on the west end of the block).

# of trees on north side: ☐

# of trees on south side: ☐

1.2. Which is the biggest tree trunk on your block?

Note the number of the tree (from the start point in Question 1.1)
Use the "hugmeter" (yourselves) to find the biggest tree.

Bonus question: Measure the circumference (girth) of the biggest tree trunk you can find. *Measure round the tree at breast height, about 1.3 metres high (4.5 feet), using a tape measure provided*

Bonus question: Can you name the type of tree?

of the biggest tree: ☐

Girth of the biggest tree in cm: ☐

Species name: ☐

1.3. Play the Leaping Squirrel game:

Can a squirrel make it from one end of the block to the other, and cross the street at least twice, without coming down to the ground?

Walk along the sidewalk and look at the tree canopy. Assume a squirrel can leap about 2 metres (6 feet or the length of a person) between branches. Squirrels can also use trees in gardens.

If "No", how many gaps (greater than 2 metres) did you spot where a squirrel would have to come down to the ground?

Yes or No? ☐

# of gaps: ☐

CONGRATULATIONS!

You have completed your urban forest quest. Share completed form with others and see how you did.

WHAT DID YOU LEARN ABOUT THE URBAN FOREST ON YOUR BLOCK?

1. Are there enough trees on the block?
2. How old do you think that big tree is? How much longer do you think it will live?
3. Why is safe squirrel habitat (tree canopy) important to us, not just squirrels? What do large trees give us?
4. What would it look like if all the trees were gone?
5. How can these trees survive droughts like the one we had in 2015? Do they need our help?
6. What else do we need to do to keep a healthy urban forest?

MAP YOUR BLOCK
CLIMATE CHANGE DETECTIVE QUEST

DO YOU KNOW...

How many cars are parked on your block?
How many food gardens on your block?
Whether your roof is suitable for solar panels?

YOUR NAME/
YOUR TEAM NAME _____

TRY THIS QUEST WILL HELP YOU FIND OUT THE ANSWERS!

You will need **30 minutes**

QUESTS

ANSWERS

1.1. How many cars can you count on the block?

How many of them are carshares, hybrid vehicles (oartly electric), electric vehicles (EVs).

Why does that matter?

Hint: ground transportation accounts for 47% of household emissions in B.C.

To read more: http://www.davidsuzuki.org/issues/climate-change/science/climate-solutions/transportation-solutions/

# of vehicles: ☐

% of total (approx.): ☐

1.2. How many gardens have food being grown?

e.g. vegetables, herbs, fruits

Count the total number of gardens — # of gardens: ☐

Count the number of gardens growing food — # of food gardens ☐

How does local food help climate change?

Hint: carbon emissions come from meat production, use of pesticides and fertilizers, and transportation of food.

To read more: http://www.davidsuzuki.org/what-you-can-do/food-and-our-planet/food-and-climate-change/s

% of total (approx.) ☐

1.3. How many homes are using solar energy?

Count the number of building with solar panels (photovoltaic or solar hot water) on the north side of street only. — # of buildings: ☐

Count the number of buildings with roofs suitable for solar energy (north side of street only). *Large open areas of south-facing or flat roofs, at least 2x2 meters, & unshaded by trees or other buildings.* — # of buildings: ☐

What do most of the buildings use for energy sources? — % of total (approx.): ☐

MAP YOUR BLOCK
HABITAT MAPPING (GREY-GREEN ANALYSIS)

1. "SQUIRREL HABITAT" - TREES & CANOPY

Now you have an idea of how safe it is for squirrels on your block after the Urban Forest Quest (page 13-14). It is time to look at all the trees on your block and figure out how much canopy cover you have.

2. "CAR HABITAT" - HARD PAVEMENT

You've counted how many cars parked on your street. Do you want to see how much of your block is dedicated to cars (either driving or parking)?

3. ANY OTHER THINGS YOU WANT TO MAP ON YOUR BLOCK

E.g. grass and soil as worm habitat, south-facing roofs as solar panel potential, and total roof area as pigeon habitat.

See examples below:

Example (map with Google Earth)

4th Ave. & Cypress Street, Vancouver

"Squirrel Habitat"

"Worm Habitat"

"Car Habitat"

"Pigeon Habitat"

MAP YOUR BLOCK
HOW TO MAP

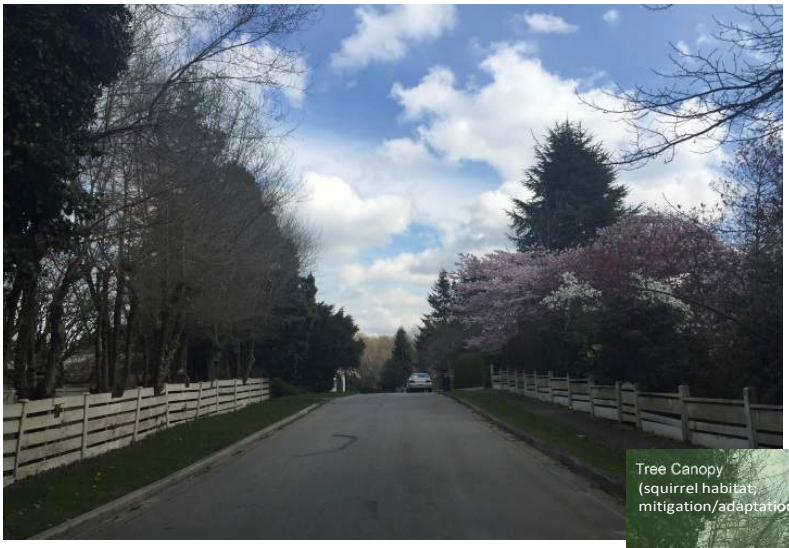
There are many ways to map things on your block. Here are three practical ways:

1. with markers (easiest and quickest) - Page 17
2. with Google Earth (simple mapping and visualization) - Page 18
3. with i-Tree Canopy (simple but more complete measurement of different land covers and benefits of trees) - Page 20

1. MAP with markers

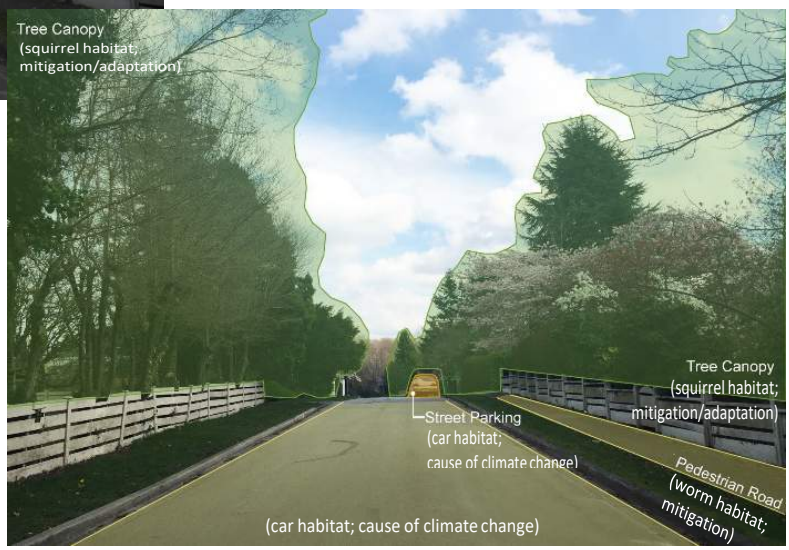
You will need:

- 30 minutes
- Several colourful markers
- A couple of photos of your block/yard to map on
  You can print them on regular paper instead of photo paper. Recommended size: 11" by 17" or 18" by 24".



Could you also map some signs of climate change too? *Hint: see CIMA below*

How are the habitats related to climate change? Which are causes and which are impacts? And are any influenced by climate change?



What is CIMA?

Causes: things related to high carbon emissions
Impacts: consequences of climate change and vulnerabilities
Mitigation: things related to low carbon emissions
Adaptation: ways to deal with the impacts of climate change

MAP YOUR BLOCK
MAP WITH GOOGLE EARTH

You will need:

- 1-2 hours
- A computer connected to the Internet

CREATING POLYGONS (HABITATS)

Here we use canopy mapping (squirrel habitats) as an example:

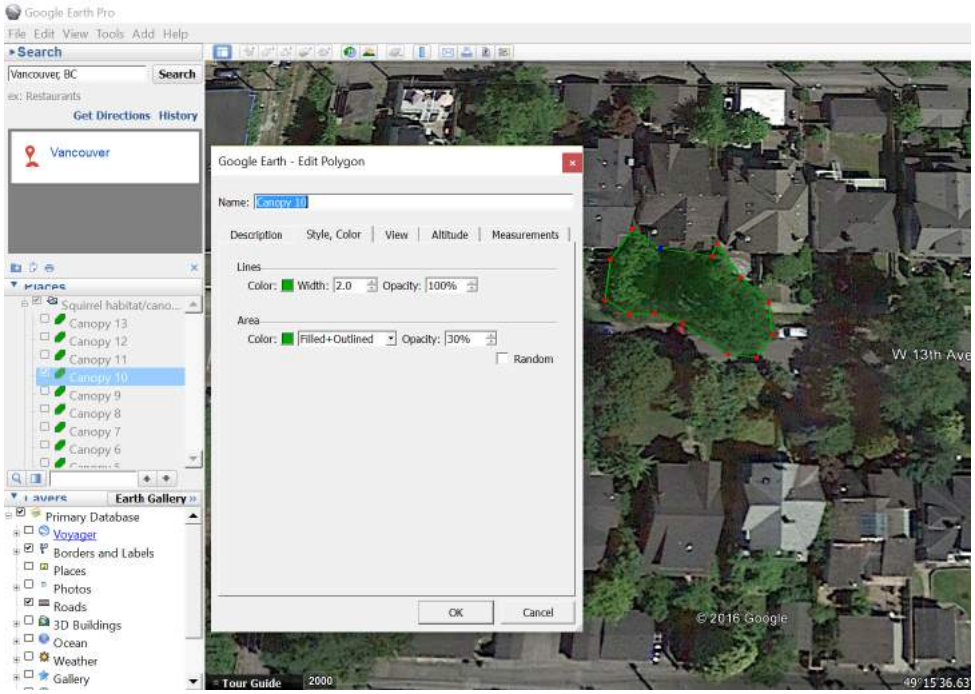
1. Download Google Earth Pro (free) on your computer first. You can download it here: http://www.google.com/earth/download/gep/agree.html.

2. Type your address in the search bar on the left panel of Google Earth to find your place.

3. Menu bar:

4. Use the button, add a polygon. Trace around the border of the canopy that you would like to mark. Left-click adds a new vertex (point), right-click removes the last vertex that you added. Click OK to finish tracking.

5. Continue adding polygons for each area pf canopy. You will see them show up in your Places menu on the left .panel. Map all trees or tree clumps on your property, and give each tree/canopy a unique name as you like.



Want to learn more? Please go here: https://www.google.com/earth/learn/

CALCULATING THE AREA OF A POLYGON

1. Once you have created a polygon, right-click it in the Places menu (on the left of the screen). Select Get Info and a Google Earth – Edit Polygon window opens up. You can see the measurements of the polygon's area and perimeter by looking under the button Measurements

   You can also change polygon styles (e.g. colour, transparency) in the Properties window under Style, Color tab (see picture in the previous page).

2. Measure the area covered by trees at your place, divide them by the total area of your place:

$$\text{Tree canopy cover (\%)} = \frac{\text{Tree canopy (total area of the polygons)}}{\text{total area of your place}} \times 100\%$$

   You will get a percentage of areas covered by tree canopies, which is the tree canopy cover.
   You can also measure the tree canopy cover at your block, and compare with the city's average (18%).

DON'T FORGET TO SAVE YOUR WORK: click *File> Save> Save my places*, and all of the polygons will be saved to the *My Places* section of the Places menu.

RESULTS

_____% of your block & _____% of your yard is squirrel habitat (tree canopy)

_____% of your block & _____% of your yard is car habitat (hard paving)

_____% of your block & _____% of your yard is _____ habitat

_____% of your block & _____% of your yard is _____ habitat

_____% of your block & _____% of your yard is _____ habitat

Think about your results a bit more...

Which habitat has the highest %? Which has the lowest?
18% of Vancouver is covered by tree canopy. How about your block?
Are there any findings that surprise you?

MAP YOUR BLOCK
MAP WITH I-TREE

You will need:

- 1-1.5 hours
- A computer connected with the Internet

What is i-Tree?

i-Tree (http://www.itreetools.org/) is a software developed by U.S. Forest Services to provide urban/rural forestry analysis and assessment. Here we will use one of the i-Tree tools, i-Tree Canopy, for this exercise. You will find out the coverage % of each habitat and estimated ecosystem services of greenspaces on your block by using this tool.

MEASURING LANDUSE TYPE COVER

Here we use canopy mapping (squirrel habitat) again as an example:

1. Go to https://www.itreetools.org/canopy/index.php. You should see the webpage on the right.

2. Click Define Project Area › when the pop-up appears, click Accept

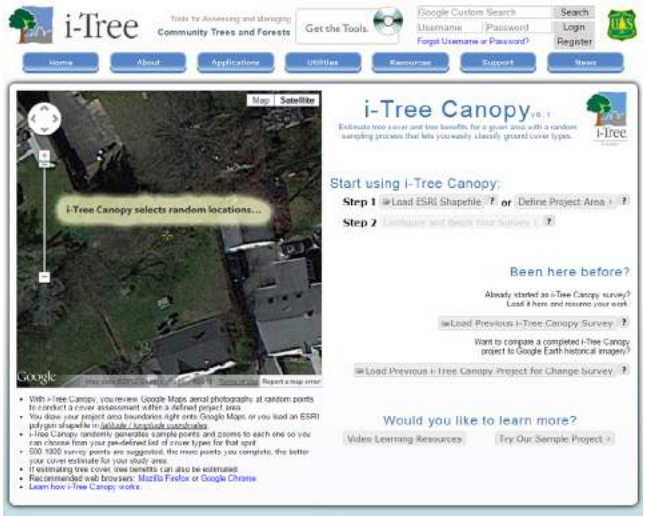
3. When the map appears, zoom to Vancouver and make a polygon of your block. Click Finish when you done.

4. The website will bring you back to the main i-Tree Canopy page. Click Configure and Begin Your Survey ›

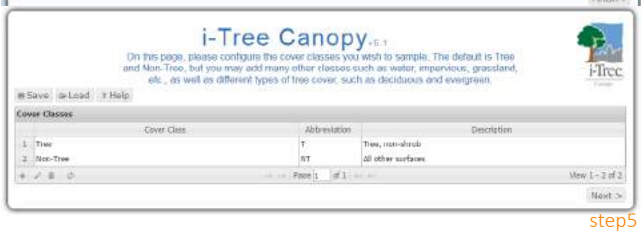
5. A new page will open with your i-Tree classes. The default classes are Tree and Non-Tree. Change the classes as squirrel habitats, car habitats, worm habitats, and pigeon habitats.

   Feel free to use these classes or make your own (some suggestions are: water, buildings, grass, and soil).

   Be aware that some classes may be difficult to distinguish from each other just using the images, so make sure that you can tell the classes apart.



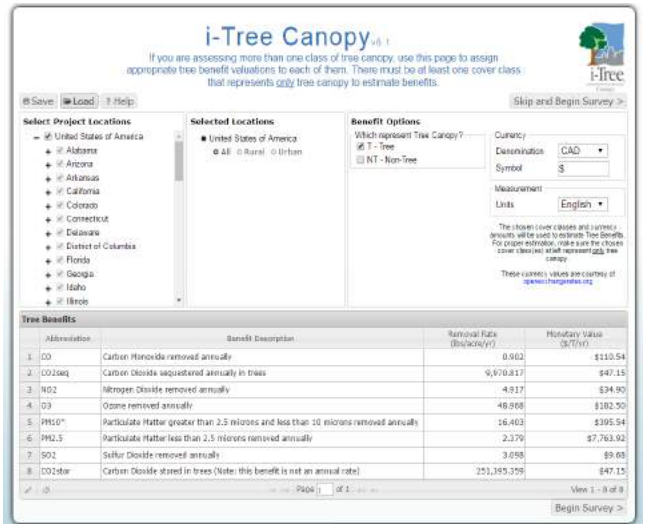
step1



step5

6. A new page will open asking you questions about how to quantify the benefits of your urban forest. Change the currency to Canadian dollars (CAD).

   Keep the project location as the U.S.A., as that is the only available location unfortunately.



step6

7. Now we get to place random points and classify them! Under Id click the + symbol.

   Which one of your classes does this point correspond to? Change the *Cover Class* to the class you want and click the + symbol again. Do this at least 100 times to get a good representation of points for each class (at least 30 for each class). Feel free to do it more than 100 times if you're having fun!

   Save your data to make sure that you don't lose it

step7

8. Click Report to check some of the ecosystem services provided by the trees and greenspace in your area, such as pollutant removal, carbon sequestration.

Cover Class	Description	Abbr.	Points	% Cover
Tree	Tree, non-shrub	T	4	100.0 ±50.0
Non-Tree	All other surfaces	NT	0	0.00 ±0.00

Tree Benefit Estimates

Abbr.	Benefit Description	Value	±SE	Amount	±SE
CO	Carbon Monoxide removed annually	$102.20	±51.10	1,799.17 lb	±899.59
NO2	Nitrogen Dioxide removed annually	$175.95	±87.97	4.91 T	±2.45
O3	Ozone removed annually	$9,162.98	±4,581.49	48.85 T	±24.43
PM2.5	Particulate Matter less than 2.5 microns removed annually	$18,941.56	±9,470.78	2.37 T	±1.19
SO2	Sulfur Dioxide removed annually	$30.75	±15.38	3.09 T	±1.55
PM10*	Particulate Matter greater than 2.5 microns and less than 10 microns removed annually	$6,652.09	±3,326.04	16.36 T	±8.18
CO2seq	Carbon Dioxide sequestered annually in trees	$481,989.45	±240,994.72	9,947.50 T	±4,973.75
CO2stor	Carbon Dioxide stored in trees (Note: this benefit is not an annual rate)	$12,152,455.49	±6,076,227.74	250,807.46 T	±125,403.73

step8

NOW YOU CAN TELL PEOPLE HOW IMPORTANT TREES ARE TO THE CITY!

Think about your results a bit more...

What was the proportion of all of your classes?
Was this surprising?
Is there less green area than you thought?

STEP 3: RATE YOUR BLOCK

This exercise is to summarise what you have learned from mapping your block, and to allow you to rate your block against other blocks (friendly competition).

SCORECARD to see whether your block is prepared for climate change, and how green your block is compared to others' blocks

It is very simple, just check the applicable boxes.

HOW DO YOU THINK OF YOUR BLOCK/YARD?

- [x] ENOUGH CANOPY COVER?
- [x] PROPER STORMWATER MANAGEMENT?
- [ ] EFFICIENT TRANSPORTATION?

RATE YOUR BLOCK
CAUSES OF CLIMATE CHANGE

YOUR BLOCK'S CARBON FOOTPRINT — POINTS

1. What is the most prevalent house type?

a. Multi-story apartment	3
b. Multiple joined units (duplex, townhouse)	2
c. Single family home	1

2. How many cars pass through your block in 20 min?

a. No cars	3
b. 1-3 cars	2
c. 4 or more cars	1

3. How many cars are parked on the street?

a. No cars	3
b. 3-5 cars	2
c. 6 or more cars	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *causes* at the block level _____

YOUR HOUSEHOLD'S CARBON FOOTPRINT — POINTS

1. How much heating (winter)/cooling (summer) space per person in your family?

Heating space per person = area that need to be heated / # of people in your household. See more info: http://www.energyexplorer.ca/home-energy/

a. <50 m^2	3
b. 50-120 m^2	2
c. >120 m^2	1

2. How do you heat/cool your home?

a. Mostly renewable energy (solar, hydropower etc.)	3
b. Combination of renewable energy and fossil fuels	2
c. Mostly fossil fuels	1

3. How many cars do you own in your household?

a. No cars	3
b. 3-5 cars	2
c. 6 or more cars	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *causes* at the household level _____

RATE YOUR BLOCK
IMPACTS OF CLIMATE CHANGE

YOUR BLOCK'S VULNERABILITY — POINTS

1. Extent of impervious (grey) surface (car habitat and pigeon habitat):

You can use Google Earth or i-Tree to find out with a grey-green analysis (see page 16 for definitions of different habitats, and page 18 and 20 for a quick guide on Google Earth and i-Tree)

a. <30%	3
b. 30%-60%	2
c. >60%	1

2. Do the trees on your block look healthy?

a. Yes	3
b. Somewhat	2
c. No	1

3. What is the approximate age of the majority of trees on your street?

a. 50+ years, mature	3
b.10-50 years, established	2
c. 0-10 years, just planted	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *impacts* at the block level _____

YOUR HOUSEHOLD'S VULNERABILITY — POINTS

1. How do you use and store water?

a. Using roof rainwater capture (waterbutts) and rain garden	3
b. Part of garden irrigated with tap-water	2
c. Garden fully irrigated with tap water	1

2. % of your house shaded by trees in your yard or on your block in the summer:

a. >60%	3
b. 30-60%	2
c. <30%	1

3. How much green or pervious area ('worm habitat') do you have on your lot?

Include the house area as part of your lot; use Google Earth to help you calculate areas.

a. >60%	3
b. 30-60%	2
c. <30%	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *impacts* at the block level _____

RATE YOUR BLOCK
MITIGATION OF CLIMATE CHANGE

WHAT YOUR BLOCK IS DOING TO CUT ITS CARBON FOOTPRINT — POINTS

1. % of homes using solar panels on your block:

a. >60%	3
b. 30-60%	2
c. <30%	1

2. % of cars on your block that are EVs, hybrids, or car-shares:

a. >60%	3
b. 30-60%	2
c. <30%	1

3. Amount of tree canopy on your block?

a. >60% (meets 'leaping squirrel test' *check page 13 for the 'leaping squirrel test'*)	3
b. 30%-60% (squirrel habitat but 1-5 gaps)	2
c. <30% (little connected squirrel habitat)	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *mitigation* at the block level _____

WHAT YOU ARE DOING TO CUT YOUR CARBON FOOTPRINT — POINTS

1. % of trips by bike/bus in one week:

a. >60%	3
b. 30-60%	2
c. <30%	1

2. % of your store-bought food that is locally-sourced (from B.C. or Washington):

a. >60%	3
b. 30-60%	2
c. <30%	1

3. Use of renewable energy (other than hydropower):

Eg. solar panels, passive solar, air-source heat pump, geothermal (ground-source heatpump), bioenergy

a. two or more types of renewables>60%	3
b. one type of renewable 30%-60%	2
c. only hydropower>60%	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *mitigation* at the household level _____

RATE YOUR BLOCK
ADAPTATION OF CLIMATE CHANGE

HOW 'CLIMATE-PROOFED' YOUR BLOCK IS — POINTS

1. % of homes growing food (based on what you can see from the street):

a. >60%	3
b. 30-60%	2
c. <30%	1

2. Distance to nearest park with shading:

a. Within 5 minutes walk	3
b. 5-15 minutes walk	2
c. More than 15 minutes walk	1

3. What type of trees on your block?

a. Mostly large & mature trees	3
b. Mostly small ornamental trees	2
c. Very few trees	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *adaptation* at the block level _____

HOW 'CLIMATE-PROOFED' YOUR HOME IS — POINTS

1. What proportion of your food is grown by yourself?

a. >20%	3
b. 1%-20%	2
c. None	1

2. What proportion of your property is pervious?

Pervious surface allows water to penetrate through soils

a. >60%	3
b. 30-60%	2
c. <30%	1

3. What type of trees on your property?

a. Mostly large & mature trees	3
b. Mostly small ornamental trees	2
c. Very few trees	1

SUBTOTAL

Add up the points, and write the number on the right as your subtotal score for *adaptation* at the block level _____

STEP 4: VISIONING YOUR FUTURE

In this exercise, you will learn basic photo-editing techniques to change photos of your block/community into the kinds of places you have been talking about with your neighbours. Through the visioning exercises, you can explore your block's futures with climate change impacts, and possible green and sustainable solutions. Show the future that you like the most and share with your friends and neighbours!

BEFORE

AFTER

by Mengqiu Chen, Kristin Defer, Alfred Duval, Siyuan Zhao (2015)

VISION YOUR FUTURE
WHAT TO VISUALIZE

Imagine what your block will look like if -

LOW CARBON FUTURE

- More hard surface is coverted to greenspace
- A community garden/orchard is developed
- Solar panels are installed
- More bike lanes are put in place

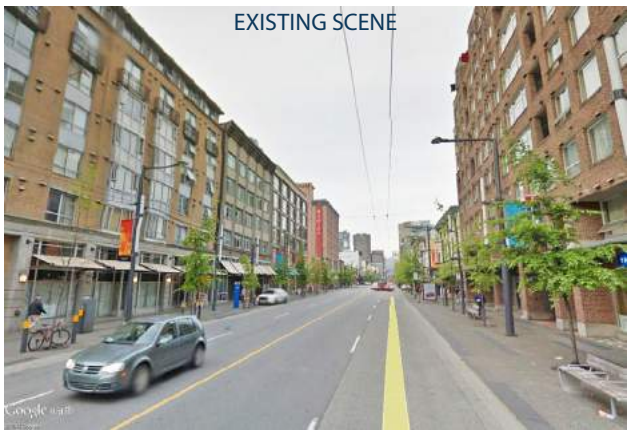
OR

HIGH CARBON FUTURE

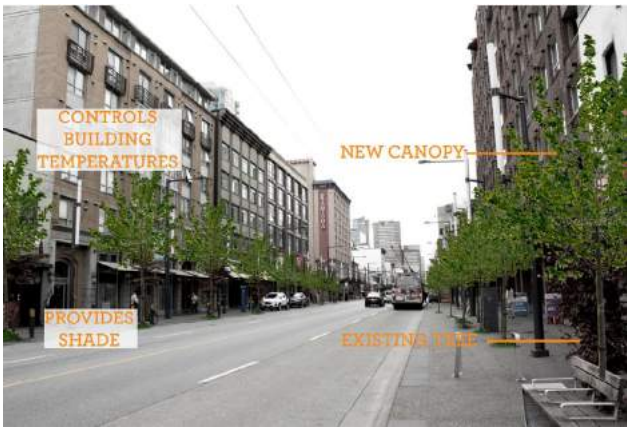
- Mature trees are gone (because of climate change)
- Streets are wider for more cars
- More street parking at your place

and any other possible futures that you want to see (e.g. shared compost piles, rain gardens, traffic calming curb gardens, passive solar houses).

Visualization Examples

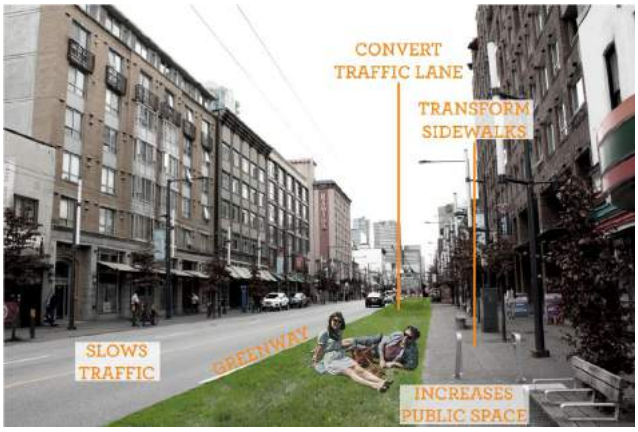


More trees



Green walls & roof gardens

Green ways



by Mengqiu Chen, Kristin Defer, Alfred Duval, Siyuan Zhao (2015)

VISION YOUR FUTURE
HOW TO VISUALIZE

There are many ways to visualize on your block in the future. Here are two of the most common ways:

1. With markers (easiest and quickest) – Page 29
2. With GIMP (free alternative to Photoshop) – Page 30

1. VISUALIZE with markers

Print a few copies of the street views on your block, and use markers to draw out the following scenarios. Please see detailed instructions on page 17.

You will need:

- 30 minutes
- Several colourful markers
- A couple of photos of your block/yard to map on
  You can print them on regular papers instead of photo papers. Recommended size: 11" by 17" or 18" by 24".

2. VISUALIZE with GIMP

There are several kinds of visualization tools that are easy to access and use, e.g. GIMP, Photoshop, Sketchup...
Here are some useful tutorials if you want to try them out:

- Adobe Photoshop: https://helpx.adobe.com/photoshop/tutorials.html
- Google Sketchup: http://www.sketchup.com/learn

by Mengqiu Chen, Kristin Defer, Alfred Duval, Siyuan Zhao (2015)

VISION YOUR FUTURE
VISUALIZE WITH GIMP

You will need:

- 1-1.5 hours
- A computer connected with the Internet
- Pictures that you want to visualize

What is GIMP?

GIMP (https://www.gimp.org/) is free image editing software that allows you to composite and retouch digital images.

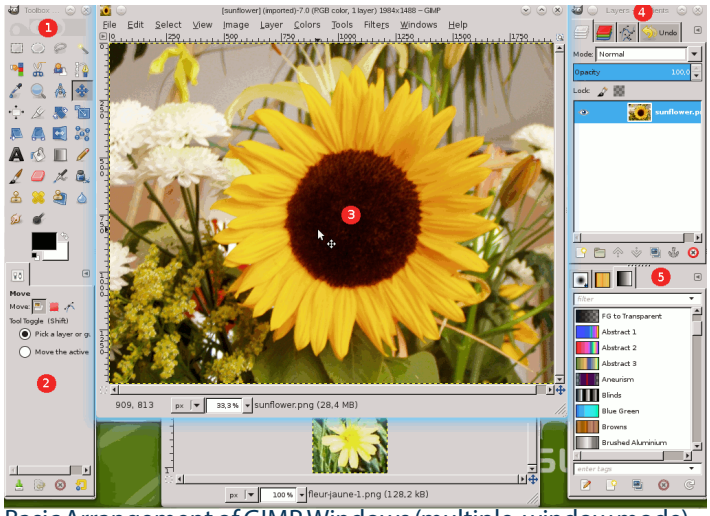
Here are some quick tutorials to help you visualize with GIMP (the following contents are adapted from **GIMP User Manual**[11]:

GIMP QUICKIES: FIRST AND FOREMOST...

Go to https://www.gimp.org/downloads/ to download the installation package and install GIMP by following the instruction.

Here is a quick intro of some key concepts and the interface of GIMP:

- IMAGE - basic entity to display and retouch in GIMP. It is like a single sheet of paper where you can draw.
- LAYER - like a sheaf of transparent papers stacked one on top of the other, so you can draw on each paper (i.e. image) but still see the content of the other sheets through the transparent areas.
- UNDOING - this is very important to know especially when you do something wrong, try the keyboard shortcut: *Ctrl+Z*.
- SAVING YOUR WORK - DON'T FORGET TO SAVE YOUR FILES: go to *File* > *Save as*... an .xcf (will save layers) or *File* > *Export as*... a .jpg (flattens layers).



Basic Arrangement of GIMP Windows (multiple-window mode)

1. **The Main Toolbox:** Contains a set of icon buttons used to select tools. You can use *Edit*>*Preferences*>Toolbox to enable, or disable the extra items.
2. **Tool options:** Shows options for the currently selected tool (in this case, the Move tool).
3. **Image windows:** Shows the image that you open in GIMP. You can display multiple images at the same time.
4. **Layers, Channels, Paths, Undo History Dock:** They are shown as tabs. The layers tab shows the layer structure of the currently active image, allows it to be manipulated in different ways.
5. **Brushes/Patterns/Gradients:** Shows the dialogs (tabs) for manging brushes, patterns and gradients.

Work with image: separating an object from its background

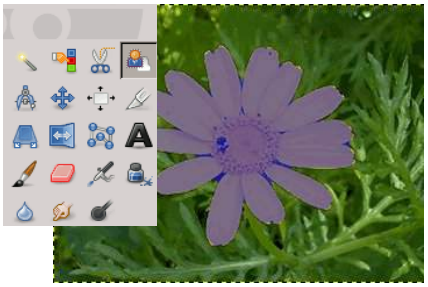
Sometimes you need to seperate the subject of an image from its background, and use it on an existing background. To do this:

1. Select the object using the following tools:

Free Select Tool that allows you to create a selsection by drawing the boundary free-hand with pointer.

Intelligent Scissors Select Tool that uses edge-recognition algorithms to better fit the border around the object.

Foreground Select Tool that let you mark areas as "Foreground" or "Background" and refines the selection automatically.



2. Once you have selected your subject successfully, use *Select* > *Invert*. Now, instead of the subject, the background is selected.

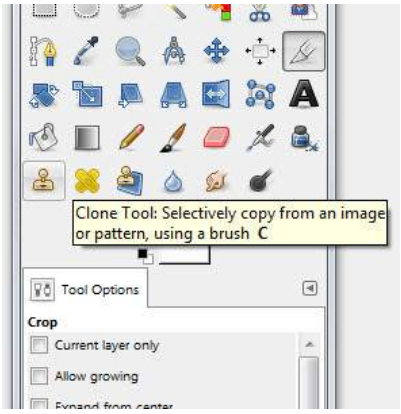
3. Use *Layer* > *Transparence* > *Add Alpha Channel* to add an alpha channel. Next, use *Edit Clear* or hit the *Del* key on the keyboard to remove the background. Please note that only a small subset of file formats support transparent areas. Your best bet is to save your image as PNG.

Work with images: combining elements from more than one image

Use *Clone* tool, adjust opacity, brush type and size, and then while holding the *Ctrl* key, sample part of an image, then clone it to a different part of the image.

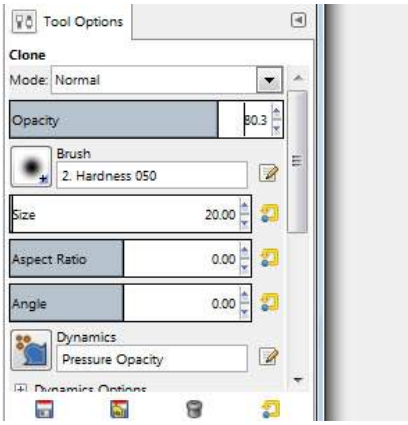
Open a new image and duplicate the layer (right-click > *duplicate*). Drag the layer into the first image.

Under *Image* > *Canvas Size*, double the canvas size, and then move the new layer to the side. Clone stamp elements of one layer over the other.



The Clone Tool in the Main Toolbox

Detail Setting of the Clone Tool



Want to learn more tools and functions of GIMP, please check **GIMP User Manual** at https://docs.gimp.org/en/index.html

STEP 5: ACT ON THE GROUND

Now we know the urgency of combating climate change, and the importance of urban trees to our lives. It is time to TAKE ACTIONS! This section provides you tips and external resources on what you can do to help.

1. MAKE A PLEDGE
2. PLAN AHEAD
3. PROTECT YOUR TREES
4. BEAUTIFY YOUR YARD/BLOCK

ra.ouimette
www.flickr.com/photos/8244126@N06/512532859

ACT ON THE GROUND
MAKE A PLEDGE

What goals are you planning to achieve in the new year?

Are they about preparing for climate change or protecting trees in your yard or on your block?

Write them down!

I PLEDGE

#1
e.g. plant a tree that I like in my yard and take good care of it

_____

_____

_____

#2
e.g. water street trees on my block during dry seasons

_____

_____

#3
e.g. volunteer at least once at a City tree planting event with my family and/or neighbours

_____

_____

DO YOU KNOW

Vancouver has a Climate Change Action Pledge:
http://vancouver.ca/green-vancouver/climate-change-action-pledge.aspx

ACT ON THE GROUND
MAKE A PLAN

What will you do by when?

Make a calendar to plan small steps that can help you achieve your climate action goal(s), and stick it in a place where you see everyday!

PLEDGE 1

_____

_____

_____

Week 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
	1 Jan	2 Jan	3 Jan	4 Jan	5 Jan	6 Jan	7 Jan
Week 2	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
	8 Jan	9 Jan	10 Jan	11 Jan	12 Jan	13 Jan	14 Jan
Week 3	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21
	15 Jan	16 Jan	17 Jan	18 Jan	19 Jan	20 Jan	21 Jan

PLEDGE 2

_____

_____

_____

Week 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
	1 Jan	2 Jan	3 Jan	4 Jan	5 Jan	6 Jan	7 Jan
Week 2	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
	8 Jan	9 Jan	10 Jan	11 Jan	12 Jan	13 Jan	14 Jan
Week 3	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21
	15 Jan	16 Jan	17 Jan	18 Jan	19 Jan	20 Jan	21 Jan

PLEDGE 3

_____

_____

_____

Week 1	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
	1 Jan	2 Jan	3 Jan	4 Jan	5 Jan	6 Jan	7 Jan
Week 2	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14
	8 Jan	9 Jan	10 Jan	11 Jan	12 Jan	13 Jan	14 Jan
Week 3	Day 15	Day 16	Day 17	Day 18	Day 19	Day 20	Day 21
	15 Jan	16 Jan	17 Jan	18 Jan	19 Jan	20 Jan	21 Jan

ACT ON THE GROUND
PROTECT YOUR TREES

HOW I CAN HELP

by City of Vancouver
http://vancouver.ca/files/cov/vancouver-tree-week-caring-for-your-tree.pdf

BE CAREFUL WHEN USING A LAWNMOWER OR WEED TRIMMER[12]

It can do detrimental damages to the base of the tree. Severe damage (like the picture) can kill a mature tree.

by Gratisography
https://static.pexels.com/photos/2259/man-hand-garden-growth.jpg

WATER STREET TREES OVER THEIR ROOTS IN FRONT OF YOUR YARD[12]

Two watering cans or 5-10 minutes from a slow-running hose. Twice per week will do.

z

PARTICIPATE IN ARBOR WEEK TREE-PLANTING ACTIVITIES[12]

The City and various organizations e.g. TreeKeepers organize at least once tree-planting events per year.

by StuJP
http://www.geograph.org.uk/photo/4589591

TELL THE CITY IF YOU HAVE ANY QUESTIONS OR CONCERNS[12]

You can request maintenance of trees in parks and on streets online
http://vancouver.ca/home-property-development/trees.aspx

ACT ON THE GROUND
BEAUTIFY YOUR YARD

1. PICK A TREE YOU LIKE

Here are some suggestions on trees that are able to survive the future impacts of cliamte change[13 14]:

'Forest Pansy' Eastern Redbud[15]

(Cercis Canadensis)

Medium-size (20-30 feet tall) deciduous tree with beautiful pink flowers and heart-shape leaves

- Can survive well under very dry environment
- Prefer full or partial shade
- Grow in well-drained sandy/clay soil

'Workhorse' European Hornbeam[16]

(Carpinus betulus)

Large (can be over 40 feet) deciduous tree with pointy oval leaves, and a beautiful canopy

- Can survive in harsh conditions with little care
- Tolerant to various levels of light exposure and soil pHs
- Prefer moist and well-drained soil

'Tough Survivor' Honey Locust[17]

(Gleditsia triacanthos)

Medium- to large-sized deciduous tree that can grow up to 70 feets with beautiful bright yellow flowers in the fall. It is fast-growing and easy to plant.

- Flood and drought tolerant
- Prefer to grow with full sun exposure
- Grow in various types of soil

'Pollution Fighter' Garry Oak[18 19]

(Quercus garryana)

The only native oak species in B. C.. It can grow up to 70 feets with majestic large canopy. It is great for improving air and water quality, and provides habitats for a number of rare plants and animals.

- Once established, minimal maintenance is needed
- Can tolerate very dry conditions
- Prefer open space with full or partial sunlight
- Grow in well-drained coarse sandy soil

'Well-Rounded Adapter' Green Ash[20]

(Fraxinus pennsylvanica)

Medium-sized (can be over 85 feet) deciduous tree. Leaves turn golden yellow in the fall. It is fast growing and provides nice shade in the summer:

- Can survive in harsh conditions with little care, e.g. droughts and floods
- Prefer full sun exposure
- Tolerant to various levels of pollutionsm and soil textures & moisture

Still having a hard time picking a tree you like?

Try the Tree Match: http://vancouver.ca/parks-recreation -culture/treelationships.aspxa

WANT TO KNOW MORE SPECIES?

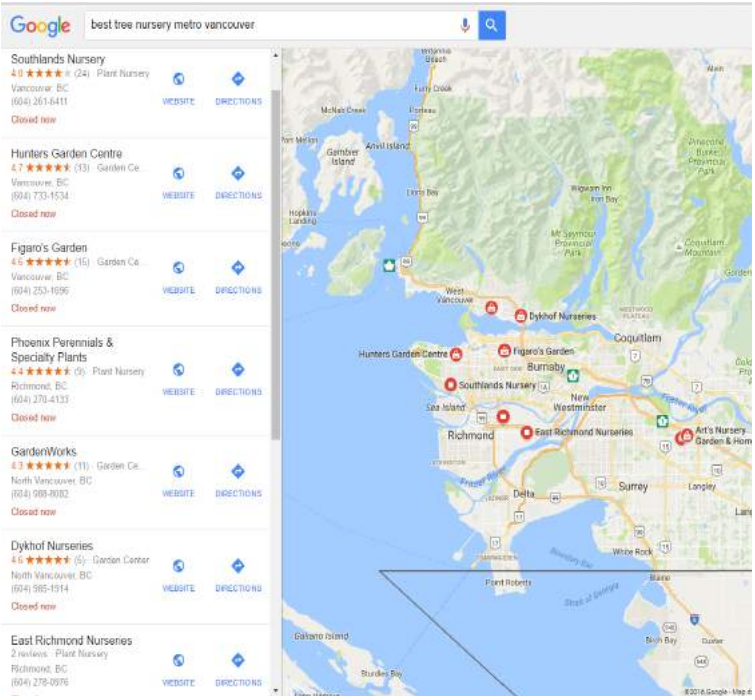
Trees in B.C. and identification keys: https://www.for.gov.bc.ca/hfd/library/documents/treebook/trees.htm

Tree Keepers: http://treekeepers.ca/plant-a-tree/

Native plants in B.C.: http://www.npsbc.ca/

2. WHERE TO BUY A TREE

You can buy trees or seedlings at local flower stores or tree nurseries (see below)



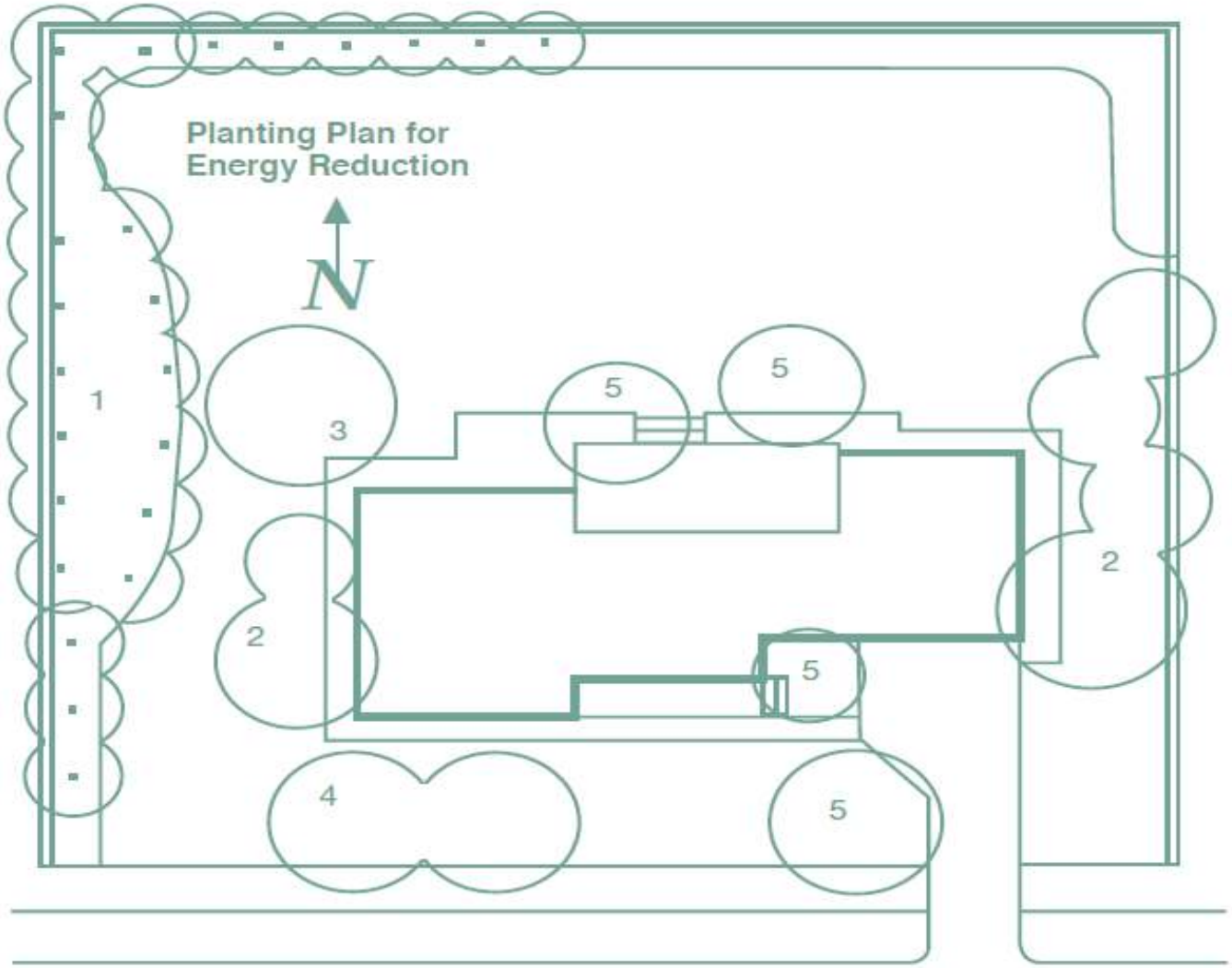

Tree Nursery by Jonathan Billinger
https://commons.wikimedia.org/wiki/File:Tree_Nursery_near_Cattat_-_geograph.org.uk_-_279007.jpg


Plant Store from Google Image Gallery

You can also buy trees for only $10 at the City's Tree Sale Event. It is usually three or four times a year. Check the City's website for more information http://vancouver.ca/parks-recreation-culture/vancouver-tree-weekend.aspx

3. WHERE TO PLANT A TREE

You can buy trees or seedlings at local flower stores or tree nurseries (see below)



KEY

1. Coniferous windbreaks to the north and west block winter winds.
2. Trees on the east and west sides provide summer shade.
3. A tree here will provide shade as the sun sets in midsummer.
4. A variety of deciduous trees to the south should grow tall and permit pruning of lower branches so that lower winter sun will strike the roof, walls, and windows uninterrupted.
5. The year-round effect of foundation and driveway planting seems never to have been measured, but they would be expected to be energy savers if they do not shade windows in the winter.

From *Forest Stewardship Backyard Trees*[21]

4. HOW TO PLANT A TREE

Need some help plant a tree? Here are some guides from the Vancouver Board of Parks and Recreation[22]:

1. DIG A SAUCER-SHAPE HOLE 3-4 times wider than the container or rootball. Make sure it is the same depth as the root ball.

2. PLACE THE TREE IN THE CENTRE of the hole. The top of the rootball must rest at ground level. If your tree is in a container, gently tap the sides of container to help loosen the edge and slide the trees out carefully.

*** DON'T PLANT TOO DEEP!** Roots require air as well as water to grow. The tree root flare (the bottom part of the trunk that flares out) should be above the soil.

***** To prevent the roots from growing in a circular pattern, cut a few vertical slices along the sides of the rootball. You can also gently spread the roots making sure not to break them.

*** FOR BALLED & BURLAPPED TREES**, cut away any twine or wires wrapped around the rootball and peel back the burlap.

3. BACKFILL THE HOLE WITH NATIVE SOIL FROM TREE PIT. If the soil is of marginal quality, ensure that topsoil amendment is thoroughly mixed with native soil.

SOME MORE TIPS ON TREE CARE[22]:

1. **MULCH** is an invaluable tool to improve the soil and provide more nutrients for the trees.

2. **BEWARE OF THE WEED EATER**. They can do devastating damage to trees.

3. **WATER. WATER. EVERYWHERE**. For the first few years, water your new tree twice a week during the summer. Water slowly for 5-10 minutes (10-20 litres of water or 2 watering cans or use a watering bag).

FOR MORE TIPS, please see the full version: http://vancouver.ca/files/cov/vancouver-tree-week-caring-for-your-tree.pdf

ACT ON THE GROUND
BEAUTIFY YOUR BLOCK

WORK WITH YOUR NEIGHBOURS TO CREATE A GREEN & CALMING SPACE ON THE BLOCK

You can create a street garden on the traffic circles or on the street in front of your place by planting plants that you like. Creating this type of green space can benefit you and your block in various ways[23]:


by Erin MacDonald
http://www.yourleaf.org/blog/erin-macdonald/2014-02-06/say-o-new-volunteer-and-stewardship-coordinator

- Boost the character of your block by personalizing gradens
- Slow down traffic on your block
- Provide free compost for your own garden, and sometimes even free food (depending on the species that you plant)
- Strengthen the bonds with your neighbours and friends
- They are just beautiful to look at!

STEPS TO CREATE A STREET GARDEN[23]:

1. **Decide** what type of garden you and your neighbours want to create: e.g. food gardens, bee hives, ornamental gardens...

2. **Pick** plants that you like.
Recommended plant list: http://vancouver.ca/home-property-develop ment/recommended-plant-list.aspx

3. **Plan** a day with your neighbours to plant!
Watch out for traffic when you are working. Stay visible and stay alerted.

For more specific rules and guides, please visit http://vancouver.ca/home-property-development/gardening-guidelines.aspx

You can also volunteer for the **City's Green Streets Program** to help them take care of street gardens near you. You will weed and water the gardens, make new friends, receive free training on gardening and various fun events by the Green Streets[23].

Sign up here: http://vancouver.ca/home-property-development/green-streets-volunteer-application-form.aspx

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