PART THREE – VISIONING CHARRETTE

SECTION A – AUTO ORIENTED PATTERN: CITY OF SURREY
SECTION B – PEDESTRIAN ORIENTED PATTERN: CITY OF VANCOUVER

SECTION A – AUTO ORIENTED PATTERN: CITY OF SURREY

VISION OVERVIEW

APPROACH

A1. Back-casting:

- Back-casting from a series of pre-determined objectives
- Formulate solutions for specific objectives
- Cross reference solutions and check for consistency

A2. Neighbourhood plans:

- Study individual neighbourhoods and use solutions from above for site specific interventions

A3. Surrey Vision:

- Combine neighbourhood plans into the Surrey / Auto-oriented Vision

THE BASICS

Sanitary Sewer:

- No combined sewers
- Composting toilets
- Neighbourhood scale sewage treatment

Transportation:

- 90% fewer private vehicles
- modal split:
  - 10% auto
  - 55% transit
  - 20% walk
  - 15% bike

Energy:

- photo voltaic cells
- net metering
- retain grid
- local food production

Stormwater:

- infiltration maximized
- pervious surface system

Greywater:

- rainwater collection
- infiltrate waste at parcel

A1. "Back-casting"…

OBJECTIVE: 20% OF FOOD TO BE GROWN LOCALLY BY 2101

How to get there…

- allotment gardens
- animal husbandry – guinea pigs, ducks, hens, rabbits, pigs, lambs
- green walls – use of sun exposed walls for producing fruit
- fruit or nut producing street trees
- convert fountains and water features to fish rearing facilities
- integrate patio planters and window boxes into apartment design
- backyard vegetable gardens
- more formal landscaping incorporating ornamental edibles
- rooftop gardens
- convert excessive asphalt areas to productive gardens (ie: driveways)
- bylaws requiring installation of edible plants in commercial landscapes
- need zoning/by-law flexibility and municipal cooperation for most interventions

20 YEAR TARGET:

- make progress on changing bylaws/zoning for allotment gardens, fruit trees, etc

50 YEAR TARGET:

- 5% of food grown within the city limits

EXAMPLES:

- 1/3 of China's population currently fed through urban agriculture
- Montreal currently has 6654 allotment garden plots in 75 different locations; this is possible through zoning and a parks board that encourages urban agriculture as a legitimate and important use of public open space (source: www.cityfarmer.org)
- Assuming a conservative average food production of 7kg/m^2 and an average consumption of 150kg/person/year, converting a block of driveways to gardens, as shown to the right, could feed 21 people. (Calculation excludes boulevard fruit or nut trees and backyard gardens) or 25% of the block at 6 persons per house.

OBJECTIVE: To have 100% renewable energy alternatives in place BY 2101

What will Surrey's energy future look like? It would perhaps be beneficial, if somewhat fanciful, to speculate along lines of science fiction and try to envision a future that would look something like an episode of "The Jetsons." Speaking practically, however, the best approach is to examine available technologies and try to extrapolate forward from there in order to see if a target of 95% of the region's energy demand to be met by energy sources that are clean, efficient, and renewable can be met. This overview presents current options that would likely have an impact on Surrey's energy future.

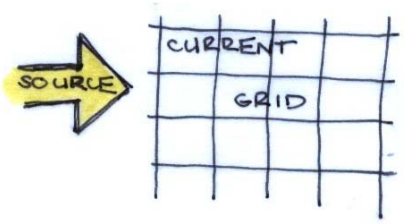
In a region where water resources are abundant, **hydro power** is an obvious choice to supply some of the area's power needs, but this does not have to mean the major scale technology of a dam on the Fraser River or any of its tributaries that one might at first imagine. Smaller scale, **micro-hydro technology** can be used in a variety of applications, from the use of small canals to channel river water through a turbine to locally implemented and operated water wheels. The potential political implications of who has the right to generate power would have to be dealt with at all levels of government, but the potential for small scale hydro power applications is great.

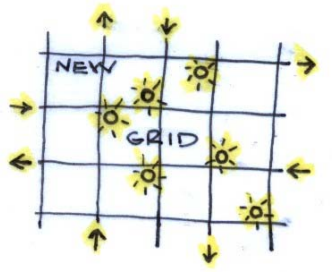
Solar energy is another renewable resource that is much under-utilized. Among its many uses is the conversion of sunlight into electricity, heating hot water, and to providing energy for cooling buildings. Solar energy can be used on the local scale to heat several or even single houses, as well as on the power plant scale to provide greater levels of energy. Even on a part-time usage basis, solar energy could provide relief for major energy provision systems and lessen the environmental impacts associated with non-renewable resource usage.

Geothermal energy is a system that uses heat from the earth to provide energy. This technology utilizes heat sources found in shallow ground as well as those found deeper in the earth, such as that found in hot water or hot rock. The potential even exists to tap into molten rock miles below the earth's surface and it is not inconceivable that this technology could be a major part of our planets energy future over the next one hundred years. More immediately, however, this technology would allow for heat pumps to draw energy from the upper ten feet of the earth's surface that could then be used to heat buildings. This technology would be especially applicable in the agricultural areas around Surrey, as one of its best possible uses would be heating greenhouses. It also has applications for industry, which could use direct heat from the earth to heat and cool industrial buildings of various sizes.

Perhaps one of the best and most readily available renewable energy sources is the wind. **Wind power** is currently being used in many areas, notably California, as an excellent source of clean energy. From the wind plants, that use a large number of wind turbines to create electricity, to small-scale applications that use simple windmills to pump water, this technology could be used to great effect in the Surrey area. The creation of a power grid to serve the region would be one possibility offered by this source, or on a smaller scale, neighbourhoods could utilize wind power as a supplement to reduce electric costs incurred from other sources until larger applications were implemented. Wind power would likely be one of the most efficient renewable energy sources for this area, and combined with solar power, could have a major impact toward making the Surrey region a leader in the use of renewable energy resources.

OBJECTIVE: 50% OF ENERGY NEEDS PRODUCED ON THE BLOCK





How to get there…

- Overall energy consumption reduction at the parcel level
- Net metering – allows meter to turn backwards when local energy production system is over producing
- Retain existing grid to allow energy sharing
- Retain smaller proportion of existing energy imports to region for periods of reduced local production
- Sell local overproduction of power through grid (revenue could be used to fund social assistance programs – see below)
- Caution against using subsidies for implementation of solar/wind/micro-hydro – prevents technology from maturing naturally and develops subsidy dependency
- Phase in real cost accounting on existing energy supply to make new technology more appealing (may require social assistance for low income earners)
- Change regulations to permit local energy production and grid tie-in

- Energy production regulation changes are essential

20 YEAR TARGET:

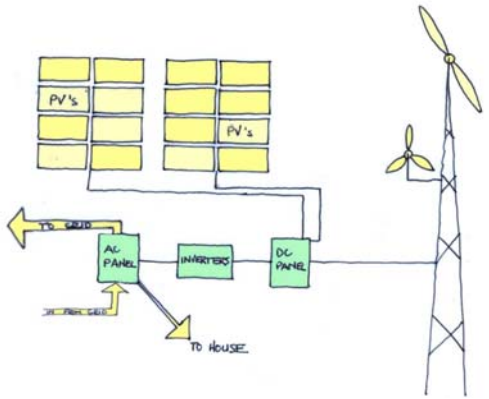
- make progress on changing regulations; start implementation of local green energy production

50 YEAR TARGET:

- 10% of energy produced locally

EXAMPLES:

- Use of energy efficient and European models of appliances potentially reduces residential energy consumption from current BC average of 29.3 kWh per person to the 15-20 kWh per person range (source: www.ctax.com/~wmbjk/index.htm & http://www.bchydro.bc.ca/rx_files/info/info3519.pdf)
- Typical combined solar/wind system can produce as much as 10-20 kWh reducing dependency on external energy sources by over half (see schematic at right)



OBJECTIVE: URBAN DENSIFICATION – 0% CHANGE IN URBAN AREA

Agriculture needs long-term protection from the adverse impacts of urbanization and sprawl. To design for sustainability, it is essential to maintain the existing areas of urbanized area and Agricultural Land Reserve in the City of Surrey. The upland areas of Surrey contain most of the urban zones with the low-lying areas constituting the ALR. Protected salmon-bearing streams flow from the upland urban areas into the ALR low-lands. It is imperative for the city to preserve the ALR for habitat, wildlife corridors, green infrastructure, aesthetics and most importantly, local food production.

How to get there…

- Zero% change in overall urbanized area. Prohibit expansion of city boundary beyond the current 315 square km or 126 square miles.
- Increase population density in urbanized area to 40 persons per ha.
- Maintain existing 60 square miles of Agricultural Land Reserve in low-lying floodplains of the Nicomekl and Serpentine Rivers. Retain marginal agricultural lands for possibly improved agriculture technology in 2102.
- Prohibit development of ALR for any use other than agriculture.
- Restrict the sale or lease of land in the ALR to farmers on a long-term basis.
- Do not introduce land convenants that would prohibit normal agricultural practices.
- Do not sub-divide large agricultural fields into small unproductive hobby farms.

Agricultural areas are intertwined with urban structures. It is imperative that agricultural lands be protected from land development for low-density housing and road networks.

- Introduce in-fill and densification programmes. This will generate long-term savings in infrastructure costs.
- Introduce urban agriculture activities into any marginalized areas or open spaces in the urban areas.
- Retain the ALR as the mechanism to restrain urban sprawl.
- Do not restrict farmers in their ability to improve land to support viable agricultural production.
- Permit diversification of activities on farms to allow for broader their financial bases.

Infill empty lots with higher density housing, such as low-rise apartment buildings or townhouse complexes.

Change zoning to allow for rental suites in existing housing, such as basement suites or outbuilding apartments.

Change zoning to allow housing parcels to be sub-divided for the construction of new houses.

References:

1000 Friends of Oregon. Making the Case Against Rural Sprawl. Online Vers. October 2002 http://www.friends.org/issues/betrayal.html October 04, 2002.

James Taylor Chair. The Damascus Design Workshop: A Regional Model for Clean, Green, Affordable and Fair UGB Expansion. Vancouver: University of British Columbia, 2002.

Moffat, Sebastian. CityGreen: A Guide to Green Infrastructure for Canadian Municipalities. Vancouver: Sheltair Group, 2001.

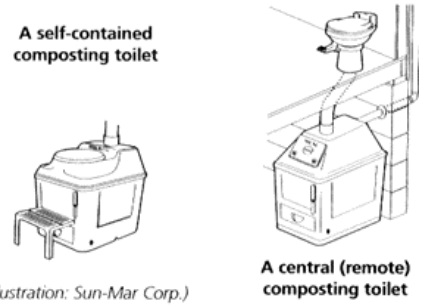
OBJECTIVE: 100% OF ALL ORGANIC WASTE COMPOSTED

How to get there…

- *Composting Toilets* contain and control the composting of human waste, toilet paper, carbon additive, and (optionally) food wastes. Aerobic bacteria and fungi break down wastes to 10 - 30% of its original volume, resulting in humus which may be used as a soil conditioner. Systems are either self-contained in one unit or centralized, where the toilet connects to a composting reactor that is somewhere else.
- *Home Composting* speeds up the decomposition process, converting yard trimmings, leaves, and many kinds of kitchen scraps into humic material. Using a container helps the compost pile retain heat and moisture and look neat. As materials are added and mixed together, the finished compost settles to the bottom of the bin.
- *Vermicomposting* utilizes worms to speed up the decomposition process described above. These systems can be directly connected to kitchen garbage disposals, and located inside or outside of the home.

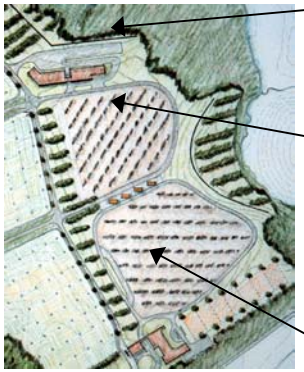
- In a similar fashion to "Blue Box" recycling programs, a "Green Pail" compost system would be set in place, and organics delivered to a central composting facility.
- At the composting facility, organics are digested in large vats for about four days. Afterwards, the digested compost is laid out in windrows. In the example shown, one compost field will consist of "browns" (yard waste trimmings); a separate field will consist of "greens" (green leaves, grass clippings, raw fruit and vegetable scraps, etc). Sewage sludge, piped from around the district, would also be composted at this facility.
- Over time, parcel scale composting would grow steadily in popularity due to incentives (such as free bins) and community education programs. This growth would coincide with the rising popularity of local community gardens. As more and more compost is created and used at the parcel scale, the demands on the central community composting facility will decrease, allowing the facility's size to remain the same despite population growth.

TIMELINE: **20 YR TARGET**: Parcel 5%, District 70% (75% of all organic waste)
50 YR TARGET: Parcel 60%, District 30% (90% of all organic waste)



(Illustration: Sun-Mar Corp.)


Compost Windrows, Newby Island, CA



Facility Plan by Lindsey Whang

OBJECTIVE: 0% OF NEW STRUCTURES IN HIGH-RISK, CULTURALLY SIGNIFICANT, OR ENVIRONMENTALLY SENSITIVE AREAS

How to get there…

Composite mapping of an area will be done before any new structures or developments are planned. High-risk or environmentally sensitive areas will be recorded on these area-wide maps and should involve the following items:

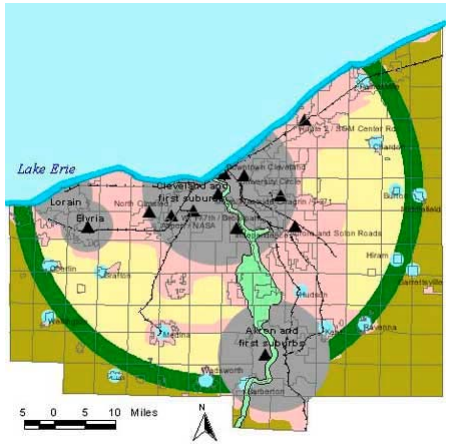
1. Wetlands (tidal and fresh) and all riparian zones
2. The 100-year floodplains
3. Steep slopes (see table below)
4. Habitats of species that are red-listed, blue-listed or locally significant
5. Historic, archaeological, or cultural sites
6. High-yielding aquifers and their recharge areas
7. Woodlands of a size that makes them locally significant

Such area-wide composite mapping allows for a basic understanding of the most critical elements existing on each site. Street and lot layout can then be planned around these elements and set by ordinance.

TIMELINE: **20 YR TARGET:** 10%of new structures in areas with significant elements
50 YR TARGET: 5% of new structures in areas with significant elements

Land Use	Maximum	Minimum	Optimum
House sites	20-25%	0%	2%
Public Stairs	50%	-	25%
Septic Drain fields	15%	0%	0.05%
Parking Lots	3%	0.05%	1%
Sidewalks	10%	0%	1%
Streets	15%	-	1%
Industrial sites	3-3%	0%	2%

Slope requirements for various land uses: site scale . Source: Marsh, Landscape Planning, 3rd edition.



Composite mapping at the bioregional scale: example from northern Ohio.

SANITARY SYSTEM (No Corresponding Cities Plus Objectives)

Municipal sewage is a major source of water pollution. Both untreated (raw) sewage and inadequately treated sewage pose a threat to both human and aquatic environments. The percentage of the population served by public sewage treatment in Canada is 78%. When the figures are looked at closely to examine the quality of sewage being provided, Canada's performance is less impressive. Only 33% of the population is served by tertiary treatment.

Present: Every home and business in Surrey has its own private link with the municipal street sewers. Wastewater comes from sinks, toilets, washing machines and showers, as well as wastes from industry. Wastewater flows from piping in the home and industry into municipal sewers. Municipal pipes range from 100 to 150mm in diameter, and are the responsibility of the individual property owner (*Ten year Servicing Plan*, 2001). The current sanitary system for Surrey has an inventory of 1430km of gravity mains which discharge the wastewater into large diameter sewers to be routed to a wastewater treatment plant for processing, prior to discharge into the rivers and oceans (GVRD, 2002).

Future: In Surrey, waster water bypasses sewage treatment during heavy rainfalls, combining with storm water in sewer outflows.
The ***20 year vision*** for Surrey is to separate the 1630km sanitary and storm sewers into independent systems. The aim is to reduce wastewater entering into intensive treatment plants to allow a higher level of efficiency and quality of output water entering rivers and oceans. The storm water runoff will be treated instead in a connected detention basin and wetland system within the urban structure. Surface permeability will be increased and roof runoff collected to decrease the amount of overland flow.
The ***100 year vision*** for Surrey is the installation of smaller Package Wastewater Treatment Plants as a pretreatment to the municipal sewer system. The Plants will be located on a block level and will include Biological nutrient removal, sludge dewatering and odor removal. These Plants can deal with up to 200,000L/day and will function as a stalling mechanism to even out demand on municipal systems and provide an extra level of processing to reach the goal of total tertiary treatment of wastewater in Surrey.

Note: All statistical data not referenced is based from the Organization for Economic Cooperation and Development, "Environmental Data Compendium 1999" (Paris: OECD, 1999)

OBJECTIVE: ZERO CO2 EMISSIONS PRODUCED IN 2101

Canada ranks 26th out of 27 OECD nations in carbon monoxide emissions per capita. Canada produces 334.9kg of carbon monoxide per capita and produces 16.4 kilograms of carbon monoxide emissions per $1000 US of GDP. These figures rank Canada as one of the highest carbon monoxide emission producers compared with other OECD nations.

Present: In Canada there are 0.58 motor vehicles for every person. The number of motor vehicles in Canada is currently growing faster than the Canadian population (OECD, 1999). To counteract these trends, alternative fuel supplies need to be developed to reduce carbon monoxide emissions produced in Canada.

Future: Our long-term goal is very simple: zero emissions in the air. ***20 year vision***: Alternative renewable energy will become major power sources in the next 20 years. We predict a gradual shift in the next 100 years from hydrocarbon fuels with high carbon content (wood, peat, coal) to fuels with less carbon and more hydrogen (oil, natural gas) leading to pure hydrogen as the principle energy source. This decarbonisation will reduce environmental impacts per unit of energy consumed, translating directly to lower CO2 emissions (Hoffman, 2001).

Our ***100 year vision*** is 'zero emissions' from cars and buses, industry, ships and home furnaces. This will be achievable through taking the carbon out of the hydrocarbons and relying on the 'hydro' part – hydrogen. The future 'hydrogen economy' will run by clean primary energy such as wind and solar power providing energy to split water into hydrogen as fuel. Hydrogen will be used as an energy storage medium that will smooth the fluctuations of wind and solar power. As a gas it is easy to transport and more importantly will not pollute. Used as a fuel, it would reduce and eventually eliminate at least the man-made share of CO2 deposited in the atmosphere.
Energy will be generated at a handful of large sites far removed from population centres and generated energy will be transported either as electricity (through long-distance, low-resistance cryogenic cables), as hydrogen gas (in pipelines) or as cryogenic liquid (in huge tankers). Hydrogen is a renewable long-term vision. It is non-toxic and used in fuel cells generates electricity and emits only water vapour. Cars that use hydrogen fuel cells run 2 – 3 times more efficiently than gasoline engines (Hoffman, 2001).

Reference: Hoffmann, P. 2001 *Tomorrow's Energy: Hydrogen, Fuel Cells, and the Prospects for a Cleaner Planet*. MIT Press Cambridge, Massachusetts

Note: All statistical data that is note referenced comes from the Organization for Economic Cooperation and Development, "Environmental Data Compendium 1999" (Paris: OECD, 1999)

ELIMINATING AUTO-DEPENDENCY

OBJECTIVES: By 2101, Surrey will…

- Increase percentage of non-auto share in peak period to >=**90%;**
- Increase percentage of non-auto share used for commuting to >=**95%;**
- To reduce VKT to **10** vehicular kilometres per person.

How to get there…

- *Light Rail and trolley expansion* that aims to convert an increasing percentage of commuters from auto-dependency to transit-dependency:
  - -20 year goal: 35% rider conversion;
  - -50 year goal: 45% rider conversion;
  - -100 year goal: 55% rider conversion (more walking and biking)

- *"Telework" incentives* that allow people to work at home or in the community:
  - -20 year goal: 25% of work force working in community
  - -50 year goal: 50% of work force working in community
  - -100 year goal: 85% of work force working in community

- *Commuter/Van pools* that aim to drastically reduce VKT and eliminate single driver occupancy:
  - -20 year goal: 80% of auto share is carpools; VKT <35;
  - -50 year goal: 100% of auto share is carpools; VKT <25.
  - -100 year goal: 100% of auto share is carpools; VKT <10

- Developing *Intelligent Transportation Systems* that use real-time tracking systems that increase accessibility and efficiency of transit systems (more buses, less stops, better flow, less travelling time):
  - -20 year goal: 75% of transit system incorporated;
  - -50 year goal: 100% of transit system incorporated.

Precedents…

- *Light Rail expansion projects:* Colorado (since expansion,50% of riders are using LRT for a trip they previously would have driven for);

- *"Telework" incentives:* Maryland (250,000 people commute to work over phone/data lines instead of autos, representing 12% of work force);

- *Commuter/Van pools:* Georgia (In 2000, Metro Van Pools provided 12 million trips, and commuters avoided 19 million miles of solo driving;

- *Intelligent Transportation Systems* : California (Metro Rapid Bus systems have decreased travel times by 25% and increased ridership by 37%).

COMMUNITY-BASED HOUSING DEVELOPMENTS

OBJECTIVES: By 2101, Surrey will…

- Increase percentage of dwellings located within 350m of a transit/trolley stop or 1000m of a LRT/trolley stop to >=**90%**;
- To improve Surrey walkability to **100%**

How to get there…

- *Transit-oriented Development* aims to enhance economic growth of surrounding communities through major public transit projects:
  - -20 year goal: 75% of community grid infrastructure accessible by public transit;
  - -50 year goal: 100% of community grid infrastructure accessible by public transit.
  - -100 year goal: Eventually, focus will be on enhancing the walking and biking portions of the modal split, decreasing reliance on transit.

- *Transportation incentives for new housing* involves subsidizing transportation costs for developments that build housing in walkable neighbourhoods close to transit:
  - -20 year goal: 60% of projects subsidized;
  - -50 year goal: 100% of projects subsidized;
  - -100 year goal: Eventually, subsidies can be focused to other initiatives as the all housing projects aim to enhance a community's walkability.

- *Government grants* for home buyers to purchase homes near work:
  - -20 year goal: $5000 Cdn. Grant per home buyer;
  - -50 year goal: $10,000 Cdn. Grant per home buyer.
  - -100 year goal: Grant necessity diminishes as living and working within a community becomes the status quo.

Precedents…

- *Transit-oriented development:* Texas (since inception, the DART LRT system has brought $800 million US worth of economic development into surrounding communities);

- *Transportation incentives for new housing*: California (430 unit apartment built close to commuter rail station);

- *Government Grants*: Maryland (home buyers eligible for $3,000 US grant if buying house near work).

PROMOTING ALTERNATIVE MODES OF TRANSPORTATION

OBJECTIVES: By 2101, Surrey will…

- Increase non-auto share travelling to, from, and within the Metropolitan core within peak period to >=**100%**
- To improve modal diversity to: auto (**10%**); transit (**55%**); walking (**20%**); biking (**15%**).

How to get there…

- *Developing neighbourhood centres* that house various amenities and consumer services:
  - -20 year goal: 75% of neighbourhoods have a centre
  - -50 year goal: 100% of neighbourhoods have a centre
  - -100 year goal: All neighbourhoods are self-reliant with an identifiable character.

- *Mixed-use villages along corridors* that limit residential and commercial entrances on to highways, and focus on off-road connections between adjoining commercial centres:
  - -20 year goal: 75% of neighbourhood centres are linked by off road pathways;
  - -50 year goal: 100% of neighbourhood centres are linked by off road pathways.
  - -100 year goal: Movement between neighbourhood centres is predominantly by walking and biking

- *Create biking communities* by enhancing biking as a commuting and local transportation option:
  - *Immediate goals:
  - -increase the amount of bike racks in Surrey;
  - -establish “Bike Central” locations for storage and socializing;
  - -improve biking safety by identifying conflict zones between autos and bikes.
  - -100 year goal: Modal share of biking is at least 15% for all trips, and at least 40% for local trips.

Precedents…

- *Developing neighbourhood centres:* Sacramento (people were 4 times less likely to drive and travelled 40-50% less miles compared to conventional suburban neighbourhoods);

- *Mixed-use villages:* New York (sustainable development strategies that aim to enhance community identity and self-reliance;

- *Creating bike communities:* Portland, Ore. (has become the most biking-friendly city in the U.S.)

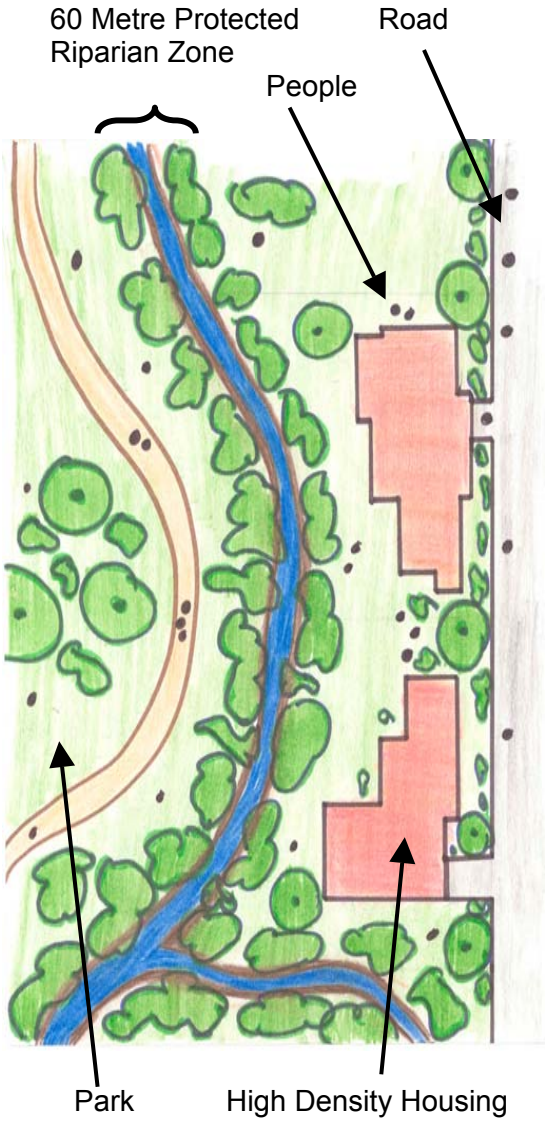
OBJECTIVE: to protect and/or restore all existing riparian areas and daylight and restore as many buried streams as possible.

How to get there…

- *Covenant Awareness:* high rates of riparian encroachment (74% in Surrey) are largely due to ignorance; inform residence about then importance of the riparian area.
- *Land Use Planning and Urban Design*: incorporate riparian areas into the OCP as sensitive areas, and use creative design to weave natural streams into block configuration
- *Conservation Covenants:* allow conservation groups to hold covenants; more useful for large swaths of private land.
- *Stream Stewardship:* a shared planning and management process involving citizens, businesses, and public officials that highlights the importance of ecological integrity.
- *Daylighting Streams:* is an effective form of storm water management, provides for the re-introduction of habitat, creates an aesthetic community amenity and enhances our connection to the natural environment. Recognizing that Surrey is partially an urban environment, it is not reasonable to commit to daylighting all streams. However, where possible buried streams should be brought to the surface.

20 Year: 50% streams restored and all existing protected
50 Year: 80% streams restored and all existing protected

Examples: Riparian habitat is extremely high in biodiversity and ecological importance, but is highly sensitive and should therefore be protected (B.C.Ministry of Water Lands and Parks. Stream "daylighting" is being considered in Vancouver (City of Vancouver, 2002).



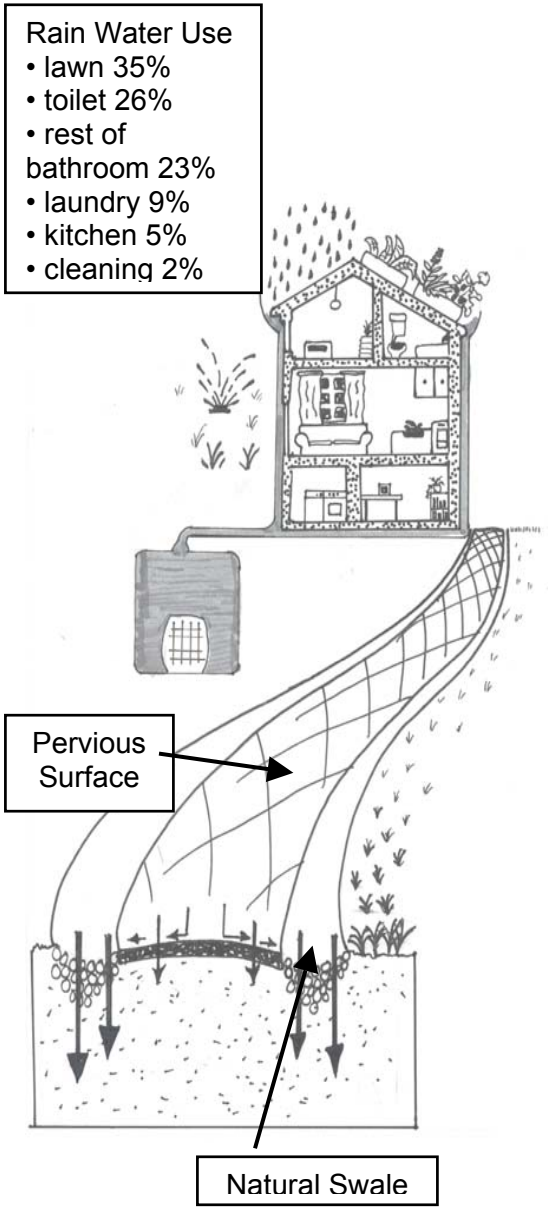
OBJECTIVE: maximize the use of water to increase infiltration and decrease clean water consumption per capita.

How to get there…

- *Parcel Infiltration:* by-laws will prevent the use of impervious surface coverage for new and repaired infrastructure, such as driveways, patios and paths.
- *Block Infiltration:* all new, and repaired, roadways and pathways will be constructed with pervious materials and natural swales. Gravel is fine for low speed use, but development of pervious asphalt is expected in the future.
- *Rain Water Harvesting:* all roofs will be required to have gutters that funnel water into a holding tank in the ground, which will be used for suitable needs. This technology is easily added on to existing buildings and can be required for new construction, which includes both residential and commercial. Potable water will be obtained from the current source.
- *Grey Water:* will be collected and directed to natural infiltration areas at the parcel level.
- *Green Roofs:* minimize rain water run off in addition to providing localized food production.

20 Years: decrease water consumption from 478 litres per day to 300 litres per day
50 Years: decrease water consumption to 200 litres per day

Examples: The Eco-Pavillion in the Strathcona Community Garden in Vancouver B.C. currently uses a grey water purification system. CMHC endorses grey water and rain water harvesting systems.



References:
S. D. Inglis,S.D., Thomas, P.A., and Child E. (1995) Protection of Aquatic and Riparian Habitat on Private Land Evaluating the Effectiveness of Covenants in the City of Surrey, 1995 Department of Fisheries and Oceans

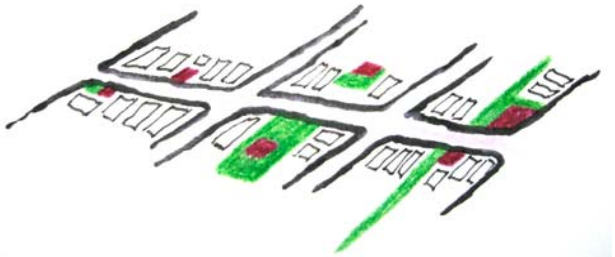
City of Vancouver, Engineering Services: Water and Sewers retrieved from the world wide web on October 5, 2002 http://www.city.vancouver.bc.ca/engsvcs/watersewers/sewers/initiatives/daylighting.htm

British Columbia Ministry of Water Land and Parks (2002) Saving Sensitive Ecosystems retrieved from the world wide web on October 6th, 2002

OBJECTIVE: ***TO HAVE A PUBLIC FACILITY IN EACH BLOCK WHICH IS USED FOR NEIGHBOURHOOD RECREATIONAL AND CULTURAL EVENTS, AND EMERGENCIES***

How to get there…

- PARCEL: located on a pedestrian route amidst ample greenspace with multiseason, 24 hour open access to the public. The parcel will have access to fresh water and an emergency centre including amenities such as suits in the event of chemical warfare. Habitat creation and community stormwater management techniques can be implemented within such a site.
- BLOCK: Street will be subject to periodic closures for festivities; street becomes like a large room, connected to lanes.
- DISTRICT: The public centre will have connections with the same facilities on other blocks.



OBJECTIVE: CREATE, AT MINIMUM 30% JOBS IN THE NEIGHBOURHOOD

How to get there…

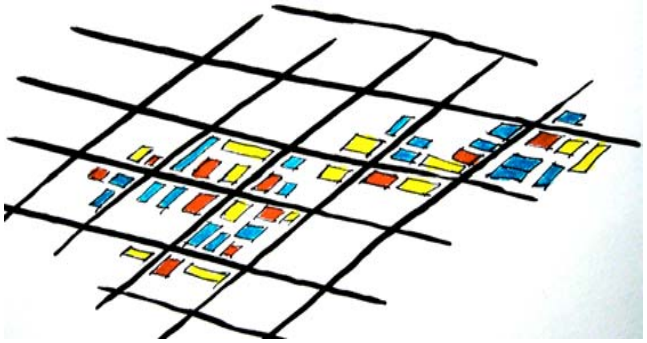
- PARCEL: Needs both physical and social integration of commercial and industrial units combined with or close to residential units. Higher densities should be maximized around various centres. Provide work-at-home options and change zoning laws to accommodate such integration.
- BLOCK: Allow for pedestrian access to work. Develop efficient strategies whereby associated businesses and industries are in close proximity to one another so that they can share resources and technologies.
- DISTRICT: Communities must be self-managed and provide opportunities for both long- and short-term jobs. This means that the locality must be able to adapt and keep productivity up to date, interesting and convenient.[1]

Higher density integration of Residential, Commercial and Industrial creates more work opportunities

TIMELINE: 20yr.= 10% 50yr.= 20% 100yr.= 30% +

[1] Jacobs, Jane The Death and Life of Great American Cities, 1961, Vintage Books, New York, p. 294.

OBJECTIVE: ALL DWELLING UNITS ARE LOCATED WITHIN 400m OF BASIC SHOPPING NEEDS AND PERSONAL SERVICES

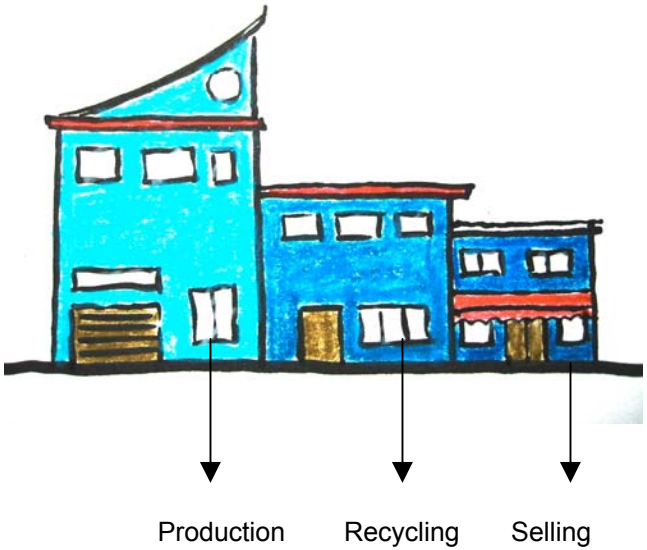


How to get there…

- PARCEL: Requires densification of building developments and harmonious integration of commercial, industrial and residential units.
- BLOCK: Needs to be short with interconnected paths for "5-minute walk" pedestrian accessibility.
- DISTRICT: Requires small-scale, easily integrated local shops and services.

TIMELINE: 20yr.= 10% 50yr.= 50% 100yr.= 100%

OBJECTIVE: AT LEAST 20% OF BUSINESSES SHOULD BE C.E.D (COMMUNITY ECONOMIC DEVELOPMENT) BUSINESSES OR SHALL BE A PROVIDER OR EXPORTER OF GREEN, CLEAN TECHNOLOGIES OR SERVICES



How to get there…

- PARCEL: Businesses shall employ green strategies such as site decontamination and restoration, air and gas treatments, and waste and residue treatment and recycling.
- BLOCK: Waste management services shall be shared between businesses in a community to employ the least amount of infrastructure required for the tasks. Communities shall have more involvement and influence in commercial development for their neighbourhoods.
- DISTRICT: Businesses shall strive to create job opportunities for the unemployed and impoverished, and create businesses whose products and services serve the unmet needs in the community.

TIMELINE: 20yr.= 2% 50yr.= 15% 100yr.= 20% +

LEED LEARDERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

100 YEAR GOAL: 100% BUILT & RETROFITTED GREEN BUILDINGS

SUSTAINABLE SITES

Erosion & Sedimentation Control
Urban Redevelopment
Alternative Transportation
Stormwater Management
Landscape & Exterior Design
Site Selection
Brownfield Redevelopment
Reduced Site Disturbance
Light Pollution Reduction

WATER EFFICIENCY

Water Efficient landscaping
Water Use Reduction
Innovative Wastewater Technologies

ENERGY & ATMOSPHERE

Optimize Energy Performance
Additional Commissioning
Measurement & Verification
Renewable Energy
Ozone Depletion
Green Power

MATERIALS & RESOURCES

Building Reuse
Resource Reuse
Local / Regional Materials
Certified Wood
Construction Waste Management
Recycled Content
Rapidly Renewable Materials

INDOOR ENVIRONMENTAL QUALITY

Carbon Dioxide Monitoring
Construction Management Plan
Pollutant Source Control
Thermal Comfort
Increase Ventilation Effectiveness
Low Emission Materials
Controllability of Systems
Daylight & Views

INNOVATION & DESIGN PROCESS

Innovation in Design
LEED Accredited Professional

U.S. Green Building Council

Building construction, renovation and operation consume more of the earth's resources than any other human activity. Each year, as much as 40% of the raw materials and energy produced in the world are used in the building sector. This generates millions of tonnes of greenhouse gases, toxic air emissions, water pollutants, and solid wastes. No other sector has a greater impact on the global environment or faces a greater obligation to improve its environmental performance. With so much of the world's resources consumed in the building sector, learning how to build with the environment in mind will make a big difference for the global environment.

ASMI, "The Environmental Challenge in the Building Sector" 1999

Green Buildings BC

HOME

DESIGN QUALITY & AFFORDABILITY

100 YEAR GOAL: 100% AFFORDABLE HOUSING

Imagine a 75 year-old widow who relies on a walker to get around and can't use the bathroom without assistance. She's living on $15,000 a year. What would her life be like, keeping in mind that she can't afford much in rent? How would she cope with day to day tasks, such as making a nutritious meal for herself?

Supportive Living BC

AFFORDABLE HOUSING

… costs less than 30% of a household's gross monthly income
… benefits low and moderate income singles, families, and seniors
… assists people with special needs, disabilities, and illnesses

AFFORDABLE HOUSING IS

… public housing
… non-profit housing
… co-operative housing
… market housing

HOUSING STRATEGIES ARE

… community partnerships
… regulatory zoning changes
… community land trusts
… secondary suites
… housing subsidies

Housing plays a central role in people's lives. Stable housing can contribute to an individual's health, safety, and security, as well as promote involvement in the labour market and in the community. Linked to well-being, stability, health, and employment, housing shapes our communities and sense of place within those communities. Without adequate shelter, it is difficult to fully contribute to society.

Affordable Housing in British Columbia

Eight years ago, Tina Suter found herself living in a one room apartment in Vancouver's West End with her mother and her five-year-old daughter. Recovering from surgery to remove a brain tumor, she was legally blind, had no feeling on the right side of her body and was suffering from both short- and long-term memory impairment.

Today, Suter (shown here with her daughter Stacey) is an active part of daily life at Mulberry Place, a non-profit housing complex for families, Heavily involved in the community, she finished her social work degree, and now facilitates brain injury support groups and represents the interests of survivors of brain injury.

BC Housing

COST

ECONOMIC PERFORMANCE

100 YEAR GOAL: 100% ECOLOGICAL SUSTAINABILITY

The earth provides enough to satisfy every man's need, but not enough to satisfy every man's greed.

Mahatma Gandhi

SUSTAINABLE DEVELOPMENT
…development that meets the needs of the future without compromising the ability of future generations to meet their needs.

World Commission on Environment and Development 1987

The principle obstacle to sustainable design is the economic framework that encompasses our culture. Traditional economic thought provides no consideration for the regional or human scale, and supports the incorrect belief that natural resources are constant and free. The challenge of sustainability is to prove that sustainable design practices are a rational economic alternative to conventional design wisdom.

It is inherent in the methodology of economics to ignore man's dependence on the natural world.

Fritz Schumacher

ECOLOGICAL SUSTAINABILITY
… task of finding alternatives to the practices that got us into trouble in the first place; it is necessary to rethink agriculture, shelter, energy use, urban design, transportation, economics, community patterns, resource use, forestry, the importance of wilderness, and our central values.

Stewart Cowan & Sim Van Der Ryn

The understanding that the economy is a subsystem of the ecosystem is central to ecological sustainability. Sustainable design practices are morally, economically, environmentally, humanly, and ethically superior to conventional design.

"At the same time that wetland wastewater technology has been used to successfully meet water quality criteria, it has also aided in restoring a degraded urban waterfront." USEPA report Arcata, California - A Natural System for Wastewater Reclamation and Resource Enhancement.

The enduring legacy of the environmental movement is that it has taught us the distinction between price and cost. Price is what the individual pays. Cost is what the community pays. The marketplace works efficiently only when guided by accurate price signals.

D. Morris, 1990

ECOLOGICAL FOOTPRINT

When dealing with sustainability, one must consider the entire ecological demand that human existence places on the earth. The ecological footprint analysis measures the productive land required to support a given population. A rough comparison can be made between the average resident of Surrey today and the average resident of Surrey in 100 years by using a simple ecological footprint calculator (provided by Redefining Progress) and our assumptions about the future of Surrey.

SURREY TODAY

CATEGORY	GLOBAL HECTARES
Food	3.5
Mobility	1.7
Shelter	2.4
Goods/Services	4.2
TOTAL FOOTPRINT	**11.8**

If everyone lived like this, we would need 6.6 planets.

SURRY IN 100 YEARS

CATEGORY	GLOBAL HECTARES
Food	1.0
Mobility	0.8
Shelter	0.4
Goods/Services	0.9
TOTAL FOOTPRINT	**3.1**

If everyone lived like this, we would need 1.7 planets.

What Do We Do With Only One Earth?

We must learn to live within the means with which we are given. Our current way of life is far from sustainable as the calculations show. We need to take significant steps towards developing a more sensible way of living. Technological advances are helpful, but they are not the only answer; we must take a holistic approach to living, which highlights awareness of ecological limitations.

IMPLEMENTATION

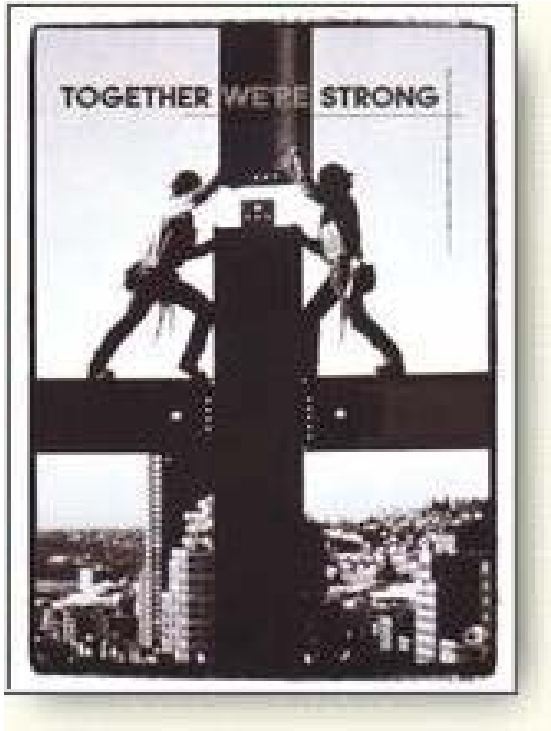
An important topic to consider is how these concepts and plans will be implemented from a human realm (political, citizen, business, etc.). What obstacles will be faced, what will the political framework be, and how realistic is it to assume the proposed changes will become reality?

Issues:

- Individual resistance to change.
- Business reluctance to alter operating procedure.
- Public government inability to agree to long-term goals.
- Slow pace of implementation may prohibit, or severely slow down action.
- Lack of transparency in political process.

Solutions:

- ***Education:*** slowly warming people up to change through educating all ages will help increase the overall acceptance of the proposed changes. If people understand why things need to change and how these personal changes will help, they will be more willing to adopt a new lifestyle.
- ***Bottom-Up:*** politicians are cautious for fear of losing public support and they are thus very slow to adopt new concepts. By taking a bottom-up approach at planning, the citizens can form critical mass that helps expediate the political will to make progress changes.
- ***Public Process:*** in order to gain the support of the public, the public must be involved in the process of change. It is vitally important to integrate the public throughout the entire process of moving towards a more sustainable future.
- ***Localized Governance:*** in order to achieve some of the initiatives that have been mentioned, a local government is better equipped to manage site specific needs. While some concepts require a regional presence, local governments need more sovereignty to deal with specific needs.



Working Together

Regardless of the specific course of action, all members of society must work together if Surrey is to become a truly sustainable city.