

DISCUSSION PAPERS ON THEMES OF SUSTAINABILITY

Theme 1 – Transportation

Transportation in Ottawa: A Greener Vision.

1) Introduction: The nature of the problem

Currently our transportation system is heavily weighted toward the car. So is the manner in which we continue to build new subdivisions. How transportation and land is planned and used are mutually and inextricably linked. The ongoing popularity of the car facilitates the familiar suburban development of single-family houses on increasingly large lots and permits us to spatially segregate various land uses.

Cars continue to demand and receive a larger portion of the available land.

In the end we get to where we are; living in one place, working in another while recreating and shopping in yet other places. These places are linked with highways and roads not with paths. Transit is of limited utility as not enough of us are going using the same routes or have the same destinations. Final result is near complete car dependence.

Our current land and transportation planning efforts appear to be reinforcing past mistakes rather than migrating them. Even our debates around mass transit systems in Ottawa miss the point. We are planning to spend billions to improve transit access to downtown while job growth is largely out of the core. We plan investments in expensive tunnels (through hard rock) rather than find ways to optimize and improve upon the existing bus rapid transit system. We continue to build on a hub and spoke style of transit planning when what is needed is building a grid.

2) The current situation

Look at Barrhaven (Farhaven) or Stittsville or any of the other communities outside of the greenbelt and you will see the same plans, the same mistakes repeated and even celebrated. Try to walk to a local store, or cycle to work or use transit to get to a doctor's appointment in any of these neighborhoods. Of course it is possible but it is usually time consuming and often simply unpleasant.

Even within the green belt we have built a car-centric transportation infrastructure – try to walk along Carling Avenue anywhere, try to cross the street. It is not surprising that you regularly see bikes on sidewalks – there are few pedestrians anyway the bike riders are simply making a logical choice.

Commute by bike to downtown and you either find yourself on car centered roads with cars passing you at 80 kms/hr or you are on recreational paths that do not bring you in a direct way to most anywhere you may need to get to and are often crowded with walkers, children, inexperienced riders and simply folk out for a little contact with nature.

We are fortunate to have a terrific transit system, if you are going to and from downtown. I think that the Transitway is a brilliant piece of infrastructure that is not being used to its potential. Ottawa, I believe, does not need a subway or a new light rail system. (Using existing tracks is a good idea) Ottawa already has a “subway” but does not recognize it as such. The Transitway ought to be used like a subway with feeder buses bringing commuters to stations and then buses on very short headways moving along the Transitway. The Transitway ought to be extended in a grid manner so that a commuter can take a direct route across the south of the city from Orleans to Kanata and have a viable alternative to driving.

3) The Vision

Ottawa’s transportation system will become focused upon people over cars. This means moving the emphasis from mobility to access. Give people access to their needs within their neighborhoods including opportunities for work without have to move quite so much.

Mobility is provided to the employment centers such as the downtown core and Kanata’s high tech corridor with direct, convenient and pleasant transit and active transportation links. But also make these business and employment centers more diverse with places to live, shop and access services, as well as work.

Technology is making this decentralization possible. Tele-work and telecommuting are increasing accepted by employers; the development of satellite offices is also growing more common. No longer do office workers need to travel for 30 to 60 minutes in a 1 to 2 ton vehicle to simply have a phone in an office.

Purely residential districts see both an increase in residential density and a greater mixture of use including places to shop and to work in meaningful jobs. Quiet streets have become people priority zones where the community members, children and adults alike, use the street as communal space for walking and playing and where cars are secondary to people.

Both within neighborhoods and between them there are strong active transportation links including a bicycle only infrastructure. Bikes need both a different set of infrastructure – on road and off, shared and exclusive and a different set of rules

4) Getting to the Vision

There are many paths that lead toward a more sustainable transportation system. It is important that better alternatives to the car be developed and built in advance of reducing car-dependence. People will not reduce car use without good and affordable alternatives.

The first steps are to reform the mass transit system and to build a viable active transportation network. Specifically the mass transit system in Ottawa requires fundamental rethought. If built around a rational grid that feeds an improved bus rapid transit system more people will have quicker and more pleasant commutes. Part of the cost will be the loss of long convoluted routes that require no transfer to get downtown. This ought to facilitate improved transit access for destinations away from the core of the city.

Zoning and land planning has to permit, even mandate, mixed use and create opportunities for people to live more of their lives within their neighbourhoods. It is interesting to note that high property values are found in mixed use and dense communities such as Westboro, New Edinburgh and the Glebe, while housing in Barrhaven is less costly. Westboro, New Edinburgh and the Glebe are all communities that are walkable, are based upon a grid; have shopping streets rather than big box stores and support locally owned businesses.

New subdivisions ought to be built with active and mass transportation rather than the car as the priority transportation modes. Grid systems should be imposed to reduce walking distances, to facilitate transit access and permit greater densities. Commercial streets should be encouraged over strip malls and big box stores. Overall the space dedicated to cars must be reduced while the walking/biking/transit environments must become more people focused.

To accomplish an Ottawa that has a more sustainable transportation system will require real political bravery. Many people will have to adapt to a style of commuting and neighborhoods will have to accept various styles of housing and a greater mixture land uses. There will be significant opposition to the necessary changes and that opposition must be honored and where possible accommodated. But the changes must ultimately be made.

A note on cars: As stated above the personal vehicle is not going away anytime soon. We need to improve our fleet fuel consumption rapidly. Changing our urban design and our urban planning priorities will take decades – time that we really do not have, where as changing consumption standards can be done very quickly. Better vehicle fuels may also be part of the solution as long as we proceed carefully so as to not make one step forward and two back. Tax and regulatory policies need to be reviewed and changed to create an environment supportive of more efficient cars and cleaner fuels. This needs to happen soon and can only be done by upper levels of government – especially the Federal government. Municipal governments can only support such change.

- Don Houston: Draft 2, August 7, 2009

I am sitting at my computer, a cup of coffee at hand thinking about energy. Where it comes from, how it is used and how its use might change in the future. My laptop was made using energy. It is now running on electricity. The coffee is an Indonesian blend and has travelled far to reach me here in Ottawa.

Most of the objects on my desk were made with the energy provided by fossil fuels and some of them were made from fossil fuels, (oil, gas and coal). I know two big things about fossil fuels. One, they will eventually run out. And two, the carbon they contain is increasing the amount of carbon dioxide in the atmosphere leading to a warming of the planet.

Global warming is big news today and it is scary. At the start of the industrial revolution the amount of carbon dioxide in the atmosphere was 270 parts per million. It is now 380 parts per million and climbing. Climate scientists keep sending out warnings that catastrophic changes in our planet's ecology and climate will occur if those amounts keep increasing.

The city of Ottawa has joined together with the City of Gatineau and the National Capital Commission in a joint planning initiative called "Choosing Our Future". One of its objectives is to set long term goals to guide future sustainability planning in the National Capital Region. They will produce a Community Energy Plan. Biosphere Eco-Cities hopes to help the city at the community level by encouraging citizens to carry out sustainability projects in both the rural and urban parts of Ottawa. These may include community energy projects.

The way we use energy today is the major contributor to global warming. Even if we have enough oil, gas and coal left to power our economies, global warming is a fast growing danger. It will destroy economies and ecosystems throughout the world. So what can we do about it? How can we support our institutions as they try to change? How do we support each other and our communities as we try to change?

First we have to keep talking with each other, respectfully and with understanding and compassion. Some of us may be ahead on the climate change/peak oil learning curve. Some of us know more about systems theory. Some of us understand economics better. Some of us have studied ecology and ecosystems. We need to increase opportunities to converse with our friends, our neighbors, farmers, businesses and our institutions. We need to share our knowledge. We need to focus on the things that we can do.

Most of us have heard about the things we can do in our homes to reduce our use of energy. Things such as lowering the thermostat in the winter and raising it in the summer, to reduce the need for heating and cooling. We can add insulation to our homes and put in energy efficient windows. We can change our light bulbs to

fluorescent or LEDs. We can put our electronic devices that use standby mode on power bars that we turn off when we are not using them.

We can choose to buy electricity from companies that buy from renewable energy sources and encourage our local institutions to do so too. We can drive our cars less and walk, use bicycles and public transportation more. In short we can become conservers and promoters of renewable energy.

The technologies certainly exist and have been tried that could reduce our use of coal, oil and gas. Enough sunlight falls on our planet every day to power human society many thousands of times over. There are places where wind blows so regularly that wind generated electricity is a natural. Wave and tides can generate power, as can small rivers. Biomass is another renewable resource that can be used in a way that does not increase greenhouse gas emissions as long as the plant matter is replaced by re-growth.

Perhaps with institutional support more of us could be energy producers. I know a family that has installed PV panels on their roof. They are producing electricity during the peak summer load periods and supplying it to the Ontario electricity grid. Imagine more citizens in Ottawa producing electricity on their roofs and helping to insure that there will be no more summer blackouts during a heat wave when everyone turns on their air-conditioning!

Other families have installed solar hot water heating systems that provide hot water for household use and also for heating. Some have installed geothermal heat pumps that provide both heating and cooling using only a small amount of electricity. It is true that these options may seem more expensive than the ones we are used to. But most often we are not including the cost of managing pollution caused by using carbon based fuels. Perhaps we might talk together about the economics of renewable energy use.

Perhaps we could talk about community energy plans at the local level, in neighborhoods, in new communities, in high-rise dwellings. Business too could get together to explore joint renewable energy options. Governments are beginning to offer incentives to people and business to adapt to non-carbon based energy systems and we can encourage them to increase and accelerate their support of renewable energy options.

Farmers in Ottawa along with growing food might also be encouraged to grow wind farms. Crops can be grown up to the base of windmills. There is lots of waste biomass on farms that could be used to produce fuel. Wind farms and biomass conversion could provide another source of income for local farmers. The community conversation about becoming a sustainable and resilient region must include farmers and other rural landowners.

This paper only touches the surface in exploring alternative and renewable energy options for our city and our region. "The Choosing Our Future" initiative surely needs

our input and our support. We need to put ourselves in the picture and imagine our lives and the life our region transformed from a carbon powered to a solar powered future.

- Leandrea Kane- Energy GP draft 1, July 26, 2009

How we design and build our roads, bridges, homes, institutional buildings, transportation systems and agricultural systems influence whether Ottawa becomes a sustainable city. Compact cities make public transportation more efficient. Denser cities make walking easier and mixed-use neighborhoods are safer because there are more people about the streets.

Buildings use about 40% of our energy consumption and produce a similar amount of carbon dioxide as waste. We know transportation contributes another significant amount of carbon dioxide, as does road building. Industrial agriculture also uses large amounts of fossil fuels to power agricultural machinery and fertilize crops and generates waste most seriously in the form of water pollution. Modern agricultural practices can also lead to soil depletion.

There are a number of movements afoot to help reduce the amount of energy used and pollution produced by our built environment. There are smart growth strategies, environmental design standards, improved public transit systems, organic farming, urban and suburban densification projects, improved recycling systems, and more urban and rural tree planting.

Perhaps Ottawa citizens might engage in conversation with each other about the different ways in which we can make Ottawa more sustainable and resilient. Climate change and increasing energy costs are two of the challenges facing us. Both will affect how we design new infrastructure and homes and how we grow our food and where it comes from. We may decide that using local, renewable or recycled materials in our buildings and producing and buying food locally are the ways of the future.

Cities around the world are becoming denser. Denser, more compact cities can use less energy. All around Ottawa we see new high-rise buildings going up with LEED (Leadership in Energy and Environmental Design) certification. This certification tells us that there is an attempt by the designers and builders to increase the efficiency of the buildings in their choice of materials, energy and water systems. LEED certified buildings usually have better air quality too. And they are often cheaper to operate.

Other buildings might produce their own energy using photovoltaic solar panels on the roof or sides producing electricity. Solar panels can also heat water. New developments might be encouraged to supply district heating and electricity systems using renewable technologies. Geothermal systems, heat pumps that use the difference in temperature between the ground and the air to provide heat and cooling, are a good option for new developments as well as replacement systems in buildings that need to refurbish their heating systems where there is enough space to install them.

New homes and developments can make use of the latest ideas in sustainable living including roof top gardens, district heating systems, mixed use neighbourhoods that include small local businesses and community food production. The houses and business of the future will use much less energy to heat and cool than those of today. More food will be produced and consumed locally.

What about older buildings? Many of our older homes could use serious upgrades to make them more energy efficient such as increasing insulation and adding energy efficient windows. Homeowners can get various grants from government for renovations, which will reduce pollution by using less energy and also save money.

Transportation infrastructure will change greatly in future as our fossil fuel supplies become more expensive and we try to reduce the amount of carbon we release into the environment. Our transportation system will become more extensive and perhaps more varied. As well as buses and light rail, we might encourage more shared ride systems including vans, taxis and smaller buses to serve less populous areas.

Our cities might change also in the amount of green space that is created and used. Perhaps as public transit use increases, parking areas can be returned to parkland. The number of community gardens should increase in the future. Neighborhood community centres will be offering more cooking and canning courses. We may even see neighborhood chicken coops!

Suburban areas will probably need to become denser too. As the price of fuel increases, living in the suburbs may become too expensive unless more jobs are created. Zoning laws might change to allow more businesses in residential areas so that suburbanites can find jobs in their community. Perhaps larger suburban lots will be places for intense gardening, animal husbandry, and small energy production such as wind or PV. The possibilities are endless.

The City of Ottawa's "Choosing our Future" initiative is looking at building a sustainable and resilient National Capital Region. They will be sharing their on going work with us and seeking input from us. We can help the city by learning more about the different models cities have developed till now. The Natural Step, Cities Plus, Agenda 21 Cities, Transition Towns and the Permaculture Movement are all models that we might look at and talk about as we come together to redesign Ottawa. The Biosphere Eco-Cities project is also a framework to share information, ideas and local projects for a sustainable Ottawa.

Let's get come together to redesign our communities. The challenges are many but we have enough education, experience, skills, ingenuity, and creativity to meet the challenges of the future.

- Leandrea Kane, August 5, 2009

Habitat is where we live. It might be in a high rise building in the city centre; it might be in a single family home in an urban neighborhood with tree lined streets and small shops a few blocks away; or perhaps it is in the suburbs on a large lot covered with grass, shrubs and wildflowers which we plant and tend. Some of us live in villages and small towns surrounded by farms, wetlands and forests. And some of us live on these farms and provide food for communities nearby and far away. The nearby city is a source of employment, consumer goods, culture, sports and entertainment.

Our habitats are found in many different ecosystems. An ecosystem is an interdependent community of plants and animals and the non-living things such as water, soil and air that support it. The National Capital Region is part of the Ottawa River Watershed, which is a part of a bioregion also known as the Great Lakes/St Lawrence River watershed.

More and more of us on Earth now live in urban ecosystems, which depend on the surrounding rural areas and even further away for food, energy, organic materials and inorganic materials. In return our cities produce and export products and services, money and culture that enrich rural life. The city and the nearby countryside are linked and mutually interdependent.

There are many animals that are able to exploit the habitats that we have created in the city. For example, spiders and silverfish live in our damp dark basements and in our cats' litter boxes. Pigeons thrive in intensely populated cities as do sparrows and starlings. They are able to nest in our homes, on porches, under bridges and on highrises and feed on our handouts, our garbage as well as on insects and plants. Racoons and skunks find refuge in attics and under garden sheds. Robins and cardinals can live in urban areas too, in back yards and urban forests, as do squirrels and bats. Gulls, redwing blackbirds and Canada geese are often seen feeding by urban waterways next to busy roads.

Rodents such as mice and rats live in our homes and our sewers and our garbage dumps. Groundhogs can often be seen grazing in green spaces along highways and beavers are common in our rivers where they flow through urban areas. In urban rivers and along the shorelines can be found muskrat, great blue heron, cormorants and various species of ducks. These animals use our waterways to travel as explorers and settlers once did.

Black bears, white-tailed deer, red fox and beaver may even stray onto city streets and become confused when they leave their natural habitat such as nearby Gatineau Park, the greenbelt around Ottawa and the Ottawa River and enter ours by error. Their appearance in our neighborhoods can cause a great deal of consternation for both them and us.

Many of us are happy to see the birds, mammals and insects who share our urban ecosystem with its many habitats, whether a damp basement, overgrown right of way, or river shoreline. We love wildflowers, shrubs and trees and feel good when we spend some time outdoors. We also enjoy going out into the countryside to enjoy nature in a quieter setting. We may not enjoy mosquitoes or rats and we may worry about diseases that animals carry but we would feel impoverished if our urban and rural landscapes were bereft of wildlife. Consequently it is important for us to find out about the habitats that wildlife need and to consider their needs when we are planning both the urban and rural parts of the city.

If we wish to retain a diverse urban ecosystem with many habitats for us and wildlife and plants, we need to maintain urban forests and wetlands. The Britannia Conservation area is a good place to see great horned owls and painted turtles. Carlington Woods, a small area surrounded by residential and industrial development is habitat for oak, hickory and basswood and a great place to see migrating birds. Baxter Conservation Area includes diverse habitats such as marsh and forested wetland.

It is important that we retain these habitats. We need to connect green spaces in the urban area with suburban and rural green spaces so that animals don't become isolated and can have more opportunities to finding mates for breeding. We need to protect our wetland habitats, not just for the animals that live and reproduce there but also for the natural services that they provide for us such as water retention and water filtration.

Our urban ecosystem is dependant on food and energy from the surrounding rural areas and even from places far away. The surroundings receive waste from the city. People spend energy travelling from rural to urban areas and the roads we need disrupt habitats for the animals that live around us. When we expand our city, especially into suburban and rural habitats we may be reducing the amount of agricultural land which we may need in future when the cost of transporting food from across North America and the world becomes too expensive and too polluting. Major roads cut across animal travel routes and cause accidents dangerous for both animals and humans.

There are lots of good reasons for us to spend some time thinking about our place in the world and that of the other animals and plants with whom we share it. Humans are so adaptable and we are able to live in so many different ecosystems and extend our habitats to so many different corners of the world. Some of our fellow earthlings can live with us. On the other hand there are other animals whose requirements are more exacting and they will not survive if their habitats are not protected. Our world would be impoverished if polar bears disappeared, or blue whales or mighty bald eagles. There is much we can do to protect and even recreate habitats for our fellow earthlings in and around our city. And we can work with others to protect endangered habitat worldwide.

- Leandrea Kane-draft 2, August 7, 2009

All of us want a sustainable food supply. But we also want quality and affordability in the foods we eat. We know that this requires a healthy agricultural sector. But we also know

that this sector is facing significant challenges. Dependence on oil in an era of declining petroleum resources is one of them. Reduction of agricultural biodiversity – the variety of plants and animals that constitute our potential food supply – is another. The food system is complex. How can we, as rural and urban residents, address these daunting problems?

Two fundamental aspects of a Biosphere Eco-City are: Participation of all stakeholders and Cooperation among urban and rural components. These two elements are key to our actions to ensure a sustainable, affordable, high quality food supply in the future. We may think of farmers and consumers (all of us) as two ends of a business equation, but our desire for sustainability is very similar. We need to find ways to act together. Also, many organizations are involved in the food system – agricultural associations, retailers, distributors, consumer groups, government and so forth. As employees, business owners and citizens, we can contribute to the directions of these organizations. Also through our community associations, we can suggest project ideas, linking these organizations and take part as well.

One way to address sustainability is to ensure a regional supply of food. To make a local food program successful, we need to understand both the local demand and the local capacity to produce those foods. Which foods are best for local production will depend on factors such as price, specialized production and competition. For example, exotic fruits such as bananas and mangos would be very expensive to produce locally. At the same time low cost bulk crops such as wheat, that are efficiently produced elsewhere, may out-compete all but the organic locally grown offerings. The seasonal nature of many crops also creates a demand for a distant supply. But fruit, vegetables and meats that are valued for qualities such as taste, freshness and nutrition are good candidates for local production and sale. This fact is already borne out by the success of local farmers markets in both urban and rural areas.

Demonstration projects on food sustainability can work well in a local area such as a Biosphere Eco- City. This is because a local project is developed directly through individual producers, service providers and consumers. We all have a role in the project. Farmers can decide on how to participate, with what crops and how to evaluate success. Consumers can indicate preferences by their purchases, as well as verbally in project feedback. In between there will be a variety of local businesses such as: cheese factories, truckers, abattoirs, warehouses and retail outlets. We can also include institutional factors such as: labour pools, governments, colleges and universities (for training and research). Ideas can come from discussions within and among any of these organizations. Our urban and rural community associations can contribute ideas to the projects and encourage member support.

Cooperation among stakeholders in a local sustainable food project can lead to partnerships. These will help the project and lead to other joint ventures. We will find natural alliances forming. For example, urban gardeners might find they had common interests with local farmers. Both groups share a love for growing things, a respect for soil fertility and a desire to produce good food. It is easy to see how the urban group

could become advocates for the rural. We might find this partnership leading to strong support for farmers markets, and for maintaining good growing land in both urban and rural parts of the city.

Urban agriculture could also develop out of this cooperation. Backyard, vertical, rooftop and communal gardens – perhaps with small animals – could supplement rural products at local farmers markets. It would also be a source of family food as well as income.

A great challenge for agriculture is the maintenance of soil nitrogen and phosphorus in the face of increasing costs and reducing supply for these chemicals. But there are things we can do cooperatively. A project that developed techniques to produce Bio-char (from farm wastes) could reduce nitrogen needs by 20% to 30%. Phosphorus is perhaps a bigger challenge because a long-term solution will require the recycling of urban nutrients. We will need to push for a complete redesign of urban sewage systems to separate all toxic wastes so that phosphorus and other nutrients can be provided to farms.

Our community associations have organized workshops on sustainable food and could play an even bigger role. For example, the need for nutrient recycling (discussed above), local food marketing and nutrition are important areas for discussion. The associations could also organize practical training on a variety of food topics such as: urban gardens, root cellars, home canning and freezing etc.

Small, diversified farming systems, with on-farm recycling of nutrients, mimic natural ecosystems. This model was common when some of us were young. Animals provided a regular source of nitrogen for crops as well as some of the farm's energy needs. Policies that support small-scale farms and gardens will help us make the transition to a sustainable food supply in the coming post-carbon era.

Less mechanized farms will require more labour and specialized services. As we develop new farming systems, we shall need to link them to regional employment programs. This will require a lot of local input as we find ways to provide public transportation for urban workers in rural areas etc.

Knowledgeable urban residents and politicians can lend their support to the agricultural community for policy changes that will help farmers adapt to high fuel costs and other factors. It is through cooperative activities among rural and urban components of the region that we will learn enough to be able to do this. Together we will all benefit.

Agricultural biodiversity is a very important topic that can be addressed locally through cooperation. Modern agriculture is based on a narrow range of plants and animals, provided by large seed companies and breeders that cater to an international market. Today, only a fraction of the world's genetic diversity of food crops and animals is being used in production. As we cast aside local seeds and animal varieties, we lose the security of a large genetic base that would help us adapt to climate change and disease. Within a local food project, however, we might find economical ways to market

traditional varieties of crops and meats, and protect this precious agricultural biodiversity.

Food links easily to other Themes of Sustainability. Here are some examples:

Energy – Biogas, waste conversion, low energy cropping

Design – Agricultural land retention, roof top gardens

Habitat – Preservation of habitat on local farms

Natural Capital – Soil maintenance through crop selection and equipment use

Waste – Full-system nutrient recycling, urban compost for farm soils

Health – Food freshness and nutrition, health impacts of farm chemicals.

Questions to debate could include:

How to bring back the best of past practices (e.g. farmers saved seeds from year to year, added natural soil amendments, and produced most of their energy needs)?

How to add the best from the present (e.g. organization, science, education, technology) ?

How to build resistance against scarcity and volatility of agricultural inputs?

Can small-scale farming be reliable and profitable?

Can renewal of local agriculture create employment in areas such as: food handling, transport, marketing, sales and farm labour?

Could sustainable agriculture form the basis of a youth education program?

How to develop rural-urban networks to make cooperative projects happen?

Jim Birtch, 8 August 2009

Theme 6 – Natural Capital

PRESERVING NATURAL CAPITAL IN THE NATIONAL CAPITAL

Human well-being depends on the services and assets that nature provides for free, everyday and everywhere.

WHAT IS NATURAL CAPITAL?

The term 'natural capital' refers to the land, air, water, living organisms and all formations of the Earth's biosphere that provide us with ecosystem goods and services essential to our survival and well-being. These include the services that nature provides free of charge, including supporting services such as soil formation, maintenance of soil health and fertility, natural pest control, pollination, nutrient cycling, and a stable climate; provisioning services such as food, clean air and water, fuel and fiber; regulating services such as prevention of soil erosion and flood control; and cultural services, which include recreation, spiritual value and a sense of place, among many, many others.

NATURAL CAPITAL IN THE NATIONAL CAPITAL – WHY SHOULD I CARE?

We are increasingly recognizing that healthy natural systems perform a series of vital functions on which our lives depend.

One of the most critical services is watershed protection. Intact watersheds play a pivotal role in providing us with clean drinking water by filtering sediments and pollutants. They also play an essential role in storm protection through managing floods and storing water. These are key functions upon which our communities depend.

Forests, too, provide us with vital ecological services, including storing carbon in trees, vegetation and soils. This process of carbon sequestration is a critical component of the global carbon cycle that regulates the earth's climate. This particular service is likely to become increasingly important as the world strives to address the challenges of climate change.

Soil is yet another example of natural capital that is critical to our well-being, taking hundreds to hundreds of thousands of years to build up – and yet very few years to be lost. Soil moderates the water cycle; shelters seeds and provides the physical support they need to sprout and mature into adult plants; retains and delivers nutrients to plants; plays a central role in the decomposition of dead organic matter and wastes, rendering many potential human pathogens harmless; recycles the products of decomposition, or nutrients, back to plants; and plays a key roles in regulating the earths' carbon, nitrogen and sulfur cycles. When fungi, worms and bacteria transform the raw "ingredients" of sunlight, carbon and nitrogen into fertile soil this transformation is an ecosystem service.

Ecosystem services are not well understood and are far too complex for us to reproduce even with the most advanced technology. Since the flow of services from ecosystems requires that they function as whole systems, the structure and diversity of the system are important components of natural capital. If we allow our natural capital to be depleted and to degrade, so will the benefits. On the other hand, if we look after and maintain our natural assets, we will benefit from greater returns!

THE DEPLETION OF NATURAL CAPITAL

Until recently, we have tended to take ecosystem services for granted, as they have generally been 'free', despite their obvious economic value to us. Traditionally, produced and human capitals have gauged economic performance, while natural capital has been left out of the equation. This has led to degradation and depletion of natural environments and the loss of valuable ecosystem services with the appreciation of the often tremendous importance and economic value of natural capital only upon its loss.

Although natural capital is essential to sustaining our lives, human activities are often responsible for its depletion and degradation. The quality of natural capital may be degraded through the disposal of wastes from industry and consumption by households.

Emissions of various gases from factories and cars can change the composition of the air and contribute to global warming.

As a result of degradation and destruction of nature we could lose some of the sustainable benefits in our region:

Our neighbourhoods get flooded

Urban areas get hotter in the summer

We can no longer find good local fishing places

Our fresh water supply becomes less reliable and requires more costly processing,

Our neighbourhoods become flat and boring

Thus, the preservation of natural capital plays a pivotal role for sustainable development: development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.

THESE ECOSYSTEM SERVICES HAVE ECONOMIC VALUE

How much is a forest worth? And how do we determine that value? Do we simply count the trees and determine their value if we were to cut them down and turn them into logs, lumber, and pulp and paper? Although this has been the traditional approach, it is becoming clear that a forest is much more than the timber it holds. A forest provides habitat for wildlife, recreational opportunities for hikers and hunters, a place for quiet contemplation, and filtration a place of carbon sequestration, and storage of drinking water. When all the ecological benefits, or services, a forest provides are taken into account, we have to re-evaluate the way we make decisions about how we manage them.

Taking into account all the values of a forest doesn't mean an end to logging and mining, of course. It just means finding better ways to sustainably manage all our activities in these ecosystems.

WHAT CAN I DO?

We are making choices. The choices we make in our activities have an impact on natural capital, and could save money, locally, with the right choices. In fact, protecting natural capital in settled areas could save Canadians hundreds of millions to billions of dollars each year.

Be part of the solution - get involved in Eco-city projects that:

- promote compact urban form, encourage sustainable agriculture or maintain forest cover near cities can help preserve precious soil resources;
- retain forest cover, reduce agricultural pollution in upstream areas, preserve headwaters, wetlands, aquifers to help maintain the quality and a reliable supply of fresh water to meet growing demands;
- reduce road expansion or recycle construction materials can reduce the use of natural resources.

- Kara Vlasman- Natural Capital Draft 2 - August 6, 2009

Introduction

Sustainable cities learn how to reduce, reuse, and recycle their waste. As cities adopt more progressive environmental practices, their citizens accept more personal responsibility for the waste they generate and for its adverse environmental and social effects.

Outlined below are three scenes that address key waste control challenges that cities face as they strive to be more sustainable. The first scene focuses on a conversation about waste between a woman and her granddaughter. The second scene examines the natural ways that farmers handle waste. The third scene features the waste elimination practices of a green building in a sustainable neighborhood. All three Ottawa scenes are set on a hot September day in 2030 as you drive your solar-powered Segway along Bank Street's bike path. These scenes invite you to imagine how waste will be dealt with sustainably one or more generations from now.

First Scene

Overhead, wave upon orange wave of Monarch Butterflies migrate southward. You pause by a shaded park bench nestled in a natural garden by a wee wetland to listen to a grandmother, Nan, chatting with her granddaughter Tina.

Tina: "What did people in Ottawa do with waste when you were my age Nan?"

Nan: "Now that's a sad story Tina. Fifty years ago, in the 1980s, almost everything we used became waste. So we dug big holes and threw our garbage into them. We made mountains of solid waste, polluted the rivers, fouled the air, and released tons of greenhouse gases into the atmosphere. And we made animals, plants, and people sick and spoiled some of the habitat needed to support life."

Tina: "That is a sad story! Wasn't it wrong to hurt people, plants, and animals and make nature sick?"

Nan: "I think it was wrong and many people now realize that these wasteful practices weren't right."

Tina: "When did people in Ottawa stop being so wasteful and start making nature feel better?"

Nan: "Well, for a long time everyone talked about waste but few people did anything. But then around 2010, when your Mum began school, people started to get serious about eliminating waste."

Tina: "What did people do to make waste go away?"

Nan: “More than anything else, people changed the way they thought about their waste. It seemed as if all at once they realized they consumed much more than they needed, drove their big cars everywhere, lived in oversized, unhealthy houses, and spoiled nature. So, they changed their lifestyles.”

Tina: “How did they change their lifestyles?”

Nan: “People started living sustainably. They grew more of their own food, and they started buying local things in bulk and shunned wasteful packaging. And they travelled around on foot, bike, or public transit unless they had to drive their compact, pollution-free cars. Also, many of them moved into mixed-use, low-rise green buildings closer to where they worked. They began practicing the three R’s”

Tina: “What are the three R’s?”

Nan: “The three R’s stand for Reduce, Reuse, and Recycle. The most important is to reduce your wants to your needs. After that, before you buy something new, reuse what you already have or buy something already used. And, finally, recycle as much as you possibly can before discarding anything”.

Tina: “That’s a lot! Did this make the waste go away?”

Nan: “Yes, that is a lot, but people did more. They made sure that polluters paid. If someone put out extra bags of garbage, they paid to dispose of it. Consumers insisted that producers take responsibility for their wasteful products and either stop producing them or take them back. Landfill operators began capturing the large volumes of greenhouse gases still escaping from the mountains of old organic waste in dumps and converting the gases into green energy to power villages and towns. And look at the small wetland behind us – it catches the storm water runoff, cleanses it, and slowly releases it into the river. By doing all these things, people in Ottawa made the waste go away”.

Second Scene

It is late afternoon. Here and there, Ravens perch in the crowns of Mountain Ash. Continuing along the bike path, you spot Bill Thompson, a sharp 85-year-old friend, tending his stall at the farmers’ market near the restored Patterson Creek in our Central Park. Seeing Bill makes you realize that you’re missing the rural part of Ottawa’s waste saga. After filling your container with Bill’s organic honey**, you ask how farmers handle waste.

Bill: “What will surprise you the most is that my grandparents Lloyd and Martha and my grandson

Tyler and his wife Megan – five generations spanning one hundred years – farm in similar ways. Lloyd and Martha had a tough go of it during the Great Depression of the 1930s – no running water or hydro and only a windmill to pump well water. They grew much of what they ate and wasted nothing. They preserved vegetables in sealers, and perishables were stored in an icehouse with blocks of river ice covered in sawdust to keep things cool. And, they kept the cattle out of the river because the family down stream drank from it. Crop rotation was common sense, and animal manure was natural fertilizer that enriched the soil. Loggerhead Shrikes dotted the trees bounding the fallow fields. What wasn't needed wasn't done – they closed off spare rooms in the winter to save on cordwood.

Lloyd and Martha lived simply, wasted not, and were proud and good stewards of the land. And here and now in 2030, Tyler and Megan have come almost full circle and follow most of their ancestors' sustainable farming practices. They still compost, use only heritage seeds and natural fertilizer, and keep the livestock out of the river. The Loggerhead Shrikes are abundant again. For sure there are some changes – such as the old farm house now has R-2000 insulation. We're energy self-sufficient thanks to the many solar panels and two wind turbines. We feed our surplus energy into the grid to share our green energy with others and to cash in on Hydro's generous feed-in tariff. The tractor is solar-powered and so is our car. You couldn't fill a wheel barrel with the waste we generate in a year.

So that's it: five generations of waste-free farmers acting as good stewards.”

Third Scene

Twilight now fills the sky with thick flocks of Chimney Swifts wheeling their way to communal nests nearby. Arriving home, you park the Segway in the “share-drive” spot so neighbors can also use it. Then you stop downstairs to collect some fresh vegetables from the communal garden, irrigated by the rainwater cistern, and to buy organic milk at the neighborhood store below your home. Climbing the stairs to your second-floor unit, you marvel at how cool it is inside despite the scorcher outside.

Happily, you remind yourself that this LEED-certified building, constructed from recycled materials, has extensive insulation, a green roof, and louvers and trees to block out the sun, as well as solar-powered fans that draw up cool air from the basement and discharge the hot air from vents near the roof. The building is further cooled by storm water circulating in pipes in the floors. Entering the unit still bathed in natural light from the light wells and ample windows, you see a flashing message on the computer monitor from Hydro Ottawa thanking you for feeding hundreds of kWh of electricity into the grid in the past month from your solar panels, geothermal systems, and neighborhood wind turbine and composting facilities. You must finish a project, so you log on to your laptop and begin working remotely with your colleagues spread across the City.

Questions for Discussion

What values and beliefs do you think make some people want to do more to eliminate waste?

- How important do you think the three R's described in Scene 1 are in controlling waste?
- In Scene 2, Bill Thompson outlines several ways farmers live sustainably and avoid waste.
- Can you think of other ways farmers do, or could further, reduce their waste?
- Do you think the waste reduction practices in Scene 3, on green buildings and healthy communities, make sense?
- It's 2030. If a child asks you how Ottawa rid itself of waste; what do you hope to tell them?

* Thanks to Bill Toms for inspiring this scene by sharing his mother's story of her family's simple but good farm life during the Great Depression.

**Fortunately, the Thompsons refuse to use pesticides and so their organic bee colony is immune from the pandemic collapse of commercial bee colonies worldwide. Indeed, the Thompsons are spearheading a campaign to support and grow the organic apiary industry across Canada. Also, increasingly the family, and many other organic beekeepers, now loan their bees to thousands of Ontario farmers who desperately need pollinators.

- Mike Lascelles, 8 August 2009

A sustainable urban region will have clean air and water for all its residents. People will live in safety and the needs of more vulnerable members of society (children, the elderly and the infirm) will be taken care of. In both urban and rural areas, it will be possible to find places of tranquility that will ease the pressures of daily life.

CLEAN AIR AND WATER

As residents of Ottawa, we are proud of the healthy environment we enjoy. Yet there may be things we can do to ensure that it stays healthy for ourselves in the future.

As urban dwellers, we may have witnessed the dumping of oil or other chemicals down sewers that will take this pollution to the river. Is there something we can do in our neighborhoods to help educate everyone about the importance of clean water

Some of us run small businesses and might like to reduce the exhaust emitted by our delivery vehicles. Perhaps of a hybrid vehicle would have a better economic as well as environmental payback. Or perhaps we could reduce the number of vehicles we use. There maybe an industry in a rural area that seems to be polluting, or there may be one that is an example of stewardship. Perhaps a 4H group, school, guide troop, women's

auxiliary or legion might celebrate good business practices and help to correct problems.

Our farms are certainly contributing to the beauty of the countryside while satisfying our need for food. But are farmers taking care of their own health? Do they leave partly used containers of chemicals in the barn? Do they equip themselves properly to limit their exposure to dangerous products? Do farmers take advantage of all the training courses offered to them to learn how they can protect themselves and the environment while carrying out the business of farming? We all need healthy farms and healthy farmers.

In urban areas, the threat of automobile traffic to pedestrian safety can be reduced through urban design and better public transit. In rural areas, it might require community action to change dangerous stretches of road or to transport young people to recreational facilities. Can we work with others to identify and fill these needs?

Pedestrian-friendly areas of cities may have less crime. Robberies, vandalism and assault tend not to occur where people are out and about enjoying themselves. Also, lines of sight and openness can be important. We may wish to learn about and talk about the developing specialty of crime prevention through environmental design with in neighbors.

Many of us live with dogs. Do we ever think of the public safety benefits of dog walking? Whether at dawn or the evening, dogs and their owners are the eyes and ears in our streets and parks. They notice when something strange is going on. Maybe some things haven't changed that much – 100,000 years ago dogs guarded human's hunting camps, today they help keep our neighborhoods safe.

Teenagers can sometimes be the source of various crimes. Can this be addressed through recreation and training projects? Young people need activity that is enjoyable and affordable. They also need to develop skills that will allow them to be creative, feel important and earn an income. A recent example of community action on behalf of teenagers involved a youth centre, which the young people both designed and built. The project coordinator purposely recruited some of the local troublemakers to erect the building, giving them a positive outlet for their extra energy and producing a sense of pride in their accomplishment.

The City of Sao Paula, Brazil has a very interesting environmental program to keep young people out of crime and dead-end jobs in suburban areas (where social problems are greater than in the urban centre). A one-year training program provides accreditation in sustainable forestry or agriculture, food preparation, or the production of art from recycled materials. Perhaps a business association might work with a school board to sponsor a similar program here.

Fire safety in poorer residential neighbourhood may depend on building renewal and education (e.g. teaching people about the importance of smoke detectors). In rural

areas the lack of water lines is an issue in fire fighting. The range of protection can be extended through the installation of “dry hydrants” which are non-pressurized suction pipes in lakes and ponds.

INDOOR AIR QUALITY

We know that insulation and a tight building envelope will reduce winter heating and summer cooling costs for homes or offices. But a well-sealed building also reduces dust infiltration, as well as moisture that could lead to mould and mildew. Not only does this make a building more comfortable, but it also protects health. Look for insulation that does not off-gas noxious chemicals. For some flat roofed buildings, summer insulation might be a layer of soil supporting a garden

What about installing a whole-house fan? Mounted in the attic over a louvered cover, the fan will pull fresh air into the house in the evening, put the warm inside air into the attic and push the oven-hot attic air outside. When we come home from work, all we need to do is open a couple of windows on the cool side of the building, turn on the fan and experience a gentle breeze through the house that feels several degrees cooler than the still air that was there moment earlier. On very warm nights, the fan can be left on at low speed all night and the temperature of the house in the morning is the same temperature as the nightly minimum. And a 24-inch fan that is sufficient for a normal house uses 10% of the electricity of a 3-ton air conditioner and is much cheaper to buy and install as well.

ADDRESSING THE NEEDS OF VULNERABLE GROUPS

There are always vulnerable people on our neighborhoods and we need to ensure their safety. Can the needs of different groups be addressed in similar ways? It is clear that children should have open areas to play in that are close to their homes, healthy and safe. Seniors and handicapped persons require similar areas. So if our neighborhood is planning a park or a green space we can plan it so that our common and individual needs are met?

People often move to villages because they are seeking a sense of tranquility. But if they are driving everywhere, are they finding it? Many towns and villages have enhanced the tranquility of their environments with walking paths and meeting places. Do we have ideas on how to do more of this?

In urban areas, tranquility is enhanced with a more human scale of city design, reductions of traffic and noise, and development of green spaces. Sometimes the only peace a harried office worker or store clerk finds during the day is during lunchtime on a park bench. What are the health benefits of that?

Recreation is an important use of green space in both urban and rural locations. If designed poorly, outdoor recreation can degrade the environment. But when we plan

carefully, our leisure uses of green space can provide social and economic benefits that help to maintain natural elements of our landscapes.

Facilities for recreation are important to sustainability for a number of reasons. The buildings and other structures are visited by a significant percentage of the local citizenry. Therefore they have the potential to demonstrate sustainable practices. As well, proper location and transportation linkages will improve their benefits.

Recreation also provides social benefits that relate to the goals of a sustainable city. Health, safety and community participation are among these.

This paper discusses various aspects of these general qualities of recreation and links the topic to other Themes of Sustainability. The goal is to encourage the development of ideas and debate so that we may make our recreation system more sustainable.

Rural green space is essential to recreational activities of both rural and urban residents. Here are some issues we might discuss:

- Campgrounds and Picnic Areas
- Do they have sound environmental practices? Are they accessible to handicapped persons?
- Conservation Parks: Can they be connected by corridors to urban parks to support species biodiversity?
- Farm Properties: Can we compensate farmers for maintaining wildlife habitat? How might farm visits be increased in school and tourism programs?
- Waterways: Are recreational water vehicles and activities polluting lakes and rivers? Should emission tests be required?

Urban green space is smaller than rural but more intensively used. We might contribute our ideas in the following areas:

- Parks: How can we ensure that parks are safe and accessible by vulnerable groups such as children, seniors and the handicapped? How do parks provide habitat?
- Pathways & Trails: Can we ensure that trail use does not degrade the environment? How do these routes form part of our transportation system?
- Dog Parks: Can we add more fenced dog parks to reduce the need for dog owners to drive to the few current designated areas?
- Sports Fields: How should we make sports fields more environmentally friendly?
- Specialized Sports: Can we reduce chemical management of golf turf for the health of the environment and of players? Can horse-riding areas demonstrate sustainability?
- Beaches: Can we minimize health risks to swimmers? How can we eliminate environmental and health impacts of sewage dumping? Is it better to build and maintain indoor pools or keep our lakes and rivers clean? Theme Parks and Ski Hills - Are they being built and run with environmental precautions? Would government incentives or consumer pressure help them to become more environmentally friendly?

Recreation centres are part of our public built environment. Here are some points we might wish to debate:

- Multiple Use Centres: Is it a more effective use of resources to provide multiple recreational activities in one location? How important is public transportation to these centres?
- Single Use Centres: How can we add on to the offerings of these centres - generally found in rural and older urban areas – to increase efficiency?
- Environmental Standards: How do we ensure sustainable operation?
- Co-location: Can we reduce cost of construction and travel by locating recreational facilities in workplaces and schools?

Outdoor facilities are important features on the landscape. We might have ideas on the following questions:

- Outdoor Pools and Splash Pads: Can we use solar water heating? Should we put more of these in poorer neighbourhoods where there is less air conditioning?
- Skateboard Parks: Can we reduce the use of concrete to save on environmental costs? Should we plant shade trees to protect skaters and spectators?

Recreation links to other Green Paper Themes. Here are some examples:

Energy – Reduce energy requirements of swimming pools.

Habitat – Integrate water management for habitat, drinking and water recreation.

Food – Favour local foods at recreation centres and sports events.

Natural Capital – Use recreational benefits to protect forest cover and wetlands.

Health & Safety – Use recreation to promote health. Promote sports involvement to reduce destructive behaviour in youth. Ensure the security of walking trails for the safety of all users.

Sense of Place – Increase access to nature to enhance environmental stewardship.

Jim Birtch / Tracy Birtch, 7 August 2009

Theme 10 – Sense of Place

Certain places hold special meaning both for those who live there and for many of those who visit. Such a feeling may come from the natural environment of the place but it is more likely to be a mix of many natural and cultural features. Fundamental to a sense of place is a strong feeling of authentic human attachment and belonging and this fosters human engagement and commitment.

In a sustainable urban region a common understanding of the place of people in the urban and rural environment and respect for the delicate balance within it is essential. Ottawa is not only home to its residents but it is also the National Capital for all

Canadians. A strong sense of place is important for both a sustainable urban region and for a truly national capital.

A BIOREGIONAL PERSPECTIVE

Fundamental to a sense of place is a bioregional perspective, which situates us within the natural world and recognizes it as an extension of ourselves. Such a perspective requires both knowledge about the parts and a sense of the whole. Much can be learned in this regard from our aboriginal peoples who are imbued with this perspective.

We need to know our bioregion with its own watershed, soil, climate, plant types, animals and history and to understand its rhythms, its potential and its limits. Mapping our place also helps us to relate to the natural surroundings. Those who develop intimacy with a place over time are apt to take responsibility for it and assure its long term health.

Supportive of this perspective are our educational institutions, parks, bike and nature paths, protected areas, nature museums as well as numerous community based organizations such as guides, scouts and young naturalists.

There is a difference between living on the land and dwelling in it. Trying to satisfy our needs and find our pleasures within the bioregion leads to an appreciation of our ecosystem, which encompasses both economics and ecology.

Farmers' markets and local fairs introduce us to the richness of our region and the availability of local products and creative arts. The 100 mile diet has led to the 100 mile movement and locally raised and produced food has been called "the new organic" — better tasting, better for the environment, better for local economies, and better for our health.

SPIRIT OF PLACE

Sacred places such as churches, museums, galleries and aboriginal sites engender respect for the past and communion with those who came before. This connects people of different generations and strengthens our sense of continuity with the past and responsibility to future generations.

Ceremonies and traditions such as Jane's Walks, the Aboriginal Blessing of the Waters, the Tulip Festival, the International Jazz Festival, the Changing of the Guard, Winterlude and skating on the canal all strengthening this connectedness.

Inclusiveness

A sustainable urban region includes all living things who share the urban and rural habitat.

Sustainability requires a re-thinking of the place we are taking and of the balance within the system. Interpretive centers, nature walks, our experimental farm, our bike, hiking trails and ski trails all introduce us to our habitat.

Such a region includes those who have strong links with the past and those who have chosen this place to put down new roots. All have their own particular connection with the place but share a strong commitment to the future. Libraries, building and street names are part of a terrain of consciousness, which complements the geographic terrain and contributes to our sense of who we are. Multicultural festivals and developing villages within our city celebrate the diversity of the present

Community

A sustainable urban region is built on a broadly shared commitment to the bioregion. It encourages participation at the individual level through backyard gardening, composting, habitat restoration and tree planting. It lets individuals take responsibility for a city tree, a neighborhood skating rink or a stretch of highway and welcomes and supports our Riverkeeper to protect and promote the ecological health and diversity of our river and its tributaries.

We all need to be seen and heard and a sustainable community welcomes expression in a variety of ways including the encouragement of graffiti in special places celebrating this art form. It celebrates our poets and writers through our statuary and poets' walks and writers readings.

A strong sense of place facilitates and engenders a truly sustainable urban region.

Elaine Isabelle, 14 May 2009