PLANNING RESOURCE GUIDE

Climate Change Mitigation through Land Use Planning

Manitoba

The new Provincial Planning regulation continues to promote sound land use planning in Manitoba. It expresses the province's interest in preserving land, resources and infrastructure.

Among the new ideas in the regulation is climate change mitigation through land use planning. Manitoba is interested in building communities that can adapt to a changing climate. The new Provincial Planning regulation encourages communities to anticipate and plan for the effects of climate change. It also recommends mitigation strategies through various planning documents and methods.

To help understand these new ideas and how they can apply at the local level, Manitoba Local Government prepared this planning resource guide. It outlines how local governments can use the information – from reducing local greenhouse gas emissions to developing land use planning policy and practices – to help communities promote more sustainable development patterns that reduce emissions.

The guide is mainly intended for a planning audience. This includes planning staff from municipalities and planning districts, consultants and provincial staff involved with land use planning. However, it is anticipated the topic will also appeal to a wider audience.

CLIMATE CHANGE MITIGATION IN MANITOBA

Climatologists around the world have determined that the global temperature is rising rapidly due to human activity. This accelerated change is caused by releasing greenhouse gases (GHGs) into the atmosphere. The most common GHGs are carbon dioxide and methane. Carbon dioxide is released by burning fossil fuels. Motor vehicles, coal plants and natural gas all emit carbon dioxide. Methane is released by organic matter. Livestock and landfills emit methane. Most of Manitoba's emissions come from transportation, agricultural practices and natural gas used to heat and cool buildings.

The Manitoba government has committed to taking action on climate change through *Beyond Kyoto*, Manitoba's climate change action plan. The plan sets a goal for Manitoba to meet the Kyoto Protocol target – a six per cent reduction in GHG emissions below 1990 levels by 2012.

Local governments can also take action on climate change. Up to 50 per cent of GHG emissions are under the direct or indirect control or influence of local governments.[1] This influence is prominent in local governments' land use planning decisions.

[1] Federation of Canadian Municipalities.

LAND USE PLANNING AND CLIMATE CHANGE MITIGATION

Land use planning shapes the patterns of energy use and development within communities. The form and function of different settlements can reduce or increase demands for energy, influencing how energy is produced, distributed and used. For example, by facilitating compact development that requires less energy for heating, planners will promote development patterns that can reduce GHG emissions.

Climate change mitigation depends, to a certain extent, on individual behaviour change. This too can be influenced by land use planning. For instance, municipalities can design and develop settlement patterns that cluster a variety of land uses together. This would reduce the number and length of vehicle trips and make other transportation options more viable. Land use planning, with mitigation in mind, can make sustainable behaviour easier for people.

The Provincial Planning regulation identifies the provincial interest in climate change mitigation via land use policy. Its purpose is to ensure that local plans – the blueprint for local development – consider the relationship between development and GHG emissions. Planners should recognize how emissions can be reduced through planning procedures and tools such as development plan policy, zoning, development agreements and the subdivision application process.

How do municipalities reduce emissions? As with provinces, each local community has its own prominent sources of GHG emissions. This fact sheet will explain how to use information about local GHG emissions to inform land use planning decisions that mitigate climate change locally.

The United Nations Framework Convention on Climate Change defines climate change **adaptation** as the adjustment in natural or human systems in response to actual or expected climate change effects, which moderates harm or exploits beneficial opportunities. By contrast, **mitigation** is defined as interventions or policies to reduce the emissions or enhance the sinks of greenhouse gases (GHGs) that contribute to climate change. A robust approach which incorporates both adaptation and mitigation is most effective in addressing climate change.

GHG EMISSIONS BASELINE INVENTORY, FORECAST AND REDUCTION TARGET

The first step in climate change mitigation is a baseline inventory and forecast. Any municipality or planning district can complete an inventory and forecast, and set a reduction target. These are the first steps of the Federation of Canadian Municipalities (FCM) Five Milestones to reduce GHG emissions. The inventory, forecast and target can be incorporated into land use planning in ways that mitigate climate change.

What?

A ***baseline inventory*** documents the sources and measures the levels of GHG emissions in a given year (the baseline year). The ***forecast*** projects where those levels will be some year in the future (the target year), based on population projections, assuming no changes are made to reduce GHG emissions. The ***target*** is the goal for emissions reduction, normally expressed as a percentage below the GHG-emissions level of the baseline year. A baseline inventory, forecast and target are developed for the municipal corporation. A separate inventory, forecast and target are applied to the broader community.

Why?

The inventory, forecast and target tell the municipality where it is at, where it needs to go and how far it has come toward the target.

The inventory and forecast help determine:

- the amount of energy being used and the subsequent GHGs emitted, by source and sector
- how this is changing over time (the impact of projected population growth/decline on emissions)
- where there is potential to reduce emissions
- possible socioeconomic costs of these reductions
- the impact of the reductions relative to a business-as-usual scenario

How?

The inventory, forecast and target illustrate the implications of development on GHG emissions. This helps local governments make land use planning decisions that are informed and locally relevant. An inventory, forecast and target provide the municipality with a better understanding of the potential impact normal operations and activities have on climate change. They also help demonstrate the changes that could be made to reduce that impact. This information is the foundation for a plan to reduce emissions and a benchmark for measuring progress.

Resources for developing GHG inventories:

Federation of Canadian Municipalities: Developing Inventories for Greenhouse Gas Emissions and Energy Consumption www.fcm.ca

Federation of Canadian Municipalities: Partners for Climate Protection Milestone One www.sustainablecommunities.fcm.ca/

Province of Manitoba: Guide for Conducting Municipal GHG Inventories and Forecasts in Manitoba www.gov.mb.ca/ia/climate/toolkit/gcmgeif.pdf

There are several ways to incorporate the information from the inventory and forecast, as well as the target, into land use planning to mitigate the effects of climate change. These involve using existing tools and procedures available to Manitoba municipalities. In general, per capita energy consumption and GHG emissions are lower in areas where development is concentrated and features small-scale, mixed land uses (particularly residential development mixed with commercial and institutional), such as in urban settings, whether a small village or large city.

The development plan, secondary plan and zoning bylaw are tools already in place. Together, they can be harnessed to facilitate such climate-friendly development. Other tools that can be used include development agreements, incentive zoning and the subdivision application process. Community consultation, and integration with other climate change mitigation activities, can also help a community move towards long-term reductions of GHG emissions.

The RM of De Salaberry and the Town of Virden have both signed on to the Federation of Canadian Municipalities (FCM) Five Milestones. They have committed to reducing emissions by 20 per cent below 2003 levels (for the municipal corporations) and six per cent for the broader communities, by 2012. The City of Brandon has committed to this target by 2013.

The villages of Notre Dame de Lourdes and St. Pierre-Jolys have each conducted a GHG emissions inventory and incorporated the information into a climate change action plan.

1. DEVELOPMENT PLAN, SECONDARY PLAN, ZONING BY-LAW

The ***development plan*** is a guiding document incorporating the community's vision and general policies. A ***secondary plan***, also a visionary document, concerns a specific component of the development plan (ex: a neighbourhood in a town, a village centre in a rural municipality). It contains more detailed policies than the development plan but the two should be complementary. The ***zoning bylaw*** is the primary means of implementing both the development and secondary plans through specific controls, such as lot size and shape, lot coverage, siting, parking requirements and provisions for secondary suites. Local decision-makers can use the inventory, forecast and target to help inform these plans and bylaws.

Look at the baseline inventory – what are the main sources of GHG emissions? For most Manitoba municipalities, ***transportation*** is the largest emissions source. In this case, the goal is to minimize dependence on single-occupant vehicles (SOVs) and reduce trip lengths. Below are ways to use the development plan, secondary plan or zoning bylaw to reduce emissions from transportation:

- Include policy statements in the development plan to indicate a commitment to making a variety of transportation options viable (ex: improve transit routes, expand bicycle paths). Link these to other, broader goals of the municipality, such as ***aging in place***, community health or town beautification.

Aging in place means increasing the opportunity to remain in the community as one gets older. See Manitoba's fact sheet for a summary, available at www.gov.mb.ca/health/aginginplace/docs/aging_in_place.pdf

- In an urban municipality, designate areas of the municipality, in the development plan, for more concentrated, compact development. This development encourages ***infill***, or the use of land within a built-up area for further construction. This makes travel by foot or bicycle easier and makes transit service more viable.

- In a rural municipality, designate areas for new development in clusters adjacent to existing development, such as a local urban district. Avoid policies that enable sprawling, leapfrogging development that requires new road construction and lengthy travel.

- Using a secondary plan, designate areas of the municipality as mixed use, locating commercial, residential, institutional and office uses in close proximity to one another. This will allow people to walk and cycle more easily between destinations, and also make transit service more feasible.

- Integrate lots for gardening and small-scale farming in a secondary plan by including green space. This will facilitate urban agriculture and reduce ***food miles***.

- Include items in the zoning bylaw that encourage multiple transportation modes (ex: limited parking provisions in core areas, bicycle parking requirements for all new developments).

Food miles is the distance that food travels from the point of production to the consumer. It is a means of assessing food's environmental impact.

In the City of Winnipeg's zoning bylaw, all new commercial development is required to have bicycle parking facilities.

Another major source of GHG emissions for Manitoba municipalities is the energy used to **heat** and **cool** buildings. By facilitating compact development, where heating and cooling sources are shared between multiple buildings, energy use is reduced. These tools can also be used to facilitate the development of renewable energy. The following are ways to use the development plan, secondary plan or zoning bylaw to reduce emissions from building heating and cooling:

- To facilitate the development of local renewable energy sources (ex: solar, wind), identify certain tracts of land in the zoning bylaw where these energy sources could be zoned as a permitted or conditional use. This land should be away from settlement centres; however, the renewable energy generated could then be used to service any settlement centres nearby.

- Include a policy in the development plan, requiring any new developments to approach energy needs at the community level – rather than at the individual building or household level. Infrastructure for renewable forms of energy, such as geothermal heat pumps, is much more cost-effective when made available for an entire neighbourhood, rather than for individual buildings. Further, planning ahead to accommodate renewable energy prevents the need for retrofits in the future. These are expensive and disruptive.

- Zone certain parts of urban centres, in the zoning bylaw, for more concentrated, compact development. This would encourage infill and shared walls, reducing the heating needs of individual buildings.

- Remember that any permitted use in a zoning bylaw will have no provision for a fee collection. So be sure to zone lots that are less environmentally sustainable as conditional uses. The fee charged for a conditional use will act as a disincentive to undesirable development.

Organic matter sent to landfills is another source of municipal GHG emissions.

- Designate land in a secondary plan for public green space. This is where residents can grow community gardens, with composting facilities, to accommodate residential organic waste and minimize waste sent to the landfill.

A major source of emissions in some Manitoba municipalities is **industry**.

- Include a policy in the development plan that limits the type of industry to be accommodated in the future. Encourage industry that is less resource-intensive.

Some GHG emissions come from municipal pumping stations for **water and wastewater systems.**

- Designate certain areas of the municipality, in a secondary plan, for more concentrated, compact development that encourages infill. This will reduce the amount of new water and wastewater infrastructure needed, as well as shorten the distance the water will be pumped.

2.DEVELOPMENT AGREEMENTS, INCENTIVE ZONING AND SUBDIVISION APPLICATIONS

A development agreement is an opportunity for a municipality, or planning district, to impose requirements to facilitate mitigation interventions in new development areas. This could include requiring the provision of sidewalks or adhering to specific building design standards.

Zoning can also be used as an incentive for more climate-friendly development. Specify, in the zoning bylaw, the kinds of activities and development that will be encouraged.

All subdivision of land, such as a large farm lot to be divided for residential development, must be approved. As such, the municipality or planning district can require subdivisions to facilitate development that helps mitigate climate change. For example:

- Require that all subdivision applications in the area adhere to certain design criteria, such as concentrated, mixed-use development in, and immediately adjacent to, settlement centres. Secondary plans can also be used to promote climate-friendly subdivision design.

See Sections 73 and 150 of *The Planning Act* for more details on incentive zoning and development agreements.

- Require that all subdivision applications include efficient street design that accommodates all modes of transportation. This also prevents the need for future street retrofits, which are costly and disruptive.

3. COMMUNITY CONSULTATION

Land use planning is a public process and requires community support. Before developing or updating any development plan, secondary plan or zoning bylaw, consider first conducting a baseline inventory and forecast and then setting a target for GHG reductions. You can then incorporate that information into planning activities. These activities will have opportunities in place for community consultation. Use those opportunities to gain public input, feedback and suggestions.

Continue to take advantage of any existing procedures of community consultation, in the land use planning process, to inform the public about proposed activities to mitigate climate change. The baseline inventory establishes a base of scientific knowledge. This is needed to understand and evaluate the impacts and consequences of climate change mitigation activities. Use the inventory to raise awareness about the proposed activities and to build popular support. Cite the inventory and emissions reduction target to justify the activities and initiatives proposed.

Awareness of climate change is rising. Solicit ideas from community members and local environmental groups on how they think emissions could be reduced through land use planning.

Land use decisions influence municipal finances, infrastructure needs and service to ratepayers, which, in turn, influence behaviour. Behaviour can have a major impact on GHG emissions. As an overall goal, keep in mind a built environment that encourages more climate-friendly behaviour. This includes cycling and walking, using less energy for heating and cooling, and minimizing waste.

4. OTHER CLIMATE CHANGE MITIGATION ACTIVITIES

Integrating land use planning with other municipal activities, in a co-ordinated effort to address climate change, ensures the resources for implementation are strategically aligned to maximize benefits. For example:

- In the urban centres of a region, develop a transportation plan that explores and promotes opportunities for walking, cycling and transit as viable transportation options. Integrate this plan with the development plan, secondary plan and municipal budget.
- Support policies that take a community approach to meeting energy needs, with a detailed community energy plan for new neighbourhoods. A community energy plan explores sharing renewable energy (ex: geothermal heat pumps), and plans for it along with the development of the new community. Integrate this plan with the development plan.
- Local community groups may be taking their own initiatives to reduce emissions at the grassroots level. Facilitate these activities through supportive policies and zoning.

General climate change mitigation resources for municipalities: Canadian Institute of Planners: *Model Standard of Practice for Climate Change Planning. www.planningforclimatechange.ca*

Province of British Columbia: *BC Climate Action Toolkit*
www.toolkit.bc.ca/solution/land use-solutions

Province of New Brunswick: *Sustainable Community Design*
www.gnb.ca