SUSTAINABLE LAND USE PLANNING

ANALYSIS AND RECOMMENDATIONS

Prepared by: Alberta Urban Municipalities Association

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ABBREVIATIONS

AMAH ..... Alberta Municipal Affairs and Housing
AUMA ..... Alberta Urban Municipalities Association
CIP ..... Canadian Institute of Planners
EUB ..... Energy and Utilities Board
GAA ..... Growth Area Authority
GIS ..... Geographic Information Systems
MCMS ..... Minister's Council on Municipal Sustainability
MGA ..... *Municipal Government Act*
MSP ..... Municipal Sustainability Planning
PDR ..... Purchase of Development Rights
TDC ..... Transfer of Development Credits
TDR ..... Transfer of Development Rights
UGB ..... Urban Growth Boundary
UGC ..... Urban Growth Centre
ULI ..... Urban Land Institute

1 INTRODUCTION

Land use planning is a complex, multifaceted and usually highly political process. Planning for sustainability must consider the multiple and often competing environmental, economic and social values of a wide range of the public, decision makers, and interest groups. In addition, many of these considerations require analysis and solutions at scales beyond that of individual municipalities. To complicate the matter further, and to address issues of sustainability, planning needs to be carried out not only over large areas of space, but also over very long periods of time.

In order to prepare reasoned and workable planning solutions, new processes and tools are needed to deal with this complexity. The purpose of this paper is to provide a brief overview of current land use planning in Alberta together with a summary of potential tools and approaches to support municipal planning efforts. The document identifies the major land use issues and pressures that successful planning systems must address, and presents summaries of relevant methods used in other regions facing similar pressures to those of Alberta. The paper is background support to guide the development of the AUMA position paper on Land Use Planning in Alberta that will identify how municipal governments can assist in sustaining essential land resources in Alberta.

1.1 Land Use Planning

Land use planning refers to a branch of public policy that encompasses various disciplines that seek to order and regulate the use of land. The Canadian Institute of Planners defines land use planning as:

> *Land use planning means the scientific, aesthetic, and orderly disposition of land, resources, facilities and services with a view to securing the physical, economic and social efficiency, health and well-being of urban and rural communities (CIP 2000).*

Land use planning is a key municipal function, which includes long-range land use policy, growth management, capital budgeting and regulatory or 'implementation' planning (AUMA 2007). It generally involves zoning of appropriate types and forms of land uses, as well as infrastructure and open space planning directed at the efficient utilization of land in order to provide benefits to the broader population, the economy and the environment. Land use planning is an important aspect of regional planning, which also encompasses social and economic concerns.

1.1.1 Sustainable Land Use

Sustainable land use planning requires recognition of the limitations of the biosphere and the need for a balance of social, cultural and economic uses within these natural limitations (Chalifour 2007). Land use planning is fundamentally related to sustainability planning, defined by AUMA as planning that integrates five dimensions of sustainability: social, cultural, environmental, economic, and governance. AUMA believes that municipalities should invest in sustainability initiatives that make economic sense today and that logically move the community towards a future of social inclusiveness, cultural vibrancy, environmental stewardship and strong governance practices. Practical aspects of sustainability planning include (among others) growth management, housing choice and affordability, and inter-jurisdictional coordination (AUMA 2007).

The difference between 'growth' and 'development' is central to the concept of sustainable land use. Growth refers to increase in quantity, whether in terms of goods, wealth, housing, resource extraction or other measures. Development, on the other hand, refers to *the increase in quality of goods and services, as defined by their ability to increase human well-being, provided by a given throughput* (Daly and Farley 2004, Chalifour 2007). Given the limits of a finite biosphere, development is a more reasonable goal than growth when it comes to land use planning. Having said that, rapid growth under the current economic climate in Alberta is certain to continue in the near to mid future and land use planning has an enormous influence on the related social, cultural, economic and environmental impacts. Wise stewardship of land resources and informed allocation of uses will greatly aid both economic development and the protection of valued environmental and societal elements.

1.2 Land Use Planning in Alberta

Land use planning in Alberta is a responsibility shared by the provincial government and local municipalities. Coordinated planning on both public and private land is a key factor in sustainable development and the achievement of local economic development and land use objectives. The following sections outline the current structure of land use planning in Alberta.

Each order of government has certain responsibilities in relation to planning within the province. The Provincial Government is responsible for provincial parks, public lands, environment, forestry, oil and gas, minerals, public health, energy and wildlife. Provincial legislation also requires the development of various management plans closely associated with land use. These include Forest Management Plans and Range Management Plans. In addition, Water Management Plans are required in some areas. The Provincial government also influences land use planning through its regulation of the Energy and Mining sectors as well as through transportation and other infrastructure initiatives.

Much of the responsibility for land use planning in the province was given to municipalities with the passing of the 1994 *Municipal Government Act* (*MGA*). The regulations pursuant to Section 622 of the *MGA*, the *Land Use Policies* (1996) dictate that municipal and provincial planning efforts must be consistent and complimentary. All municipalities and improvement districts are subject to the *MGA*. Other municipal responsibilities include storm water management, transportation network and street improvements (excluding Provincial Highways), potable water and other public utilities, as well as land use approvals.

The integration and coordination of planning efforts among and between provincial and municipal jurisdictions provides many challenges. For example, transportation and major utility corridor planning affects municipal land use plans. Forest Management Plans are closely related to Water Management Plans that in turn need to be developed in concert with municipal plans to ensure that objectives are not at cross purposes.

The new provincial Land Use Framework will "establish an approach for governing and managing land, resources, and the natural environment in the face of growing development pressures" (Government of Alberta 2006). The Regional Strategies and other initiatives of the Land Use Framework are intended to provide overarching high level direction to plans prepared at a finer scale. The program is in preparation but is described in more detail in following sections. Further discussion on current land use planning systems in Alberta including the *MGA* and the *Land Use Policies* are given in Appendix A.

1.3 Land Use Framework for Alberta

Alberta's rapid economic growth and increasing population are creating impacts on both public and private land. In many areas, there are serious concerns related to land use, natural resources, environmental quality and the municipal resources required to adequately support development.

With the objective of defining a vision for the future of land use in the province and to develop an approach to balance the various demands on land and natural resources, the Government of Alberta is in the process of developing a Land Use Framework to address a wide range of land management issues. It is intended to be "a shared, over-arching, values-based vision for land use in Alberta" (Government of Alberta 2006). The draft vision for the Provincial Land Use Framework reads:

> *The people of Alberta respect the land and work together to care for, make the best use of and sustain the land. Alberta's lands are well managed in a way that acknowledges the diversity of its people and balances the needs of present and future generations.*

Development of the Land Use Framework is one of the Alberta government's eight key cross-ministry initiatives for 2005-2008. Participating ministries are: Sustainable Resource Development; Energy; Municipal Affairs and Housing; Environment; Agriculture and Food; Tourism, Parks, Recreation and Culture; and International, Intergovernmental and Aboriginal Relations. The Framework is in preparation and consultation continues.

1.3.1 Land Use Planning Issues

Several issues related to land use planning that face Alberta municipalities were identified during the municipal consultation on the provincial Land Use Framework and associated work. These issues can be considered to be of two general types: pressures on land resources, and policy/regulatory issues.

Agricultural land preservation was important to Albertans as urban and rural residential land areas continue to grow at unprecedented rates (The Praxis Group 2006).

Environment was ranked highly important as an issue in the province, especially the amount, quality of and access to water. Climate change and biodiversity loss are also key environmental issues that require consideration in sustainable land use planning. Existing environmental policy is weak and does not adequately address the environmental impacts of development or the need for environmentally sustainable land use planning (The Praxis Group 2006).

Growth, including urban sprawl, land fragmentation, urban/rural development conflicts and infrastructure and service provision is a prominent issue because of the unprecedented rates of population growth and lack of growth management strategies at all levels of government (The Praxis Group 2006, AUMA 2007). The development preferences shown by changing demographics (e.g., aging population, increasingly multicultural society) also influence the trends and type of growth. Different types of growth also have different resource requirements which must be addressed.

Resource management is a direct pressure on the land because of the proliferation of resource facilities, especially pipelines and energy-related facilities (The Praxis Group 2006). Commercial and industrial land development often requires specific conditions, which can create additional land use conflicts (AUMA 2007).

Transportation and utilities are another pressure related to growth, and require long-term coordinated planning (The Praxis Group 2006).

Authority and decision-making was regarded as an issue because appointed boards (e.g., EUB, DFO) do not always adhere to local planning initiatives such as area structure plans, causing frustration for local planning authorities (The Praxis Group 2006).

Governance issues include the lack of inter-departmental and inter-municipal cooperation and co-ordination leading to inconsistent and even contradictory planning schemes (The Praxis Group 2006, AUMA 2007).

Land use conflicts include incompatible land uses and competing land interests that exist at all levels, between landowners, sectors and municipalities (The Praxis Group 2006, AUMA 2007).

Regulations, definitions and classifications are unclear with respect to land use planning, and policies are seen as weak and outdated (The Praxis Group 2006, AUMA 2007).

Funding and resources from the province are often inadequate and unpredictable, which causes problems for municipal infrastructure, capacity building and service delivery in the face of growth pressures (The Praxis Group 2006, AUMA 2007).

Public lands are seen as needing the same land use regulations as private land, and are not currently being managed effectively (The Praxis Group 2006).

1.3.2 Preliminary Recommendations from the Land Use Framework Discussion Forums

Some recommendations for land use planning arising from the Alberta Land Use Framework discussion forums include (The Praxis Group and Canada West Foundation 2006):

- clearly linking land use policies to other key policies and legislation (e.g., Clean Air Strategic Alliance, Water for Life);
- clearly allocating responsibility between governments with respect to land management;
- providing a means of measuring and addressing cumulative effects when making land use decisions;
- incorporating full-cost accounting for natural capital;
- identifying trade-offs and consequences; and,
- including implementation and enforcement 'teeth'.

Other recommendations for the provincial Land Use Framework coming from the agri-food industry include (Agriculture and Food Council 2005):

- updating zoning definitions and descriptions, including primary production operations;
- using market-based tools to recognize the stewardship role of producers on the urban fringe;
- implementing smart growth strategies; and,
- supporting both regulatory (e.g., Agricultural Land Reserves in B.C., Greenbelt Act in Ontario) and voluntary approaches such as Purchase of Development Rights (PDR) and Transfer of Development Rights (TDR).

Additional recommendations from the Minister's Council on Municipal Sustainability were as follows (MCMS 2007):

- maintain municipalities as the major land use planning unit, with provincial support in metropolitan areas or areas of high growth or land use conflicts; and,
- consider a mandatory requirement for areas of high growth and/or land use conflicts to develop intermunicipal or regional development plans that address regional planning, land use and cost/revenue sharing.

AUMA (2007) also made several recommendations on policy direction for the Land Use Framework with respect to facilitating multi-jurisdictional planning.

More recently, discussions on the draft vision statement for the Provincial Land Use Framework arising at the President's Summit workshops focused on the need for a clear statement that will drive action on the part of governments, organizations and individuals towards achieving a more sustainable future. 'Respect', 'working together' and 'stewardship' were key concepts of a vision described by participants. The notion of working together within a framework was introduced to include the idea of a defined strategy guiding action in the province. Other comments included the need for general understanding that 'land' also includes air, water and resources.

1.4 Approaches to Land Use Planning in Other Jurisdictions

The planning models and tools of different jurisdictions recognized for their land use planning efforts are examined, including the provinces of Ontario and British Columbia; several U.S. states including Oregon, Utah, Vermont and Minnesota; the U.K.; and Australia. Each program begins with a defined planning process that culminates in a land use plan that makes use of a variety of approaches and tools, both regulatory and market-based. In many cases, scenario modelling tools aid the planners throughout the process in assessment of impacts and selection of alternative futures. Approaches used in many of the western U.S. states (e.g., Arizona, Colorado, Utah, Oregon, California) are particularly relevant to Alberta because of the high rates of growth and similar pressures they have experienced over the last 15 years (McKinney and Harmon 2002).

Specific recommendations for Alberta based on successful models and tools from other jurisdictions are given after each topic in the report. A summary of and further detail on these recommendations are outlined in Section 4.0.

2 STRATEGIES FOR GOVERNANCE AND THE LAND USE PLANNING PROCESS

The following sections discuss key elements of the planning approaches from various jurisdictions. While the planning process in most areas is cyclical and under regular review, most jurisdictions follow a general process whereby:

1) the planning authority and decision-making framework is outlined,

2) scenario modeling and assessment of impacts are carried out,

3) a comprehensive land use plan is developed, and

4) a strategy for plan implementation is designated.

2.1 Major Steps in the Preparation of a Land Use Plan

The following flow chart (Figure 1) and accompanying sections indicate the major steps to carry out sustainable land use plans.

Land use has physical form. Therefore, land use planning ***must*** be spatially explicit. Non-spatial analysis and policy plans will not solve land use conflicts. It is only when uses are prescribed for specific areas of land that the true conflicts (or lack thereof) become apparent. Analysis that is non-spatial will only lead to generalities that then require further spatial investigation. Spatially explicit cross boundary analysis must take place before jurisdictional boundaries are taken into account. These can be overlaid later in the process for the purposes of local planning. Local planning is thus done within a regional context.

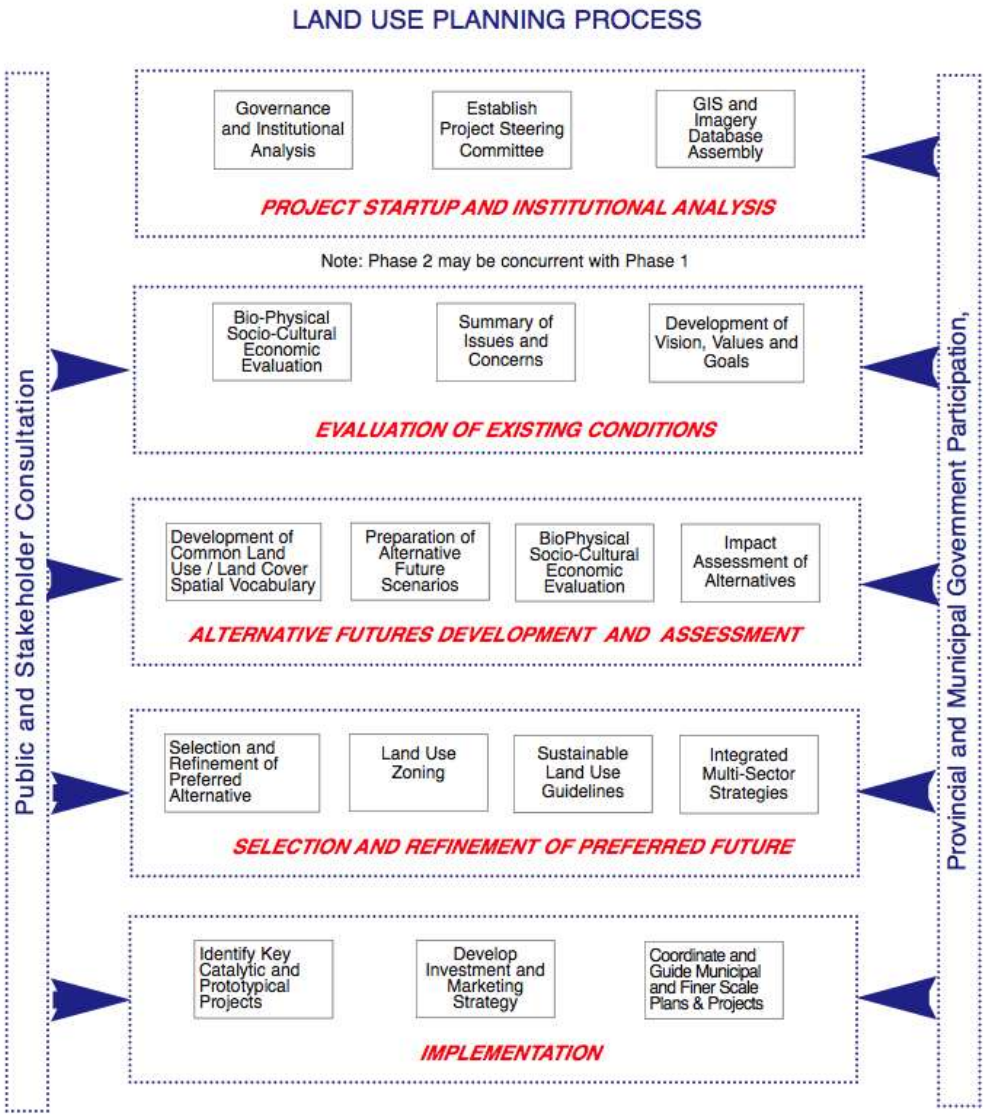


Figure 1. Major tasks in a typical land use planning project.

2.1 Recommendations

*1. Establish and test a **new planning process strategy** that incorporates the major steps and considerations discussed in Sections 2.1 to 2.6.*

2.2 Project Startup and Institutional Analysis

Authority and decision-making in land use planning first depends on the scale of analysis. This scale sets up the forum for decision-making: who is involved in the process, and what are the principles and criteria upon which decisions are based.

2.2.1 Scale of Analysis and Planning

Planning and decision making can take place at the provincial, regional, subregional (e.g., watershed) or municipal scale. In jurisdictions with well-established land use planning programs in place, the state or province takes the lead in setting goals while the local governments are responsible for implementing more detailed plans according to local conditions. In Alberta, much of the responsibility for land use planning in the province was given to municipalities with the passing of the 1994 *Municipal Government Act* (*MGA*). This gives municipal governments considerable autonomy, whereby they can make decisions irrespective of neighbouring jurisdictions.

Oregon and Hawaii both have had statewide land use planning efforts in place for many years (McKinney and Harmon 2002). A state-wide planning program was implemented in Oregon in 1973 which prescribes a set of planning and zoning requirements for cities and counties to carry out (Oregon Office of Energy nd.). The role of the state is to set general rules for planning decisions, provide technical assistance and grants, and review local plans and amendments for consistency with statewide planning goals. This system allows for definition of the broader public interest.

In Vermont, planning occurs at the state, regional and municipal scales. Regional planning commissions provide planning assistance to municipalities and address issues that cross municipal boundaries (CVRPC 2003). These regional planning commissions prepare regional plans consistent with state-wide goals and compatible with municipal plans and adjoining regional plans. The planning commissions also provide technical assistance to municipalities in terms of community planning, bylaw development and administration, capital budgeting, community development and GIS (CVRPC 2003).

In Ontario, the provincial government has the authority to mandate the development of regional growth management plans in consultation with local officials and stakeholders through the *Places to Grow Act (2005).* Municipalities must use this regional growth framework when developing their land use plans. The Growth Plan for the Greater Golden Horseshoe, the first growth plan developed under the *Places to Grow Act (2005)*, involves eight cities, six regional municipalities and seven counties.

Planning occurs at both the state and municipal scales in the state of Victoria (Australia). The state implemented the *Planning and Environment Act (1987, amended 2000)* which relies heavily on local governments as the primary planning and implementation bodies. Land use planning controls are prepared and administered by both the state and local governments. The council or local government is responsible for preparing a strategic policy framework for the municipality and any changes to the planning scheme, as well as for administering the planning scheme and making decisions on individual planning permit applications (MAV 2007b). The state government reviews the Municipal Strategic

Statements (MSS) and authorizes changes to the planning scheme (MAV 2007b). The Municipal Association of Victoria helps councils through the land use planning process by providing current resources on a range of planning issues and programs, including the planning system, rural planning, urban planning and the built environment (MAV 2007a).

In terms of building sustainable neighbourhoods and communities, the AUMA feels that the most appropriate level of government is the municipality, given a strong provincial framework within which to build sustainable communities (AUMA 2007). While Minnesota Planning (2000) is in agreement, it is also stated that comprehensive regional and municipal planning should precede and take precedence over fine-scale planning such as zoning and subdivision regulation.

It is clear that there is no single scale for planning: a nested hierarchy of plans is required with potential plans created for the region, the sub-region and the municipality.

2.2.2 Identify Project Decision and Stakeholder Groups

In order to determine the full range of planning issues, the decision makers and stakeholders who are affected by and influence the plan must be identified. These may include federal, provincial, and municipal governments, as well as other non-governmental organizations, industry, farmers, local community groups, etc. Some are formal decision makers, such as government departments, while others are more informal such as farmers or developers making local decisions to change the landscape that collectively may be of profound importance. Citizen engagement and the development of partnerships with key community leaders and organizations remain important throughout the planning process (AUMA 2006).

In addition, the organizational and institutional arrangements between the decision-makers in relation to land use planning must be understood and modified if necessary. In some cases, regulations and laws will need to be changed. In others, policies may need to be adjusted. While this may be a lengthy process, plans without authority have little chance of implementation.

A combination of formal decision-making and participatory process is recommended by various planning authorities. The active participation of both citizens and municipal officials is necessary to a comprehensive land use plan that can be supported and implemented (Stokes et al. 1989, City of Portland 2006, VTPI 2007). The AUMA also encourages extensive community participation as part of the Municipal Sustainability Planning (MSP) process in order to sustain governance momentum on sustainability planning.

Citizen participation is mandated by some jurisdictions including Glendale, Arizona. A sample ordinance based on the Glendale model is given in Appendix B (from Minnesota Planning 2000).

Public participation and stakeholder involvement was a large part of the process of *Envision Utah*, a growth strategy for the Greater Wasatch Area, Utah. The first stage in the process involved the establishment of a public/private Partnership and Technical Committee (Envision Utah nd.). The Partnership included 130 key stakeholders from state and local government, business leaders, developers, conservationists, landowners and church and citizen groups from around the region. To direct the process, the Steering Committee of Envision Utah hired consultants. The consultation was initiated by surveying residents to determine what they value about the region (Envision Utah nd.).

To make public involvement in the process more accessible, there are booklets available as public information tools that give the facts on land use such as higher-density developments

or sustainable transportation. The Urban Land Institute (ULI) publishes a series of fact books on responsible, well-planned developments. The AUMA in cooperation with AAMDC is also developing a toolkit for citizen engagement to be completed in the fall of 2007.

2.2.3 Define Planning and Decision Making Criteria

In order to foster understanding and dialogue amongst the various interest groups and to aid in conflict resolution, agreement on how plan options will be judged must be sought early in the process. *By avoiding positional stances, and by placing an emphasis on planning principles and design criteria rather than predetermined solutions, conflict is reduced and the potential for resolution is enhanced.* Stakeholder and public consultation is required at this point to ensure all relevant criteria are identified and considered in the process. Decisions about planning options may be based upon the following typical ecological, cultural, and economic criteria:

- Protection of Air Quality
- Water Quality and Quantity
- Protection of Soil Productivity
- Accommodation of Expected Population
- Health, Diversity and Sustainability of the Economy
- Cost of Public Infrastructure
- Employment, Income and Taxation
- Provision of Basic Needs and Services
- Equitability of Costs and Benefits
- Reduction of Vulnerability to Flooding
- Species and Habitat Diversity (Biodiversity)
- Single Species of Concern Habitat Abundance
- Protection of Important Ecological Processes
- Consideration of Ecological Goods and Services
- Protection of Cultural Resources
- Protection of Traditional Uses and Values
- Visual Quality
- Recreational Opportunities
- Long Term Flexibility

AUMA (2007) identified several principles as part of a land use vision for Alberta, including:

- environmental, social, and economic sustainability (triple bottom line);
- clean environment and healthy communities;
- protection and proper management of natural resources and agricultural land;
- community and economic development;
- efficient land use, density, and service provision;
- responsible fiscal management and governance by autonomous local governments; and,
- effective multi-jurisdictional planning and growth management (considered a necessary pre-condition for achieving the other components).

These principles are aligned with many planning principles and criteria used in other jurisdictions. The state of Utah, for example, has identified quality of life as an economic imperative for land use planning (McKinney and Harmon 2002).

Many of the planning criteria for forward-looking jurisdictions include Smart Growth planning principles. Smart Growth initiatives identify four principles for responsible growth (Minnesota Planning 2000):

1. **Stewardship** – use of land and natural resources in a way that sustains them for the future.

This principle encompasses growth management in a way that sustains natural land and resources, especially on the fringes of urban municipalities. Development density is an important criterion for growth management in an urban municipality. This includes supporting infill development, rehabilitating or reusing existing structures and creating denser new developments (Haughey 2005). Communities with a mix of densities, housing types and uses can help curb urban sprawl, especially when implemented regionally (Haughey 2005). In the U.K., the setting of national targets for the percentage of development occurring on brownfield land and housing density have been successful in protecting open countryside and restraining urban sprawl (Barker 2006). Sixty percent of residential development in England should occur on previously developed land; in London, this figure reached 98 percent in 2005 (Barker 2006). Other criteria for evaluating stewardship can include measures such as open space preserved (VTPI 2007).

2. **Efficiency** – more efficient and integrated public investment in public facilities and infrastructure such as transportation, housing, schools, utilities and information services.

This second principle includes criteria such as location-efficient development, which refers to development located and designed specifically to maximize accessibility (VTPI 2007). Efficiency can also be achieved by innovative land uses such as providing shared office/residential parking, which increases land use efficiency in mixed-use developments as the two user groups generally require the parking at opposite times of the day. Criteria for evaluating efficiency can also include the ratio of jobs to residents in a community – higher ratios tend to reduce commuting distances and increase local services used by residents such as shops, restaurants and schools – or the portion of regional employment located in transit-oriented developments (VTPI 2007).

3. **Choice** – more options and choices, encompassing both housing and transportation.

4. **Accountability** – responsibility for development decisions at the local and provincial levels.

Ontario's Greater Golden Horseshoe Growth Plan is one example of planning that integrates many of these goals and targets. One example is a mandate that at least 40% of all residential development take place within built-up areas, or greater for those municipalities currently exceeding this target (Ontario Ministry of Public Infrastructure Renewal 2006). Within areas identified as Urban Growth Centres (UGCs), other targets identify desired population and employment densities depending on the current and projected growth of the UGC and the municipality. For example, minimum gross density targets include 400 people and jobs per hectare for the City of Toronto, 200 people and jobs per hectare for Downtown Hamilton, Downtown Pickering and Mississauga City Centre, and 150 people and jobs per hectare for Downtown Guelph and Downtown Peterborough (Ontario Ministry of Public Infrastructure Renewal 2006). Designated Greenfield Area developments have a minimum target density of 50 people and jobs per hectare (Ontario Ministry of Public Infrastructure

Renewal 2006). For the expansion of small cities and towns, the Ontario Ministry of Public Infrastructure Renewal (2006) recommends a minimum of one full-time job per three residents within or adjacent to the community.

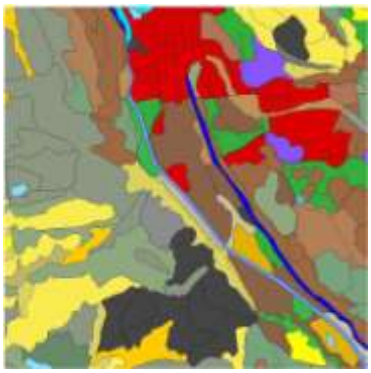
2.2.4 Geographic Information System (GIS) and Databases

Land use planning over broad areas requires computerized spatial analysis tools as well as a common language for describing existing conditions and future alternatives. If land use planning is to be truly integrated with other broader scale initiatives such as the provincial Land Use Framework, compatible land use classes are required. The following is needed:

- A comprehensive geographic information system (GIS).
- A common spatial vocabulary outlined in the provincial Land Use Framework that describes the existing land use/land cover for the entire province. It is the descriptor language of potential alternatives and is the single input into a range of computerized impact evaluation models. The vocabulary may be a combination of land use and land cover (e.g., an ecological land use classification combined with a land use classification; Figure 2).
- Regions are generally too large for spatially explicit planning. They will need to be stratified into smaller planning units such as municipalities, groups of municipalities or landscapes that have similar underlying physiographic conditions and a similar repeating pattern of local landscape elements (Figure 3). These landscapes are areas of analysis that can be expected to respond to

  management in a similar manner and will likely have common issues. In addition, local people generally relate to this scale and often have names for the landscapes. The sub-regional planning units should respond to ecological units where practical although this is not always feasible.
- Watersheds need to be mapped and considered if any fluvial processes are analyzed.
- Further stratification into landscape compartments (landscapes combined with watersheds) may also be required, as interventions directed at watershed management may not be uniformly applied over the entire basin (Figure 4).

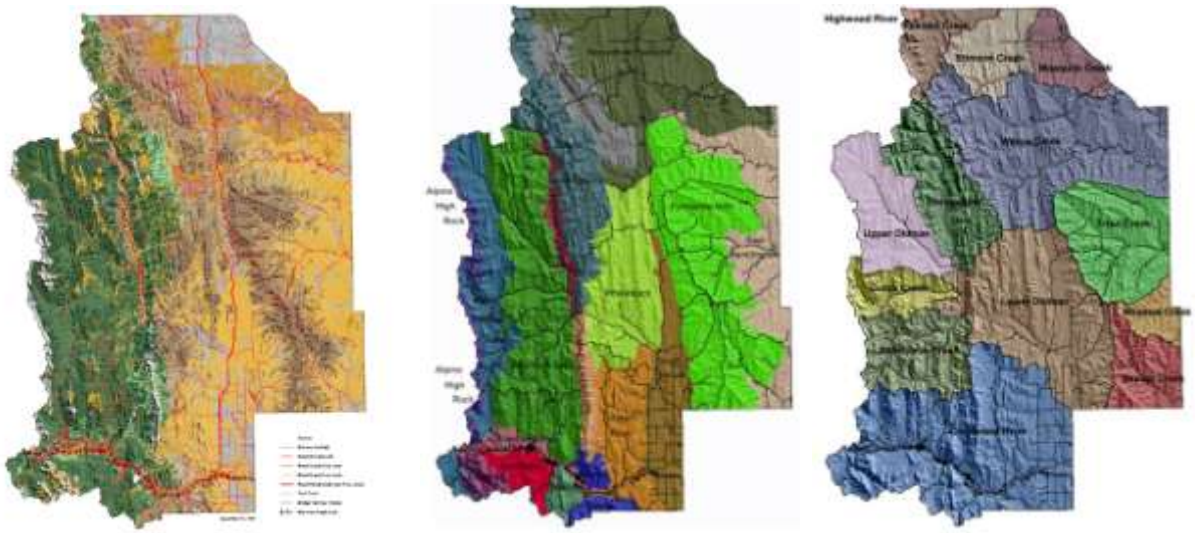
Land Use Zoning



Ecological Classification

Zoning / Ecological Classification

Figure 2. Examples of a common landscape vocabulary.



Ecological Classification *Landscapes* *Watershed Sub-Basins*

Figure 3. Landscape stratification examples.

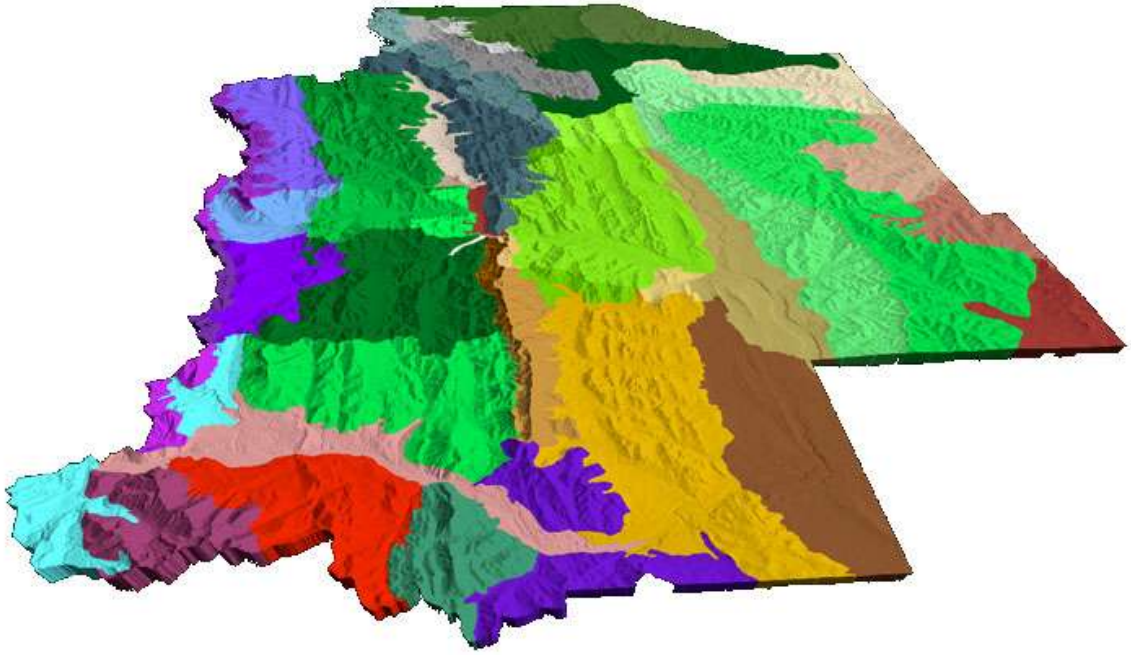


Figure 4. Landscape compartments (Landscapes x Watershed Sub-Basins).

2.2.5 Ecological, Cultural and Economic Models

A range of computerized process models will need to be prepared for use in subsequent steps in the plan development. These models may be spatially explicit or non spatial but they must directly relate to the criteria used to judge the plan options. Ecological, socio-cultural and economic models are invariably required (see Section 2.4.1).

2.2 Recommendations

*2. Establishment of a **provincial land use planning body** to develop and implement province-wide planning goals.*

*3. Development of enabling provincial legislation to authorize the Lieutenant Governor in Council to determine whether a **growth plan** is required for any region/area in the province.*

*4. Provincially mandated establishment of **multi-jurisdictional planning processes to coordinate land use plans** between municipalities and ensure consistency with provincial goals.*

*5. Encourage **citizen involvement** in the planning process.*

*6. Establishment of **criteria or performance measures** as part of land use plan development, against which a municipal or regional land use plan could be assessed.*

*7. Outline a **common spatial vocabulary** in the provincial Land Use Framework that describes the land use/land cover across the province.*

2.3 Assessing the Existing Conditions

Using the process models, the existing conditions are analyzed to identify regional issues and constraints as well as to provide baseline data against which to judge the impacts of alternative futures. The modelling facilitates a fully integrated review of the economic, social and biophysical conditions of the region as they relate to the decision criteria identified earlier.

A range of land use and economic analyses are needed. The following, among others, are generally reviewed: current land use designations, development trends (urban and rural), economic analysis and overview of activity by sector, transportation and major infrastructure, public sector activity, energy (hydro power, oil and gas), etc.

Analysis of the existing social conditions is also needed. This includes overviews of demographics, immigration, emigration, education, employment, income, housing, etc. Cultural landscape conditions including condition, significance and threats are also analyzed.

Biophysical conditions are examined including: climate, geology, landform and topography, hazard areas (landslides, flood inundation areas), unique and outstanding landforms, surface water (quality, quantity, and timing), groundwater (quality, aquifer recharge areas), pollution sources, soils, biodiversity, vegetation, wildlife, landscape patterns, single species

of concern, special landscape elements, ecological reserves and parks and protected areas, among others.

2.4 Identify Potential Future Alternative Scenarios

A set of ***spatially explicit*** alternative land use scenarios needs to be prepared. These always include the current trends as well as a collation of the existing plans for the municipalities. The Trend Scenario represents the option of business as usual. Existing development trends are projected into the future. Current zoning plans are built out. Known migration rates are followed. Trends in development, income, housing, etc. are maintained into the future. This scenario is critically important as it will indicate what will happen if new planning is not undertaken.

In addition, a range of new alternatives is developed that addresses, with varying emphasis, the opportunities of the region. The extent and arrangement of land uses defines the alternatives. The alternatives are described in terms of:

- types of development (land use/land cover);
- amount of each development type;
- location (the spatial arrangement);
- rate of development; and,
- required supporting infrastructure.

A GIS file is produced for each scenario in the same land use/land cover vocabulary, allowing for evaluation of the impacts using the process models. In addition, more balanced alternatives are prepared. Highly detailed 3D visualization models (static and movies) are prepared for each alternative to aid in communication and public consultation.

One tool used within the integrated framework for evaluating and proposing strategies for Europe is the MOLAND (Monitoring Land Use/Cover Dynamics) model for forecasting urban and regional growth (Barredo et al. 2005). This model produces future urban scenarios by incorporating land use development trends, population growth, socio-economic factors and spatial planning policies. Both population and employment forecasts are used to plan and manage growth. These forecasts should be reviewed on a five-year minimum basis and revised as required.

2.4.1 Evaluate Alternative Scenario Impacts and Select Preferred Alternative

The measurable impacts of alternative futures are assessed across the full range of evaluation criteria. Impacts are tabulated, compared and the information presented to decision makers and the public in order to facilitate more reasoned decisions about the future direction of the region. Considerable government, stakeholder and public consultation is required at this point. Computerized spatially explicit models are heavily used both for evaluation and visualization of results.

Planning ability depends highly on the quality of the land use database and the ability to predict how changes to land use will affect the land resource and even community sustainability. An evaluation of biophysical, socio-cultural and economic evaluation of the alternative future scenarios is the next step in determining development and land use impacts. A variety of models and tools are available for this purpose, a few of which are discussed here.

Visualization tools are often used to evaluate alternative scenarios in participatory processes. The state of Utah uses visualization techniques and aerial photos to map unplanned growth and then growth under planned cluster developments to aid in public discussion forums (McKinney and Harmon 2002). *Envision Utah* made use of extensive scenario development as a basis for a public awareness, education and media campaign (Envision Utah nd.). Four alternative growth scenarios varying in development type and density were identified and results modelled and analyzed as to their costs/impacts on population, infrastructure, air quality, water, open space

and recreation, traffic congestion, affordable housing and business patterns, among others. Public preferences were found to focus on a strategy that emphasized walkable and transit-oriented development on unused land as well as encouraging more infill and redevelopment (Envision Utah nd.). CommunityViz is one software tool that allows visualization of alternative land use scenarios in a town setting (Smart Communities Network 2004).

There are several tools available for quantifying growth impacts on the community. One is the computation of direct route time and distance using GIS (e.g., ArcView's Spatial Analyst; Snyder and Bird 1998). Other tools measure city efficiency in terms of energy, water, air quality and other indicators like ecological or sensitive areas. Programs that calculate efficiency include PLACE3S, INDEX, and SmartPlaces (Snyder and Bird 1998). PLACE3S (Planning for Community Energy, Economic and Environmental Sustainability) was developed by the U.S. Department of Energy, the California Energy Commission, the Washington State Energy Office, and the Oregon Department of Energy and is a land use/urban design method intended to aid communities in understanding how their growth and development affects urban sustainability (Snyder and Bird 1998). CITYgreen is a GIS-based program used for mapping and analyzing urban ecosystems that allows the user to analyze stormwater, summer energy savings, carbon storage and sequestration, air quality and urban wildlife (Smart Communities Network 2004).

Based on the evaluation of the impacts, a preferred alternative is selected and refined. Models are generally rerun on the refined alternative to finalize predicted impacts (both positive and negative). The results are visualized for ease of communication. Major public consultation is again required at this point.

The resources required for this process can be considerable, which can present a challenge for small municipalities. Coordinating a process for multi-jurisdictional planning can aid multiple municipalities in overcoming resource constraints (see Section 2.5.2).

2.4 Recommendations

*8. Enable the use of **scenario modelling** tools by regions and municipalities through training, financial support and institutional strengthening.*

2.5 Develop and Coordinate Multi-Scale Implementation Plans

Using the impact assessment of alternative futures, the decision-makers and planning authority can then choose a desirable future scenario upon which a comprehensive land use plan can be developed. *A common language between jurisdictions is extremely important at this stage in order for municipal plans to be understood within a regional and provincial*

context. The key to successful integration of regional, sub-regional and municipal plans is consistency of intent, content and language.

Following selection of the preferred alternative, integrated multi-sector strategies are prepared including:

- Urban Strategy
  - Existing and Future Growth Centres and Corridors
- Industrial Strategy
  - Major Industrial Nodes and Service Centres
- Agricultural Strategy
- Housing Strategy
  - Sustainable Affordable Housing, Major Nodes for New Construction
- Infrastructure Strategy
  - Solid Waste Facilities, Wastewater Treatment Facilities, Potable Water Supply, Telecommunications, Flood Protection
- Transportation Strategy
  - Major Transit Corridors, Alternative Transportation Choices, Transit Oriented Development
- Environmental Management Strategy
  - Water Conservation, Aquifer Protection, Energy Conservation, Soils and Land Reclamation, Waste Reduction, Air Quality, Biodiversity, Parks and Protected Areas

Municipalities will prepare strategies based on the municipal land use plans together with the sector-specific plans. These plans need to be consistent with the broader scale regional strategies and inter-municipal plans in order to achieve the vision for the area. Again, the governance structure is critical to successful implementation.

2.5.1 Development of Comprehensive Land Use Plans

The comprehensive plans of different jurisdictions often have somewhat different content; however, similar themes and language occur throughout.

Plans are developed at the municipal, regional and state levels. At the municipal level, a research organization based in Victoria, British Columbia recommends that a comprehensive land use plan include the community's vision, an inventory and projections of residential and employment populations, land uses, economic development, and facilities and public services (VTPI 2007). The city of Portland, Oregon has a comprehensive plan that includes a Comprehensive Plan Map and set of regulations for development including a revised Zoning Code to carry out the policies, a guide for major public investments required, and a process for plan review and amendment (City of Portland 2006). The format of the comprehensive plan identifies and outlines a series of goals, policies and objectives.

Ontario's regional Growth Plan for the Greater Golden Horseshoe is divided into four major sections: where and how to grow; infrastructure; protecting what is valuable; and implementation (Ontario Ministry of Public Infrastructure Renewal 2006). Approaches to growth management outlined by the Plan include directing a major proportion of new growth into already built-up areas of a community through intensification (Ontario Ministry of Public Infrastructure Renewal 2006). Designated greenfield areas may be developed, but

only with compact, transit-supported communities. These communities are intended to contain a variety of housing and employment and services within a configuration that supports alternative transportation services. The Growth Plan also states that sufficient employment land should be available to support projected growth (Ontario Ministry of Public Infrastructure Renewal 2006). Setting aside lands as employment land (industrial, commercial and institutional) to meet growth forecasts is important to provide opportunities for a diverse economic base and ensuring adequate infrastructure requirements (Ontario Ministry of Public Infrastructure Renewal 2006). Major retail uses are not considered employment uses by Ontario Ministry of Public Infrastructure Renewal (2006). The intent of the Growth Plan is also to provide a balance of jobs and housing in each community (Ontario Ministry of Public Infrastructure Renewal 2006). Part of the growth plan is to mandate that all municipal plans should include a strategy for achieving intensification within the identified areas. Regional plans should also identify major transit station areas and intensification corridors (Ontario Ministry of Public Infrastructure Renewal 2006).

At the state level, Oregon identified 19 state-wide planning goals, which include such areas as land use planning, agricultural lands, natural resources, and transportation (DLCD 2007). Each city and county is responsible for implementation according to local needs, and comprehensive plans are made at the city and county level. Two key strategies of Oregon's planning program are the implementation of urban growth boundaries to protect the state's resource lands, and sustainable transportation with an emphasis on options and efficiency (Oregon Office of Energy nd.). State law in Oregon mandates that each city and county shall have a comprehensive land use plan in place (City of Portland 2006). This strong state planning framework means that municipal plans have greater practical influence especially on growth management, since a municipality with a land use plan in place cannot be undermined by unmanaged growth from adjacent jurisdictions.

Similarly, Minnesota adopted 11 sustainable development goals under a Community-Based Planning Act in 1997. These goals include citizen participation, economic development, conservation, livable community design and land use planning, among others (Minnesota Planning 2000). Minnesota recommends that the comprehensive plan be used to identify important community resources (e.g., natural, historic or economic assets) in order to make use of land use bylaws to manage these (Minnesota Planning 2000).

In Southern Australia, a state Planning Strategy is intended to provide medium term (10-15 years) state direction on land use and development, which applies to all private and public development activities. The Strategy includes maps, strategies and policies intended to act as a resource for municipal councils undertaking finer scale planning, Development Plan reviews and Development Plan Amendments (Government of South Australia 2007a). Achievement of the strategies is reported on an annual basis.

Development Plans are the key implementation plans for land use in South Australia, and contain rules and criteria for the types of development permitted on any given piece of land (Government of South Australia 2007a). Each local government within the state has a separate Development Plan. Besides dictating the land uses and zones for each Plan area, policies describe a range of social, environmental and economic concerns and the desired character of different areas. All Development Plans must contain general provisions (policies and principles that apply to all development within the Development Plan region); zone provisions (policies and principles applying to each zone within the Development Plan); tables (giving specific criteria or standards applicable to various forms of development, often regardless of zone); and zoning maps (Government of South Australia 2007a). Development Plans are amended through a Plan Amendment Report (PAR) process, initiated by either local government or the Minister for Urban Development and Planning. Any

amendments require formal public consultation, and an independent body known as the Development Policy Advisory Committee (DPAC) is often referred to for advice and review for consistency with the Planning Strategy. *The Minister must approve all Development Plan amendments, whereupon they are sent for review by the State Parliament's Environment, Resources and Development Committee* (Government of South Australia 2007a).

Currently, a Regional Land Use Framework is in preparation as an alternative to the existing state Planning Strategy. The Yorke Peninsula Regional Land Use Framework is the first Regional Framework developed in a new approach to land use planning by the State Government (Government of South Australia 2007b). Its purpose is to provide a sound and clear basis for physical development in order to:

- provide a framework for decision-making to overcome land use conflicts;
- create certainty for investors in the economic and social development of regions;
- provide regional guidance on using land in a way that balances economic, social and environmental factors;
- integrate resource and catchment management with land use planning;
- assist local government to prepare and implement local strategies; and,
- reduce 'ad hoc' and duplicated decisions by coordinating government, private sector and community action (Government of South Australia 2007b).

The new framework will guide future development across the Yorke Peninsula and the Wakefield Plains, an area covered by four councils (municipal equivalents; Figure 5). The Framework will have statutory authority as it becomes an official part of the State Government's land use Planning Strategy for South Australia (Government of South Australia 2007b). It will provide formal direction to both local councils and the private sector and will guide the modernization of the four local Development Plans covering the region. These Development Plans will still detail local zoning and other land use policies and guide approvals of all development applications and must be consistent with the Planning Strategy (Government of South Australia 2007b). In the development of the framework, the state government has employed detailed Geographic Information Systems (GIS) mapping and considerable public consultation. The collaboration between neighbouring local councils has produced an integrated approach to land use planning and development for the entire region.

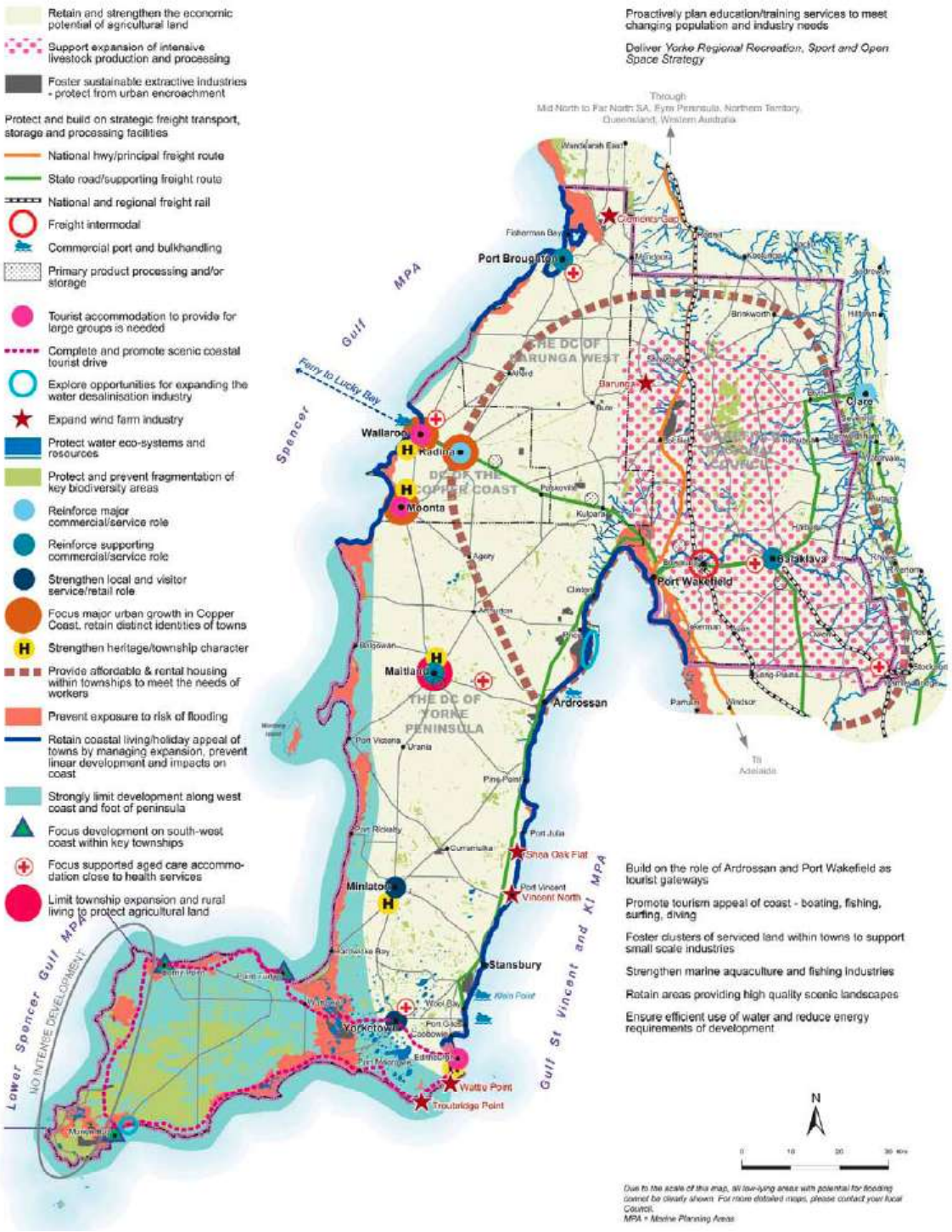


Figure 5. Integrated Plan of Yorke Peninsula Region including the four councils (Wakefield Regional Council, DC of Marunga West, DC of Copper Coast, and DC of York Peninsula; Government of South Australia 2007b).

2.5.2 Training and Institutional Strengthening

Institutions such as municipalities in regions are often not equipped to deal comprehensively with regional land use planning. It is important to strengthen institutional capacity through training programs and sharing of technology and methods. A process for multi-jurisdictional planning may be established to coordinate work throughout the region or across multiple municipalities. There are economies of scale involved, and overall planning costs may be reduced if methods and modelling as well as human and technical resources can be shared amongst municipalities.

2.5.3 Monitor Performance and Adapt Over Time

Modeling is extremely useful throughout the planning process to predict the potential impacts of proposed interventions. However, predictions may be wrong. Therefore, regular monitoring of plan performance measures is needed, together with adaptive management, in order to redirect or revisit plan decisions if the predicted direction or magnitude of impact is inaccurate.

2.5 Recommendations

*9. Mandate the inclusion in municipal plans of a strategy for achieving **intensification** within identified areas. Regional plans should also identify major transit station areas and intensification corridors.*

2.6 Benefits of the Approach

An integrated approach to land use planning that addresses conservation, development and governance issues has many benefits. These include:

- both conservation and development planning efforts have a far greater chance of success when they are considered in an integrated fashion and coordinated across municipalities;
- scarce resources can be directed to those lands which are strategically important in the region;
- harmonization, consolidation and streamlining of multiple initiatives, programs and objectives;
- planning processes will be accelerated and public consultation will be more coordinated; and,
- a clear and shared vision of the future is more likely to emerge.

3 SPECIFIC TOOLS FOR LAND USE PLANNING

Once a comprehensive plan is developed, the next step is practical implementation. Local governments have three general options for implementing a land use plan (Minnesota Planning 2000):

1. **Encourage actions** consistent with planning goals

This strategy refers to public education programs, demonstrations and pilot projects to encourage actions on a voluntary basis.

2. **Provide incentives** for actions consistent with planning goals

This option involves the use of market mechanisms to encourage efficient land use and sustainable planning.

3. **Regulate actions** to be consistent with planning goals

Zoning, subdivision regulations and environmental overlays are just some of the regulatory approaches that can be used.

The following discussion on tools and approaches in Sections 3.1 and 3.2 will focus on the second two options and examples of their use in other regions and municipalities. It is noted that these approaches are not mutually exclusive: many jurisdictions use combinations of two or three approaches effectively. For example, regulatory approaches (e.g., urban growth boundary) can be combined with market approaches (e.g., excise taxes or impact fees) for greater success (Minnesota Planning 2000).

3.1 Regulatory Land Use Planning Tools

Zoning and building codes often favour low-density development by segregating uses. Examples of policies that encourage sprawl are large-lot exclusionary zoning and funding for highway transportation (Stokes et al. 1989, Haughey 2005). However, there are two general approaches to encouraging sustainable and efficient based on regulatory mechanisms: altering zoning and subdivision regulation to promote sustainable practices, and using flexible land use regulations within land use zones.

3.1.1 Zoning and Subdivision Regulation

There are ways to make use of the system of zoning and subdivision regulation to encourage responsible development and growth management in urban municipalities. These methods include designation of an urban growth boundary or similar growth limit, overlay zoning, and changes to subdivision regulations.

The location of an urban growth boundary (UGB) is based on community agreement and accounts for projected population, commercial and industrial growth in a long-term scenario. A common planning period for estimating population growth is 20 years, but longer time periods can also be used. Decisions regarding the location of the UGB should also take into account an inventory and projected needs analysis of public facilities and infrastructure based on desired densities and development patterns of the city, and an estimate of the amount of land needed and available for development at the desired densities to meet population growth (Minnesota Planning 2000). Inside the UGB, planning emphasizes urban services and infrastructure. UGBs typically restrict development for a period of 20 years or more (Snyder 2005).

Outside of the UGB, planning focuses on growth management, land-based resource industries and natural resource protection. Minnesota Planning (2000) describes two planning zones located outside the UGB: the Agricultural and Forest Protection Zone and the Conservation Subdivision Zone. The location of the former is strongly tied to physical and historical attributes such as soil type and agricultural/forestry history. The latter zone is typically located just outside the UGB and permits well-planned cluster developments of rural residential communities, without urban services. Appendix B gives sample ordinances from the U.S. for establishment of Agricultural and Forest Protection Zones and Conservation Subdivision Zones.

In the U.S., state-wide mandates for growth boundaries exist in Oregon, Tennessee and Washington (CT21 2003, Snyder 2005). A sample ordinance based on the City of San Jose is given in Appendix B (Minnesota Planning 2000).

The Victorian Government (Australia) also implemented a UGB as part of state legislation. The Victorian government additionally chose five growth corridors in which greenfield development will be encouraged and managed for sustainable development by an independent statutory body called the Growth Area Authority (GAA). The UGB for the city of Melbourne was set according to a public consultation process and is located outside the designated growth areas, extending across 17 municipalities. The UGB and the Growth Areas are identified in the strategic plan for Melbourne, *Melbourne 2030*. A key part of the *Melbourne 2030* plan is the protection of 12 'green wedges' surrounding the city: areas that represent valuable land in terms of environment and/or agriculture (DSE 2007; Figure 6). The Melbourne land use plan including the UGB is managed by the state Department of Sustainability and Environment.

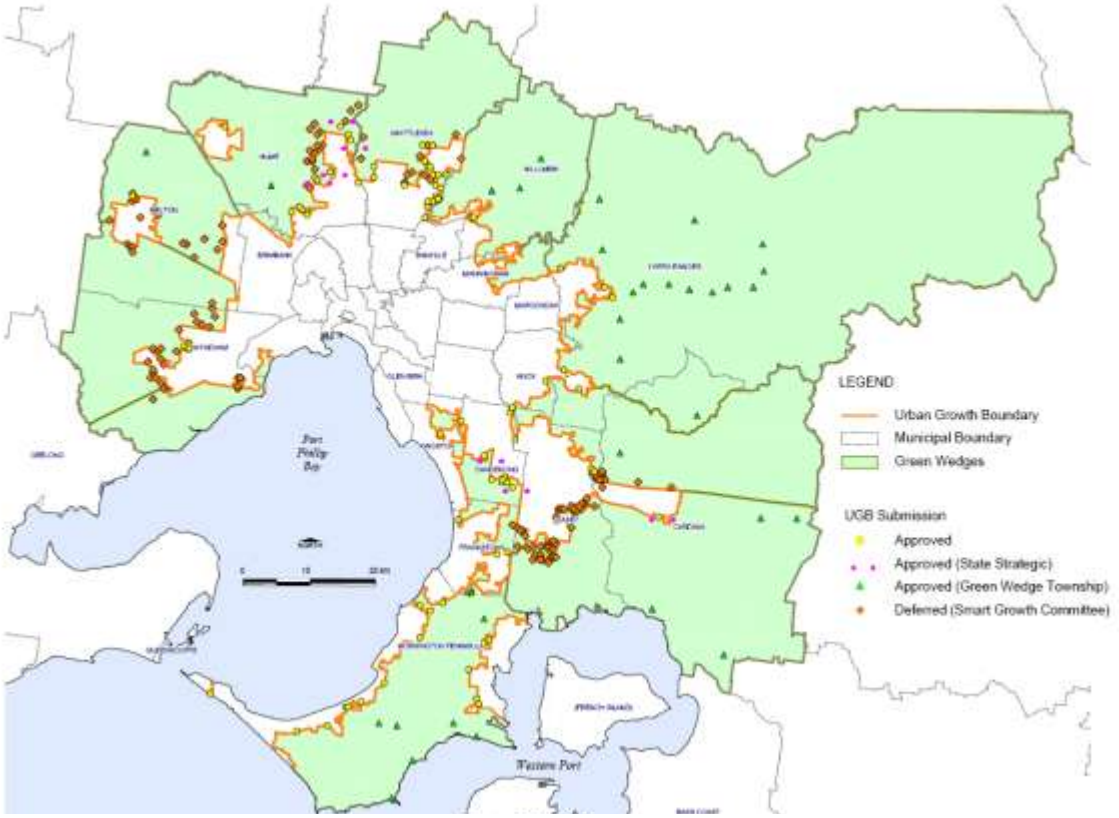


Figure 6. Urban Growth Boundary and green wedges in the *Melbourne 2030* land use plan (DSE 2007).

UGBs often exhibit mixed success, however, since spillover growth in the form of rural residential development still occurs in many cases. UGBs should be combined with requirements for higher density development, such as transit-oriented development to be most successful in attaining planning objectives within the boundary (Snyder 2005). These measures can include zoning for higher densities, especially around transit nodes, or incentives for infill development. Another problem sometimes associated with the creation of UGBs is an increase in housing costs within the boundary. This has been the case in Portland, Oregon. These effects can be minimized by combining a boundary with market-based incentives that help mitigate the effects of the artificial real-estate market (Staley et al. 1999).

Urban limits or greenbelts are another less restrictive measure, and are mandated in New Jersey, Maine and Washington (Snyder 2005).

A similar approach is used by Ontario's Greater Golden Horseshoe Growth Plan, which identifies 25 Urban Growth Centres (UGCs) across the planning region. The purpose of UGCs is to provide a focus for investment in public services and commercial, recreational, cultural and entertainment uses; to support major transit and other infrastructure; to act as high density employment centres; and to accommodate a high proportion of population and employment growth (Ontario Ministry of Public Infrastructure Renewal 2006). Designation of

UGCs is managed provincially and in consultation with municipalities to determine their approximate size and location. The municipalities then determine the UGC boundary in their comprehensive plan (Ontario Ministry of Public Infrastructure Renewal 2006).

Environmental overlays typically include all green infrastructure (land, water and vegetation) within the community (Minnesota Planning 2000). Where potential development is proposed in the area of an environmental overlay, the developer is responsible for more specific inventories of natural features within any overlay areas that fall on the developer's land. The municipal government can then decide which areas are suitable for protection, preservation, conservation or restoration (Minnesota Planning 2000). Overlay zoning can be used to protect areas identified as important green infrastructure, as identified in the scenario modelling stage and evaluated with programs such as CITYgreen. Overlay zoning can also include historical districts or cultural sites (Stokes et al. 1989).

Currently, subsurface rights for resource extraction can be bought by the province irrespective of surface land cover/land use. Rights to develop any mineral and energy resources found are obtained through application to the Alberta Energy and Utilities Board (EUB). Coordination between the EUB, a provincial planning body, and municipalities is therefore required before any overlay zoning can protect against subsurface exploration and resource extraction activity and the subsequent disturbances to the land, water and biota.

There are alterations that can be made to subdivision regulations to protect resource lands or to improve urban growth management.

To protect resource land in McHenry County, Illinois implemented a subdivision bylaw in which the minimum residential lot size is 160 acres – the size of an average farm in the county (Stokes et al. 1989). This regulation helps to protect the prime farmland on which the county is situated from urban sprawl and rural residential developments.

Subdivision bylaws can also provide for a 'sunset', a time limit on which sale and construction of a property must occur or the developer must re-apply for approval (Stokes et al. 1989). This type of bylaw protects against development based on out-of-date or non-existent land use plans.

3.1.2 Flexible Land Use Regulations

Flexible land use regulations tend to allow for more options on the part of the developer or landowner while maintaining community planning goals. Types employed most commonly by other jurisdictions include conservation subdivisions or cluster development, performance systems, and Purchase or Transfer of Development Rights.

This type of development focuses on developing units on small lots within a given land parcel, while protecting the remaining open space (Minnesota Planning 2000). In conventional development with a regulated lot size of 2 ha per unit, a 20 ha land parcel would be developed into 10 individual units each on a 2 ha lot. Cluster development would look at the land and identify natural areas for protection (e.g., forest, pond, meadow) and then build the same 10 units on smaller lots (e.g., 1 ha) at one end of the parcel while protecting the other 10 ha as natural space, agricultural land, or recreational area. The advantages of cluster development include retaining more of the original character of the environment, providing a more attractive setting, and allowing for greater flexibility in site planning (e.g., avoiding slopes or retaining natural vegetation). The development also requires shorter streets and utility lines, making it more resource-efficient and economical. However, the development must include a provision for protecting the open space that is retained or it could run the risk of being developed in the future.

Performance systems can include either performance standards or performance zoning. The intent of these systems is to evaluate the actual impacts of any proposed development by placing the burden on the developer to mitigate any objectionable impacts (Stokes et al. 1989). This is usually achieved through use of a points system (Stokes et al. 1989). Points can be obtained by reduced impact on a number of criteria, including wetland, vegetation, critical slopes, groundwater, traffic generation and visual impact, among others (Stokes et al. 1989).

Performance standards apply to permitted uses within traditional zones, while *performance zoning* permits any use in any location in the community provided the development meets the required performance points. In some jurisdictions, performance zoning is also known as form-based codes or district-based zoning (VTPI 2007).

In order to permanently protect parcels of land from development, either a Purchase or Transfer of Development Rights can be used as an alternative to zoning changes, which are not necessarily permanent.

With a Purchase of Development Rights (PDR) a landowner is paid to permanently restrict future development of land parcels. This is typically applied to agricultural lands and natural areas, and places a perpetual conservation easement on the land. Another benefit of PDRs is that speculators are prevented from purchasing land outside a given growth boundary in the hope that zoning would change in the future (Minnesota Planning 2000). However, PDRs are expensive and are recommended only to complement an overall growth management plan. Washington County, Minnesota is one region using this tool.

With a Transfer of Development Rights (TDR), a landowner sells the right to develop on his/her land to a private developer looking to build on another piece of land. Development rights are sold from areas designated for protection on the fringes of town (sending zone) to areas designated for urban development (receiving zone). The number of rights that can be sold depends on subdivision bylaws and is usually based on the area of the selling parcel (Minnesota Planning 2000). For example, a landowner owning 50 ha of farmland on the outskirts of a city where the bylaw allowed for subdivision of 2 ha lots could sell off up to 24 rights. If the farmer sells 20 rights to a developer with a 20 ha parcel, the developer can now build 30 units on that land rather than the 10 he was previously allowed with the 2 ha per unit regulation density. The receiving parcel can then allow development at densities greater than that set out in the bylaw, which concentrates development in areas with adequate and efficient service provision. The farmer's land is then permanently protected and the sale of rights is recorded on the land deed so they cannot be sold again. TDR programs are in place in Montgomery County, Maryland, Monterey County, California and Palm Beach County, Florida (Stokes et al. 1999). A sample ordinance for establishment of a TDR program in the U.S. is given in Appendix B.

In Canada, TDR is a relatively new and underutilized policy tool. Beale and Fay (2006) recommend renaming this tool as Transfer of Development Credits (TDC) for the Canadian context, as the Charter of Rights does not mention property rights. While government policy does not currently give authority to municipalities to set up a TDC scheme in Alberta or elsewhere in Canada, it is also argued that specific legislation is not needed for a municipality to set up a TDC scheme (Beaudry 2006, Miistakis Institute 2006). To set up a TDC scheme, the municipality must clearly identify a sending area and a receiving area (Beaudry 2006). The complexity of setting up the scheme in terms of administration and the resources required for planning, education and public outreach may be the primary drawback for many municipalities. However, the benefits of a TDC scheme for protecting prime agricultural land in Alberta from urban sprawl and rural residential development may

outweigh the initial setup costs. A pilot program may help determine the cost/benefit tradeoffs associated with a TDC scheme, although intermunicipal training and institutional strengthening could decrease costs of program implementation.

3.1 Recommendations

*10. Determine, at the provincial/regional level, a system of **greenbelts and urban growth boundaries** to protect agricultural and other resource lands as well as conservation of natural areas.*

*11. Implementation of **environmental overlays** to protect water resources and other sensitive areas in order to preserve biodiversity and ecological integrity.*

*12. Encouragement of **cluster or nodal development** as an alternative to traditional development.*

*13. Encourage use of **TDCs as a growth management strategy** by piloting a provincially-supported planning/financial aid program for high-growth municipalities to develop a TDC scheme.*

3.2 Market-Based Land Use Planning Tools

Current market mechanisms often encourage sprawl, as outlying areas are cheaper than downtown locations in terms of construction, permitting, parking, design costs and property taxes (Snyder and Bird 1998). Sprawling developments often do not pay enough property taxes to cover the cost of municipal services required (Haughey 2005).

However, there are many fiscal interventions that can be implemented for the purpose of growth management and promoting efficiency in land use. Barker (2006) suggested better use of these market mechanisms to encourage more efficient use of urban land in the U.K. Market-based land use planning tools include impact fees or off-site levies, development excise taxes, tax revenue/cost sharing, and incentive zoning.

3.2.1 Impact Fees

Impact fees are charges imposed on new developments to offset the public cost of providing municipal services and facilities to the area. These fees are intended to place the cost of additional infrastructure (e.g., sewage, water, roads, municipal services) in outlying areas back on the homeowner or developer (Snyder and Bird 1998). These fees are also called off-site levies, developer charges, benefit assessments or connection charges, among others.

Impact fees are used in Florida, California, Oregon, Colorado and Texas, Arizona, Georgia, Maine, Maryland, Nevada, Vermont and Washington (Snyder and Bird 1998). The average impact fee for a single family house in the U.S. in 1998 was $6400 with a range of $2000 to $17,000 (Snyder and Bird 1998).

Some considerations when setting up impact fees include determining the appropriate formula, the amount of flexibility in setting the fee, and whether offsets (e.g., for donated land) should be allowed (Snyder and Bird 1998). Typically, formulas are based on the need for new facilities, the current population, the size of the building and amount of sewage flow (Snyder and Bird 1998).

To better capture the impact of development, impact fees can be set up to vary relative to existing municipal services or the new development's density. Fee discounts or exemptions

can be granted to urban infill developments, for example (VTPI 2007). To enable impact fees to guide city growth, Lancaster, California sets fees based on the distance of the development from the urban core for street sweeping, park maintenance and police protection (Snyder and Bird 1998).

Alberta has a provision for allowing off-site levies as a tool for recovering capital costs of infrastructure improvements to accommodate new developments (*MGA* Section 648). For a municipality to implement and enforce an off-site levy, it must be able to prove the correlation between the levy and the impacts of the development and include how the levy was calculated (e.g., *Keyland Development Corporation vs. The Town of Cochrane*).

3.2.2 Development Excise Taxes

The difference between a tax and a fee is that taxes must be approved by the public; but, once approved, the level of the tax need bear no relationship to the cost of providing services to the development. This means it cannot be argued in court as can a fee (Snyder and Bird 1998). An adjustment on property taxes to reflect service provision costs and favour more compact, infill development is another tax reform suggested by Smart Growth initiatives (VTPI 2007). Some examples of tax reforms include (VTPI 2007):

- lower tax rates on properties within an urban growth boundary;
- structure tax policies to favour redevelopment of older buildings and more compact, infill development over new construction;
- tax greenfield development or prime farmland conversion; and,
- tax parking facilities and impervious surfaces.

Boulder, Colorado is a city that has implemented excise taxes, using the funds to support affordable housing programs (Snyder and Bird 1998).

3.2.3 Tax Revenue / Cost Sharing

The purpose behind tax revenue sharing between municipalities (especially urban and surrounding rural municipalities) is to reduce the competition for high tax revenue-generating development, such as big box retail development. With reduced fiscal competition, land use decisions can be made to a larger extent on public interest and sustainable land use planning principles.

An example from California shows a tax sharing revenue plan between the City of Modesto and Stanislaus County allowing regional land use planning to take precedence over purely financial land use decisions (Association of Bay Area Governments nd.). The tax sharing agreement was a result of a state-wide amendment (Proposition 11) which allowed cities and counties in California to develop sales tax sharing agreements with the approval of a super-majority vote of city council and county board of supervisors (Association of Bay Area Governments nd.). In 1998, the City of Modesto and Stanislaus County created a tax sharing revenue plan in which the county collects and distributes sales tax revenues to the city within an identified area, based on the estimated sales tax that existing and future developments were expected to generate (Association of Bay Area Governments nd.). The results of this agreement have been positive, and a new administration building was set up to serve both jurisdictions in a long-term partnership (Association of Bay Area Governments nd.). An annual audit is undertaken to ensure accuracy and equality in management of sales tax revenues (Association of Bay Area Governments nd.).

Another example from the Minnesota-St. Paul region shows each city contributing 40% of growth in its commercial industrial tax base to a regional pool. The funds are then distributed back to the cities so that those with the lowest commercial industrial tax base receive the most money (Snyder 2005). The idea was to reduce the financial inequalities between municipalities in the region to combat sprawl; however, the system has had relatively little success in affecting the patterns of growth. A stronger alternative is recommended that also includes tax revenue sharing on a larger proportion of the commercial industrial tax base as well as some of the high-value residential tax base in order to further reduce competition brought about by fiscal zoning (Snyder 2005).

3.2.4 Incentive Zoning

Incentive zoning encourages development to occur in certain districts or areas of the city. Tax breaks for businesses locating in an economically depressed area is one example (Snyder and Bird 1998). A second is incentives such as reduced parking requirements and lower development fees for projects that generate fewer vehicle trips (VTPI 2007).

Austin, Texas offers financial incentives to developers for locating building projects within existing neighbourhoods and in the downtown core (Haughey 2005). Other incentives include awarding points to developments for attributes such as transit access, empty lot redevelopment and increasing pedestrian facilities (Haughey 2005).

In Maryland, land use plans including priority growth areas are mandated by state policy. Incentive zoning for development is initiated by the state: state funding for development is only given for projects within priority growth areas (CT21 2003).

3.2 Recommendations

*14. Enable processes for **cost/benefit sharing** (in terms of both revenue and infrastructure) between municipalities.*

3.3 Combination Approaches

It is noteworthy that regulatory and market-based are not mutually exclusive: many jurisdictions use combinations of two or three approaches effectively. For example, regulatory approaches (e.g., urban growth boundary) can be combined with market approaches (e.g., excise taxes or impact fees) for greater success (Minnesota Planning 2000). Combined with public education programs and other methods of encouraging actions consistent with planning goals, municipal and regional land use plans can be effective in fostering continued *development*, rather than *growth*, of the community.

3.3 Recommendations

*15. Implementation of a **combination of regulatory and market-based approaches** to land use planning and growth management.*

4 CONCLUSIONS AND RECOMMENDATIONS

Land use planning in Alberta can benefit from the examination of processes and tools used in other jurisdictions facing similar growth and land resource pressures. This section discusses the need for new approaches to planning, a set of objectives for land use planning in the province, three strategies to be considered in land use planning, and a summary of recommendations for improving the ability of municipalities and other planning authorities to manage the land resource.

4.1 The Need for New Approaches to Planning

There is a need for an explicit, long term sustainability vision that spells out continued viability of both natural and social systems. The need for a new integrated approach to land use planning that considers multiple sectors, multiple scales and multiple institutions (municipalities, the province, various departments, etc.) is compelling. The following points emphasize this need and apply to most areas in the province that are rapidly changing:

- With increasing urbanization and populations, demands on finite resource bases are multiplying at an accelerated rate.

- There is a need to establish sustainable development strategies that capitalize on the natural, cultural and economic resources of entire regions.

- Regions and their constituent landscapes and municipalities are changing rapidly and often not for the better. In many cases there is damage to soil and forest resources, surface water and aquifer contamination, loss of biodiversity, loss of agricultural production, loss of cultural landscape resources and increased vulnerability to natural disturbances (e.g., flooding, fire, insects and disease; Beatley and Manning 1997, Busch and Trexler 2003, Hill et al. 2005, Ahern et al. 2006, Lindenmayer and Fischer 2006). Many of the causes and effects spread beyond municipal boundaries and need to be addressed at broader scales.

- The equitable distribution of the costs and benefits of regional growth is needed if environmental protection, economic development and protection of quality of life strategies are to be realized.

- Integration of environmental, economic and social objectives is needed in order to ensure plans and programs are not at cross-purposes. Harmonization of different provincial and municipal development initiatives, including private investment, is required.

- There is a need to coordinate finer-scale municipal and individual sector plans in order to ensure they are not at cross-purposes as well as to make the best use of scarce resources.

- The institutional arrangements and authority necessary to sustain integrated planning and the resulting coordinated development are seldom in place.

4.2 Principle Objectives of Land Use Planning

The following are the principle objectives of land use planning that may be applied throughout the province:

- To provide spatially explicit[1] integrated plans that address planned growth for multiple uses, infrastructure requirements and environmental protection in a sustainable manner.

- To identify appropriate land use zoning in a spatially explicit manner. This will guide finer scale municipal plans and address regional issues, environmental protection and development requirements.

- To identify sustainable development guidelines and prototypical projects for the land use types identified in the regional zoning.

- To strengthen the institutional capacity of the municipalities to carry out and sustain land use planning in the region.

4.3 Three Strategies for Land Use Planning

While the details and issues vary considerably by locale, land use planning can be approached using three basic strategies (Figure 7). All are required if plans are to be effective, comprehensive, integrated and sustainable. The strategies will simultaneously address development and environmental conservation/protection objectives while, at the same time, consider required institutional capacities and arrangements. A successful land use plan will rest upon three integrated general strategies:

The Defensive (Conservation) Strategy considers the vulnerability of the area for development. It identifies what and where conservation or protection is required, where development should be avoided and what mitigation is required if it does occur. What do we want to conserve and where is it? Sensitive or valued elements are identified, including, among others, aquifer recharge areas, steep, unstable slopes and erodible soils, productive agricultural land, special natural and cultural elements, ecologically sensitive, rare or unique areas, flood inundation areas, fragile lands, and important landscape ecological patterns.

It must be stressed that the defensive strategy needs to be identified prior to identifying the offensive-development strategy as it will be unlikely, if not impossible, to achieve otherwise. The residents of the area need to identify what they value and want to keep before development objectives are set.

The ***Offensive (Development) Strategy*** identifies the type, amount, form and location of development. It identifies where development is to occur and in what form. It considers the attractiveness of the land for various land uses, as well as the infrastructural components needed to support development such as solid waste disposal, potable water, transportation, telecommunication and green infrastructure.

The ***Governance Strategy*** considers government laws and policies, new institutional arrangements and capacity strengthening, human resource requirements and sustainable

[1] Realizing the importance of location, land use planners and policy makers are increasingly conducting analysis, creating plans and writing policies that are directed at particular places. Explicitly accounting for actual location is of great benefit as it allows for more accurate assessment of potential impacts – both negative and positive. Spatially explicit land use planning uses maps, imagery and geographic coordinates to specifically locate where different types of uses may occur in a region. Non-spatial planning and assessment may indicate a percentage of the area is a particular land cover class but does not identify where in the study area it is located.

economic development strategies. Governance analysis looks at the ways the institutions carry out their mandates, determines how they relate to each other and how they work for and with the community. It also focuses on the way decisions are made and the authority behind them. Without an effective governance strategy, plans will remain without authority, unfulfilled and unimplemented.

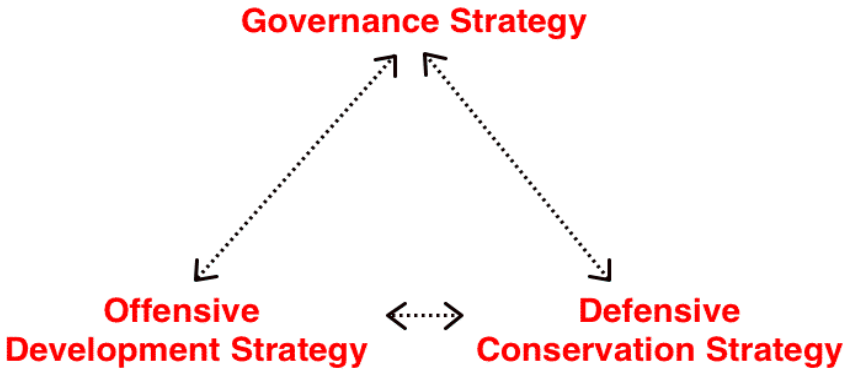


Figure 7. Three integrated strategies for land use planning.

In addition or adjunct to these three strategies, plans need to incorporate the following key requirements of sustainable land use planning and human resource development:

- a planning framework to organize and rationalize the work;
- an understanding of how the region works - its patterns and processes;
- an understanding of government, public and stakeholder values and concerns;
- the provision of alternative future scenarios (over time and space) that address these concerns in order to promote meaningful public dialogue; and,
- an assessment of the economic, social and ecological cumulative impacts of the alternatives to inform decision-making towards the selection of a preferred alternative.

4.4 Summary of Recommendations

The recommendations can be divided into two general categories: strategies for governance and the planning process, and specific tools for land use planning.

4.4.1 Governance and Process Strategies

*1. Establish and test a **new planning process strategy** that incorporates the major steps and considerations discussed in Sections 2.1 to 2.6.*

The planning process begins with an institutional analysis, assembly of GIS data and evaluation of existing conditions. This is followed by development of alternative futures and assessment of these alternatives using spatial modelling against a set of pre-determined criteria. The creation of a comprehensive land use plan and strategy for implementation completes the process. This process may be used at regional or municipal scales across the province. It should be institutionalized so that it becomes a predictable planning processes undertaken by all regions and/or municipalities undergoing rapid change.

*2. Establishment of a **provincial land use planning body** to develop and implement province-wide planning goals.*

In Alberta, this may involve an extension of the secretariat managing the provincial Land Use Framework consultations to be maintained beyond the framework development.

This system has been beneficial in many jurisdictions with well-established land use planning programs in place. In these areas, the state or province takes the lead in setting goals that represent the broader public interest while the local governments are responsible for implementing more detailed plans according to local conditions. Successful state-wide planning goals are in place in Oregon and Hawaii. The state sets general rules for planning decisions, provides technical assistance and grants, and reviews local plans and amendments for consistency with state-wide planning goals. This system still allows authority for municipalities to determine the most appropriate means of applying provincial goals within their jurisdiction. Having a strong provincial framework allows for better coordination between municipalities and at regional scales, and has greater practical impact on growth management.

*3. Development of enabling provincial legislation to authorize the Lieutenant Governor in Council to determine whether a **growth plan** is required for any region/area in the province.*

This recommendation prioritizes those regions experiencing the greatest growth and development pressures.

The provincial government in Ontario has legislative authority through the *Places to Grow Act* to require growth plans for any given region of the province, leading to the development of the Growth Plan for the Greater Golden Horseshoe. A similar comprehensive regional growth plan encompassing four councils (municipal equivalents) was developed in South Australia through the Yorke Peninsula Regional Land Use Framework. A growth plan may be initiated by the provincial planning body acting in consultation with the region's municipalities and local stakeholders.

Land use consistent with the growth plan is then determined at the level of the municipality through the development of a comprehensive land use plan within a multi-jurisdictional and intermunicipal framework.

*4. Provincially mandated establishment of **multi-jurisdictional planning processes to coordinate land use plans** between municipalities and ensure consistency with provincial goals.*

There are many ways to approach this aspect of planning. In Vermont, regional planning commissions have been successful in providing multi-jurisdictional assistance to municipalities. In Ontario, regional growth plans are developed by the province in consultation with the municipalities involved and local stakeholders.

*5. Encourage **citizen involvement** in the planning process.*

Citizen involvement, in combination with formal municipal decision-making, is important for developing a publicly supported land use plan that can be implemented. Methods of engaging citizen participation are described in the AUMA Municipal Sustainability Planning

(MSP) process and in Urban Land Institute (ULI) booklets. Citizen participation in planning is mandated in Arizona and has been used extensively in Utah.

*6. Establishment of **criteria or performance measures** as part of land use plan development, against which a municipal or regional land use plan could be assessed.*

These criteria should include social, environmental and economic measures, decided on through dialogue among the public and stakeholder groups. Some examples of Smart Growth planning principles have been developed into criteria by jurisdictions including the U.K. (e.g., national targets for brownfield development) and Ontario (e.g., regional targets for population and employment densities).

*7. Outline a **common spatial vocabulary** in the provincial Land Use Framework that describes the land use/land cover across the province.*

A common spatial vocabulary is critical to establishing a basis for multi-jurisdictional integration of plans within a regional and provincial context.

*8. Enable the use of **scenario modelling tools** by regions and municipalities through training, financial support and institutional strengthening.*

Modelling tools can be made available to municipalities and regions developing land use plans, to evaluate alternative scenarios across a range of evaluation criteria. Use of modelling and visualization tools can aid in government, stakeholder and public consultations.

Utah makes extensive use of visualization tools to engage citizens in alternative growth scenarios, while California uses a program to calculate city efficiency under different scenarios in terms of a number of indicators including energy and water.

*9. Mandate the inclusion in municipal plans of a strategy for achieving **intensification** within identified areas. Regional plans should also identify major transit station areas and intensification corridors.*

Ontario's regional Growth Plan for the Greater Golden Horseshoe requires all municipalities within that region to specify their intensification strategy. An intensification strategy must be spatially explicit, as demonstrated in Portland, Oregon.

4.4.2 Tools for Land Use Planning

*10. Determine, at the provincial/regional level, a system of **greenbelts and urban growth boundaries** to protect agricultural and other resource lands as well as conservation of natural areas.*

State-wide mandates for urban growth boundaries (UGBs) are found in Oregon, Tennessee and Washington as well as in Victoria (Australia). These are best created in concert with market-based approaches to mitigate unwanted effects such as dramatic increases in housing costs and rural residential spillover growth. Zoning outside of the boundary should reflect land use goals, such as an Agricultural and Forest Protection Zone and a Conservation Subdivision Zone (e.g., Minnesota), or designated growth corridors and green wedges (e.g., Melbourne, Australia). Greenbelts and UGBs are best designated by regional or multi-jurisdictional plans rather than individual municipal plans. A similar approach is to

designate urban growth centres (UGCs) and focus intensification of employment and housing within these areas (e.g., Greater Golden Horseshoe, Ontario).

*11. Implementation of **environmental overlays** to protect water resources and other sensitive areas in order to preserve biodiversity and ecological integrity.*

Land use planners at both the municipal and provincial levels must act in coordination with subsurface resource planning bodies in order for environmental overlays to be effective in supporting planning goals.

*12. Encouragement of **cluster or nodal development** as an alternative to traditional development.*

Cluster development, also known as conservation subdivisions, refers to a development design that increases housing density in a certain area while protecting land in another. However, the development must include a provision for protecting the open space that is retained or it could run the risk of being developed in the future.

*13. Encourage use of **TDCs as a growth management strategy** by piloting a provincially-supported planning/financial aid program for high-growth municipalities to develop a TDC scheme.*

TDR programs have been successful in protecting land in Maryland, California and Florida, in areas where high development pressure ensures that there is a strong market for development rights or credits.

*14. Enable processes for **cost/benefit sharing** (in terms of both revenue and infrastructure) between municipalities.*

While the *MGA* currently authorizes the development of intermunicipal plans, currently only three items must be included: procedures for dealing with conflict between municipalities, procedures to amend or repeal the plan, and provisions related to plan administration (see Appendix A). It is recommended that procedures related to cost/benefit equalization between municipalities with respect to development associated with a high tax base or service requirements be included as a 'must include' item in intermunicipal plans.

Tax benefit sharing between municipalities is recommended for both the commercial industrial tax base as well as high-value residential tax base in order to affect growth patterns (e.g., Minnesota-St. Paul region).

*15. Implementation of a **combination of regulatory and market-based approaches** to land use planning and growth management.*

A classic example is the use of greenbelts or UGBs as a regulatory tool combined with development excise taxes to offset housing costs. Boulder, Colorado then uses funds acquired from excise taxes to support affordable housing programs.

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APPENDICES

You can find the appendices at the following link:

http://www.auma.ca/live/digitalAssets/13613_Sustainable_Land_Use_Planning_09072007.pdf