

4. LOCAL CONDITIONS

Inherent in the provincial policy statement is the principle that its application must be geared to the local conditions of an area. These local conditions will influence the options available and the actions that will be taken through the land use planning process to meet the intent of the policy statement.

The wide variety of planning approaches available to enable a municipality or planning board to address flood plain planning concerns has been alluded to already. They will also be further elaborated in section 5. The selection of the appropriate approach or combination of approaches will be a task to be performed in recognition of the opportunities and limitations that are created by local circumstances. Since these circumstances will vary from municipality to municipality and from watershed to watershed, there is no single preferred approach to flood plain planning. Similarly, there is probably not one approach that can be applied directly from one municipality or planning area to another.

Efforts must then focus on solving a local problem with the methods and measures available to and compatible with the local situation.

Local situations can vary in several ways:

- . jurisdictional issues;
- . physical characteristics;
- . availability of technical information;
- . the nature of development;
- . existing water management program.

The variations possible within each of these circumstances will greatly affect the options available for dealing with a flood plain planning concern.

4.1 Jurisdiction

A principle consideration in identifying an appropriate flood plain planning approach is who has the authority, responsibility and/or capability to implement policies and regulations. There are many variables in this regard:

- . Is the flood plain area in a municipality or in an area without municipal organization?

Many planning tools require direct municipal council control, decisions or actions in order to be used, e.g. site plan control, building permits. Areas without municipal organization would not have these tools available in their repertoire of responses. Similarly, the variations in financial and staff resources likely inherent in these two systems would also greatly affect the approaches that could be adopted. (See section 5.6)

- . What is the nature of the municipal organization? Is it large, small, urban, rural, with or without planning staff?

The availability of staff and financial resources would again be a variable factor among different types and sizes of municipalities. With limited staff and other resources, there would likely be a resulting limitation on the complexity of the flood plain planning approach that could be adopted. In addition, the development demands within an urban municipality would differ significantly from those in a rural municipality resulting in different needs, hence different approaches to be adopted.

- . Is there a Conservation Authority?

As indicated in section 5.2, most Conservation Authorities administer Fill, Construction and Alteration to Waterways Regulations. These regulations would likely be part of a comprehensive approach adopted by a municipality or planning board to deal with flood plain management. Where there is no Conservation Authority or where the Conservation Authority does not have regulations in place, this control provision obviously cannot exist. Therefore, there will have to be greater reliance on the more standard planning mechanisms (i.e. official plans, zoning by-laws).

- . Is the area within a one-tier or two-tier planning system?

In view of the variation in planning responsibilities resting with upper and lower tier governments in Ontario, it is important to understand which planning mechanisms are available to the respective levels for achieving flood plain planning objectives. For example, site plan control can only be implemented by the local municipality although the authorizing official plan policy can be in either an upper tier or lower tier plan. Therefore, there must be assurance that the local municipality is not only willing but able to undertake the responsibilities if called upon to do so in an upper tier planning document.

In the same regard, only broad flood plain policy objectives and/or delineations on land use schedules will be possible in the upper tier plan due to limitations in scope and scale. These policies and/or land use delineations would then be refined in the lower tier plans.

4.2 Physical Characteristics of the Flood Plain

The topographical variations of a flood plain directly affect the nature and characteristics of a flood. The geomorphology, i.e. shape of the basin, affects the water velocity or speed, as well as the peak volumes (or amount of water at its highest point). Soil and geological factors affect water infiltration (absorption) capabilities and ground water movement. The gradient of the flood plain, i.e. whether it is steep or flat, also affects the water flow. The antecedent moisture conditions (or the general ability of the ground to absorb moisture) affects whether the water gets absorbed or whether it runs off over adjacent areas. These are some of the many characteristics that affect the way in which water will behave in a flood situation. Therefore, the planning decisions that will be made must be extremely cognizant of them.

In Ontario, these characteristics translate into three general types of areas:

- . rolling (moraine) topography.
- . flat topography.
- . shield topography.

In areas characterized by rolling topography created by glacial moraines (i.e. much of South-Central Ontario), flood plains tend to be well defined. Areas subject to flooding are generally distinguishable from areas that are not subject to flooding or subject to minimal flooding. The resulting floods in these well-defined valleys are usually deeper, with higher velocity flows. The concern in these areas is risk to life.

In areas characterized by flat topography (i.e. Southwestern Ontario), the flood plain can be extensive. The severely hazardous areas are not as clearly definable. In these areas, the resulting flood is usually shallow with low velocity flows. The concern in these areas is more a risk to property than to life. These areas may offer more opportunity for development providing flood susceptibility is minimized through appropriate floodproofing and problems upstream or downstream are not created.

In shield topography areas (i.e. Muskoka), the rock base and formations have poor absorption capacity and result in extensive surface runoff. In addition, the flood characteristics are much more variable because of the many differences in topography. In these areas, there are also many interconnected lakes and watercourses. Therefore, the water characteristics of the watercourses may be linked to the lake levels. In view of this variability, it may be difficult to differentiate areas that can be developed from those that cannot (because of excessive risk) without careful scrutiny of the detailed local conditions.

The physical characteristics will have to be examined in order to determine such factors as the degree and focus of risk (i.e. life, property, or both); and whether detailed information is available about the flood characteristics. Based on that information, there could be some assessment as to the amount of land where development may take place subject to conditions and the areas where development should be restricted or prohibited.

Clarification of these issues will then assist a decision-maker in determining the planning options available.

4.3 Technical Information

The availability of information on a variety of factors relating to the flood plain will dictate the planning options available.

Of primary importance to sound flood plain planning is flood plain mapping. For various areas in Ontario, engineered mapping exists which identifies the limits of the flood plain. In other areas, the mapping used to define the flood plain is based on interpretations of photographs (referred to as "airphoto interpreted lines") taken from the air. The lines delineated on the photographs represent the best flood-related information for the area. In many instances, flood related information is combined with erosion and unstable slope information and collectively referred to as a "hazard line". In some cases, even aerial photograph information is not available and other methods such as setbacks from watercourses, or elevations, are used to identify possible flood areas.

With increased accuracy in information available, there can be an increase in the precision of planning policies and options related to where development can or cannot take place in a flood plain. For example, engineered lines are a prerequisite to using the approaches identified to achieve more flexibility, i.e. two-zone concept, special policy area concept.

Other technical information that may also vary in terms of availability, therefore in terms of planning options possible, include:

- . definition of the floodway based on the criteria discussed in section 3;
- . Conservation Authority regulations (with respect to construction and floodproofing provisions that could be provided for);
- . floodproofing methodologies (with respect to implementation ability);

- general planning expertise or experience (in terms of dealing with flood plain planning issues).

4.4 Nature of Development

Development pressures and availability of land for development differ significantly in urban and rural areas. Therefore, it is clear that the approach to be taken in addressing flood plain planning concerns will vary, likewise.

For example, in an urban area where demand for development is continuous and where desirable land for such development is in relatively short supply, there will be a greater need for information that is as accurate and precise as possible. It is much more critical to know exactly where development can occur, even with floodproofing, and where it cannot.

In a rural area where the intensity of development is far less than in an urban area, and where lots are generally significantly larger, there may be somewhat more flexibility with respect to where development can or must take place. A flood plain may only affect part of a larger rural lot. In addition, there may be far fewer applications for development in flood plain areas.

The planning document policies and provisions would have to be prepared accordingly, recognizing the local variations in development conditions.

Other development issues that will come into play in different areas and that must be recognized in preparing a local planning strategy are:

- Is the main focus of development infilling, replacement, additions or new large scale, multi-lot development?

The policy statement (as indicated) calls for official plan policies to be developed to deal with this issue. Their importance could vary from one area to another, depending on local circumstances.

Is the pressure for development focussed on seasonal residential (including related development such as boat houses, moorings and marinas) as opposed to permanent residential?

Generally, seasonal residential development should be subject to the same rules as permanent because the risk to life and property is the same. This issue will be very important in some areas and therefore policies may have to be developed (in accordance with local circumstances).

Are there many lots of record affected by the flood plain?

While existing lots of record may require special consideration due to real or inferred development rights, the technical information and subsequent policies change over time. Because development rights may have been conferred on individual properties at one point in time, there should be no inferred property owner entitlement to development rights in perpetuity.

4.5 Nature of Flood Control Works

In certain instances, flood control capital works have and will be carried out to address flooding problems. Works such as channels, dams and dykes undertaken by Conservation Authorities or the Ministry of Natural Resources are intended to address existing problems in total or in part. They are not intended to enhance the developability of flood plain land, although it is recognized that some redevelopment or infilling may be more readily achieved with flood control works in place.

Flood control works can be grouped into two major categories - those that modify the flood plain through channelization (either through the lowering of the bed of a watercourse or the filling of land adjacent to a watercourse) and those that hold back flood waters (e.g. dykes and dams). The actual type of flood control work to be proposed would be dependent on an assessment of local conditions including such factors as benefit-cost analysis, and upstream, downstream and on-site implications.

The potential exists for any flood control work to be overtopped or fail under extreme flood conditions. However, proper design, construction, maintenance and operation should minimize such potential.

If a channel failed, the major concern would be for erosion. If a channel is overtopped, the excess flood water would spill on to the adjacent lands. The depth of flooding would be dependent on the extent of the excess flood waters and the nature of the surrounding topography. Where flood waters are held back by dykes or dams, failure of a structure could result in far greater impacts. Therefore, in considering new development behind dykes or downstream of dams, the following is to be taken into account.

4.5.1 Dykes

Where a dyke has been properly designed and constructed to the regulatory flood level, and a suitable maintenance program is in place, the area behind the dyke can be considered as flood fringe. As such, new development would be required to be floodproofed to the regulatory flood level.

The floodway would be considered to be contained within the dyke area. If new development cannot be floodproofed to the regulatory flood level, then special policy area status may be requested, subject to the appropriate requirements.

As a precaution, certain areas immediately behind a dyke may be considered too hazardous for any or certain types of uses, if failure of the dyke was ever to occur. Also, the area immediately behind the dyke may be required for maintenance purposes.

The establishment of no or limited development zones behind a dyke will be dependent on local conditions (e.g. flood depth and velocity) and local approaches to flood plain management.

4.5.2 Dams

Various types and designs of flood control dams can be found. Some are passive in that there is no means of controlling discharge (e.g. earthen dams), some have basic means of control such as stop logs, and others have electrically operated flood gates with full time operators. Some dams are considered multi-purpose providing recreational use, irrigation or flow augmentation, in addition to flood control. Some are designed to regulatory flood criteria and others to higher levels (e.g. maximum probable).

The extent to which the operation of a dam is taken into account in the calculation of downstream flood lines, the extent to which new development may or may not occur in downstream areas, and the extent to which floodproofing for new development may or may not be required, are all dependent on the type and design standard of the dam and local watershed conditions. For example, small or steep watersheds offer limited or no advance warning making dam operation more difficult and providing little time for evacuation or other emergency measures. In larger watersheds, with wide and shallow flood plains, more advance warning is available thus providing more time for precautionary measures to be taken through the operation of the dam prior to the flood actually hitting.

It must be remembered that the function of a flood control dam is to hold back upstream flood waters. When a flood occurs below a dam, the dam is of limited or no use. Whatever the type or design of dam, these structures are not a floodproofing option and the provisions of section 5.1 apply to any proposed development.

The local Conservation Authority or the Ministry of Natural Resources, where no Conservation Authority exists, will have to be consulted as to their treatment of flood control dams within their overall approach to flood plain management.

4.6 Flood Plain Management Approach

As watershed conditions vary across the Province, so do the approaches to flood plain management.

The policies and programs (i.e. prevention, protection, and emergency response) collectively represent the local approach to flood plain management. This approach will influence how future development is addressed within a specific watershed or area. Therefore, land use planning policies and programs should be prepared in accordance with decisions made about the overall approach to flood plain management.