

IMP Document 1

Infrastructure Master Plan Review

Preliminary Proposals

City of Ottawa
Planning, Transit and the
Environment Department
April 22, 2008

PREFACE

UPDATE OF THE INFRASTRUCTURE MASTER PLAN (IMP)

The City of Ottawa adopted its first Infrastructure Master Plan in June 2003. The Infrastructure Master Plan, along with the Transportation Master Plan, provides support to the City's Official Plan by outlining strategic directions and policies for the provision of infrastructure and the major capital projects that would cover the planning horizon of the Official Plan. The Infrastructure Master Plan forged a new path for Ottawa as it put forward an integrated approach to growth planning by including water, wastewater and stormwater infrastructure policies and by linking growth and rehabilitation planning. The broad policy direction it set remains applicable.

Since the preparation of the Infrastructure Master Plan, there have been a number of changes in Provincial legislation and regulations:

- The Provincial Policy Statement, incorporating the Province's policy requirements for Official Plans, was amended in 2005.
- The *Safe Drinking Water Act* was enacted in 2002.
- The *Clean Water Act* was enacted in 2006.
- The *Planning Act* was amended in 2007.

At the municipal level, other changes have occurred that need to be reflected in the contents of the Infrastructure Master Plan

- Council adopted the Groundwater Management Strategy in May 2003.
- Council adopted Stormwater Management Policies in September 2007.
- Council adopted new growth projections to guide future plans in November 2007.
- A community-based review of rural policies has been completed.
- A Capacity Management Strategy to support Intensification and Infill has been prepared by staff.

It is emphasized that this review of the Infrastructure Master Plan is an update and not a rethinking of the document. Most of the Infrastructure Master Plan policy direction remains entirely relevant and applicable to the issues it has addressed. However, with the review of the Official Plan it supports, and in light of the development and adoption of a number of individual strategies, there are certain areas in the Plan that need to be updated or/and where more detailed policy guidance is now available and necessary.

Please Note: At this stage of the review, changes to the Infrastructure Master Plan are related to Plan policies only. The major water, wastewater and stormwater growth-related capital projects, 2009 to 2031 will be available as part of the draft Infrastructure Master Plan.

HOW TO READ THIS DOCUMENT

This document includes major and minor policy changes to the Infrastructure Master Plan and supporting pieces of information. It is divided into two parts as follows:

IMP Document 1

- This summarizes the reasons for proposed policy changes that affect a section or sub-section of the Infrastructure Master Plan as well as a preliminary draft of the proposed changes. These are also the key policy areas in which more detailed guidance in the Infrastructure Master Plan is required to support proposed changes in the Official Plan. In each case, the section includes the ‘requirement’ which explains the reason for the change, the ‘current policy’ in the Infrastructure Master Plan, a brief ‘discussion’, a ‘proposed direction’ and ‘draft Infrastructure Master Plan section or sub-section amendment’. Where there are references to White Papers, these are available at: Ottawa.ca/beyondottawa2020
- Following the summary of the Section or Sub-section changes to the Infrastructure Master Plan are the documents that support the change or that relate to the specific issue. These include:
 - **Supporting Intensification through Capacity Management Strategies for Piped Infrastructure:** (included as IMP Document 1a)
 - Managing Infrastructure Capacity to Support Intensification and Infill
 - **Groundwater Resources:**
 - Council Report adopted May, 2003: Groundwater Management Strategy
 - **Stormwater Management:**
 - Council Report adopted September, 2007: Stormwater Management Strategy Stage 2: Policies

IMP Document 2

- An accompanying table includes a number of additional changes that are of less importance as well as a reference to the strategies or reports in the main document. Where specific policy changes are being proposed, the deleted policies are identified with a “~~strikethrough~~” and the added policies are shown in grey shading.

The numbering system used in this report is not to be confused with the Infrastructure Master Plan sections.

NEXT STEPS AND TIMING

The material in this document, which has not been adopted by Council, is subject to discussion and review. In keeping with the Official Plan schedule, public consultation will be focused in May and June of 2008 but some aspects may continue to be discussed into the summer. It is recommended that all feedback be provided by July 31, 2008. A revised draft Infrastructure Master Plan with policy changes, based on feedback, and a revised list of major capital infrastructure projects will be tabled for public review in November 2008.

April 22, 2008	• Preliminary Proposals released for public consultation
May, June, 2008	• Public consultation

	<ul style="list-style-type: none"> • Intensification Workshop
July 31, 2008	<ul style="list-style-type: none"> • Deadline for comments on Preliminary Proposals
June, July, August	<ul style="list-style-type: none"> • Evaluation of Future Urban Areas
November, 2008	<ul style="list-style-type: none"> • Revised report with proposed Official Plan Amendment • Draft Transportation Master Plan • Draft Infrastructure Master Plan
January, 2009	<ul style="list-style-type: none"> • Public Information Meeting
February, 2009	<ul style="list-style-type: none"> • Public Meeting under the <i>Planning Act</i>.

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IMP Document 1a - MANAGING INFRASTRUCTURE CAPACITY TO SUPPORT INTENSIFICATION AND INFILL

IMP Document 2 - MINOR POLICY AREA CHANGES

PART ONE -MAJOR POLICY AREA CHANGES

1. MANAGING INFRASTRUCTURE CAPACITY TO SUPPORT INTENSIFICATION AND INFILL

1.1.1. Requirement

The Provincial Policy Statement (PPS) states that growth should be accommodated by efficiently using existing sewage and water services and promoting water conservation and efficiency. It directs municipalities to optimize the use of existing infrastructure to support intensification and redevelopment. Municipalities should also set, and achieve, minimum targets and phasing policies for intensification and redevelopment targets prior to, or concurrently with, supporting new development in growth areas. The Ministry of the Environment (M.O.E) through the *Safe Drinking Water Act* requires municipalities to prepare a number of documents (e.g. an operational plan, audit, financial plan) in order to be accredited a Municipal Drinking Water Licence. As well, MOE procedure F 5-5 requires the City to capture and treat 90% of combined sewer overflows to the Ottawa River.

The City's current Official Plan (OP) has promoted intensification and infill inside the Greenbelt and has identified locations for major intensification. However, it does not specify targets for intensification or a phasing plan. With the Official Plan review, urban intensification is a major focus in terms of what it is (the OP definition differs from that of the PPS), what level of intensification is desired (targets) and how it will be phased.

While the Infrastructure Master Plan contains policies related to growth planning for existing infrastructure, the policy guidance is not sufficiently detailed to address the pressures which the PPS, MOE requirements and the OP policies place upon the management of older infrastructure systems in which capacity currently may be limited or not available under certain wet weather conditions.

1.1.2. Current Policy

Under Section 5.6 of the Infrastructure Master Plan, there are policies pertaining to: the distribution of capacity improvements to alleviate risks to the infrastructure systems and provide support for growth; inventory and assessment of the physical condition of the infrastructure systems; maximization of existing infrastructure; working with the development industry to alleviate system concerns where capacity is constrained; and municipal efforts to prepare remediation plans and construct works which can rectify capacity concerns.

1.1.3. Discussion

Continued intensification and infill has presented an increasing challenge to older sewer systems in which there is no, or limited, capacity in parts of the system during wet weather events. Parts of older water and sewer systems do not meet current design standards and, with limited budgets, rehabilitation and replacement of these systems takes time. Intensification puts pressure on the City's pace of renewing and upgrading older infrastructure and, at times, the choices of projects. In addition, current Provincial

regulations and standards add to the pressures on the City regarding water and sewer system performance. To deal with the demands of intensification and the limitations of its older infrastructure, the City has developed a Capacity Management Strategy with more detailed policy and implementation guidance than is currently available in the Infrastructure Master Plan policies.

The delivery of water and sewer servicing to support intensification and infill faces a number of challenges including insufficient knowledge of the extent of sewer capacity constraints. While, the City maintains a city-wide water model, the wastewater system has been modeled at the trunk or collector level only. Developing a city-wide sanitary model is a large, time-consuming undertaking, which requires an analysis of the impact of rainfall and snowmelt on the system. Undertaking City-wide storm modeling is even more complex due to the presence of independent sewersheds and variations in the velocity and intensity of storms which affect the potential impacts on the storm system. A further complication is the extent to which climate change will affect these systems. Currently, the City does collect and analyse capacity information through such means as detailed inventory, flow monitoring, and the use of computer models to predict performance. However, further detailed analysis of infrastructure systems is a critical initial step in planning works to renew and expand these systems to support intensification and infill.

While the City is developing its knowledge of the capacity constraints in older systems and undertaking the upgrading and rehabilitation of these systems to protect existing properties and support intensification and infill, it is important to understand that intensification activity also can offer the potential to exert some very positive impacts on existing municipal infrastructure through such measures as: on-site retention and storage, disconnection, flow removal, and green infrastructure when new development is approved. Intensification can be a ‘good news’ story for older systems, especially for areas in which stormwater from existing properties flows into sanitary systems.

One of the primary impediments to advancing specific projects to better accommodate intensification has been the lack of sufficient resources, particularly the lack of Development Charge (DC) revenues to fund the analysis required to identify projects and then to construct the works that can build capacity into the existing systems. Insufficient DC revenues are available to support system assessments and the planning studies that would advance the identification of projects required to meet the needs of the intensification proposed. DC revenues to support these studies, as well as the cost of system upgrades, need to be provided to solve capacity issues as the City currently focuses on the replacement of older pipes and facilities to increase levels of service for existing properties. Without DC revenues to support upgrades for the older systems, the City relies on Water Rate revenues to pay for projects in intensification areas through its rehabilitation programs. These are user-pay (non-growth) revenues and the City, therefore, directs work in existing areas to the highest needs of existing residents and sizes projects to meet these needs rather than the requirements of future users.

With limited public interest, the debate regarding water and sewer servicing capacity to support the OP’s focus on intensification has primarily been held internally at the City. The

PPS requirements for municipalities to pursue intensification with targets and phasing makes the resolution of this issue even more pressing and, potentially, of more public interest.

1.1.4. Proposed Direction

The draft Capacity Management Strategy which the City has developed addresses the various aspects of the issue: giving higher priority and more financial support to the assessment of system capacity; giving priority to determining solutions and scheduling works for the most pressured growth areas; recommending changes to the review of development applications; undertaking public and private capacity building projects including innovative ways to involve and work with the development community; preparing public information materials; and providing additional funding for non-traditional infrastructure programs (e.g. water efficiency, peak demand management and water loss projects) to reduce reliance on ‘bigger pipe’ capacity building solutions.

The Capacity Management Strategy outlines the directions and actions which can be undertaken to support the City’s legitimate desire, and the Provincial requirement, to intensify even with the stark reality of the state of older municipal infrastructure systems. It provides a comprehensive set of ‘solutions’ that together can best alleviate the situation until additional works and traditional pipe rehabilitation projects can ‘catch up’ to the increasing Provincial demands that these older infrastructure systems perform under new regulations and denser development conditions. The CMS will be included in the amended Infrastructure Master Plan Update as a separate section.

1.1.5. Draft: IMP Amendments

Amend Section 5.6 Growth Planning for Existing Infrastructure by deleting the current policies below:

~~The City will:~~

- ~~1. Account for system capacity improvements realized from system rehabilitation and reconstruction.~~
- ~~2. Distribute capacity improvements to reduce risk to private property.~~
- ~~3. Distribute capacity improvements to reduce risk to the environment.~~
- ~~4. Distribute capacity improvements to provide support for growth.~~

~~The City will:~~

- ~~1. Ensure objective decision making when assessing the physical needs of infrastructure systems;~~
- ~~2. Maintain service standards including risk criteria against which to assess and prioritize physical need issues;~~
- ~~3. Direct available resources in a balanced manner to address needs in separate systems and towards lowering the overall total need in infrastructure systems.~~

~~The City will:~~

- ~~1. Maintain inventories of available capacity in City trunk water, wastewater, stormwater and stormwater management systems.~~
- ~~2. At the planning allocation level, direct available capacity to specific areas to facilitate growth management objectives~~
- ~~3. Review available capacity and planning allocations in conjunction with Official Plan reviews.~~
- ~~4. Institute new capital projects to fulfill planning allocation based on the City's priorities including growth management.~~
- ~~5. Review draft allocation within 3 years of development approval.~~

The City will consider, subject to its own assessments of risk, approval of implementation based on:

- ~~• Developer led demand planning and reduction initiatives may be considered in advance or in addition to City programs;~~
- ~~• Developer led flow or pressure monitoring may be considered if the resulting analysis refines City data and predictions demonstrating that the new development does not result in unacceptable risk;~~
- ~~• Developer front-ending works in accordance with the Development Charge By-law.~~

In order to implement the Official Plan policies, the City will over time:

- ~~• Clearly define City priorities related to the extension of infrastructure to support growth;~~
- ~~• Clearly define City priorities related to the completion of capacity allocation studies; and~~
- ~~• Develop capacity remediation plans for trunk systems to support orderly growth, and include opportunities for developers to participate in capacity remediation.~~

Replace with the following policies from the Capacity Management Strategy and consult the strategy for the discussion related to the policy and the implementation tools for each policy:

ADDRESSING CAPACITY MANAGEMENT CHALLENGES AND OPPORTUNITIES

1. The City will identify growth constraint areas where the risk of wet weather flow conditions could lead to greater occurrence of basement flooding.
2. The City will identify five or more top priority areas where pressure for intensification and infill is expected to occur over the next five-year period; consult with the development community to supplement the information; and give these areas priority for capacity assessment and solutions.
3. The City will identify, by collector and spine, the capacity anticipated to be required for future intensification and/or infill projects. Where there is a capacity constraint related to a collector or spine, the City will endeavour through on-going infrastructure

- renewal and maintenance initiatives to ensure that capacity to support a spectrum of intensification and infill projects will be available.
4. The City will identify specific levels of service for collector drainage areas serving properties within potential intensification and infill areas.
 5. Within the context of servicing levels identified for potential intensification and infill areas, the City will undertake works to provide capacity in the local water and sewer systems to accommodate growth as per its DC emplacement policy or identify the works that are required to provide capacity.
 6. When flow has been removed as a result of major intensification projects within a collector drainage area, the City will reserve this freed-up capacity to support future intensification and infill projects.
 7. The City will add 'growth potential' to its present list of criteria to assess priority for its rehabilitation program.
 8. In its investigation of the potential impacts of climate change on sewer systems, the City will take into account the factors related to the accommodation of future intensification and infill in constrained systems.

PUBLIC AND PRIVATE CAPACITY IMPROVEMENT PROJECTS

1. In the partially-separated sewer system, the City will give priority to extraneous flow removal projects that provide capacity for intensification and infill as well as benefit for existing properties.
2. For intensification and infill projects, the City will continue to:
 - Require, where deemed advisable, applicants to undertake measures that would protect structures from future flooding (e.g. sump pumps, back flow valves, slab on grade construction); and
 - Require new development and redevelopment to undertake means of stormwater management and/or other compensation projects (e.g. roof gardens, rain barrels, permeable surfaces, parking lot retention, etc.)
3. For intensification and infill projects, where extraneous flow removal is restricted, the City will explore other opportunities for flow removal through such means as cash-in-lieu and/or alternative off-site compensation projects.
4. The City will explore opportunities for contributing to alternative compensation projects that could help to reduce and/or delay the construction of future infrastructure capital works. Such a program will incorporate the following features:
 - Identification of compensation works for existing properties (type of project, location, drainage area affected, amount of flow removed, benefit to the system due to location, developer credited, completion date)

- Identification of the intensification or infill project to which the flow credit would apply (project details such as size, type, location, drainage area affected, impact on the system due to location, developer to be debited, completion date)
5. The City will resolve any situations in which its requirements lead to design features and/or lot configurations that contribute to flooding in intensification and infill areas.
 6. The City will encourage all intensification and infill projects to use green building technology so that any additional demands on existing infrastructure systems can be minimized.
 7. The City will explore the use of green technology in relation to its infrastructure construction and reconstruction projects so that the demand on existing infrastructure systems can be minimized. Exploration will include the municipal role in such options as green infrastructure, facilitating potential reuse of grey water or reuse of heat generated from private property.

RELATED PUBLIC EDUCATION PROGRAMS

1. Within the partially-separated areas, the City will continue to encourage moderate growth through intensification and infill when disconnection requirements are met. The City will also provide information to the public to better inform citizens of the benefits of these projects for improving system capacity.
2. A well-developed public education campaign will include the following features:
 - In easily understood terms, apprise citizens of the potential benefits of intensification and infill on underground infrastructure when disconnect measures are taken;
 - Provide examples and illustrations of positive moderately-sized growth projects;
 - Inform citizens within partially-separated and other constraint areas of ways to protect their own properties from flooding;
 - Inform citizens of the mechanics of flood-protection devices, identify properties at risk of flooding, explain the principles of flow management; and
 - Distribute timely information to people and locations that will best ensure that the public is well informed about measures specific to individual properties.

FUNDING CAPACITY WORKS

1. The City will use its front-ending policy and/or negotiated agreements to accommodate the special needs of intensification and infill projects within the following guidelines:
 - provide for individual front-ending agreements and/or negotiated agreements between the City and developers whose intensification or infill projects will require additional major infrastructure and/or require the advancement of major rehabilitation work;

- if intensification and infill projects require the advancement of major new or rehabilitation works, permit the developer to fund these works with reimbursement scheduled in the year the works are planned for construction;
 - encourage developers to undertake local works to accommodate their developments where such works are not of sufficient size to be included as Development Charge projects;
 - where projects will benefit more than one development, make use of the Front-ending Agreement provisions of the Development Charges Act.
2. In recognition of the potential lower-cost opportunities to provide capacity for growth afforded by Water Efficiency, Water Loss, Green Infrastructure and Flow Removal measures inside the Greenbelt, the City will explore the use of development charges or an alternative source of growth funding to help support these programs.
 3. The City will give priority to the use of Development Charges funding and the exploration of other feasible funding opportunities to support capacity management projects in areas in which intensification and infill are encouraged. Such opportunities will include but not be limited to:
 - Use of DC funding for the growth portion of projects completed within the City's rehabilitation programs (e.g. enlargement of pipes, new sections, enlargement of pumping stations, etc.)
 - Appeal to the Federal and Provincial governments to financially support projects (e.g. the Provincial government in light of the PPS, Federal programs through FCM such as the Green Funds);
 - Exploration of DC changes such as: elimination of discretionary exemptions and exemption areas, recognition of growth capacity allowances in rehabilitation projects, improved accuracy in estimates;
 - Coordination of DC and Water Rate funding to support capacity management

MONITORING CAPACITY MANAGEMENT INITIATIVES

1. The City will monitor system changes on an on-going basis to identify the current and expected future status of the system's capacity as intensification and system improvements proceed.
2. The City will monitor and evaluate its progress with regard to allocating sufficient capacity in existing systems to support intensification and infill and adjust strategies and implementation plans as required.

The draft Capacity Management Strategy is attached in Attachment A.

2. GROUNDWATER RESOURCES

2.1.1. Requirement

The Provincial Policy Statement (PPS) sets out a number of municipal responsibilities for the protection, improvement or restoration of both surface and groundwater including: identifying groundwater features and hydrologic functions; restricting development and site alteration to protect designated vulnerable areas; protecting, improving or restoring vulnerable and sensitive groundwater features and their hydrologic functions; maintaining linkages; and ensuring stormwater management practices that minimize contaminant loading. The PPS also states that development and site alteration near or in sensitive groundwater features are to be restricted and that mitigating measures and/or alternative approaches may be required to protect, improve or restore these features (S2.2.2). The *Clean Water Act* requires the development of Source Water Protection Plans that include: groundwater recharge areas, wellhead protection areas and other vulnerable sources of groundwater such as wetlands.

The Official Plan addresses the PPS in a number of sections of the plan. Policy 2.4.4, Groundwater Management states that the City's zoning by-law may restrict development when monitoring and characterization has indicated that a significant groundwater resource function exists or where degradation of the groundwater resource function may occur. Under policy 2.4.2, Natural Features and Functions, groundwater resources, including recharge areas, will be protected by designation and development restrictions. The development requirements are set out in 4.4.2, Private Water and Wastewater Servicing, in relation to subdivisions, severances, small water and wastewater works. As well, policy 4.7.5 sets out the need to safeguard groundwater resources and to assess potential development impacts. Where wellhead protection areas have been identified, 4.8.2 outlines study requirements and zoning restrictions.

2.1.2. Current Policy

Infrastructure Master Plan Section 5.4, Groundwater, addresses in more detail, municipal well systems, land use, rural development approvals and stewardship. The City extracts groundwater from a number of municipal water supply systems and the IMP polices under 5.4.1, Municipal Well Systems includes policies related to wellhead protection areas, controlling development that impacts them and monitoring. Sub-section 5.4.2 addresses the impacts of various land uses on groundwater and outlines initiatives such as the Groundwater Management Strategy, groundwater capacity to support rural settlement, private well monitoring and water balance issues. 5.4.3, Rural Development Approvals, outlines the City's intention to increase its role and authority for some groundwater matters. 5.4.4, Stewardship addresses the City's effort to improve the understanding of and proper use of private wells and sewage systems.

2.1.3. Discussion

Groundwater management is a shared responsibility in Ontario. Groundwater is considered a resource by the Province and there are a number of Ministries with interest and responsibilities including: the Ministry of the Environment, the Ministry of Natural Resources, Agriculture and Food and the Ministry of Municipal Affairs and Housing. The

local Conservation Authorities are concerned about groundwater as a resource within their watershed areas and recently CAs are leading the development of Source Water Protection Plans under the *Clean Water Act*. The City of Ottawa regulates land use and development that impacts groundwater resources; it operates public drinking water systems including public communal wells and other utilities; and it organizes and delivers public health programs and educational materials. The proliferation of agencies involved in the management of groundwater resources has led to some public confusion about individual responsibilities and, as a result, 'who to turn to with a problem'. Knowing who is responsible was one of the main concerns expressed by the Groundwater Resources Working Group.

In their discussion of major issues, the Groundwater Resources Working Group touched on a number of areas related to the City's role in groundwater management including its role in: coordinating its own work and the work of others; identifying organizational responsibilities and where to obtain information; and collecting data and monitoring the impact of development on aquifers and on existing wells. The Working Group's concerns appeared to relate more to the effective and efficient implementation of current OP and IMP policy rather than moving in a different direction. In their opinion, people want to have the details related to the policy clearly stated and to get a sense that the City has the commitment to undertake the works required.

There is considerable concern in the rural area about the impact of development on existing wells and the cumulative impact of development over time. One contaminated well could result in contamination of the entire aquifer and negatively impact other existing wells. Therefore, the two main concerns raised by residents were in the areas of: monitoring, data collection and analysis of aquifers and the quality of the installation and maintenance of individual wells and septic systems. Some citizens wanted the City to take a more proactive role in coordinating the management of private wells and septic systems to ensure that the quality and quantity of public groundwater resources is maintained and protected. Public education and better communications also seemed to be a key concern – both in terms of individual responsibilities and in informing the public as to who does what.

These concerns raise the question of who should pay if the City enlarges its role in groundwater management and takes on a greater workload and level of responsibility? Paying for increased efforts related to groundwater resources is a major issue in the current municipal financial environment. For urban water and sewage systems, there is a user-pay approach. All municipal programs and projects are covered through Development Charges or Water Rates – not through general taxation. The City is not intending to meter wells so a rate approach is not viable in the rural area. To use an equivalent approach to that employed in the urban area, a levy of some sort would appear to be the best choice. When it came to funding increased municipal efforts related to groundwater resources, people's responses were divided as to who should undertake the work and who should pay for it. Generally, it seemed that there was acknowledgement that urban people pay for their urban systems and rural people should pay for the work related to aquifer management and well inspections. Since the Province regulates groundwater, some people felt that the Province should ensure that the work is done and should pay for it. The means of financing proposed changes to the

Official Plan and the Infrastructure Master Plan is a topic for further discussion and will be addressed as part of the review.

For the City, the key challenges appear to be in putting greater priority on the on-going implementation of the first phase of the Groundwater Management Strategy and on increased effort in the development and analysis of information on aquifers and other groundwater resources, which may assist in the review of development applications. Implementing the work program identified in the Groundwater Management Strategy requires greater City commitment and the identification of appropriate funding sources.

2.1.4. Proposed Direction

In May, 2003, the City adopted a Groundwater Management Strategy with a two-phased approach. The supporting staff report and adopted Groundwater Management Strategy can be found here: <http://ottawa.ca/calendar/ottawa/citycouncil/occ/2007/09-12/arac/ACS2007-PTE-POL-0037.htm> Rural residents are generally not aware of this or of the elements of the strategy, nor of the work that the City has undertaken in carrying out the first phase of the strategy. The strategy addresses many of the concerns of rural residents but would be better recognized if its direction is more fully incorporated into the Official Plan and Infrastructure Master Plan and if there were an increased level of effort in implementing the strategy.

Along with changes in the Official Plan policies, parts of Infrastructure Master Plan Section 5 should be revised to reflect more recent Provincial direction, the City's Groundwater Management Strategy and the recommendations of the Groundwater Resources Working Group. A draft of the proposed changes is included below.

The City is also developing draft guidelines entitled, "Technical Requirements for Hydrogeology and Terrain Analysis Studies for Privately Serviced Developments" to outline municipal requirements to support safe and sustainable development of private services for subdivisions and individual applications of six or more severances. It is proposed that, once these are adopted, the Official Plan reference these requirements and that they be used in the review of development applications in the rural area.

The Groundwater Management Strategy outlined a two-phased approach. Work has been proceeding on Phase One, which has been to continue with public education programs and groundwater characterization studies. The City will soon initiate Phase Two of the Strategy, which will develop a framework in which to identify, prioritize, and complete the groundwater management activities outlined in the strategy. Public consultation on the framework should be part of this stage of the review of the Infrastructure Master Plan policies.

2.1.5. Draft IMP Amendments

Amend Section 5.4 Groundwater as follows:

5.4 Groundwater Resources

The City has modest and somewhat distributed groundwater resources. While those resources are important ecological and economic functions in the City, our understanding of those functions is limited. Groundwater sufficient in quantity and quality to supply private residential uses is generally available throughout Ottawa, playing an important role in the economy of rural settlement. There are some more specific economic uses and management of groundwater in Ottawa - agricultural livestock and crop watering and groundwater management in aggregate extraction operations are examples. Groundwater flow into surface waters has been determined to play important roles in maintaining unique fish habitats in some area streams.

As groundwater is a natural environment resource, many of the issues surrounding the overall definition, protection and uses of groundwater are considered to fall under the City's environmental mandates. In some instances, the City's ability to fulfill a role in groundwater planning is limited by the Provinces overriding authority in resource management. There are, however, some very specific links between groundwater, growth and infrastructure planning. In order to play an effective role, the City will undertake studies to define the groundwater resource by collecting baseline data and monitoring groundwater in the City.

5.4.1 Municipal Well Systems

The City extracts groundwater for ~~four~~ a number of municipal water supply systems: The City will play a role in planning so that these well supplies are maintained for the continued use of its customers.

The City will:

1. Control development and connection to well based municipal water supply systems to the stated ~~sustainable~~ capacity limits in the Infrastructure Master Plan;
2. Define wellhead protection areas for municipal wells and control land uses for these protection areas in consideration of risks to the groundwater supplying the municipal well;
3. Understand and monitor the performance of the existing wells to ensure sustainability; and
4. Place controls on water use if required to maintain ~~sustainability~~ reliability
5. Protect alternative wellhead areas for future ~~developments~~, expansions and or replacements of existing well systems.

In order to implement these policies, the City will over time:

- Undertake comprehensive peer-reviewed studies to define wellhead protection areas and develop source water and ecological protection and sustainability reliability plans;
- Regularly update studies and plans in consideration of on-going well performance and environmental monitoring; and
- Pass through By-law the limits of wellhead protection capture zones and land use controls in those areas;
- Study new areas of possible alternative municipal well developments or expansions in order to plan for growth.

5.4.2 Land Use

The City approves land uses that can have an impact on groundwater resources. Hard surfacing resulting from intense land use can reduce infiltration and deplete reduce groundwater volumes available for economic use or environmental function. Septic sewage systems, designed to put wastewater into groundwater, with substance discharge, can influence the quality of groundwater, raising nitrate levels as well as other constituents. Municipal management practices such as road salting to support land use can influence the quality of groundwater, raising chloride and sodium levels.

The Ottawa 20/20 process, the Official Plan and the associated growth expectations and land use policies present an opportunity to establish a rural servicing strategy to meet the City's visions of rural settlement and population growth, including sustainable reliable private wells. Land use approvals must consider the impacts on the groundwater resources to ensure it is sustainable that they are reliable and able to support the land use as well as consider the possible impacts on future and adjacent land uses. Recognition in the Official Plan includes policy to:

- Consider impacts on the economic and environmental function of the groundwater resource as a factor in approval of land use;
- Direct intensification of land use to areas that minimize impacts on environmentally sensitive or economically beneficial groundwater resources; and
- Monitor the impact of developing land use on the groundwater resource to confirm impact assumptions predictions.

Implementation these policies can be provided through resource initiatives and the City will over time:

- Further develop and maintain a City Groundwater Management Strategy program in response to keeping with Provincial initiatives in groundwater management;
- Develop rural settlement capacity studies based on sustainable reliable use of and impact on groundwater;
- Incorporate consideration of groundwater resources in watershed and subwatershed studies;
- Establish on-going monitoring and use existing wells to obtain regular data on groundwater function; and

- Develop water balance equations methodologies for area groundwater resources and monitor long range stresses, such as climate change and land use change, to understand possible impacts on water balance.

5.4.3 Rural Development Approvals

The City approves rural development supported by private wells and septic systems. Faulty well construction can contribute to contamination of groundwater supplies. Septic systems, while designed to put sanitary effluent into the ground and therefore typically into surficial groundwater, have the potential to exceed the sustainable capacity of the groundwater or through faulty operation result in contamination of the groundwater. These potential problems, coupled with the proximity of wells and septic systems in intense rural settlements have the potential to result in public health and environmental problems.

The City's requirements for approval of development on private systems are detailed in the Official Plan. The intention outlined here relates to the City taking an increased role and authority in some of those matters presently regulated by the Province. Other municipalities in Ontario have recently taken similar actions.

~~It is in the City interest to~~ The City will:

- Ensure that ~~the scope of regulation of wells and septic systems~~ its development approvals framework is sufficient to protect the economic and environmental functions of groundwater in the City, as well as meet the City's goals in protection of public health.

To protect this interest the City over time will:

- Consider the authorities delegated to the City for septic systems regulations under the Ministry of Municipal Affairs and Housing and consider the scope of City response to that authority, including consideration of implementation of septic re-inspection programs as allowed under the legislation;
- Consider application to the Province for delegation of municipal authority under Ontario Regulation 903, the Ontario Water Resources Act and other legislation governing the construction of wells and the use of groundwater, including delegation of well inspection authority and ~~an~~ a review of its approval authority role in the Permit to Take Water process;
- Undertake studies to define the economic and environmental functions of groundwater in order to make assessments regarding the sufficiency of existing Provincial regulation; and
- Undertake studies to determine the existing groundwater asset condition and monitor for changes to that condition.

5.4.4 Groundwater Stewardship

Stewardship choices residents can make every day, can play a very important role in the planning and protection of groundwater. The City's role in promoting stewardship is discussed in the Environmental Strategy. The City role in promoting stewardship activities

related to sustainability reliability of groundwater as a resource for as it relates to private wells and septic sewage systems will be directed at understanding of the resource and proper use of wells and septic sewage systems.

To do this the City will over time:

- Develop, maintain and transmit information to assist residents in understanding their role in groundwater stewardship, including well and septic instruction workshops, participation in national and international awareness campaigns and programs such as Children's Groundwater Festivals.

3. STORMWATER MANAGEMENT PLANNING

3.1.1. Requirement

The PPS (S.2.2.1) states that the quality and quantity of water shall be protected, improved or restored by:

- using the watershed as the ecologically meaningful scale for planning;
- implementing necessary restrictions on development and site alteration to protect sensitive surface water features and their hydrologic functions; and
- ensuring that stormwater management practices minimize runoff volumes and contaminant loads and maintain the extent of vegetative and pervious surfaces.

The PPS also supports the integration of servicing and land use for all stages of the planning process (S.1.6.4.1).

Also at the Provincial level, the *Conservation Authorities Act* and its regulations require that increased runoff from development not increase regulatory flood levels, resulting in the need for stormwater management measures to control peak flows. The *Ontario Water Resources Act* requires the implementation of stormwater management or new development to: “provide for the conservation, protection and management of Ontario’s waters and for their efficient and sustainable use.”

At the federal level, the *Fisheries Act* precludes the discharge of deleterious substances, effectively requiring the treatment of urban runoff via stormwater management measures.

The above policies and legislation generally apply to new development; however, the PPS supports intensification and redevelopment on existing services wherever feasible (S.1.6.4.2). This presumably includes existing drainage services (as well as water and sanitary sewers). In addition to ensuring adequate drainage services, stormwater management is also a consideration in these areas to address the cumulative impacts of infill and redevelopment on receiving watercourses.

3.1.2. Current Policy

Under Section 5.2 of the Infrastructure Master Plan, there are policies pertaining to undertaking various efforts to move toward a more integrated approach to planning for stormwater management. These policies include: identifying subwatershed priorities; preparation of a SWM planning guideline; developing sufficient monitoring programs for receiving watercourses to allow evaluation of stormwater management efforts; and undertaking efforts to further incorporate runoff volume control into standard SWM design practices.

3.1.3. Discussion

To address the policy direction in the IMP, the City is currently developing a Stormwater Management Strategy. A key step in this Strategy was the development of stormwater management (SWM) policies that were adopted by Council in September 2007. The supporting staff report and adopted SWM policies can be found here:

<http://ottawa.ca/calendar/ottawa/citycouncil/occ/2007/09-12/arak/ACS2007-PTE-POL-0037.htm>

The SWM policies were developed to incorporate directions taken from the PPS, the IMP and other emerging concerns (e.g., climate change). For example, the PPS calls for stormwater management practices to minimize runoff volumes and maintain the extent of vegetative and pervious surfaces so policies have been developed to require not just the conventional peak flow control but volume control as well. The PPS support for intensification and redevelopment on existing services, has been reflected in the need to develop a City-wide SWM Retrofit Plan that will identify and prioritize a list of SWM retrofit projects to address both existing problems and mitigate the impacts of infill/redevelopment. Finally, the anticipated impacts of climate change have been reflected in a policy calling for the implementation of “robust” drainage systems that will improve protection for events that exceed the design criteria capacity.

Based upon the adopted SWM policies, the City is now proceeding with the development of a Stormwater Management Planning Guideline to further detail how the proposed directions promoted by the SWM policies are to be achieved.

3.1.4. Proposed Direction

Proposed new directions for the City’s approach to planning for stormwater management include:

- i) Reducing Runoff Volumes - Planning for the Full Spectrum of Rainfall Events:
Municipalities across North America are acting on the need to address more than peak flow control and to require measures to reduce runoff volume. The need to implement volume control for frequent rain events is based upon the growing body of science that indicates peak flow control is not sufficient to maintain the long-term health and stability of receiving streams. Habitat, infrastructure, and private property are all put at greater risk.

- ii) “Robust” SWM Infrastructure - Planning for Uncertainty:
There is an inherent uncertainty in planning and designing for SWM infrastructure that stems from the natural variability of rainfall events, the need for long-term and effective maintenance of engineered works, etc. The anticipated impacts of climate change only add to this inherent uncertainty.

There has been little direction provided to municipalities from higher levels of government regarding how to address the anticipated impacts of climate change on infrastructure planning. There is also an acknowledged infrastructure-funding deficit so the oft-suggested approach of “building bigger pipes” would put a further significant strain on limited funds. This suggestion also does not recognize the perhaps more serious issue of the lack of major systems in many older parts of the City – simply replacing existing pipes with bigger ones may not provide a greater level of protection in many instances. And in newer developments and greenfield areas, the requirement for a major system does provide significant protection (notwithstanding that the minor system level of service may decrease should the frequency and intensity of events increase).

For new development, implementing various measures (safety factors, buffers, freeboards) that can provide additional protection without significant additional cost or design effort will increase the ability of SWM/storm drainage systems to withstand extreme events.

iii) Retrofitting for Stormwater Management:

Stormwater management is now a typical requirement for greenfield development and this has been a main focus of the City's stormwater management efforts for some time. However, in older areas of the City that developed without SWM and where infill/redevelopment may be proposed, the opportunities to implement 'greenfield-type' SWM solutions are limited due to the existing built-up condition. Typically, there is little or no land available for 'end-of-pipe' approaches, especially given the relatively small area of individual infill sites. Nevertheless, to meet regulatory requirements, avoid cumulative impacts, and achieve infill/intensification targets, these sites must still address SWM requirements. However, addressing SWM concerns for infill/redevelopment on a site-specific basis can be more costly and less effective than trying to address SWM requirements more comprehensively, (i.e., developing an overall SWM retrofit plan that more effectively addresses both existing problems such as water quality, erosion, and flooding, at the same time as mitigating the impacts of infill/redevelopment with costs being apportioned to both new/infill development and existing residents).

To address this need, the Stormwater Management Strategy includes the development of a SWM Retrofit Plan. This plan will address SWM planning needs for the existing urban area and future infill/redevelopment by identifying and prioritizing a list of SWM retrofit projects (lot level, conveyance and end-of-pipe) to address both existing problems and mitigate the impacts of infill/redevelopment.

3.1.5. Draft IMP Policy Amendment

In Section 5.2 Stormwater Management Planning, remove the policies under 5.2.6 No Net Loss on a Subwatershed Basis Policy

The City will:

- ~~1. Implement a stream based and integrated approach to stormwater management planning; and~~
- ~~2. Implement a no net loss on a subwatershed basis policy in conjunction with subwatershed planning.~~

Replace Section 5.2 with the following policies and additional text and implementation tools based on the Stormwater Management Strategy: Stage 2 Policies report adopted by Council in September 2007.

Water Quality

Objective: Reduce flood risk to public health and safety and to property

For Greenfield areas, the City will:

1. Require measures to protect against the capacity of the minor (pipe) system being exceeded.

2. Require sufficient major system flow capacity within public ownership or control to prevent flooding of private property.
3. Require the implementation of robust drainage systems that will improve protection for events that exceed the design criteria capacity.
4. Require the implementation of stormwater management measures, where required, that will ensure no increase in the regulatory flood elevation resulting from changes in land use.

For existing areas, the City will:

1. Allow infill and redevelopment while not exceeding the capacity of existing stormwater/storm drainage infrastructure.
2. Improve the existing level of flood protection for known flood prone areas.
3. Give priority to the use of the major system (maximize flow on the surface) to protect the minor system.
4. Improve the existing level of flood protection for areas identified with major and/or minor system deficiencies.

For all areas, the City will:

1. Ensure that the planning and implementation of SWM systems is consistent with Provincial floodplain policies and guidelines.

Objective: Reduce erosion impacts that are detrimental to property and stream habitat

For Greenfield areas, the City will:

1. Delineate the limits of stream corridors to incorporate geotechnical and natural hazards, and ecological and geomorphological concerns.
2. Require the implementation of SWM measures to mitigate the impacts of urban runoff on existing erosion rates.

For existing areas, the City will:

1. Remediate erosion threats to public safety, infrastructure, and private and public property
2. Incorporate habitat improvements to the extent possible when implementing erosion protection works.

Objective: Preserve and/or re-establish a more natural hydrologic cycle

For Greenfield areas, the City will:

1. Require the implementation of stormwater management measures that minimize or eliminate runoff from frequent events.

For existing areas, the City will:

1. Promote and facilitate the implementation of retrofit stormwater management measures to reduce the volume of runoff to urban streams.
2. Maintain the water quantity benefits afforded by existing roadside ditches and swales.

SURFACE WATER QUALITY

Objective: Reduce the impact of non-point source runoff on receiving watercourses

For all areas, the City will:

1. Require the implementation of SWM measures to improve the quality of runoff to acceptable levels.

For existing areas, the City will:

1. Promote and facilitate the implementation of retrofit stormwater management measures to improve the quality of runoff from areas that developed without stormwater treatment.
2. Undertake operational activities to improve the quality of runoff.
3. Maintain the water quality benefits afforded by existing roadside ditches and swales.
4. Manage the combined sewer system consistent with Provincial requirements

Objective: Eliminate contaminants originating from point sources.

For all areas, the City will:

1. Prevent the release of contaminants from point sources through the development approvals process.

For existing areas, the City will:

1. Identify and eliminate the release of contaminants from point sources.

Objective: Reduce the impacts of runoff on existing public beaches and maintain the potential for the provision of new public beaches and recreational activities.

For Greenfield areas, the City will:

1. Require the implementation of SWM measures to improve the quality of runoff to an acceptable level.

For existing areas, the City will:

1. Implement retrofit stormwater management measures to improve the quality of runoff from storm outfalls that affect public beaches.
2. Undertake (non-structural) activities to improve the quality of runoff at beaches.

VALLEY AND STREAM CORRIDORS

Objective: Protect, enhance or rehabilitate natural features and functions of valley and stream corridors.

For Greenfield areas, the City will:

1. Require the implementation of SWM/drainage servicing solutions that do not impact natural features identified for protection.
2. Identify and promote the preservation of low order and/or headwater streams.
3. Promote the rehabilitation of degraded streams in combination with the implementation of stormwater management to maximize benefits to servicing solutions and habitat improvement.
4. Acquire valley and stream corridors dedicated through the development approvals process.

For existing areas, the City will:

1. Incorporate habitat improvement works in conjunction with the implementation of erosion and/or flood protection works.

GROUNDWATER

Objective: Reduce the potential impact of runoff on groundwater drinking sources.

For Greenfield areas (rural), the City will:

1. Screen and preclude any SWM infiltration measures that may threaten contamination of proposed drinking water wells (private and/or communal).

For existing areas, the City will:

1. Screen and preclude any retrofit SWM infiltration measures that may threaten contamination of existing drinking water wells (private and/or communal).
2. Undertake operational activities to improve the quality of runoff.

COMMUNICATIONS

Objective: Encourage communication within and external to the City to bring about greater collaboration among the City, public agencies, and the public.

For all areas, the City will:

1. Take the lead on sharing and integrating SWM information.
2. Consult widely with agencies, the general public, other municipalities and all other interested parties on SWM-related studies and initiatives.

INTEGRATED SWM PLANNING

Objective: Integrate SWM planning with other City programs and functions.

The City will:

1. Undertake SWM planning on a subwatershed basis.
2. Integrate SWM planning with land use planning to maximize opportunities to meet SWM objectives early in the planning process.
3. Integrate SWM planning with parks and open space planning to ensure the respective objectives of both groups are achieved.
4. Ensure that drainage infrastructure requirements inform future land use to avoid the need for substandard servicing.

INFRASTRUCTURE

The City will:

1. Comply with all applicable provincial and federal legislation, regulations, policies, guidelines and municipal by-laws in the planning, implementation and operation of SWM infrastructure.
2. Ensure the design and implementation of SWM infrastructure are consistent with state-of-the-art practices.
3. Ensure that the planning and design of SWM infrastructure and in-stream works are adequately supported by sufficient field data.
4. Manage receiving watercourses as an integral part of the City's drainage infrastructure.