

Current Trends and Emerging Issues

Urbanization Pressures on Great Lakes Water Quality

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How has the basin changed since PLUARG?

Based on work published by the International Joint Commission in its 1999-2001 and 2001-2003 Priorities reports, the Basin is facing rapid, poorly controlled urbanization pressures coupled with a high rate of land conversion. This growth is particularly troubling in centers like Chicago, where population growth is modest (roughly 12% from 1982 to 1997) but growth in land area is much greater (25.2%) and increase in vehicle distance traveled (>70%) greater still. Even cities like Milwaukee and Cleveland, which have stable or shrinking populations, are experiencing sprawl. And population growth is expected to continue unabated, with a further 3.3 million additional residents expected in Chicago, Toronto, and four smaller cities by 2021. Much of the growth in the Basin is occurring in major city centers such as Toronto and Chicago, while smaller centers like Duluth and Windsor are shrinking. We are therefore slowly creating megacities and thus localized growth foci, generally around transportation hubs, rather than dispersing population growth throughout the basin.

The impacts on agriculture of land conversion are equally troubling. Between 1977 and 1997, the seven counties around Cleveland, Ohio, lost approximately 2 million acres of farmland, and almost 50% of operating farms, all to sprawl. Cleveland is expected to lose 3% of its population by 2010, while its land area is expected to grow 30% - with associated loss of prime farmland.

Particular development challenges exist at the urban fringe, where there is high pressure to create low density light industrial development, again with associated land conversion. Such development is of concern not only because of its high land consumption rates and high imperviousness, but also because it requires extensive major transportation service corridors and thus secondary land consumption and imperviousness.

Why is this happening?

Urban sprawl, agricultural land conversion, and their associated environmental impacts are in my view just symptoms of an endemic problem. In my view, the principal factor in poorly-controlled planning, the root cause of the problem, is the local nature of planning processes. Such processes not surprisingly respond to local economic and social pressures, and even to the influence of particular personalities. Very few jurisdictions in the basin make any substantive attempt to coordinate planning activities on a regional or even a watershed basis. Even in Ontario, with its system of watershed-based Conservation Authorities, those agencies play only a peripheral role in land use planning,

and must rely for their funding on their member municipalities. In some, like the Grand River Conservation Authority in Southwestern Ontario, the agency has a close and collaborative relationship with local municipalities; in most others, however, this is not the case, and the conservation authority often finds itself caught between quarrelling municipalities with different economies, different demographic structures, and fundamentally different planning goals.

These differing views of an ideal landscape are not uncommon. While Chicago's land area grew at twice the rate of its population, the same was not true for Toronto over the same time period. Toronto's areal growth was roughly equivalent to its population growth. The reason may be traced to differing societal views about the desirability of alternative development forms.

A particular challenge in this local-level decision making is the vicious cycle of propose-land-build. Developers are not bad people intent on creating concrete wildernesses. But they have businesses to run and profits to make. They will tend to promote projects for which there is an established market and which lenders are willing to finance. They are much less likely to risk funds on innovative lot- or street-level strategies that "look" different to consumers and lenders. As a result, without changing the economic incentives for innovative or low-impact development, it will be difficult to encourage the adoption of non-traditional urban forms.

Furthermore, current planning approval processes largely ignore the cumulative impact of development on regional surface and groundwater systems. Even widely-touted watershed-based planning is not, in itself, enough. Groundwater and urban infrastructure do not follow watershed boundaries. A regional view – including a regional, or even state/provincial vision of an ideal landscape – is critical. We can undertake all the "smart growth" we want, but if that "smart" growth isn't coordinated regionally, and isn't predicated on the protection of carefully-chosen ecological or hydrologic functions, we may actually be doing more harm than good. "Smart growth", in other words, attempts to address local symptoms with a common rubric, whereas different landscapes with different populations may in fact require not the same *solutions*, but rather protection of the same *natural functions*. The two are not always, or even often, the same.

Impacts of urbanization on nonpoint source pollution

The impacts of urbanization on nonpoint source pollution are difficult to generalize, because they depend so fundamentally on the form of development, the nature of the local landscape, and the parameters of concern to the analyst. One development, like Prairie Crossing in Illinois, for example, has large lots and large houses, but low density; it is highly energy efficient, and has many naturalized features for stormwater infiltration. Conversely, Coffee Creek, in Indiana, couples high-density mixed development with large tracts of common green space and naturalized streams. It accommodates more people, but may not be as energy efficient as Prairie Crossing, nor is its land surface as uniformly pervious.

These two examples illustrate a common development tradeoff, between the need to house more people (which is most efficiently accomplished through compact development, for instance in high-rise apartments and condominiums) and the need to reduce impervious cover and preserve green space (which is critical for minimizing impacts on streams and aquatic biota).

So is there a “best” urban form? Given the choice of fewer, more compact developments (e.g. apartment buildings) or more large-lot “executive style” residences, which would we prefer? This is the central and most critical question in land use planning for the Great Lakes Basin – and yet it is a question for which we do not have explicit answers. The reason is not surprising. Individuals’ view of a “best” form is highly dependent on their personal life and work experience, economic status, local water quality and flow conditions, and the local landscape. In some cases, compact development will be “best”; in others, low-density development may be preferred. It is likely impossible to arrive at a single “best” approach, because so much of the decision depends on local and even site-level considerations. As a society, however, we can do better on developing regional or state/provincial guidance on planning objectives – what we as a society consider a “best” development strategy. Do we want strong trout populations? Less stormwater runoff? More people accommodated? Less agricultural land converted?

Developing regional planning objectives usually means deciding what natural stream and biological functions we want to protect, and creating explicit planning objectives for them. We are a long way from this in most parts of the Basin. In part, this is because it is scientifically challenging to discover these things. Even ecologists cannot tell us with certainty what ecological functions are most critical to preserve. But in more immediate terms, the task is difficult because of the reluctance of senior governments to intervene in what is perceived as an area of local responsibility. Who should initiate such a discussion? Who would make the ultimate decision? Who can enforce it?

In addition to planning objectives, we also lack agreement on a systematic method of assessing sites, streets, and subwatersheds for development. Such a process, which could ultimately be entrenched in planning law, might look something like this:

1. Assess major natural features, soil type, slope
2. Impose planning constraints (e.g. protect recharge areas or productive farmland; restore sensitive species; protect well heads and drinking water sources)
3. Estimate expected population growth
4. Assess available land area to maintain desired level of impervious cover
5. Select and site urban form(s)

The Center for Watershed Protection (Maryland) has undertaken some work along these lines, and has developed a simple planning level model based on a large volume of empirical research. Their conclusion – based on their priority of restoring and maintaining natural hydrologic regimes – is that the single best indicator of potential impact is impervious cover. They have developed simple planning guidance for rural watersheds (<10% IC), suburban watersheds (10-25% IC) and urban watersheds (>25%

IC) that provides a straightforward “game plan” for planners and developers interested in reducing the impacts of urbanization on natural hydrology. The Center’s model is useful not because it is “correct”, but rather because it is simple, easily applied, and is based on explicit stream protection criteria. It does not, however, address many other issues of concern in land use planning, such as energy efficiency, air emissions from transportation corridors, and so on.

It has in fact been quite rare for state/provincial and federal governments to intervene in the land use planning process. Ontario is one of the few to do so. On October 28, 2004, Ontario Premier Dalton McGuinty announced a province-wide strategy to protect large tracts of land in Southern Ontario. His plan is explicitly intended to:

- Set strict limits on urban boundaries
- Articulate clear planning objectives:
- Protect high value agricultural lands
- Protect surface and groundwater quality, including recharge areas
- Provide for sustainable infrastructure

This strategy is ambitious and innovative for Ontario, and indeed may be the first time in decades that a senior government has intervened – clearly, explicitly, and with specific penalties attached – in the land use planning function. Such initiatives are rare indeed within the Basin, although some cities (Vancouver, British Columbia is one example) have attempted regional planning exercises in the past, with good results.

Opportunities and obstacles

In my view, we must eventually the root problem – the lack of regional/state/provincial coordination and accountability for planning decisions – or we will continue to face problems with uncontrolled and inappropriate land use. It’s sort of like choosing a “best” new car. You like yours red, compact and fast. I like mine blue, roomy, and gas-efficient. There’s no “right” answer here - our choices reflect our personal values and priorities.

It will take some time to achieve regional coordination of planning, because local planning processes are solidly entrenched in local governments and personalities. In the meantime, there is much we can do to control nonpoint source pollution from urban and urbanizing areas – once we have established what we are trying to achieve with our planning decisions. We should therefore begin with a regional and perhaps Basin-wide dialogue about the critical ecological, hydrologic, agricultural, social, and economic goals of land use planning. Once those goals are clear, we will have more explicit guidance on how to make progress toward our goals.

It has been suggested by authors such as John Sewell, former mayor of Toronto, that our main challenges now may be economic. In Sewell’s view, we have not made sufficient use of economic incentives to change development practices. He argues that charging for parking at suburban malls, or imposing development charges for wider-than-necessary

roads and sidewalks, would create an immediate and effective incentive to avoid sprawl. As discussed above, it will be necessary to confront the linkage between nervous lenders, cautious developers, and an uninformed public. Economic incentives, Sewell argues, would make the real costs of such development clear to the consumer.

Ultimately, it will like require a combination of regulatory limits (for instance, regulated urban development boundaries) and voluntary or economic incentives (such as fees, tax incentives and disincentives, and so on) to reduce sprawl. And this in itself will be a challenge, requiring as it does the interface of architecture, landscape architecture, engineering, ecology, geography, and planning – professions with very different professional traditions and practices. But the fundamental problem remains a lack of shared vision about an ideal landscape, the natural hydrologic and ecological functions that society wishes to protect, and the responsibility for guiding and implementing those decisions.