OMAFRA RESEARCH DAY

Using Green Infrastructure (GI), i.e., nature's goods and services In a Land Use Planning Framework for Resilient Rural Communities

By

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The logo of the University of Guelph, featuring the text "UNIVERSITY of GUELPH" in white on a black background.

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SCHOOL OF ENVIRONMENTAL DESIGN
AND RURAL DEVELOPMENT

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Research Question on GI:

- Can a planning systems framework be devised acknowledging the goods and services (G+S) of nature as a mechanism to build resilient rural communities
- Research involved a mixed method qualitative study examining:
 - Definitions of GI
 - How is GI used in planning today: elsewhere & in Ontario
 - What are opportunities/challenges of a GI planning approach
 - Conclusions/recommendations

Kraehling, 2015

Dissertation Work Program

Definition of Green Infrastructure (GI)

- Natural elements (real and artificial) that are linked together to provide multifunctional benefit to both human and natural communities
- The elements build upon the natural features that are found within any community's landscape

Elements Contained within a GI Planning Framework – examples

Local, neighbourhood and village scale	Town, city and district scale	City-region, regional and national scale
<ul style="list-style-type: none"> • Street trees, verges and hedges • Green roofs and walls • Pocket parks • Private gardens • Urban plazas • Town and village greens and commons • Local rights of way • Pedestrian and cycle routes • Cemeteries, burial grounds and churchyards • Institutional open spaces • Ponds and streams • Small woodlands • Play areas • Local nature reserves • School grounds • Sports pitches • Swales, ditches • Allotments • Vacant and derelict land 	<ul style="list-style-type: none"> • Business settings • City/district parks • Urban canals • Urban commons • Forest parks • Country parks • Continuous waterfronts • Municipal plazas • Lakes • Major recreational spaces • Rivers and floodplains • Brownfield land • Community woodlands • (Former) mineral extraction sites • Agricultural land • Landfills 	<ul style="list-style-type: none"> • Regional parks • Rivers and floodplains • Shorelines • Strategic and long distance trails • Forests, woodlands and community forests • Reservoirs • Road and railway networks • Designated greenbelt and strategic gaps • Agricultural land • National parks • National, regional or local landscape designations • Canals • Common lands • Open countryside

Source: European Environment Agency (2011). Green Infrastructure and Territorial Cohesion: The Concept of Green Infrastructure and Its Integration into Policies Using Monitoring Systems. Copenhagen, Denmark, European Union.

Illustrative Example of GI Elements – A Southern Ontario Community

The GI Literature

- Federal Gov't Interest in infrastructure dollars – addressing issues of current infrastructure 'deficit' and building community resilience

The screenshot shows the Infrastructure Canada website. At the top, there is a blue header with the "Infrastructure Canada" logo on the left and the "Canada" wordmark on the right. A red maple leaf is centered in the background. Below the header is a navigation bar with links: "The Minister", "Investing in Canada Plan", "Portfolio", "Bridges", and "Investments Map". A search bar is located on the right side of the navigation bar. Below the navigation bar, the breadcrumb trail reads: "Home > Investing in Canada Plan > Investing in Green Infrastructure". The main heading is "Green Infrastructure". Below this, there is a sub-heading "Investing in Green Infrastructure". A green circular icon with a white leaf is positioned to the left of the text. The text describes the government's commitment to green infrastructure, mentioning the Clean Water and Wastewater Fund (CWWF) and the Pan-Canadian Framework on Clean Growth and Climate Change. It also mentions the Canada Infrastructure Bank and the Budget 2017: Building a Strong Middle Class. At the bottom, there is a list of additional information on Budget 2016 green infrastructure initiatives, including: Adapting to Climate Change Impacts - Building Design Guides and Codes, Addressing Waste Management for First Nations Communities, Advancing Regional Electricity Cooperation, Building Capacity in Municipalities to Address Climate Change, Developing Community Capacity for Asset Management Best Practices, Funding Innovative Green Municipal Projects, Investing in Electric Vehicle and Alternative Transportation Fuels Infrastructure, and Strengthening On Reserve Water and Wastewater Infrastructure. At the very bottom, there are five icons representing different infrastructure sectors: Public Transit, Green, Social, Trade and Transportation, and Rural and Northern Communities.

Infrastructure Canada

Canada

The Minister Investing in Canada Plan Portfolio Bridges Investments Map

Home > Investing in Canada Plan > Investing in Green Infrastructure

Green Infrastructure

Investing in Green Infrastructure

To ensure that Canada's communities are healthy and productive places to live, Budget 2016 included investments of \$5 billion over five years towards infrastructure projects that protect communities and support Canada's ongoing transition to a clean growth economy. Of this, \$2 billion will flow through Infrastructure Canada's [Clean Water and Wastewater Fund \(CWWF\)](#) to provide communities with more reliable water and wastewater systems.

To advance Canada's efforts to build a clean economy, Budget 2017 lays out the Government's plan to invest \$21.9 billion in green infrastructure, including initiatives that will support the implementation of the [Pan-Canadian Framework on Clean Growth and Climate Change](#).

Of this, \$9.2 billion will be provided to provinces and territories over the next 11 years through bilateral agreements. A further \$5 billion will be available for green infrastructure projects through the [Canada Infrastructure Bank](#) and \$2.8 billion through a series of national programs.

For more information, visit: [Budget 2017: Building a Strong Middle Class](#)

For additional information on Budget 2016 green infrastructure initiatives, see:

- Adapting to Climate Change Impacts - Building Design Guides and Codes
- Addressing Waste Management for First Nations Communities
- Advancing Regional Electricity Cooperation
- Building Capacity in Municipalities to Address Climate Change
- Developing Community Capacity for Asset Management Best Practices
- Funding Innovative Green Municipal Projects
- Investing in Electric Vehicle and Alternative Transportation Fuels Infrastructure
- Strengthening On Reserve Water and Wastewater Infrastructure

PUBLIC TRANSIT GREEN SOCIAL TRADE AND TRANSPORTATION RURAL AND NORTHERN COMMUNITIES

- Provincial gov't interest in municipalities implementing:

- Provincial Policy (PPS);
- Assisting with several provincial strategic initiatives:
 - Healthy Communities
 - Climate change adaptation/mitigation
 - Biodiversity protection
 - Acts for Clean Water/Protection of the Great Lakes

Literature on GI Plans from Elsewhere – the European Union

- Significant literature on the subject. . . Strong EU interest in addressing climate change impacts and protection of biodiversity

ec.europa.eu

Literature on GI Plans from Elsewhere - the USA

State of Maryland Smart Growth Planning

Best Practices

The Plan for the Valleys

The Plan for the Green Spring and Worthington Valleys in Baltimore County has been widely recognized as a seminal model for sustainable growth management. Baltimore County was one of the first jurisdictions in the country to use urban growth boundaries and conservation design as a method for controlling sprawl and directing growth away from sensitive landscapes. The results include resource conservation zones designed to protect farmland and natural resources, more than 50,000 acres of land in permanent protection under conservation easements, and the creation of an urban-rural demarcation line restricting water and sewer service to urban areas. The plan by Wallace-McHarg Associates (now WRT) received a National Planning Landmark Award from the American Planning Association, but the county deserves recognition for sustained implementation efforts.

The Plan for the Valleys

GI Plans from Elsewhere – the USA (con't)

Central Indiana State, 2012

Texas, 2008

Lancaster

Central Missouri State,
2014

Some General GI Planning Thought in Ontario

- Green Infrastructure Ontario Coalition

<http://greeninfrastructureontario.org/>

[ABOUT GREEN INFRASTRUCTURE](#)[ABOUT US](#)[WHAT WE DO](#)[RESOURCES](#)[EVENTS & NEWS](#)[JOIN](#)

We organize our work around these six green infrastructure focus areas:

URBAN FORESTS

STORMWATER SYSTEMS

GREEN ROOFS

PARKS AND OPEN SPACES

AGRICULTURE & URBAN AGRICULTURE

NATURAL HERITAGE

Health, Prosperity and Sustainability:
THE CASE FOR GREEN INFRASTRUCTURE IN ONTARIO

GI Survey Respondents

GI Key Informants & Discussion Group Locations

GI Strategic Community Planning Conceptual Framework

Adapted from Rouse & Bunster-Ossa, 2013

Findings:

Key

Regional GI Planning Efforts

- Some regional plans:

www.tvo.org

www.caroliniancanada.ca

www.eomf.on.ca

GI Elemental Planning Efforts in ON

- A 'green' municipal Official Plan, i.e., Georgian Bay Tshp.
- Rural non-point source stormwater management efforts:
 - Essex Region CA "Clean Water ~ Green Spaces"
 - Huron County Garvey-Glenn Sub-watershed planning/implementation efforts – a LID proposal for the agricultural landscape
- Climate change impact planning at the municipal level:
 - Essex OP policy acknowledging GI as a tool to adapt to/mitigate impacts of climate change
 - Tay Valley Tshp. Development Guidelines via OP policy, e.g., riparian strip buffer requirements along waterways
- Tree planting for ecological/human community benefit:
 - Green Legacy Wellington County-wide tree planting program
- Wingham River Flats Ecological Park – natural reclamation of former 'mill pond' area

Conclusions:

Potential for GI Planning in Ontario

- Represents a strategic planning approach to accomplish multiple objectives:
 - Represents a 'conversation starter' to acknowledge & prioritize community assets and actions
 - Can 'link' opportunities to various other system planning efforts: natural heritage systems, water protection efforts, agricultural systems
 - Can be used in a process to 'leverage' natural G+S within a community

Conclusions:

Potential for GI Planning in Ontario (con't)

- **Community/municipality interest:**
 - General interest as a mechanism to generate new local economic activity/revenue streams; and/or lower municipal costs
 - Tap into \$ from others (NGOs, Senior Gov'ts)
- **NGO interest:**
 - Implement 'specific interest' initiatives & integrate actions with others
- **Senior government interest:**
 - Implement strategic priorities such as climate change impact mitigation/adaptation measures, biodiversity protection strategies

OMAFRA RESEARCH DAY – THANKS FOR LISTENING

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