

Clean Air Council Green Development Standards Workshop
Meeting Notes
October 25th, 2019



1. Gabriella Kalapos, Update on Green Development Standards (GDS) Resources and Efforts

What is GDS? Voluntary or mandatory measures implemented by municipalities to encourage sustainable community design. The metrics guide development at a level of planning and design that focuses on the community as a whole. The goals are: minimize GHG emissions, preserve the natural environment, create thriving, connected communities, improve public health.

Why using GDS? Ontario's population is projected to grow by 30.2 per cent (4.3 million) between 2017 to 2041. To reach GHG targets, new buildings need to be built to minimize GHG emissions (net zero). This is easier and cheaper than retrofitting them later. Incorporating GDS is an opportunity for a municipality to ensure that new development considers public health, climate change, energy, and resource use.

What are the benefits of Green Development Standards?

- Building better quality buildings
- Reducing operating costs through decreased need for heating and cooling
- Increasing resilience to extreme weather and power disruptions
- Reduce GHG emissions
- Improve air quality and reduce the urban heat island effect
- Reduce storm water runoff and potable water consumption while improving the quality of storm water draining to water bodies
- Protect and enhance ecological functions, integrate landscapes and habitats and decrease building-related bird collisions and mortalities
- Divert household and construction waste from going to landfill sites.

What is the legislative framework? Municipalities have the tools in existing policy to enable these types of requirements. Municipalities have the authority and power to create GDS through the *Municipal Act* and *Planning Act*, where the latter includes the Provincial Policy Statement. At a local level, the Municipal Official Plan should have some broad principles or considerations that include GDS within the planning approval process. Finally, the Municipal Plans and Policies need to be aligned with the Regional Plans and Policies.

GDS toolkit provides a Milestone Framework that includes each step in developing and incorporating GDS. There are four main steps: Declaration Phase, Metric Development and Consultation, Implementation, and Monitoring and Reviewing.

The way we see the implementation of GDS happening is through a step approach to move to higher energy efficiency (also known as Tier approach). Examples of municipalities using the step approaches are Vancouver and Toronto. The difference is that Vancouver is looking from an energy perspective and Toronto from an emission perspective. Further, the national building energy code is also adopting a step approach. The consultation will be open in January 2020.

More information on the metrics and the step approach you can find in a webinar Clean Air Partnership delivered. You can access proceedings here: <https://cleanairpartnership.org/cac/meetings/green-development-standards-metric-rationale-and-incentives-pros-and-cons/>.

Potential incentives for Green Development are:

1. Community Improvement Plans
2. Development Charge Rebates
3. Tax Increment Based Grants
4. Expedited Approval Process
5. Recognition Program
6. Density/Height Increases
7. LIC Financing

2. Shaun Joffe, Great Gulf Homes: Advancing the Developer & Municipal Conversation on Advancing Lower Carbon Homes

Some of the **challenges** that builders experience relates to the fact that different jurisdictions have different requirements and **use different metrics**. Further, implementing new requirements for energy efficiency and/or emissions reduction requires **consistent and continues training for the sells team, mechanical trades, and architect**. The biggest challenge, however, is **timing**. From figuring out what standards are in play in the particular municipality (site approval, permit...) to the approval process, which sometimes can take up to 7 years. During this time period, some requirements might change.

For this reason, a step approach, such as Toronto GDS, is a good approach that shows what is coming and the next steps. Nevertheless, timing is the biggest burden for builders, and if there is a way municipality to accelerate the approval process, that will be the best incentive. Perhaps, it can establish an expedited approval process for buildings that are Tier 3 or Tier 4, similar to the expedited approval process for the Affordable Housing program in Toronto.

The **needs** that had been identified are **having standardization of government standards and across the region**. Further, there is a need for **educational programs for homeowners on energy efficiency, architects, and trades**. Communicating Lower Carbon Homes with focus on tenant comfort, as opposed to reducing GHG emissions, will resonate better with homeowners and perhaps will make a change in their preferences moving away from glass buildings. Meanwhile, architects should move towards low carbon building design, reducing the glass surfaces; and education on trades will allow meeting the requirement needed to move towards net-zero buildings.

Furthermore, there is a need for **different departments within the same municipality, to be involved in decision making and approval process** (Planers, Developers, Energy Division, Climate Change/Sustainability staff). Perhaps, a good practice would be to have one leader among all departments to whom builders can connect/contact in need and who can communicate with the rest of the staff involved. A great example of such initiative is from City of Mississauga. They have a process called DARK Meeting, where it is required for every department to be in the room for preliminary process discussion.

Questions/Comments:

1. The importance of having a 3rd party certification (e.g., LEED, CaGB, BOMA)

Third-party certification organizations are more flexible and can more easily make updates/changes and push forward, as compared to municipalities. Municipalities are slower to approve, adopt, and implement programs. Nevertheless, municipalities have the advantage of the policy to use 3rd certification.

2. Submission process

Municipalities, similar to builders, would like a better/easier submission process. However, this requires additional resources (staff, designated time, funding) that often are insufficient. In regards to timing, sometimes an approval is slow because of council approval.

3. Andrew Pride, Pride Consulting: National Model Building Code – Advancing Net Zero Buildings

Canadian Codes Development System is based on collaboration between the provincial and territorial regulatory authorities, the Canadian Commission on Building and Fire Codes (CCBFC) and the NRC. The Commission stands for independence from federal and provincial/territorial governments, which gives it the buy-in from industry. All committee is balanced by region and interest and decisions are made by consensus. The provinces and territories pass legislation enacting building, plumbing, energy and fire regulations. This legislation either refers to the relevant national code or a provincial code. Even in provinces that have their codes such as BC, Alberta, Quebec and Ontario, the codes are substantially based on the National Model Codes. They inform the Commission of their policy goals. And some provinces (AB, QC and BC) contribute substantially to the funding of the system. The NRC provides technical support to committees and conducts research to support decision making. **But NRC has no regulatory authority and staff does not vote on committees.** NRC is currently in the process of copying this model to develop codes and guides for climate resilient infrastructure in the hopes that this will create the same buy-in among infrastructure regulators and industry

In this presentation, Andrew introduced the most significant changes to the National Energy Code of Canada for Building (NECB) and Section 9.36. Of the National Building Code (NBC). A total of 23 Changes are proposed to NECB and Section 9.36. of the NBC. Andrew focused on the following changes:

- Airtightness testing
- Fenestration and door areas
- Thermal transmittance of opaque assemblies and fenestration
- Lighting
- HVAC and service water heating
- Alignment with the EnerGuide system
- Tiered performance requirements

Changes under the first 4 items are proposed for the building envelope and lighting part of the NECB only. Changes proposed for item number 5 and 6 on the list above to both NECB and Section 9.36. of the NBC. While the changes for item no. 7 i.e. alignment with the EnerGuide rating system is proposed for Section 9.36. of the NBC only.

NECB deals with energy efficiency requirements for Part 3 buildings, while Section 9.36. of the NBC deals with the energy efficiency requirements for Part 9 buildings.

To decrease the overall building energy consumption, **the thermal performance** of the building envelope has to be improved through a better thermal performance of opaque and fenestration surfaces and lowering the fenestration areas. To accomplish that, three more changes are proposed to the building envelope part of the NECB:

- The allowable fenestration and door areas are being reduced to 10 – 30% (depending on the climate zone). This change will result in archetype averaged energy savings of -1.4 – 5%.
- Thermal transmittance values for opaque building assemblies is changed, which will result in archetype averaged energy savings of 0.1 – 1.2%.

- Thermal transmittance of fenestrations and doors are being changed in consultation with the fenestration industry. This change is to result in archetype averaged energy savings of 0.5 – 2.8%.

Interior Lighting:

To catch up with the advancement that is happening for the lighting product efficacy in the Canadian and North American marketplace, the Lighting power density (LPD) values in the NECB are updated. It harmonizes the NECB with ASHRAE Standard 90.1. Relative to NECB 2017, the effect of this change on the overall building energy savings ranges from 0.2 to 5.9%.

Exterior Lighting:

Certain exterior lighting areas are not addressed by the NECB, and this exhibits a gap in the current provisions. To address this issue, a new table is added to address the exterior lighting areas not covered by the existing Code provisions. This change also harmonizes NECB with ASHRAE 90.1. A consultant study found that the lighting designers will have no difficulty in new lighting designs within the proposed LPD values, as the lighting system costs will be lower than the NECB 2017 baseline values, resulting in a simple payback of 0 years.

The HVAC and SWH performance requirements both in NECB and Section 9.36. of the NBC are out of date and do not align with current and anticipated minimum Canadian standards for the manufacture and sale of these devices. The updates to equipment performance requirements in the NECB and Section 9.36. of the NBC include: adding equipment that was previously missing aligning equipment with the forthcoming amendments to the federal energy efficiency regulations, and other standards such as ASHRAE and CSA. The proposed changes will have a limited impact since the equipment is already or soon to be regulated to these performance levels through regulations beyond the codes. Alignment of the code's requirements and regulations will reduce confusion and inconsistency in the market.

Tiered Performance Requirements

To prepare the industry for increasingly stringent energy efficiency codes in the future and acclimate industry to the use of performance modelling solutions as a comprehensive compliance methodology, it is proposed to introduce tiered performance requirements that will offer increased flexibility to authorities having jurisdiction (AHJ). A new Part 9 is introduced into the NECB. This new Part adds another compliance path for compliance. It proposes four tier levels for NECB, with each successive tier being more stringent in terms of the building's overall energy consumption. This path relies on existing Part 8 for energy modelling.

Similarly, a new Subsection (9.36.6.) is introduced for tiered performance requirements for the Part 9 buildings. It defines five tiers with each tier specified in terms of three parameters: overall energy performance improvement, improvement in building envelope performance and airtightness level. For Part 9 buildings, two more new Subsections are being proposed to supplement the tiered approach. The first Subsection proposes a prescriptive approach for tier 2. This Subsection uses the energy conservation points system which has broad acceptance through the ENERGY STAR for New Homes program. The second Subsection defines air leakage rates in terms of the most commonly used metrics: Air Changes Per Hours, Net Leakage Area and Net Leakage Rate.

Alterations to Existing Buildings guide is in process and will be available 2020

There will be a consultation on the new National Building Code, where CAC members can provide collective or individual input.

4. Tim Weber, Diverso Energy: The Geothermal Utility Business Model

Diverso Energy Design, builds, owns and operates geothermal systems for Multi-Residential, Office & Institutional clients. Following a utility-like model, a Third Party Owner will design, build, pay for, own and operate the Geothermal Borefield. The solution they provide reduces construction cost, improves building value, and allows to meet the emissions/energy reduction targets. **However, an important point that Tim made is that even though they have the solution, often builders will not consider using their service because they are not required to. This is where the municipalities have an important role to play by strengthening the GDS requirements.**

What is geothermal?

Plastic Pipes & Pumps that under the ground and circulate water. The ground is used as a battery to provide Thermal Energy. During the summer months, heat from the building is rejected into the ground to cool the building. During the winter months, heat is extracted from the ground to heat the building. The system is compatible with conventional in-suite HVAC equipment (Heat Pumps, Water Source VRF, 2/4-Pipe fan coil).

Why geothermal?

It eliminates the need for Cooling Towers & Heating Boilers. It reduces Carbon by up to 80% & Energy Usage Intensity by up to 15%. Increases GFA & Amenity space and it is more reliable than a conventional cooling tower & boiler system

Geothermal challenges:

Capital cost is up to 10x more than a cooling tower and boiler and requires an intensive installation process. Also, Borefield requires constant temperature management but project engineers have limited geothermal management experience. Lack of experienced implementation partners harms the process by potential delays on a project schedule.

Benefits for Building Owners

Budget Certainty - Variable operating costs attached to the displaced conventional equipment are replaced with a single fixed fee.

Guaranteed Performance - The Agreement carries a 30-year performance guarantee removing any uncertainty that this system will perform throughout the term

Marketability- Benchmarking programs highlight buildings with geothermal increasing marketability.

5. Discussion and Next Steps

Green Development Incentives Discussion

Community Improvement Plans seem not to be suitable for new large development but rather for retrofits.

Expedited Approval Process is very attractive from a builder's perspective. The challenge is the lack of municipal resources, such as staff, time, funds. This could be solved by having one person with the authority to do all the expedited approvals for every CAC municipality. There is an example from Vancouver, having this system in place. However, they received funding from the province. Another suggestion was to adopt the Expedited Approval Process for Tier 3/4 buildings only.

Density/Height Increases is also very attractive from a builder's perspective. It is considered a win-win strategy because of more sq. feet to sell for builders, more taxes for the municipality, and it is not necessarily increased density as it is often used for a penthouse. The latter is not known for the community and that is why there is a need for better communication and community engagement on this incentive.

The use of absolute incentives instead of sticks is still a preferred method. Also, municipalities should consider the use of a secondary plan of pre-approval instead of changes in the by-law.

Next Steps and To Dos from GDS Meeting

- Explore establishing a system where one person with authority to do all the expedited approvals for every CAC municipality
- Low Carbon Coalition – training opportunities by CaGB
- Providing a full menu of options on incentives with Pros and Cons
- Corporate Green Development Standard webinars/working group to work collaboratively on advancing the standard. Integrating energy management and asset management. Ex. Caledon has a policy requirement where the Energy Team needs to be consulted when assets are being renewed/updated. In Simcoe County, all capital projects have to be reviewed by Energy Team.
- Interdepartmental engagement strategies and municipal recognition efforts to engage municipal staff and increase awareness.
- How to use thermal comfort issues to drive energy efficiency?
- Low carbon technologies of interest include: geothermal, heat pumps, solar walls, building envelope upgrades, prefab building envelope upgrades, sharing of energy efficiency measures across the network, operational efficiency efforts and their results, challenges and maintenance.