

Moving from Buildings to Communities: The Future of Sustainable Design*

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ABSTRACT: As buildings are the #1 contributor to GHG emissions in the world, this presentation will focus on how green buildings are crucial to any city's GHG reduction strategy. Over the past 10 years, the green building design and construction industry has experienced tremendous advancements in design strategies, building technologies and equipment, and has experienced heightened building occupant awareness. The author will draw upon his wealth of sustainable design experience, sharing project experiences that highlight design and technological innovations and discussing the lessons learned over 20 years as a sustainable practitioner. Furthermore, he will focus on the firm's shifting understanding of the subject from buildings to communities, and offer observations on likely future developments in sustainable design. More specifically, this paper will present the Dockside Green project in Victoria B.C, which represents the culmination of Busby Perkins+Will's green building experience. Based on a Triple Bottom Line approach (economic, social and environmental principles), the Dockside Green project showcases how technologies and ideas previously used in isolation can be integrated successfully to create sustainable communities. The author will also share the firm's design response to the City of Vancouver's EcoDensity initiative and illustrate how a new form of urban planning that uses transit systems as catalyst for nodal development is a sustainable design and planning solution for reducing a city's per capita greenhouse gas emissions.

INTRODUCTION

Cities are at a crossroads: issues of affordability, infrastructure renewal, population growth, and environmental degradation – particularly climate change – are precipitating a re-examination of their planning strategies. In July 2006 the City of Vancouver launched its EcoDensity initiative, proposing that high-quality and strategically-located density could make Vancouver more sustainable, more livable, and more affordable. In November 2007, the City released its draft Charter of the initiative, seeking feedback on both the vision and the City's means to achieve it. The initiative's launch also sparked a debate for many in Vancouver regarding what it means to be a sustainable city.

As a firm of environmentally-conscious architects based in Vancouver, we felt obliged to respond to the EcoDensity initiative. We questioned how far the Charter went in addressing the impacts of climate change, how far the City was willing to go in setting a new planning direction, and whether or not Vancouver was committed to becoming a global leader in sustainability.

We know that climate change is real. Scientists suggest that we may have as little as 3,000 days before we witness its irreversible effects. To many, the issue seems insurmountable – a global issue over which individuals have little control. But as architects, we know that buildings are responsible for more than 30% of

Canada's greenhouse gas (GHG) emissions. Buildings are Vancouver's primary source of GHG emissions – 54% – and taken together, buildings and transportation emit 74% of our city's greenhouse gases. How and where we live and how we design our buildings impact our city's emissions dramatically. Metro Vancouver studies show that residents living in multi-family housing types in the downtown area emit one-quarter of the carbon of those who live in single family houses. Simply put, multi-family housing is more energy efficient. Shared walls reduce energy losses and shared utilities reduce overall consumption. Denser living also encourages walking, biking, and the use of public transportation over automobile use.

After the release of the draft Charter, Vancouver's Director of Planning asked our firm to offer feedback and provide insight in order to make the initiative more effective. We conducted a comprehensive evaluation of EcoDensity, examining the ways in which Vancouver could accommodate its projected growth, maintain its high standard of livability, increase its affordability, and capitalize on opportunities for sustainability.

METHODOLOGY

Our initial action was to identify carbon footprint as the best measurement tool by which to calculate GHG

emissions and compare the environmental impact of cities from different parts of the world (fig. 1).

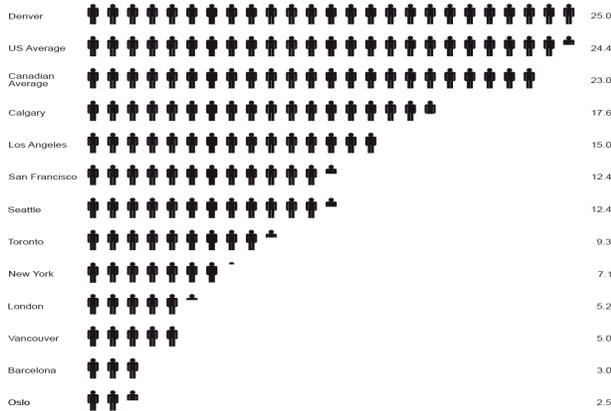


Figure 1: Current GHG Emissions of Selected Cities.

When compared to other North American cities, we found that Vancouver rates as one of the best, emitting only 5.0 tonnes of CO2 per person per year. However, when compared to internationally cutting-edge cities, Vancouver can do much, much better. Oslo's GHG emissions are only 2.5 tonnes per person per year, and cities throughout the European Union are using this figure as a target. Scientists agree that reducing emissions to this level could shift the tide of climate change.

Following our initial research, we developed a vision for Vancouver based on a nodal approach (fig. 2), strategically locating density along existing and upcoming transit corridors. This framework would allow the City to create vibrant, walkable, balanced communities that would offer a diversity of amenities and improve Vancouverites' quality of life. Moreover, our framework would encourage people to use transit instead of automobiles, further reducing the city's GHG emissions.

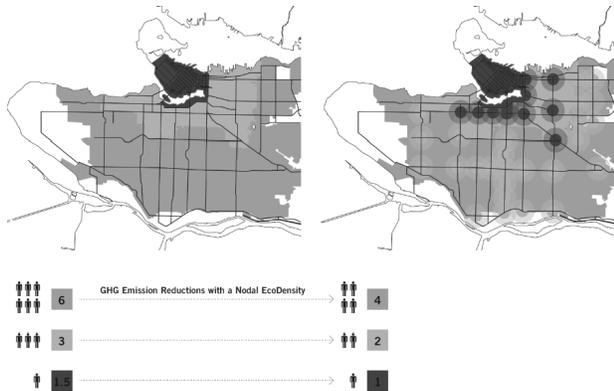


Figure 2: Vancouver GHG Emissions without and with Nodal EcoDensity (relative comparison in tonnes of CO2/capita/year).

Balanced communities are essential to this vision. They are created through a healthy mix of housing and employment, adequate amenities, services and greenspace, and access to public transportation, all within walking distance. Not all residents will work within their neighbourhood, but by providing a better mix of jobs and housing fewer people will need to travel. A greater range of dwelling types will also provide more housing options, making the city more affordable.

Additionally, balanced communities will achieve economies of scale that allow integrated infrastructure. For instance, our Dockside Green development in Victoria (fig. 3) treats and reuses all the wastewater on its 13-acre site. Excess treated water is sold to neighbouring businesses, an additional revenue stream for the project. Community waste wood is used for heating and as saleable fuel. By capturing synergies between the wastes of one process and the feedstock of another, district infrastructure can eliminate waste altogether, dramatically improving the urban energy-use pattern.

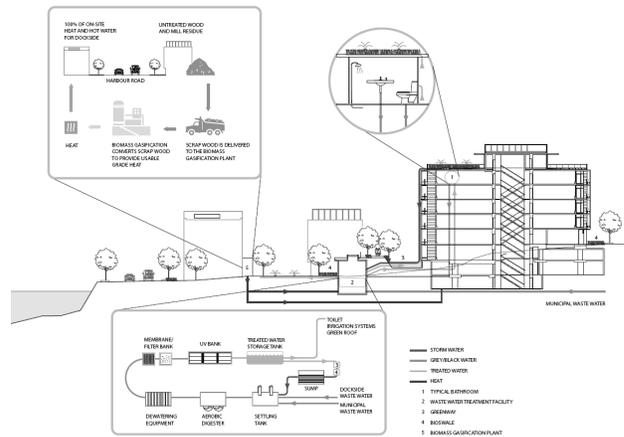


Figure 3: Dockside Green District Infrastructure.

RESULTS

The results of our analysis of Nodal EcoDensity [1] were presented to Vancouver City Council in February 2008, as part of the public consultation process. Through a series of seven special meetings, the City Council received presentations on the Charter from more than 100 citizens whose voices represented the greater populous of Vancouver.

Key themes from these presentations included:

- the urgency with which the City should take action;
- the importance of protecting affordable housing options while encouraging diversity in housing types;
- the importance of mandating green performance as a development requirement, rather than simply encouraging it with bonuses;

- the importance of simpler metrics for assessing building performance; and
- the need for more sustainable transportation options.

CONCLUSION

As a result of the consultation, the City has recently published a revised iteration of the Charter that reflects the public's comments and concerns. The consultation period was extremely valuable, as it provided the City with a broad sampling of citizens' concerns and established a much clearer set of actions for implementing the EcoDensity initiative [2]. In the new charter, we see a direction that is more balanced, more holistic, and more effective. The charter has become more balanced by focusing on all the elements of an eco-city, rather than only on density. It has become more holistic by addressing issues of affordability, heritage, and historic value, and it has become more effective by making green performance a requirement and not an option.



Figure 4: Dockside Green Development by Busby Perkins+Will architects.

However, there is still room for improvement:

1. The City requires criteria or ratings systems for building assessment, and a system for enforcing these criteria (a LEED Silver equivalency has been suggested). We worry that without stringent criteria, future development may not reflect the City's admirable intentions.
2. The City also requires a more disciplined approach to the mix of uses within its balanced communities. Provision of work spaces and public amenities in all the city's neighbourhoods is important, but so is provision of a balance of residential uses.
3. The City should assess development opportunities in direct relation to existing and planned transportation strategies. Development and density should be

located around the infrastructure that is most environmentally beneficial.

4. The City must create a retrofit program for existing buildings. The opportunities that new construction presents are significant, but they are eclipsed by the opportunities to improve performance of our existing building stock.

The City launched an aggressive and large-scale initiative that has had the positive effect of sparking a wide-ranging discussion of Vancouver's future as a sustainable city. Over the next year, the public will be watching closely as city staff report back to Council on the follow-up studies that are part of the revised Charter.

Implemented properly, the right model of EcoDensity will lead to a radical reduction of Vancouver's greenhouse gas emissions. Time will tell how committed the City Council and the populous are to truly making a difference. A vision that defines Vancouver as a field of successful, balanced, and amenity-filled nodal neighbourhoods will see reductions in emissions across the entire city, not just in the areas of increased density. This vision is what will ensure that the future of Vancouver is not only livable, sustainable, and affordable – it is part of the solution for global warming.

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REFERENCES

1. www.busbyperkinswill.ca
2. www.vancouver-ecodensity.ca