

Planning West

Volume 51 • Number 1 • March 2009

Attachment No. 1

PIBC PLANNING
INSTITUTE
OF BRITISH COLUMBIA



**North Vancouver 100 Year Sustainability Vision,
2009 BC Land Summit, Plangirl Travels, and more...**

The City of North Vancouver & the District of North Vancouver

100 Year Sustainability Vision and Concept Plan

A study led by the Design Centre for Sustainability at the University of British Columbia to achieve community-wide, net-zero GHG emissions by 2107, the City's 200th birthday.

Planning for low carbon communities requires planners to use a long-term planning lens. Bridging municipal boundaries, the *North Vancouver 100 Year Sustainability Vision and Concept Plan* both highlights and quantifies the impact of urban form on greenhouse gas (GHG) emissions, providing a roadmap for how the City and portions of the District of North Vancouver can achieve and possibly exceed provincial GHG reduction targets.

The first attempt to apply tools for estimating and visualizing the GHG emission implications of urban form decisions developed by the Design Centre for Sustainability at the University of British Columbia ("Design Centre") within a collaborative, municipal planning process was initiated by the City and District of North Vancouver¹. The resulting *100 Year Sustainability Vision and Concept Plan* ("100-Year Vision") was developed through a participatory, community-based design charrette process. Informed by compact, complete community design principles and GHG impact assessments, the concept plan identifies future land use, mobility, green infrastructure, and building design strategies to build a vibrant, diverse and highly livable community that accommodates a doubling (for the District) and tripling (for the City) of the population while achieving net-zero GHG emissions. The concept plan is intended to inform upcoming revisions to both the City and District's Official Community Plans (OCPs), Zoning Bylaws and other planning tools.

Sowing the Seeds of a Vision

The development of a long range vision and plan took root for the City in 2003 through the international recognition received by Team Canada's citiesPLUS (Cities Planning for Long Term Urban Sustainability) presentation at the World Gas Conference in Japan. Team Canada won first place for its 100-year urban plan for Greater Vancouver, and the City was recognized within the plan for its innovation and leadership in sustainable development.

The District has also been moving toward sustainability for a number of years. In 2004, Council adopted The Natural Step sustainability principles which have provided a framework for action around sustainability. In 2005, Council articulated its vision "to become among the most sustainable communities in the world by 2020". The 100 Year Vision provides a powerful context for its current work to develop a new OCP and a Climate Change Action Plan.

The Context: City of North Vancouver ("The City")

The City is a small community located at the base of the North Shore Mountains. Bounded to the south by Burrard Inlet, it is surrounded on its north, east and west boundaries by the District of North Vancouver. The City supports a population of over 48,000 and provides workspaces for more than 23,000 jobs within a land area of approximately 12 square kilometres. Due to its central location on the North Shore, relatively high density, transit accessibility and proximity to Vancouver's central business district (SeaBus connection), the City is recognized as a Regional Town Centre within Metro Vancouver's Livable Region Strategic Plan.

Most of the small land base of the City has been developed. Yet, due to its proximity to downtown Vancouver, access to natural amenities, and high quality of life, the City is expected

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100 Year Sustainability (cont'd)

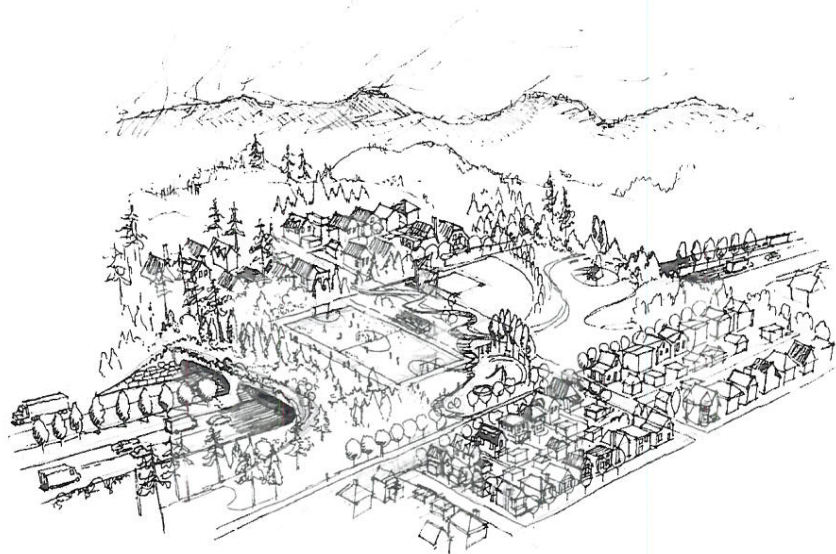
to experience sustained growth over the next century. Community stakeholders at the initial project workshop agreed that population may grow at 1% per year, to a possible tripling of population by 2107. With this added growth, development pressures will continue.

The Context: District of North Vancouver ("The District")

As a contrast to the City, the District has a vast land base of about 16,230 hectares which stretches from Capilano River on the west to Deep Cove on the east, with over two-thirds of this area either dedicated wilderness or parkland. The remaining area is developed with residential dwellings, 70% of which are single family homes; the population is approximately 85,000.

The District was too large to consider in its entirety for the purposes of the design charrette. As a result, the scope of analysis for the District was limited to the Lower Capilano/Marine Drive neighbourhood west of the City and Lower Lynn/Maplewood/Capilano University environs east of the City. These two areas have good connections with the City, are also well-served by transit, located close to regional connections over Burrard Inlet, present a mix of land uses and have established employment opportunities. Synergies with the City's energy and infrastructure systems are also present along this "bridge to bridge" corridor.

For the purposes of the charrette, the District projected a doubling of population over the next 100 years and, to promote the development of more compact communities, the two charrette study areas in the District were considered to be the areas best suited to absorb the majority of this growth. To show this more transit-oriented and multi-use type of development, the study areas were projected



Highway tunnel recreational scenario

to have more than a four-fold increase in population and more than a five-fold increase in jobs.

The Issues

For both municipalities, the issues are varied. In light of rising land values, the issue of housing affordability is universal and the loss of aging rental housing stock a key priority. Parks and open space systems will see greater use; aging municipal and regional infrastructure, including transportation routes, water and waste facilities, will be taxed with growing demand. Furthermore, without modifications to existing practices, energy consumption will increase with population, putting greater demand on the City's district energy system (Lonsdale Energy Corporation), and regional energy infrastructure. As increasing emphasis is placed on GHG emissions, cleaner energy sources for all utilities will be of particular concern.

How can the City and District continue to grow while simultaneously reducing their carbon footprints and maintaining liveability? What will redevelopment and densification look like? What technological adaptations, lifestyle changes, and policy requirements need to be considered and integrated, by design, into both future planning and the urban fabric to reduce energy consumption and GHG emissions?

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100 Year Sustainability (cont'd)

Project Principles & Targets

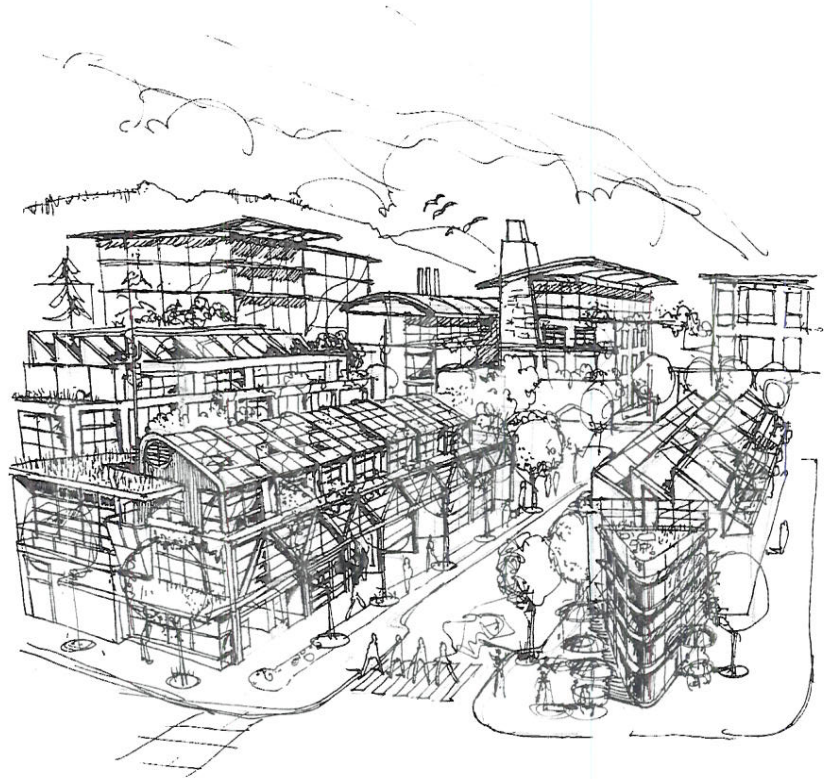
Led by the Design Centre, the City worked in partnership with the District on this multi-phase, stakeholder driven and community-based initiative as the participatory design charrette process was key to the project. Seven sustainability design principles formed the foundation:

- mixed use corridors accessible to all
- a five minute walking distance
- appropriate housing for all
- good and plentiful jobs close to home
- access to linked public places, parks and natural areas
- green, durable, timeless infrastructure
- climate change adaptation.

The project approached sustainable urban design through the lens of climate change and was fundamentally guided by the provincial *GHG Reduction Targets Act* introduced in November 2007. The final concept plan was informed by quantitative GHG assessments of current conditions and alternative development scenarios using an innovative development pattern approach. The meta-targets of the 100-Year Vision are to reduce GHG emissions by 80% below 2007 levels by 2050 and achieve net-zero GHG emissions by 2107.

The Planning Process

Meaningful stakeholder engagement was at the heart of the process. The development of the 100-Year Vision brought together citizens and experts that do not often sit at the same table, including local residents, City and District staff, Squamish Nation members, business owners, developers, professional designers and planners, and technical and academic experts. This broad cross-section of local and regional community stakeholders directly selected key framing issues, revised goals and ob-



District of North Vancouver design scenario

jectives, identified opportunities and core strategies, and developed design strategies within a series of workshops.

The Methodology

During the City's process, the Design Center's research team operated in parallel to, and in support of, two stakeholder workshops exploring methodologies and underlying assumptions needed to evaluate community-wide GHG emissions per capita and estimate future reductions. The team generated a rough evaluation of the charrette outputs, including people, jobs and GHG estimates, to quantify the extent to which the Vision achieved the set targets. The team used a "case" and "development pattern" based methodology integrating building, transportation, infrastructure and technology options to quickly assemble and evaluate scenarios representing baseline 2007 conditions and the 100-year

vision developed by stakeholders. A GIS analysis was then used to generate both quantitative GHG emissions estimates and spatial "GHG maps" of existing and future conditions in the City to evaluate the GHG implications of the urban form decisions made during this process.²

Key Design Strategies

The strategies developed by the charrette team included mixed-use and higher density development along existing corridors and within nodes, creation of an interconnected green street network, and development of alleys and mid-block connectors. These strategies established improved east and west transit connections to, from, and through the City's central core. The plan gradually reconfigured blocks and parcels, shifting the grid to improve pedestrian movement and accessibility in context of

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100 Year Sustainability (cont'd)

the City's steep topography. The 100-Year Vision will ensure walking distance to amenities and green space, provide accessible pedestrian and bicycle connections, and support viable local and regional transit services to reduce auto-dependency and transportation-related GHG emissions. It also includes design strategies to develop a mix of housing types and tenures (market and non-market) at various densities, while maintaining the unique character of the individual neighbourhoods. Strategically located residential density increases support the expansion of the City's district energy heating system, which contributes to efficient community energy production and use.

New green infrastructure, green roofs, rooftop gardens, and active mobility pathways will connect neighbourhood parks and residential areas, while also contributing to water quality and flood prevention, conservation of habitat, and local food production opportunities. With significant regional utility infrastructure on the North Shore, a number of alternative green energy sources were incorporated in the design analysis, including: biogas from a new sewage treatment plant; hydro electricity from drinking water dams; and wind, tidal and biomass potential.

The Implications for Urban Form

Many of the decisions that will be made to mitigate climate change at the regional and municipal level will necessarily involve land use and urban form. Such decisions about growth, land use, infrastructure, transportation and building form have immense impacts on the energy consumption, energy source opportunities and GHG emissions in communities.³

To help address a potential gap between urban form and energy, the innovative 'development pattern' modeling methodology used during the planning process provided participants with quick and accessible cal-

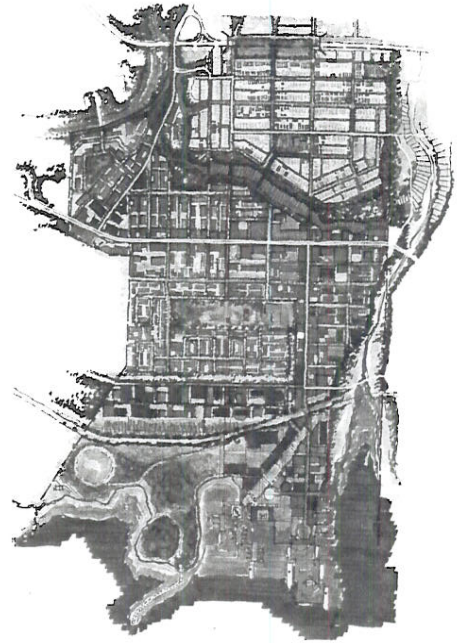
culations of the energy and GHG impact of different sets of planning and design choices. This approach demonstrates that providing a tool to quickly measure design choices against specific sustainability and GHG reduction targets during an iterative and fast-paced design process – as opposed to evaluating final project outcomes – provides invaluable knowledge to stakeholders and designers involved in decision making. A widely-accessible method to measure the urban form-GHG relationship makes the role of neighbourhoods in the reduction of GHG emissions more apparent to stakeholders and decision makers, enables comparison of auto trips and transportation emissions between alternative design scenarios, and meaningfully informs policy making.

Turning the Vision into Reality

The *North Vancouver 100 Year Sustainability Vision* is one of the first projects in British Columbia to consider, at the municipal scale, the feasibility of meeting the Province's challenging GHG emission targets. Like many other municipalities, the City faces this challenge within the context of significant population growth over the next several decades. Yet, the 100-Year Vision makes it clear that meeting the challenge is achievable. Urban form decisions alone have the potential to reduce total GHG emissions by as much as 30%. With the inclusion of appropriate technology, such as the expansion of the district energy system fueled by renewable energy sources, high efficiency new construction and retrofits, and low-carbon modes of transportation, the City and District collaboratively have potential to achieve net-zero GHG performance by 2107. ⁴

See www.sxd.sala.ubc.ca or www.cnv.org or www.dnv.org for more information.

Submitted by Suzanne Smith, MCIP, City of North Vancouver, with acknowledgement of



Lower Capilano development scenario

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¹ Design Centre for Sustainability, UBC. Nicole Miller & Duncan Cavens. 2009, January. City of North Vancouver 100 Year Sustainability Vision: GHG Measurement and Mapping. Technical Paper prepared for: Ministry of the Environment CEEI Working Group.

² Design Centre for Sustainability, UBC. Nicole Miller & Duncan Cavens. 2009, January. City of North Vancouver 100 Year Sustainability Vision: GHG Measurement and Mapping. Technical Paper prepared for: Ministry of the Environment CEEI Working Group.

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