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# RESEARCH REPORT

TOOLS FOR PLANNING FOR  
LONG-TERM URBAN  
SUSTAINABILITY:  
THE CITIES<sup>PLUS</sup> DESIGN CHARRETTE



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# Tools for Planning for Long-term Urban Sustainability

The cities<sup>PLUS</sup> Design Charrettes



# Tools for Planning for Long-term Urban Sustainability

**The cities<sup>PLUS</sup> Design Charrettes**

*Lourette Swanepoel, Elisa Campbell & Sebastian Moffatt*

*Foreword by Patrick Condon*

*Drawing edits by Shana Johnstone & Susan Milley*

*A cities<sup>PLUS</sup> publication*

*Produced by the Sheltair Group Inc.*

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# Foreword

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I have been honored to be part of the cities<sup>PLUS</sup> effort. I certainly feel that way; but so do literally hundreds of others who can say the same thing. The cities<sup>PLUS</sup> effort was special because unprecedented numbers of citizens, experts, elected officials, academics, appointed officials, were involved in the process - everyone, in short, who had anything to say about the future of their region.

The charrette portion of the larger cities<sup>PLUS</sup> effort was no intimate undertaking either. Over one hundred people were directly involved in this three day event. Three days to massage thousands of pages of information, speculation, and innovation into a concrete vision for a more sustainable future. A vision that, when it emerged, was much less a flight of fantasy than a confrontation with the uncomfortable realities of our present situation. A collectively imagined world where our progeny could secure a decent life in a safe home, even if circumstances became constrained.

What is most remarkable about the design vision presented here is not how dramatically it departs from our present world, but how closely it resembles it. What we see emerging in these speculative designs is a world that is entirely recognizable, yet a world that dramatically reduces our dependence on external supports; supports from foreign nations in the form of imported materials and food, or supports from far flung regions of our province for clean water and imported energy.

It is truly remarkable that such an exciting and yet modest vision could emerge from the immense pile of alternative policy options and futuristic technology choices with which charrette participants began. This was only possible because the mind is much stronger when used

in groups than when used alone.

No one single intelligence can produce a durable vision for a sustainable future. Questions pertaining to sustainability are immensely complex and interrelated. Methods for arriving at integrated visions are required that go beyond any one human's capacity. No method is more capable of producing an integrated and durable vision than is a diverse and creative group. Diversity breeds integration and the production of 'both-and' solutions. Solutions that are both new and old, high tech and common sense.

The cities<sup>PLUS</sup> charrettes, and the success of the larger cities<sup>PLUS</sup> project, proves once again that it is within our reach to create regions that can be maintained into the future, and that are healthy for all living things. Certain new and in some cases revived practices are all that is required. Citizens and their officials are increasingly cognizant of this need for change and are making it happen. Provincial, federal, and regional jurisdictions, along with concerned citizens and public interest groups, have come together to implement an important shift in the way our new and revived neighbourhoods are built. The cities<sup>PLUS</sup> project and the charrettes offer a tantalizing target for these efforts - a clear description of an imaginable future that is healthy for the son of our daughter's daughter. A picture that replaces the shadowy future we imagine for our kids with vivid rays of hope, and a goal worth working for.

*Professor Patrick Condon*

*UBC James Taylor Chair in Landscape and Liveable Environments*

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## Introduction

Une révolution urbaine de grande envergure se produit actuellement, car 80 % des Canadiens habitent aujourd'hui la ville, ce qui est plus du double qu'il y a cent ans. D'ici 2050, 7,5 milliards de personnes dans le monde habiteront en région urbaine. Leur survie dépend donc de la survie des villes.

Le réchauffement de la planète, la pollution de l'air, l'étalement des villes, les décharges surexploitées, les pénuries d'eau, les maladies et les conflits planétaires leur seront laissés en héritage à moins que l'on se tourne vers des modes d'aménagement plus équilibrés. Bien que le développement durable urbain soit devenu un concept largement reconnu depuis les dernières décennies, la mise en œuvre de l'ensemble des principes liés au développement durable a été lente. On peut attribuer cette situation à un large éventail d'obstacles, dont les ensembles de valeurs divergents, les préférences personnelles biaisées et les contraintes budgétaires. Si ces obstacles ont limité la transformation du marché en concepts d'aménagement plus équilibrés, ils ont aussi sérieusement mis en cause notre avenir.

En accord avec la règle universelle de planification voulant que nous ne saurions être plus grand que la vision qui nous anime, et pour surmonter ces difficultés, il nous faut créer une vision convaincante d'un avenir au sein duquel la durabilité urbaine est mise en lumière. Nous devons par conséquent laisser de côté les contraintes et les occasions à court terme, et mettre l'accent sur un horizon de planification à long terme. On doit parvenir à une planification efficace en tenant compte non seulement des besoins de la prochaine génération, mais également de ceux des générations à venir.

La capacité des villes à survivre et à prospérer d'ici le prochain siècle dépendra de notre habileté à apprendre de nouvelles façons de penser, et d'utiliser de nouveaux outils pour traiter d'enjeux complexes de manière à garantir la pérennité sociale, économique et environnementale.

Ce document traite du concept de planification en matière de durabilité urbaine à long terme, et met l'accent sur un outil important à l'aide duquel on a réussi à rédiger le plan centenaire « cities<sup>PLUS</sup> » visant la durabilité urbaine du grand Vancouver : la charrette de conception.

La première partie de cette publication aborde les concepts clés et les méthodes qui sous-tendent la planification à long terme, tandis que la deuxième porte sur une étude de cas qui procure certains des résultats obtenus à la suite de l'application de la charrette de conception au cours de l'initiative cities<sup>PLUS</sup>.



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# Introduction

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An urban revolution of great magnitude is taking place. 80% of Canadians live in cities today - double the figure of 100 years ago. By 2050, 7.5 billion people will live in urban areas throughout the world. Our survival depends on the survival of all cities.

Global warming, air pollution, urban sprawl, overflowing landfills, water shortages, disease, and global conflict will be the legacy unless we move quickly towards more balanced forms of development. But although sustainable urban development has become a widely accepted concept over the past few decades, the implementation of comprehensive sustainability principles has been slow. This can largely be attributed to a wide range of barriers that include different value sets, uninformed personal preferences, and budget constraints. These barriers serve to limit the market transformation towards more balanced forms of development; they also serve to imperil our future.

Consistent with the universal rule of planning, "you will never be greater than the vision that guides you", overcoming these barriers requires us to create a compelling vision of a desired future in which urban sustainability is achieved.

This in turn asks that we look beyond short-term constraints and opportunities, and focus on a longer-term planning horizon. Effective planning must occur with the needs of not only the next generation in mind, but of generations far into the future.

The ability of cities to survive and prosper over the next century will be directly related to our ability to learn new ways of thinking, and new tools for addressing complex issues in a way that guarantees economic, social, and environmental longevity.

This document addresses the concept of planning for long-term urban sustainability, and focuses on one important tool that was successfully used in preparing the cities<sup>PLUS</sup> 100-year plan for urban sustainability in Greater Vancouver: the design charrette.

The first section in this publication elaborates on the key concepts and approaches underlying long-term planning, while the second section provides a case study of some of the results of applying the charrette tool during the cities<sup>PLUS</sup> project.

# Planning for the long-term

## Thinking long-term

In conventional urban planning, a 20-year timeframe is considered long-term. This timeframe, however, undermines the impact that decisions we make today have on generations of the future. Particularly within the context of an increasing pace of change in the twenty-first century, decision-makers around the world can expect to face an increasing variety of longer-term challenges, including fossil fuel shortages, climate change, geopolitical instability, and revolutions in technology. These challenges cannot be adequately addressed within a twenty-year planning horizon, and therefore often get neglected in the urban planning process.

Thinking long-term is an important requisite for addressing change, uncertainty, and a multiplicity of often competing needs. Ultimately, it might be interpreted that this is what the Brundtland definition of sustainable development called for, when it introduced a multi-generational approach to planning. The choices we make now will have consequences over many decades, and should therefore be made with a longer view in mind. Planning ahead for even one hundred years is fundamental to emerging paradigms of life cycle assessment and full cost accounting.

While such an approach to planning might seem new to the western culture, it is certainly not new to the First Nations of Canada. Aboriginal wisdom places the present generation at the fulcrum of history and looks back seven generations in the past and seven generations into the future. While the challenges created by this way of thinking are substantial, they are no greater than the responsibilities articulated by an Iroquois elder speaking to the members of

Royal Commission on Aboriginal Peoples:

*"In our language we call ourselves Ongwehonwe. Some people say it means real people ... It says that we are the ones that are living on the earth today, right at this time. We are the ones that are carrying the responsibility of our nations, of our spirituality, of our relationship to the Creator, on our shoulders. We have the mandate to carry that today, at this moment in time. ...Everything that we are was given to us and was carried before us by our ancestors, our grandparents who have passed on. When they couldn't carry it any longer and they went to join the spirit world, they handed it to us and they said: "Now you are the real ones. You have to carry it." Now they are in the spirit world. They are our past. Now we have a responsibility to carry that because we hear seven generations in the future. They are our future. They are the ones that are not yet born".*

Charlie Patton

Royal Commission on Aboriginal Peoples, 1997

## Benefits

The benefits associated with adopting a long-term view include some very positive impacts on the decision-making process. Most importantly, long-term planning allows the decision-making process to be aligned with the typical lifespan of many of the infrastructure elements being designed and constructed. Planners can embrace a life-cycle approach. Stakeholders in the process are more likely to transcend political agendas and work together to maximise benefits far into the future, thereby alleviating the narrow, self-serving and divisive positions

that so often oppose any sort of managed change.

The table shown below provides a breakdown of how long-term thinking affects the planning

process, and leads to many benefits. These benefits help to justify the extra effort and cost of adopting new planning processes and tools. They provide a foundation for the remainder of this book, and for a new planning paradigm.

Benefits of long-term planning

Effect of planning long-term:	Associated benefit:
1. Slow moving characteristics of the urban system, like land uses and connectivity, can be included in the planning scenarios.	Opportunities are revealed for elegant, whole-system solutions that make sustainability very practical and cost-effective.
2. Protecting individual wealth, privilege and power becomes less of an issue, since the longterm time horizon exceeds the participants' term of office or lifetime.	A more collaborative and creative discussion can occur. A shared purpose emerges around providing a heritage for our children, and for the many generations to come.
3. Longterm horizons increase uncertainty; today's obstacles become less significant, and opportunities for influence expand.	Values become the basis for decisions. More emphasis is placed on clarifying visions, defining planning principles, and describing desired end-states. The history of the community and its location become an important context for coping with uncertainty and defining what is 'special' and thus worth preserving / enhancing.
4. Forecasts over the longterm expose the undesirability, or impossibility, of continuing 'Business as Usual'.	Attention is focused on how to manage change effectively, rather than avoiding change. Participants become more aware of the indirect consequences of their lifestyle choices, and the danger of considering any issue in isolation.
5. Alternative policies enacted in the near term may have substantial impact over the longterm - revealing the very real potential for achieving economic, social and environmental goals.	A refreshingly positive view of the future emerges - "we can do it!". Discussions become more satisfying, and participants become more willing to stay engaged in the process.
6. The longer perspective reveals mega-trends, increases the diversity and likelihood of shocks, and exposes the exponential pace of change (the 'S' curves) in areas like technology and demographics.	Risk management becomes an integral feature of planning. Plans become more resilient, adaptable and responsive. External forces, like globalisation and climate change, are addressed within policy and plans as potential threats and opportunities, and the community becomes better prepared for the foreseeable future.
7. The full life cycle impacts can be assessed for long-lived elements of the built environment, like bridges, pipelines, concrete structures, greenways and so on.	Consequences are much better understood, and choices are better informed. Arguments can recognise longterm values and the priceless and irreplaceable nature of many assets, as opposed to traditional cost/benefit calculations that discount all future benefits and assume that the value of any asset diminishes with time and becomes worthless within 25 years.

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## *Fundamentals*

A critical first step in planning for long-term urban sustainability is to embrace three key fundamentals:

1. Holistic thinking,
2. Collaborative engagement, and
3. Adaptive management.

Understanding each of these concepts, and embedding them in daily practice, is an essential part of developing plans that capture the many benefits of long-term thinking. While anyone involved with urban planning is likely to be familiar with one or two of these concepts, their importance grows in proportion to the length of the planning time horizon. A radical extension of the time horizon means a radical increase in the attention devoted to each concept.

The three concepts are interrelated, and work together to create a new paradigm or perspective on how any organisation or community can transform the built environment. Each concept is elaborated within the next chapter, although for the purpose of this publication we provide only an overview.

# Fundamentals

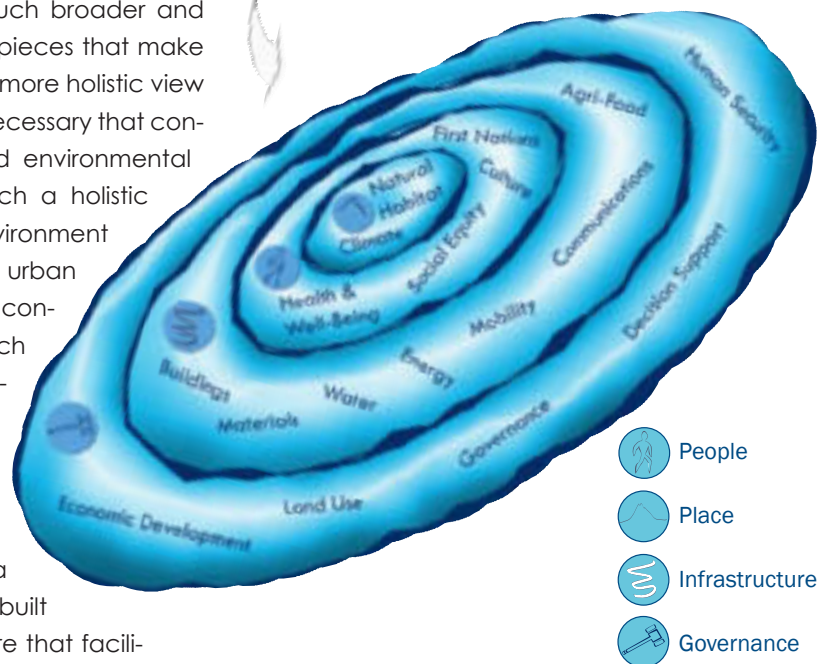
## 1. Holistic Thinking

Planning processes today bear the hallmarks of linear nineteenth-century thinking. According to this paradigm, urban systems were planned as a series of discrete components. Each urban system, be it water or transportation infrastructure, social institutions, or natural habitat, was considered in isolation from the others, and managed by separate and almost isolated entities with different goals, visions, operating budgets, and timelines. A key characteristic of such an approach is large, centralized water, waste, sewage, transportation, and energy grids, each with a single purpose and planned with little coordination or integration with other systems. This approach generates partial solutions to one problem that can often make another problem worse. Moreover, it focuses on short-term benefits without monitoring long-term impacts. Such a piecemeal approach contradicts the underlying principle of sustainable development.

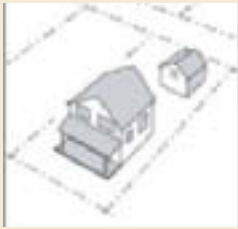
A desirable long-term view of urban regions needs to be based on a much broader and more integrated view of the pieces that make up the urban environment. A more holistic view of the urban environment is necessary that considers ecological, social, and environmental issues. One approach to such a holistic view is where the urban environment is viewed as one integrated urban system, comprised of four concentric rings each of which is populated by sub-components as illustrated. At the centre lies our place as a physical realm. The next ring includes the people who have turned the place into a community, followed by the built environment and infrastructure that facili-

tates our ability to inhabit this place in a productive and healthy way. The outer ring is made up of the governance structures that enable the urban system to become a living, learning organism capable of adaptation.

This image enables us to view the urban environment as one urban system - comprised of the people, the place, the infrastructure, and the governance. The integration across all these components is central to the integrity of the urban system as a whole. Integration between various scales, as well as integration amongst different elements of the urban system, becomes essential.



The following taxonomy of urban sites might be imagined when discussing an urban area.



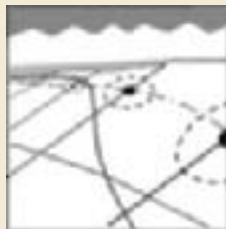
The *parcel* is the smallest increment of development, and tends to refer to an individual lot and building.

*Blocks* are the chunks of developable land that are available after a street pattern is imposed.



*Corridors* are the linear conduits for moving materials, energy, and resources within and between neighbourhoods, districts, and regions (e.g., streets, pathways, utility lines or streams).

*Districts* are the geographic and social units that collectively comprise our urban regions. They often represent the most local level of government (e.g., electoral wards).



The *regional* scale represents the collection of districts within a common geographic location.

*(Based on Taxonomy of "Urban Sites in Urban Landscapes: Site Design Manual for BC Communities" UBC James Taylor Chair in Landscape and Liveable Environments, March 2002)*

Sustainable strategies as they pertain to urban planning can be applied at a range of scales, or units of development. A hierarchy, or taxonomy, of urban scales might include, for instance, the parcel, the block, the corridor, the district, and the region. Integration across these scales includes satisfying needs as much as possible at the smallest scale, and only then moving up to subsequently larger scales. For example, if buildings can be designed and operated so as to be self-sufficient in heating and cooling, no need exists for larger scale solutions. However in most cases it is possible to obtain many additional benefits - economic, social and environmental - by investing in the block scale (e.g. orientation for solar and wind) or at the district scale (e.g. Combined Heat and Power systems). Functionality needs to be carefully distributed across all scales, with emphasis on increased self-reliance at the smaller scales.

This approach requires us to move from 'economies of scale' (where costs fall because the scale of output is increased), to 'economies of scope' (where costs fall because of synergies between complementary activities or because overhead is spread across a number of activities). The optimum scale and location for implementing strategies becomes a function of many goals and targets, rather than an optimum for any single activity.

Flowing from the Eco-Industrial concept, integration amongst different elements of the urban system involves considering the outputs of one element as the inputs of another. The result is the continuous looping and cascading of resource flows. It also entails ensuring that each element of the urban system is contributing in multiple ways simultaneously to the healthy and efficient functioning of the system as a whole. For example, a stormwater infiltration device serves not



only to reduce the rate and quantity of urban runoff, but also becomes a social amenity and a contributor to natural habitat.



Integrating Stormwater Management with Other Systems

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Because it runs counter to the way we have all come to plan, design, and construct our cities, the holistic approach can be a key challenge to put into operation. It is hard enough to consider a full range of issues and parameters within a traditional five-year timeframe, let alone considering costs and benefits of integrated systems over twenty, fifty, and one hundred-years. In fact the challenge is so great that it is simply impossible to achieve holistic long-term planning by working only with a small group of professionals and officials. The expertise required is beyond the abilities of any planning committee, and in any case the assessment of long-term implications requires involvement and buy-in from many stakeholders. For these reasons holistic thinking also implies a different approach to engaging participants and making decisions.

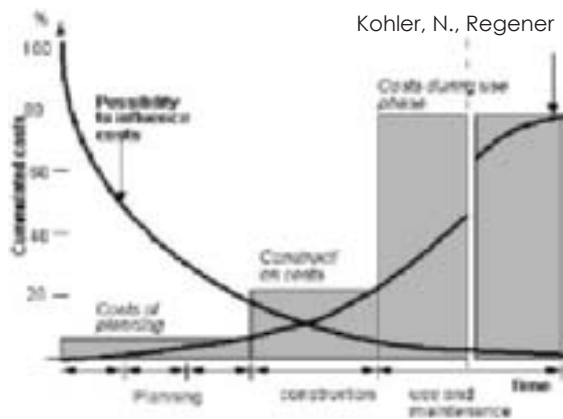
## 2. Collaborative Engagement

Fundamental to achieving long-term holistic thinking is a more collaborative model for design, planning and decision-making. This model engages a diversity of actors at very early stages of projects, and uses their expertise to influence seminal design and planning decisions. By allowing for face-to-face discussion amongst the full range of actors, we can overcome the fractured and short-term perspective embodied in our existing institutional structures, professional disciplines, information systems, and budgetary allocations.



The process of collaborative engagement calls for bringing a loose collection of organisations together as equals, to examine how each player can work with the others to achieve synergies and 'whole-system' solutions. Each player continues to address their specific mandate and mission; nobody is required to forfeit their authority and responsibility. However all players agree to cooperate wherever possible to achieve a one-system approach. Multi-disciplinary professionals, stakeholders, varying levels of government, and a diversity of sectors bring unique viewpoints and skills to the table, allowing for a rich palette of ideas and expertise to filter into the design and planning process.

As shown below, the potential for influencing the full life cycle performance is very high in the early stages of planning and design, and decreases dramatically as time goes by. At the early stages it is possible to find the synergies and out-of-the-box solutions that are needed to actually make sustainable development practical. For this reason, the process of collaborative engagement needs to start from day one and it is not merely a process of reviewing during the late stages of a project.



Because the long-term horizon makes possible a more pro-active and utopian perspective, collaborative engagement can benefit from participation by advocates. Typically drawn from the civil sector, advocates may want to address a variety of issue areas - environmental, economic and social. They help to balance the more parochial and risk-averse perspective that is common to officials and practitioners with a background in management and operations. Long-term thinking tends to sputter and die without the presence of advocates.

Collaborative engagement involves more extensive analysis in the early stages of design, requiring more time and budget up front for modelling and research. Greater expenditures are also required to ensure an effective participation process, since public meetings, mass media campaigns, and other conventional tools for 'public involvement' cannot easily accommodate shared decision-making. Instead an investment is needed in process logistics, group facilitation, and preparation of communications materials, and new tools for learning. Based on past experience with 'green' building projects, a process of collaborative engagement will likely increase upfront planning budgets by 5-10%, and extend the overall schedule by weeks or months - depending on project size.

These added costs are sometimes recovered in later phases of the design and planning, because of reduced workloads and better coordination of the team. Ultimately, the costs are small when compared with the potential for improved economic performance of the completed project throughout its life cycle. Moreover collaborative engagement can engage key decision-makers in positive ways, and facilitate buy-in and cooperative working relationships that ultimately translate into lower costs.

### 3. Adaptive Management

Adaptive Management is an approach to policy and planning that enhances our capacity for learning and responding. An adaptive approach to management has always been an essential element of effective planning. If we fail to learn from experience, we miss the opportunity improve. And if policies cannot easily be adapted to new circumstances, the policies themselves eventually become part of the problem. However the increasing complexity and accelerated pace of change in the modern world gives added weight to Adaptive Management. It is now much easier to make big mistakes, with rapid consequence.

As time horizons are extended, Adaptive Management becomes all the more important. Nobody can accurately predict the future in 50 or 100 years with any degree of confidence. The only confident prediction is that you will be wrong. Hence long-term thinking is not about fixing in place a set of long-term policies; rather it is about adopting a process over the long-term that allows for frequent readjustment of current policy and plans in the face of new knowledge, new experience and new desires.

The concept of Adaptive Management originated with fisheries and forestry biologists who discovered that natural ecosystems were so complex and interconnected that all models failed to accurately predict results. Despite their best efforts to manage the resource, policies invariably encountered surprises. Their solution was to develop policy that assumed an element of surprise, and that was intentionally designed to respond to new knowledge and altering circumstances. The same approach works well for urban areas, especially as their complexity starts to mimic natural systems.

As shown in the figure below, Adaptive Management can be viewed as pyramid, moving from general ideas to specific actions. In broad terms, the top portion of the pyramid is about envisioning where we want to go; the middle part of the pyramid is about exploring the options; the lower part of the pyramid is about implementing the best actions. Thus the pyramid defines stages for any planning project.

Three processes convert this pyramid into an Adaptive Management system. First, an alignment process is conducted from top to bottom; in other words, as general ideas are unbundled into more specific ideas a clear and up-to-date rationale is provided. Second, a monitoring process supports the pyramid, evaluating actual performance against intended results. And third, a feedback process ensures that the entire pyramid of ideas is informed about success and failure, and is encouraged to respond accordingly.



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Adaptive Management means that long-term plans become part of an on-going planning process. The built environment acquires an increased capacity for learning and responding, as the planning process mimics the nervous system of a living organism. Adaptive Management is intended to 'wake up' the urban environment, alert to threats and opportunities, and keep it alive and well over the century ahead.

# The PLUS framework

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Over the past 5 years, The Sheltair Group in Vancouver BC has developed a framework that integrates the fundamentals of long-term planning: holistic thinking, collaborate engagement and adaptive management. Referred to as the cities<sup>PLUS</sup> Framework, it helps to guide the planning process and organise the magnitude of results in ways that are transparent to everyone involved - at each stage of the plan and at any time in the future.

The cities<sup>PLUS</sup> Framework is not an ideology, a method, or a principle. Rather it is simply a learning framework that structures the planning process. It can incorporate any vision, principle, or philosophy, as long as they are consistent with the three fundamentals.

The cities<sup>PLUS</sup> Framework divides the Adaptive Management pyramid into five broad stages. Each stage is illustrated and described in the figure opposite. Each stage further expands into a series of sub-steps. The pyramid serves to connect visions and goals with strategies and actions, and incorporates feedback loops and accountability into the process. It offers a transparent process that can be transferred from one jurisdiction to another.

The cities<sup>PLUS</sup> Framework incorporates holistic Thinking at each stage. Thus the many urban subsystems, shown within concentric rings, are addressed in terms of the Scope, Vision, Goals and so on. In this way it fosters the integration of a complexity of ideas from top to bottom, across different scales, and over expanding timeframes.

The cities<sup>PLUS</sup> Framework is mediated by means of specific exercises and tools at every stage. Tools might include forecasting software, digital story-telling, visioning sessions, benchmarking and target-setting sessions, scenario workshops and so on. The tools are used to systematically engage participants in increasingly more specific discussions about key priorities. Essentially the tools underlie each stage of the Framework, making possible the difficult task of long-term planning.

## The cities<sup>PLUS</sup> Framework

### Stage 1: Scoping

Scoping establishes both where we are at present, and what is to be included, or excluded from the plan. Typically scoping begins with a situation analysis, or site assessment that inventories existing information and that outlines the full range of issues to be addressed and the boundaries of future analysis. Elements of the urban environment and natural environment are categorised. Future trends and external forces are examined in terms of their impacts. Foundation papers are produced for all urban systems, describing physical structures, key players, administrative processes, legal and economic relationships, current plans, outstanding issues, and future constraints and opportunities.

### Stage 2: Envisioning

Envisioning creates the artist's vision of what is desired. It includes an exploration of values and historical assets that help to identify our priorities. Key themes and principles are defined. Goals are described for all the different urban systems. Challenging targets are set to ensure that the pace of change is not too slow, or too fast, and to stimulate coordinated and creative activity by many players.

### Stage 3: Exploring

Exploring entails a lot of modeling and analysis in order to determine both what is likely, and what is possible. Best practices are documented, locally and internationally. Alternative development scenarios are compared, including forecasts of 'business-as-usual. Scenarios are imagined that work backwards from goals to present conditions, in a managed proactive fashion ('backcasting'). Opportunities are examined for combined strategies that take advantage of positive synergies between different systems and between different goals.

### Stage 4: Implementing

Implementing the plan requires that organising principles and crosscutting strategies be identified for the new plan as a whole. Specific strategies and actions can then be described for all stakeholders. These may include new policies that involve planning initiatives, new legislation, education programs, research and demonstration and fiscal and market reforms.

### Stage 5: Monitoring

Monitoring includes quantitative and qualitative measurements of performance, relative to the intended results. Indicators of performance are selected suitable for measuring the success of the implementation measures, and for the success of the longerterm goals and targets. Methods are stipulated for data collection, analysis, reporting and verification. Consequences are established for specific performance results.

# Using charrettes as a tool

During the “exploring” stage of the framework, a number of tools might be used to assist us in finding solutions and testing them. One such an essential tool is the “design charrette”.

Charrettes encapsulate all features of the integrated planning and design process. They are interactive, collaborative sessions that help us to explore best practices, scenarios, and the integration of ideas.

## Background to charrettes

The term “charrette” was coined during the 19th century at the Ecole des Beaux Arts in Paris. The French word “charrette” means “little cart”. It refers to the cart that was used by the instructor of a class when the deadline for a design project arrived. Students were expected to meet strict deadlines for the completion of design projects. When the deadline arrived, the instructor would get his small cart and go around the student working area to collect the drawings for transport to the “master” for critique. When students were not finished with their work, they would sometimes climb in the back of the cart and continue to put finishing touches on their work up to the last moment. Students would refer to this process of frantically drawing in the back of the cart as “charretting”.

The present day adaptation of the charrette concept has spread far beyond the Ecole des Beaux Arts. It has become a useful tool for addressing complex problems in an increasingly complex world, providing the basis for intensive, time-limited stakeholder-based workshops.

There are five standard steps that make up an integrated planning and design charrette:

1. Define the parameters

2. Establish the teams
3. Prepare the design brief
4. Plan and facilitate the event
5. Compile, integrate, & implement the results

## 1. Define the parameters

In general, a charrette evolves out of the need to address and resolve a problem or challenge. As with all planning and design challenges, planning for long-term urban sustainability involves a huge number of issues and trade-offs. The first step in preparing a charrette involves defining the scope of issues that will be examined in detail over the course of the event. This can include spatial scopes, resource scopes, timelines, and so on. Often, a range of stakeholders can assist in identifying the full spectrum of issues.

## 2. Establish the teams

A charrette can include one team working on a challenge, or a number of teams all working on the same challenge or complementary challenges. Multiple teams are preferable within visioning or planning charrettes, as they build competitive spirit and excitement, and offer multiple results from varying viewpoints. Single teams are preferable in implementation charrettes, where the focus is on working as a team to define policies and plans for implementing an existing vision.

Team sizes are at an optimum of around 6-15 participants. Building on the concept of expanded participation, the participants should be selected to include:

- Participants with varying expertise and disciplines, each bringing a unique set of skills to

the challenge,

- Participants with strong artistic / graphic abilities that can translate conceptual ideas and words into images,
- Participants from a diverse range of public and private sectors, including government officials, academics, designers, consultants, stakeholders, and NGO's,
- Participants of varying age groups to allow for the innovation of students to combine with the professionals' expertise and experience,
- Local stakeholders that can bring inside knowledge and experience to the table, as well as non-locals that can bring new perspectives and creative innovation to the situation.

Where specialized expertise is required in the challenge, it is best to incorporate these experts on each team. In some cases experts are allowed to "float" between teams, serving as resource people. Alternatively, experts can provide short "lectures" at designated points during the charrette.

In terms of the identification roles for each individual within a team, it is preferable that the team starts off as a homogenous unit where no facilitators or roles are identified. This allows team members freedom to identify how they want to govern themselves, and to define what roles they each might play to contribute to the team. In some cases a facilitator can be identified, but it should be done with caution. In the presence of a leader, the team will tend to wait for instruction and pass responsibility to the facilitator, especially if the going gets tough and the team experiences some friction. Include some general ground rules (or rules of engagement) in the design brief and to then step back and allow informal leaders to emerge as and when

the team perceives the need for leadership to satisfy their specific needs.

Most often, periodic guidance from the charrette organizers is sufficient to keep the groups moving forward. It is also possible to include charrette representatives on each team to provide some initial guidance. Tools or icebreaker activities can be used to assist the team in their group work, especially on the first day when uncertainty and frustrations can be high.

### 3. Prepare the design brief

Prior to the charrette event, many hours of work are required to develop the design brief and prepare the base materials for each team. The design brief establishes the event ground rules (or rules of engagement) that provide a starting point for the teams, especially when no facilitator is assigned as described above. The team should be provided with an opportunity to expand on this list.

#### Sample ground rules

- *Invite others to contribute. Each participant can contribute in unique ways. Everyone shares the responsibility to inviting input from others.*
- *Avoid "sideline" chatting! The best ideas may be lost if discussed between two people over coffee in the corner. Stay engaged in activities throughout.*
- *Accept all ideas. There are no wrong ideas! And even the weak thoughts can grow into something valuable.*
- *Everyone has a voice. Give them a chance to talk and allow everyone to say what is on their minds.*
- *Draw your own conclusions! A fast-paced trans-disciplinary process needs lots of pictures. Words are too specific and cumbersome. Find a way to illustrate ideas, or find someone to give you a (drawing) hand. This is not a talk-fest, but a draw-fest!*
- *Expand this list! Discuss and agree on additional rules for the group.*

The design brief also identifies goals and objectives, and often quantifiable targets, to be met. It also references components of the existing regulatory context that are pertinent to the challenge set, as well as underlying quantified assumptions that ensure that all teams are working from the same baseline. As well, the design brief includes information about the event, describes the challenge, and lists the deliverables for each team. The base materials include maps, background research material, drawing equipment, and so on.

#### 4. Prepare and hold the event

A typical urban planning charrette runs for 3-5 days depending on the challenge. In general terms, the dynamics of a charrette group can be seen to involve 5 phases.

Typically, the first phase involves "familiarizing". Starting off with a communal briefing session, where all participants are presented with the design challenge, this phase offers an opportunity for the participants to familiarize themselves with the problem, the site, the resource materials provided, and their team members. Short strategic "games" can be incorporated into the session to assist team members in this familiarization process.

The event briefing can happen a few days, or an evening prior to the charrette, and then continues into the first day of the charrette. This allows some extra time for participants to familiarize themselves with the site and materials and to let the challenge "soak in".

Once the teams break into their respective groups, each individual primarily tries to determine when he/she fits, and grapples with how

best to approach the challenge. The team gathers impressions about the similarities and differences among group members and where specialized skill-sets lie.

*In Group Development literature this is commonly referred to as the "Forming" stage. "This is the stage when the group first comes together. Everybody is very polite and very dull. Conflict is seldom voiced directly, mainly personal and definitely destructive. Since the grouping is new, the individuals will be guarded in their own opinions and generally reserved. This is particularly so in terms of the more nervous and/or subordinate members who may never recover. The group tends to defer to a large extent to those who emerge as leaders" (Blair, University of Edinburgh).*

The second phase involves "talking". The teams brainstorm some ideas, argue their individual perspectives, and hear others' viewpoints. This can be a phase characterized by growing tension as the group dynamics are exposed and differences of opinion become apparent.

*In Group Development literature this is commonly referred to as the "Storming" stage. "This is the stage when all Hell breaks loose and the leaders are lynched. Factions form, personalities clash, no one concedes a single point without first fighting tooth and nail. Most importantly, very little communication occurs since no one is listening and some are still unwilling to talk openly. True, this battle ground may seem a little extreme for the groups to which you belong - but if you look beneath the veil of civility at the seething sarcasm, invective and innuendo, perhaps the picture come more into focus" (Blair, University of Edinburgh).*

The third phase involves "scribbling". The team might break into smaller working groups that



focus on a smaller sub-set of the ideas discussed. Much of the previous day's conversations might be revisited, but this time with a pen or other graphic media in the hand. The thoughts might be roughly scribbled down on paper, but these images are usually very diagrammatic and undeveloped. Although some integration occurs, it is limited and handled in smaller pieces. Time is spent exploring the full complement of ideas and educating others across multi-disciplinary barriers.

*In Group Development literature this is commonly referred to as the "Norming" stage. At this stage the sub-groups begin to recognize the merits of working together and the in-fighting subsides. Since a new spirit of co-operation is evident, every member begins to feel secure in expressing their own viewpoints and these are discussed openly with the whole group. The most significant improvement is that people start to listen to each other. Work methods become established and recognized by the group as a whole" (Blair, University of Edinburgh).*

The fourth phase involves "drawing". This is the point where the team pools resources and ideas together and integrate them into a final solution that can be drawn in detail. The team spends its time refining the ideas as the end products are produced.

*In Group Development literature this is commonly referred to as the "Performing" stage. This is the culmination, when the group has settled on a system which allows free and frank exchange of views and a high degree of support by the group for each other and its own decisions" (Blair, University of Edinburgh).*

The fifth phase involves "presenting". It is usually a short working phase for the team, seeing

that it is mainly dedicated to the delivery of structured presentations. Some of the "drawing" phase madness might overlap with this phase as the team rushes to put some finishing touches on drawings and organize themselves for delivering their presentation. Ultimately, this phase allows for letting go and enjoying the moment. It is an important component of the process and should not be neglected.

*In Group Development literature this is commonly referred to as the "Adjourning" stage. This is the final stage where tasks are terminated and individuals disengage from the challenge and their group. Generally, the sense of achievement and energy levels are high during this stage. (Blair, University of Edinburgh)*

It is advisable to allow around one day for each of these 5 phases to occur, although it is possible in some cases to compact the event into as little as 3 days. For instance, where the majority of participants are already familiar with the site and the problem, it might be possible to integrate the "familiarizing" and "talking" stages into one day. Less than 3 days is not advisable seeing that the group dynamics and creative spirits only really settle in around the third phase of the process. If sufficient time is not allowed for each phase to play itself out, the outcomes might be below the group's potential and expectations.

The phases of group development should also be kept in mind when setting an agenda. The key to the charrette agenda is not to overcrowd it with activities, and to schedule activities at the right time in the process. For instance, if a speaker is to present a unique point of view to the teams, the best time to do this might be once the team has had some time to think about the problem, but not too late in the pro-

cess that decisions have already been made. Another thing to consider when planning a charrette is the venue. Participants will be spending long days and sometimes nights in their space so it should be a well lit, well ventilated working environment. The team should have full control over their space, especially the furniture. They should be able to arrange and rearrange tables and chairs as and when required. Plenty of space for drawing and pinning up should be provided, as well as access to computers and the internet. The pin-up space should be large enough so that teams can pin all their drawings for the duration of the event. This allows team members to recall ideas and to see linkages. Often when drawings are taken down to make space for new ones, ideas get lost or are forgotten when it is time to distil the results for the final presentation. When planning for multiple charrette teams, ensure central gathering spaces are provided, as well as individual break-out rooms for each group to work in private.

### *5. Compile, integrate & implement results*

The main outcome from a typical charrette is a lot of good ideas and visualisations. These outcomes are typically not all polished, tested or researched to the point where they can be published and/or implemented. The charrette functions as a brainstorming session where integration of disciplines and ideas can happen successfully. Although some ideas might be well documented and illustrated, others might be mere scribbles on the back of a serviette. It is therefore essential to distil and document the ideas, and take them to the next level of detail prior to publishing, presenting to a wider audience, and/or implementing.

### *Evaluating charrettes as a tool*

Most appropriate in the context of long-term planning are charrettes that move beyond the visioning process into an implementation-focused event. Four aspects of this kind of charrette contribute to it being a fundamental tool for long-term decision-making in an urban context.

First, the charrette is a long-term thinking tool. As described above, planning one hundred years ahead is a daunting task that can easily stifle the planning process with the overpowering "unknown factors". The time constraints and often competitive spirit of the charrette, makes it a useful tool for brainstorming ideas "outside the box" and it pushes participants to look beyond immediate limitations in search of ideal future solutions.

Second, the charrette is an integration tool. The multi-disciplinary nature of charrettes allows a wide range of expertise to contribute, thus avoiding the piecemeal approach by bringing everyone together to find solutions around one table. This enables the simultaneous brainstorming of ideas and an opportunity to find synergies and conflicts across issue areas and scales. Ideas are pooled and sorted, and the result is an integrated solution.

Third, the charrette is a decision-making tool. A charrette brings together those experiencing a problem and those with the power to change the problem. It provides an alternative to the polarized systems for decision-making, by integrating participation from a full range of stakeholders, professionals, and public officials. Public participation processes are often felt to be "all talk and no action", but the charrette allows for public concerns to be raised and addressed

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around the same table. It promotes the shift from one decision maker to multi-stakeholder input and results in integrated, representative solutions that can be implemented.

Finally, the charrette is a graphic or visualization tool - it brings the motherhood principles of sustainability that have become commonplace alive. While many long reports can be written outlining solutions to a planning problem, a drawing can speak a thousand words. The charrette is a graphic tool that allows for the transformation of theoretical ideas and concepts into images and diagrams. It provides a glimpse of what the future might be once the problem is addressed. Graphic representation brings us one step closer to implementing theoretical solutions, often allowing for a more in-depth view of the impacts of decisions. In many planning exercises, the use of graphics to communicate solutions to the public and even other stakeholders is essential, and the charrette provides an opportunity to produce visualisations of design decisions.

# The cities<sup>PLUS</sup> case study

## About cities<sup>PLUS</sup>

cities<sup>PLUS</sup> - or cities Planning for Long-term Urban Sustainability - is the name coined for Canada's long-term urban planning approach. The cities<sup>PLUS</sup> collaborative set out in 2001 to create Canada's first 100-year plan for a sustainable metropolitan region by incorporating economic, social and environmental priorities in an integrated urban systems plan.

A public/private/civil sector collaborative, cities<sup>PLUS</sup> was created as Canada's response to an international sustainable urban systems design competition. Initiated by the International Gas Union for the 2003 World Gas Conference in Tokyo, Japan, the competition involved nine teams from around the world, each competing to prepare a staged, 100-year plan for a sustainable metropolitan area. The other participants included China, India, Germany, Russia, Argentina, Japan, and the United States.

Selected through a national process, Greater Vancouver was chosen as the metropolitan area for Canada's submission. Greater Vancouver was in large part chosen because of the multiplicity of municipalities and development patterns that make up the region. As a whole, they were seen to represent a microcosm of urban areas in Canada. Greater Vancouver was also chosen because of the opportunity to transfer the results into the real-time planning of the Greater Vancouver Regional District (GVRD), the regional government that administers many of the urban services for the metropolitan area. This was a tremendous opportunity to develop the GVRD's long-term plan incorporating economic, social, and environmental priorities.

The competition submission was judged on the world stage in Tokyo in June 2003, where a panel of seven eminent judges from around the world awarded Canada the Grand Prix. In addition to the Canadian grand prize, the seven member international jury of eminent experts awarded three special jury awards to the teams from India, U.S. and Japan.

Mike Harcourt, vice-chair of cities<sup>PLUS</sup> and past mayor and provincial premier, summarized the significance of the project, saying "I thought I knew cities well before this project, but through cities<sup>PLUS</sup> my awareness and excitement have increased immensely. I now believe that innovative long-term planning can lead to a true renaissance in urban thought and action. Cities are all about choices - choices that become reality very quickly, with lasting consequences. Over the 21st century - the urban century - much will depend upon getting the choices right."

The cities<sup>PLUS</sup> project work plan was centred around the use of a framework as a guiding methodology (cities<sup>PLUS</sup> Framework as described previously). Consistent with the framework, work was initially conducted in an issue-by-issue ("silo") manner in order to permit maximum innovation, unconstrained by the need to address trade-offs amongst competing priorities. Later in the process, the key was to integrate concepts at varying geographic scales and across different systems areas. This integration process started off with a series of design charrettes.

# The cities<sup>PLUS</sup> charrettes

The cities<sup>PLUS</sup> charrettes brought together about 50 people for three intensive days at the Morris J. Wosk Centre for Dialogue in downtown Vancouver in December 2002. The intent of the event was to explore the transformation of the Greater Vancouver region and its neighbourhoods over the next 100 years through developing graphic images of what a preferred future might look like. It is however important to remember that ideas range from the prosaic to the profound. This documentation of the results therefore does not reflect a final endorsed solution, but rather the event exposed issues and stimulated better solutions as a starting point.

The event consisted of three charrette teams - two representing neighbourhoods at the local

scale, and one regional scale team. These three teams worked independently and in concert with each other, testing local scale decisions against regional implications and visa versa. Each team was comprised of about 18 participants from diverse backgrounds, disciplines and expertise, including representatives from the various cities<sup>PLUS</sup> expert Foundation Teams, some of the region's top designers, representatives from local governments, as well as students and other local and regional stakeholders.

## Themes

The cities<sup>PLUS</sup> charrettes involved a number of key themes that participants had to keep in mind:

### Planning and designing for the long-term

*Sustainability concepts teach us that we can no longer think only in terms of the short term -- we must keep inter-generational equity in mind. The choices we make now will have consequences over many decades, and should therefore be made with a longer view in mind. It is also important to keep in mind that the further we move into the future, the further we need to look behind.*

### Planning and designing in the face of uncertainty

*One of the only things we know for sure about the century ahead is that it will be full of surprises. Whether climate change, unexpected natural events, or devastating terrorist attacks, it is crucial to create urban environments that are resilient and adaptable. As the cone of uncertainty increases, we lose constraints of the moment, and must search for how we can influence the future.*

### Planning and designing that celebrates our unique heritage and sense of place

*The historical context, which frames our urban environments, provides us with important clues about why we are who we are, and what we might be in the future. The natural environment, which underlies our sense of place, also provides us with a key source of inspiration about our values, which transcend time. Understanding the people and place of both now and the future bears its roots in the people and place of the past.*

### Planning and design that enhances global sustainability

*It is important to remember that our region is a node in a network of city-states rather than just a geographic entity. We are a region rich in many ways, and yet we are not divorced from what happens in the world around us. We must expand our concept of sustainability to include the rest of the world so that the impacts of decisions we make for ourselves benefit the larger context.*

### Planning and design through forecasting and backcasting

*Forecasting and backcasting are tools that can be used to develop scenarios for the future. Forecasting is relevant where there are increasing levels of uncertainty and we have little control. It offers a mechanism for predicting the future. Backcasting is relevant where there are increasing levels of uncertainty and we do have control. It enables us to determine ways to influence and guide the future in a proactive way.*

## The Design Brief

The challenge of the cities<sup>PLUS</sup> charrettes was to apply a comprehensive set of key goals and targets to specific study areas within Greater Vancouver, and to illustrate a range of strategies and trade-offs that underlie the region's path to sustainability. Using the cities<sup>PLUS</sup> goals, targets, and strategies provided on the next few pages, the teams had to demonstrate how to integrate and implement these over the next 100 years within the living context of the region's urban fabric.

The local scale charrette teams focused mainly on selected study areas of approximately 100 hectares, which represented a series of blocks within a 5-minute walking distance radius. One study area was located in the Lonsdale area of North Vancouver, while the second was north of Langley City. Some examination of the corridor and district scales was required insofar as it could provide context to local scale design decisions. Similarly, examination of any specific parcel(s) within the selected study area was encouraged.

The regional charrette focused mainly on the corridor and region scales, with reference to the district scale where appropriate. In this case, the study area was considered to be the boundaries of the Greater Vancouver Regional District.

Regardless of scale, it was important for discussion between and amongst the teams to occur. For example, where a local charrette team made decisions that could have implications at the regional level, it was necessary to communicate this to the regional team. Conversely, where the regional charrette team made decisions that could impact local decisions, this needed to be communicated.

The following assumptions represent some of those given to each team:

### Starting Assumptions:

- A population in the GVRD of 4.8 million people.
- All population growth in the GVRD will be driven by net migration throughout the 21st century.
- A population of 5,671 for the Langley study area.
- A population of 14,773 for the Lonsdale study area.
- A declining average household size.
- Land currently within the Agricultural Land Reserve must be maintained.
- The green zone as it currently exists is maintained.
- Average annual temperature may increase by 1 deg C to 4 deg C.
- Average annual precipitation may increase by 10 to 20% overall (less in the some months when needed most).
- More extreme precipitation events.
- Sea level may rise by 9 to 88 cm. This could have impacts such as flooding on low-lying coastal areas.
- New residential buildings of 1-4 units have an estimated service life (EST) of 80 years.
- Major arterial and collector asphalt roads have an EST of 20 years.
- Concrete sidewalks, curbs and gutters have an EST of 80 years.
- Most conventional oil reservoirs will be exhausted by 2100 if current rates of production continue.
- Conventional reserves of natural gas will be exhausted by 2060 if consumption continues at current rates.
- If a target cannot be achieved, equivalencies are appropriate to demonstrate that the intent of the goal is achieved.

Day 1

8:00-8:30	Breakfast & Registration
8:30-8:45	Introduction
8:45-9:10	& Welcome
9:10-9:30	Presentation
9:30-9:50	
9:50-10:10	Review of Design Challenge
10:10-10:30	
10:30-11:00	
11:00-11:30	Individual Team Working Sessions
11:30-12:00	
12:00-1:00	Working lunch
1:00-1:30	
1:30-2:00	
2:00-2:30	
2:30-3:00	
3:00-3:30	
3:30-4:00	
4:00-5:00	Team Discussion of Day 1 Insights/Issues

Day 2

8:00-8:30	Working Breakfast
8:30-9:00	
9:00-9:30	
9:30-10:00	
10:00-10:30	
10:30-11:00	Individual Team Working Sessions
11:00-11:30	
11:30-12:00	
12:00-1:00	Working lunch
1:00-1:30	
1:30-2:00	
2:00-2:30	
2:30-3:00	
3:00-3:30	
3:30-4:00	
4:00-4:30	Integration Session
4:30-5:00	
5:00-5:30	Mid-course Correction Meeting
5:30-6:00	

Day 3

8:00-8:30	Working Breakfast
8:30-9:00	
9:00-9:30	
9:30-10:00	
10:00-10:30	
10:30-11:00	Individual Team Working Sessions
11:00-11:30	
11:30-12:00	
12:00-1:00	Working lunch
1:00-1:30	
1:30-2:00	
2:00-2:30	
2:30-3:00	Individual Team Result Compilation
3:00-3:30	
3:30-4:00	
4:00-4:30	
4:30-5:00	Group Presentations
5:00-5:30	
5:30-6:00	
6:00-11:00	Celebration Dinner

## The Agenda

The event kicked off with a half-day briefing session for all participants, after which they were invited to visit the sites and familiarize themselves with the design brief and the background material. A few days later the participants met back together to start the intense 3-day charrettes. The typical day started off with a communal breakfast, following which each team worked individually in separate rooms. Participants were free to govern themselves and no facilitators or working agendas were assigned - only a deadline. A working lunch was provided, and later in the afternoon the three teams gathered together to share some insights and issues with their regional counterparts and visa versa.

Throughout the three days, the teams drew upon the substantial work and input that was developed through the cities<sup>PLUS</sup> initiative, and focused on translating sustainability goals and targets into illustrations of the practical strategies required to transform the Greater Vancouver region and two of its typical neighbourhoods into a sustainable metropolitan area.

# The regional charrette

## About the Region

Located on the west coast of Canada, Greater Vancouver is a place where the snow-capped Coast Mountains meet the Pacific Ocean, where fjords, inlets, and rivers have created an abundance of scenic coastline, mineral wealth, and rich biodiversity, and where vast forests and places of natural beauty define the region's boundaries.

Greater Vancouver lies at the mouth of the mighty Fraser River, the largest salmon-bearing river in the world. Located on a sediment delta in a valley carved by glaciers, the region's climate is wet and mild, moderated by the effects of the Pacific Ocean.

The metropolitan area of Greater Vancouver is comprised of 21 municipalities and one elec-

toral area. It is home to 2 million people and is projected to reach a population of 4.8 million by 2100. The region's ability to grow outward is constrained by the mountains to the north, the sea to the west, the United States to the south, and the protected Agricultural Land Reserve to the east. Accommodating this growth over the next century in the limited land base while simultaneously minimizing the impact on the natural splendour is key to a sustainable future.

One step towards addressing this challenge is embodied by the Livable Region Strategic Plan (LRSP). The LRSP is Greater Vancouver's award winning regional growth management strategy. It aims to protect livability by protecting the working landscape from urban development, promoting more compact metropolitan development and complete communities, and increasing transportation choice.





## The Challenge

The focus of the regional charrette was to apply and integrate comprehensive sustainability targets at a regional scale. The Regional team was also requested to examine and document the regional implications of local decisions through collaboration with the two local teams to ensure cross-fertilization of ideas and decisions. In some cases, it was even necessary for the team to discuss external or global implications of regional decisions. The underlying intent was not to 'master plan', but rather to work within the parameters of comprehensive targets to illustrate detailed design strategies that have been integrated across urban systems areas.



Greater Vancouver Regional District

Because of the 100-year timeframe of this project, it was requested that the team illustrate how Greater Vancouver could transform in a staged approach (years 2025, 2050, 2100) as progress is made towards the sustainability targets. Some targets for the year 2100 included:

- Less or equal to 2 ha / capita ecological footprint,
- Less or equal to 1 tonne CO<sub>2</sub> / capita / year
- More or equal to 95% of energy is supplied by clean and renewable energy sources

Desired Outcomes:

- Integration of cities<sup>PLUS</sup> goals, targets and strategies at the regional scale
- Illustrations of how to implement practical strategies necessary for achieving targets region-wide
- Relevant drawings and graphics that show transformation of the GVRD over time
- Confirmation that targets and strategies are or are not plausible
- Input into how to translate conceptual ideas into recommendations and policy pathways that can be implemented.

Livable Region Strategic Plan





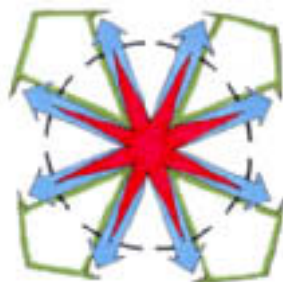
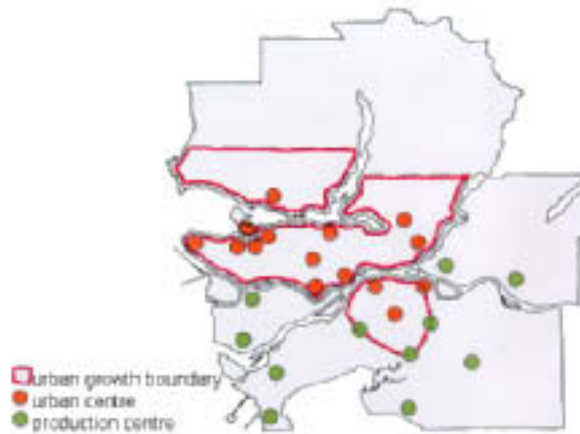
## *Envisioning the Future*

The regional charrette team acknowledged the positive impact that past planning decisions have had on the growth of the area, and concluded that consequently our region might not look much different from what it does today. This does not, however, imply that a sustainable region has been achieved. It simply means that when planning at a regional scale over the next 100 years, the sustainability challenge for Greater Vancouver is less about the actual visual form and more about the processes and underlying systems. This inevitably created a great challenge for the team in illustrating their ideas on paper during the charrette process. Nonetheless, the regional team analysed the existing LRSP and evaluated its successes and challenges. The team discovered many conceptual ideas that should be applied to the region over the next century in order to achieve the challenge set out within the design brief.

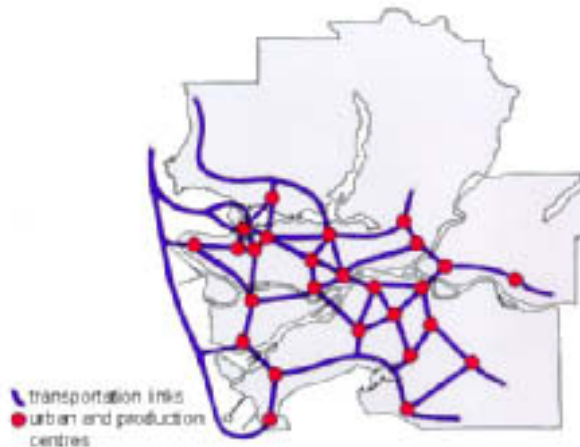


First, the team recognised that the LRSP plan of town centres linked by high-speed transportation provides a good foundation from which to build over the longer term. The team concluded that the urban growth concentration area would probably work in 100 years, accommodating the projected growth of an additional 2.4 million people. The team identified an urban development boundary and recognized that the City of Surrey would face the greatest challenges in managing growth in a more sustainable manner over the next 100 years.

The team explored the concept of the town centres identified in the LRSP and proposed a finer distinction between urban centres (which occur within the urban boundary) and production centres (which occur outside the urban boundary). While urban centres should have a primarily service-based economy, the production centres should have a more product-based economy. Each of the centres becomes a focal point for development, but is infiltrated by “fingers” of the natural features of the region. These centres are linked with one another in a fine network of transportation corridors.

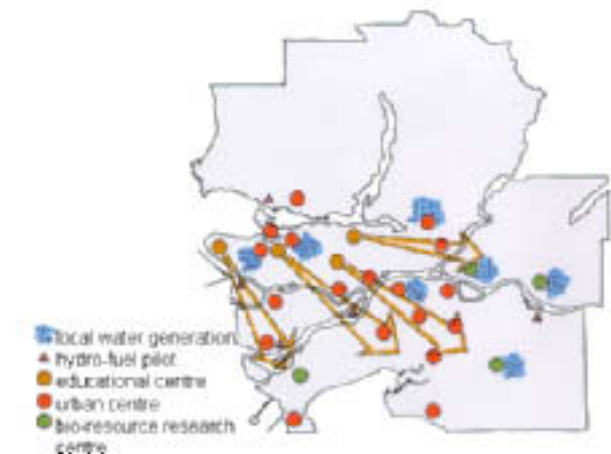


Conceptual diagram of the urban node, depicting the relationship between population density (red), water (blue) and green spaces.



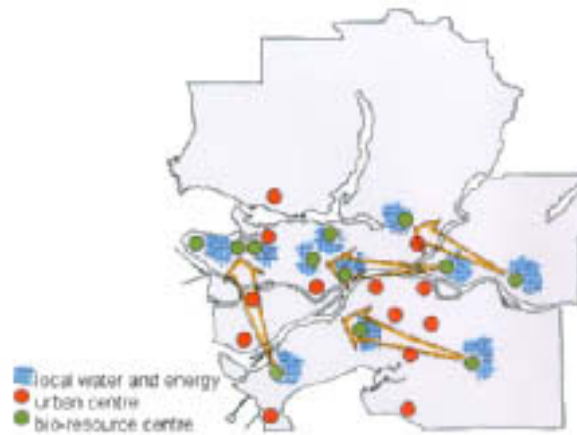
The regional team also identified the Agricultural Land Reserve as a great success, but recognised a shift in future industries and technologies. Ultimately, the team had a vision of “a city in a sea of green”, which would require preserving the existing Agricultural Land Reserve for food production and as a source of green that could potentially even be a major source of biomass in years to come.

The regional team envisioned a shift from our current technology, which is based on high temperatures and pressures, to a less energy consumptive biological technology-base. It therefore becomes a priority in the next 25 years to preserve the ALR as a biological reserve / centre. This does not necessarily imply preserving the land from an ecological point of view but preserving it as a medium for bio-fuels in the future. This will provide new economic development opportunities in those areas that are currently struggling.

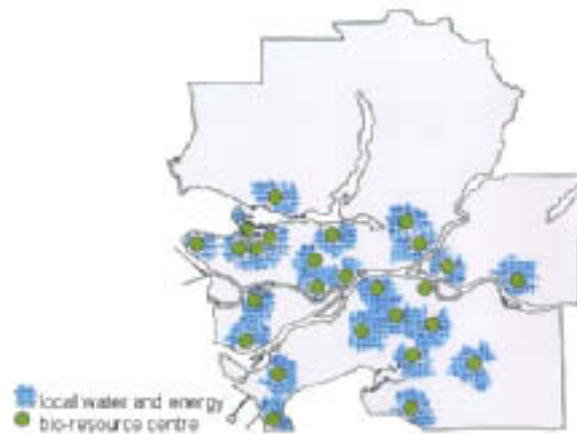


The team envisioned that in the next 25 years, the educational centres will turn to those town centres located close to the ALR (production centres) to pilot and research the new economic opportunities in the region for a bio-fuels / bio-materials based society. They proposed the harnessing of existing intellectual capital and sharing that investment in areas closer to the bio-resources (ALR) to help these centres develop and manage the transformation to a biological technology based society.

The team predicted that by 2050, urban agriculture will start to heavily supplement the ALR production, and the bio resource in the ALR can be allocated to the production of biological products that feed back into other urban areas. Through new technologies and bioengineering one might start to see significant results where, for instance, building materials have the capacity to capture and hold water in itself. This would aid in the movement away from regional water storage and the tapping of water resources at the town centre or even building scale.



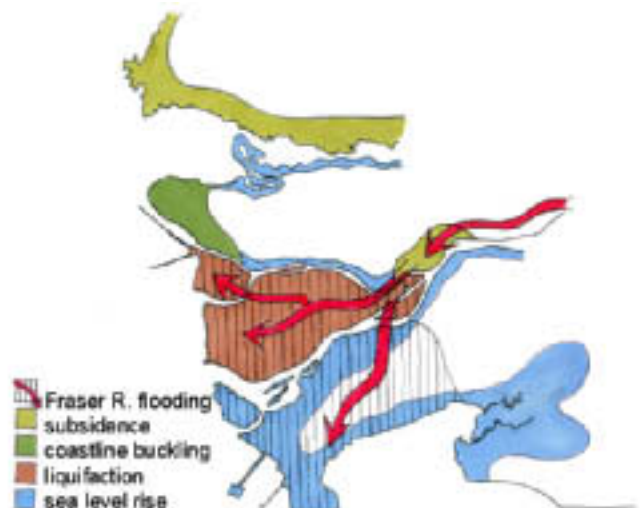
By 2100 it is likely that urban centres become the source of their own resources such as water, energy etc. Ultimately, our region is one where green bio resources are increasingly valued, not only for aesthetic and ecological reasons, but also for economic reasons.



The team recognised that the current LRSP takes into account a number of threats in our region such as flood hazards and soil instability. It was felt, however, that over the long-term the region would have to pay far greater attention to its vulnerability to such threats. Our region potentially faces all sorts of disasters in the next 100 years, some of them even in the next 50 years. In the words of the Honourable Mike Harcourt, "this isn't just a pretty place, it is a place facing some serious threats." The team therefore envisioned a more shock resistant region that could withstand the threats known and unknown to us.



The team identified Natural Threats, Technological Threats, Economic Threats, and Civil Threats, and attempted to get a sense of the real hot spots in the region. Just taking a number of the many threats the team found that Richmond is a very vulnerable area for threats such as flooding, sea level rise, earthquakes, and plane crashes to name a few. This is somewhat problematic by the fact that there currently exists a regional growth centre located in Richmond. The team explored opportunities and concluded that through adaptive reuse of Richmond, there exists an opportunity to expand the airport in this area over the next century. Richmond can also be reclaimed over time for agricultural land and to house major exhibition lands, tourist accommodation cores, and so on. It was recognised that this suggestion poses many difficult challenges, but the team realised that when looking at the facts, the future of Richmond should be raised and it deserves further debate and research.





Richmond Today



Richmond 2050



Richmond 2100

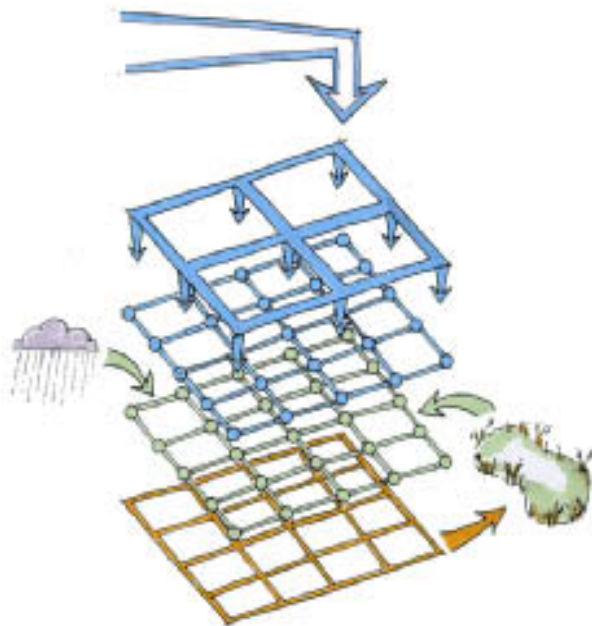
The team discussed the concept of how the region would evolve over the next 100 years in order to be more shock resistant. It became very clear that the region needs to avoid a centralized infrastructure system that is vulnerable to threats. The team designed a regional system of self-sufficient, decentralized "pods", each with the means to supply its own water, electricity, and other critical infrastructure. Gradually this system can break down even further into a fine network at the molecular level.

The transportation system will also have to improve over the next 100 years to ensure a more resilient system. Multiple connections between the "pods" should be a priority, not by merely establishing bridge connections but also through a viable water transportation system that can maintain mobility in case of structural failure of land connections.





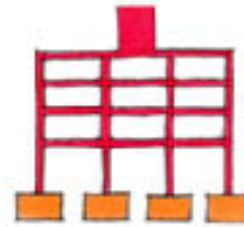
The team proposed a shift in the way infrastructure is addressed throughout the region. Currently, most of the region's urban systems are specialized and centralized. This type of system is very vulnerable, and requires a move to an integrated approach in which one component of the urban system feeds into another - the outputs of one become the input of another. This requires adding depth to our infrastructure systems so that services are matched qualitatively to the appropriate scale and service needs.



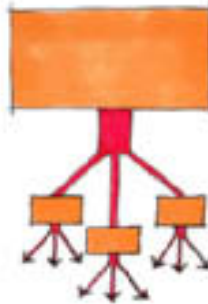
Conceptual illustration of the cascading water system

At the same time, the team proposed the move to a more decentralised infrastructure system in order to give more attention to the end uses. This implies moving from regional solutions to local solutions, and the transition from a through-pipe system to a looping system where our infrastructure grids become loops. The regional supply might still be used to supplement the system during peak times and seasons but increasingly over the next 100 years other

sources would be provided at the local level that can supply back into the system through a two-way grid distribution network.



Gridded distribution



Local production and distribution



Mass production and distribution

Finally, the team emphasized the importance of neighbourhoods in the long-term plan, realizing that the region is a consequence of incremental local decisions. Furthermore, they recognised green spaces in the city as part of the infrastructure and concluded that more emphasis needs to be given to the integration of green infrastructure in our region, where it can perform natural services such as water filtration.

# The langley charrette

## *About the langley study area*

The Langley study area is located in the Township of Langley, a rapidly developing area within Greater Vancouver. The Langley area was the first location in the lower mainland where European settlement was established, and the Township of Langley was one of the first municipalities in the province to be incorporated.

For the first half of the 20th century, Langley's growth was slow. The Township remained largely rural in character as urban development focused in areas such as New Westminister and Vancouver. To protect agricultural land from the incursion of population growth, the Agri-

cultural Land Reserve (ALR) was established in 1972, ensuring future growth would be directed to land of minimal agricultural significance. Much of rural Langley was included in the ALR.

The charrette study area is bounded by 70th Avenue to the north, 64th Avenue to the south, 204th Street to the east, and 197th Street to the west. It is part of the Willoughby Community, which is one of the few remaining areas in Langley Township designated for, and capable of, accommodating urban development.

Today this area is predominantly characterized by a flat floodplain-type landscape and small acreages, which serve as fields for feed and cattle grazing. Currently, the site is facing a



large amount of pressure from development overflowing from adjacent suburban areas. The rural character is being subsumed by super-blocks, large big box type retail developments, and suburban cul-de-sacs. This threat to the rural character of the area will continue into the next century, with the expectation that it will grow from its current population of 1,890 people to about 5,671 people in 2100: a 200% increase.

The dual purpose of the site becomes evident: serving as a sponge for absorbing development pressure from the nearby regional town centres while simultaneously serving as a unique urban-rural interface.

During the cities<sup>PLUS</sup> charrette the Langley Team was faced with the challenge of how to deal with these development pressures in the context of demonstrating how a sustainable future can be achieved.



## The local charrette challenge

Using the district / corridor / block / parcel taxonomy described previously, the challenge was to demonstrate how the prescribed goals and targets could be achieved in an integrated way. While the focus was predominantly on a series of blocks with a walking distance radius, some examination of the corridor and district scales was required insofar as they provided context to local scale design decisions. Similarly, examination of any specific parcel(s) within the study area was encouraged.

The underlying intent was not to 'master plan' at different spatial scales, but rather to work within the parameters of comprehensive targets to illustrate detailed design and technology strategies that could be integrated at different scales and across different urban system areas.

Because of the 100-year timeframe of this project, participants were asked to illustrate how Langley would transform over time in a staged approach (years 2025, 2050, 2100). Finally, the



team was asked to document in more detail the practical reality associated with implementing varying strategies. Some targets for the year 2100 included:

- More or equal to 25% of the land area in every block is used for urban agriculture.
- 100% of stream corridors have been protected and restored within 30m of the stream bank.
- Less or equal to 55 litres / capita / day potable residential water consumption

The team also had the opportunity to collaborate with the regional team on each day of the IDW.

Desired outcomes:

- Integration of cities<sup>PLUS</sup> goals, targets and strategies at varying urban design scales
- Illustrations of how to implement practical strategies necessary for achieving targets
- Relevant drawings and graphics that show transformation of our urban fabric over time
- Confirmation that targets and strategies are or are not plausible
- Input into how to translate conceptual ideas into recommendations that can be implemented.



## *Envisioning the Future*

The Langley team embraced the challenge of addressing the confluence of significant urbanization in a currently predominantly rural area. Very quickly, the team articulated the need to maintain the natural area of the site, at the same time allowing for increased population growth and need for services. It identified an existing 200m x 200m super-block street grid as a prominent feature that has been imposed on the rural Langley landscape, and recognized that, as seen in the history of cities around the world, street networks are bound to endure for

centuries to come. Working initially as a whole team to define an underlying approach, the Langley team then broke up into smaller sub-groups, each with a defined area of focus. While one sub-group dealt with infrastructure, for example, another dealt with land-use, and another dealt with the design of specific sites within the study area.



*Drawn by Langley Team (original)*

The Langley team recognised that the super-block would not be effective for future alternative transportation needs, given the projected growth in this area. A finer, more permeable circulation network that facilitates walking, cycling, and even horse riding was seen as necessary. However, given that maintaining the natural character of the site was also a key priority for the Langley team, adding more streets was not something the team envisioned for the next century. From this challenge was born the idea of a “Grey-Grid and Green-Grid”.



Though the physical location of the existing super-block street grid is anticipated to stay in place, major upgrades would be required within the next 25 years. With these upgrades the streets would gradually transform to a 6-6.5m wide street network, framed by a green canopy of street trees. Described as the Grey-Grid, this network would predominantly serve motorized movement such as vehicular and public transit circulation.

Interwoven with the Grey-Grid would be the Green-Grid. This grid has tree-shaded pathways that curve within the existing straight 30m road allowance. By incorporating primary pedestrian circulation routes along the Green-Grid and secondary routes along the Grey-Grid, a fine 100m x 100m pedestrian circulation grid would be established.

The team designed a plan through which the study area would be converted through an incremental retrofit and adaptive re-use plan for the next 100 years. As the nature of retail changes over time, “Big Box” buildings would be converted to public facilities with green houses on top, and in some cases even sliced or cleaved by riparian way as an artistic or heritage statement.

The built environment would also be reweven into the surrounding natural landscape. The team not only reclaimed what was there, but also re-created a new set of greenways along the Green-Grid that would mature into the natural environment. This could then connected into the larger regional open space network.

The green pathways are not only circulation routes for bicycles, pedestrians, or even possibly horses, but it allows for common green space on a block-to-block scale where water can be treated, agriculture can thrive and communal waste facilities can be located. These become the quiet, green spaces of rural living in the city while the Grey-Grid maintains the vibrant corridors of urbanised living. These Green- and Grey-Grid networks form the backbone of the community and heal the urban-rural split through the integration and interweaving of these realms.



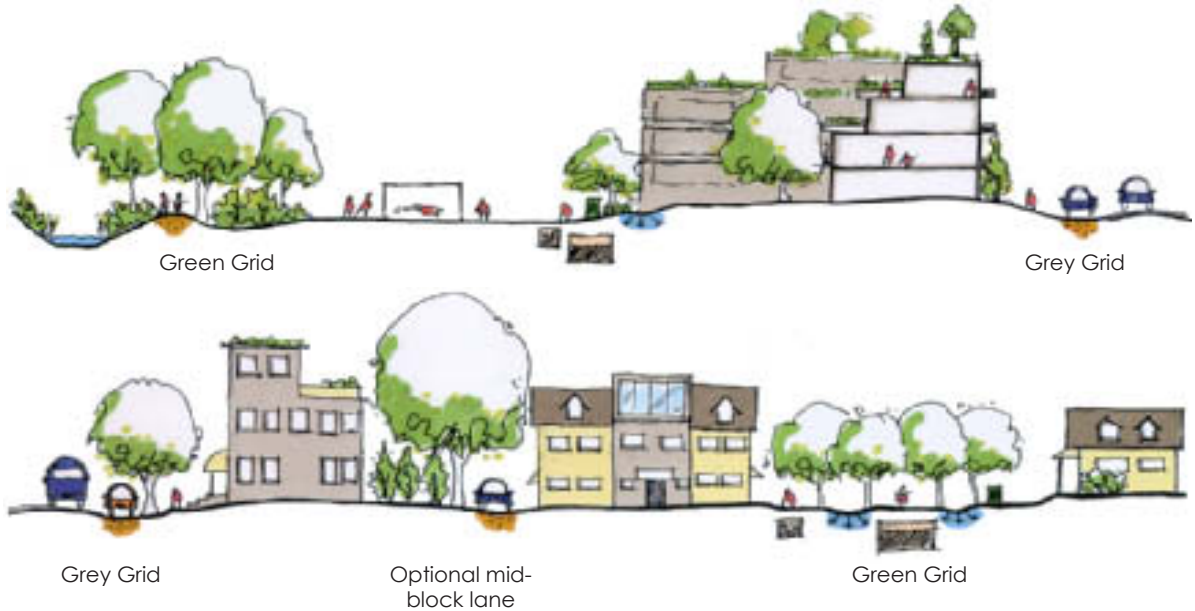


The team set out to protect waterways in the short term and to allow streams to mature despite increases in runoff and development in the watershed. Over the next 100 years, all culverted streams in the area would be daylighted and minimal development would be allowed in the wetlands associated with the headwaters of these streams.



This strategy was emphasised by diverting 70th Avenue to follow the contours where it is positioned at the edge of the clay seepage area in the northern part of the site. The only development permitted in these upper hillside areas would be a few scattered, completely self-sufficient developments hidden in the forest (1 unit/hectare) - possibly hotels or resorts. To preserve these woodlots, all other development focuses on already disturbed areas towards the south. The team felt that the increase in population and the subsequent increase in density would be quite obtainable without destroying the natural character of the site.





This Green-Grid would form the basis for the infrastructure that functions at the super-block scale. This approach to infrastructure emphasised the teams' approach of shifting responsibility from the region to its residents. The same applies to, for instance, land zoning where in the future they envisioned fully integrated communities. Mixed uses would occur at a block scale and private, semi-private, and public space would be integrated on each block.

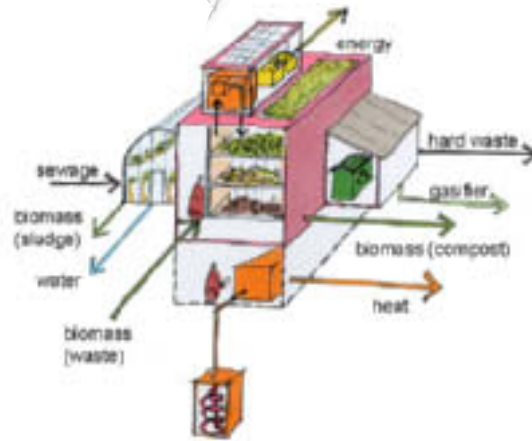
While electricity and water supply infrastructure might remain in place to some extent on the Grey-Grid in future, the Green-Grid will become the primary backbone for new infrastructure in this community. Infrastructure functions at a largely local, super-block level with excess resources distributed to the larger district or resources supplemented from the district to the block when required.

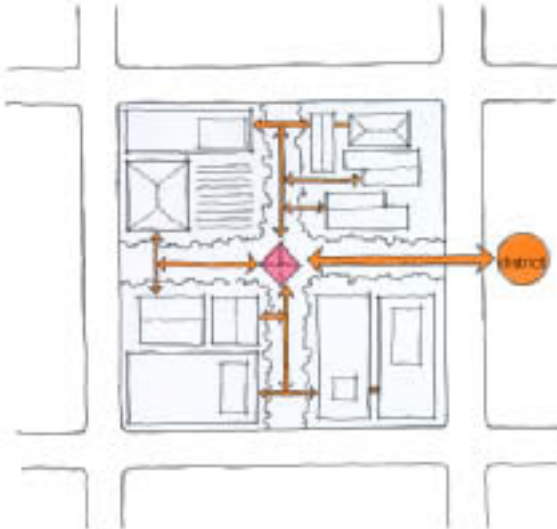




The team recognised that future technologies might have a huge role to play in our infrastructure, but concluded that regardless, the basic principle of local generation and treatment is essential. Whether economies of scale will allow for this to happen remains to be seen, but the team believed that such solutions for local infrastructure are starting to move into place and will be not only desirable, but also viable in the next 100 years

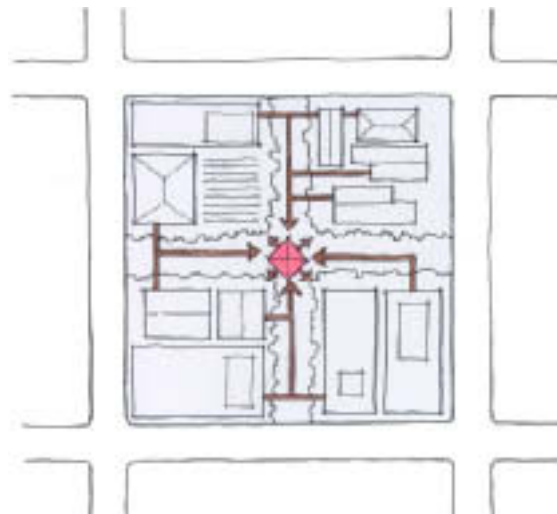
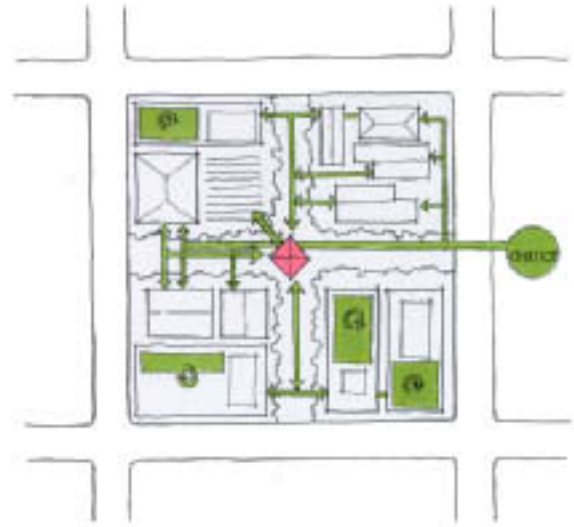
The team proposed that where the Green-Grids intersect at every block, a local infrastructure node be created that would serve as a distribution / collection point. The Langley team discussed 6 services in their community and imagined how they might function at the local level, as depicted on the following pages.





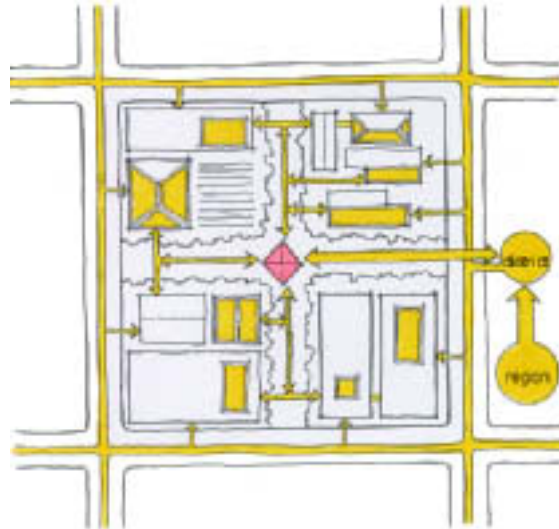
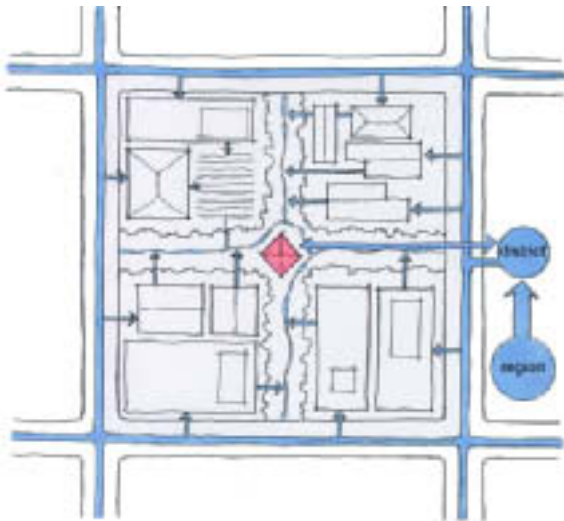
Heat - At the infrastructure node, there could be a ground source heat pump systems that distributes heat to the buildings in the super-block. In turn, solar thermal collectors on the roofs supply heating to the house with any surplus feeding back into the central node where it is stored or distributed as needed. Additional heat could also be extracted from sewage treatment and waste incineration, and then be distributed back into the system.

Biomass - Organic waste and garden waste would be collected and composted at the infrastructure node on each super-block. The compost would be fed back into the gardens and the Green-Grid of the block, and surplus compost distributed to the nearby agricultural lands. Vegetables and fruits harvested from the gardens and Green-Grid could be sold at the local market or used by residents in the block.



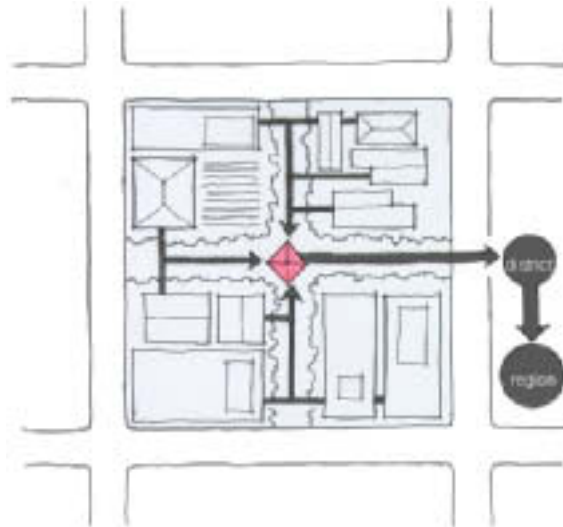
Sewage - Sewage would be treated at the building or super-block scale. In some cases, where economies of scale necessitate, this could be done at a community level. Outputs would be fed back into the community as compost for the Green-Grid, heat supply that feeds into the ground source heat pumps, and water effluent for irrigation (or even emergency drinking supply).

Electricity - Buildings would generate their own electricity through the use of photovoltaics. Excess electricity would be fed to the central infrastructure node from where it would be redistributed as needed. At the same time the existing electrical grid on the Grey-Grid would be maintained to supplement the electricity consumption from a regional source (primarily renewable).



Water - The community would rely on the region and district for its supply of potable water through the existing grid. Non-potable water needs would all be supplied within the super-block from rainwater and treated sewage effluent.

Waste - All waste and recyclables would be collected at the central infrastructure node on every super-block from which the district would transfer it to a larger, central storage and sorting facility. From this facility recyclables would be collected for processing, carbon-based wastes that cannot be absorbed elsewhere in the system would be burned at the district gasifier, and the region would collect hazardous wastes for secure disposal. No waste would be collected for landfill and heat from the gasifier facility would be distributed back to the district or potentially used to generate electricity. The region would play a management role in sorting recyclables at the district scale and collecting recyclables by regional recycling facilities.



# The lonsdale charrette

## *About the lonsdale study area*

For the purpose of the IDW, Lonsdale was selected as the study area representing an established mixed-use neighbourhood with a very urban character.

The Lonsdale study area is located in the City of North Vancouver. The District of North Vancouver was created in 1891, and the City of North Vancouver was incorporated in 1907. From early on, the city was dubbed as "The Ambitious City", where a working waterfront was envisioned, with Central Lonsdale becoming a major urban centre. From the outset, public transportation played a prominent role with the public ferry at the foot of Lonsdale

and streetcars running up Lonsdale Avenue. It was the city where everyone could walk and residents were expected to be within 400m of open space.

The depression, World War II, and the opening of the Second Narrows Bridge and Lions Gate Bridge eventually undermined the original vision. The streetcar and ferry services were terminated and the significance of Lonsdale as an urban centre diminished.

The area was revived in the 1970's when the passenger ferry service was reintroduced. Today this area is recognised by the Greater Vancouver Regional District as a designated regional town centre and the city will once again embark on a period of significant growth over



the next century. Although it is a relatively mature neighbourhood, it will have to find ways to effectively absorb increases in population and adapt to infrastructure changes.

The study area for the charrette is bounded by 17th Avenue to the north, the waterfront to the south, Ridgeway to the east, and Chesterfield Avenue to the west. With its mountain backdrop and waterfront access, the area has steep slopes that provide properties with exceptional views over the downtown core.

Over the next century this area is expected to grow from its current population of 11,529 to about 14,773 people in 2100: a 28% increase. The majority of this neighbourhood has already been developed. As a result, future growth will have to occur through redevelopment and densification. The neighbourhood is characterized by mixed use high rise developments around a central spine (Lonsdale Avenue), surrounded by varying building types such as

single family detached houses, townhouses, 4-storey walk-up apartments, commercial and retail establishments.

During the cities<sup>PLUS</sup> charrette the Lonsdale Team had to face the challenge of demonstrating how a sustainable future can be achieved through initiating change in a mature neighbourhood.



## *The local charrette challenge*

Using the district / corridor / block / parcel taxonomy described previously, the challenge was to demonstrate how the prescribed goals and targets can be achieved in an integrated way. While the focus were predominantly on a study area that represents a series of blocks with a walking distance radius, some examination of the corridor and district scales were required insofar as they provide context to local scale design decisions. Similarly, examination of any specific parcel(s) within the study area was encouraged.

The underlying intent was not to 'master plan' at different spatial scales, but rather to work within the parameters of comprehensive targets to illustrate detailed design and technology strategies that are integrated at different scales and across different urban system areas.

Because of the 100-year timeframe of this project, participants were asked to illustrate how Lonsdale would transform over time in a staged approach (years 2025, 2050, 2100). Finally, the team was asked to document in more detail the practical reality associated with implementing varying strategies. Some targets for the year 2100 included:

- 100% of dwellings are within 350 meters of arts and cultural facilities.
- 95% of buildings are capable of connecting to a low temperature thermal network.
- 50% of energy is supplied by clean and renewable energy sources.

The team also had the opportunity to collaborate with the regional team on each day of the IDW.

Desired outcomes:

- Integration of cities<sup>PLUS</sup> goals, targets and strategies at varying urban design scales
- Illustrations of how to implement practical strategies necessary for achieving targets
- Relevant drawings and graphics that show transformation of our urban fabric over time
- Confirmation that targets and strategies are or are not plausible
- Input into how to translate conceptual ideas into recommendations that can be implemented.





## *Envisioning the Future*

For the Lonsdale team, the transformation from the existing development pattern to a more sustainable urban fabric proved to be a topic of great debate and discussion. The team was confronted by the constraints of an existing grid that was applied with disregard for natural typography, features, movement patterns and so on. At the same time, the team recognized that acceptance of this grid within the short and medium terms was crucial.

The existing street pattern was seen as posing a number of problems. First, the grid promotes water runoff straight into the sea through an engineered solution that does not consider the quality or quantity of the runoff. Second, it promotes erosion due to runoff over such steep downhill slopes. And finally, the grid does not reflect optimal pedestrian and cycling needs.



To resolve these concerns, the team proposed to dissolve the street grid over the long-term. This challenge complicated the pace of change and the team was left to question how much change is feasible and publicly acceptable in 100 years. It was pointed out that the public investment in infrastructure was very high, and that radical departures from the basic service grid were an extremely costly endeavour and extremely difficult to coordinate. On the other hand, the infrastructure on a typical residential street in Lonsdale might well be renewed several times within the 100-year time period and through incremental steps and advance planning it might not be completely unrealistic to change the underlying orientation of the grid.

The team envisioned a future where the grid would be dissolved in places. Here the natural features, pedestrian paths and cycling routes become an extension of the grid. These green corridors would be meandering diagonal to the slope as far as possible to allow for better storm-water management, and universal accessibility. This would allow for higher density cluster-type developments around central public greens. The block would become an integrated unit that fosters greater social interaction and the sharing of resources.

The team recognised that public, political, or economic pressures would represent difficult obstacles for the feasibility of this vision over 100-years. However, it was recognised that profound and significant change can come from small incremental steps.







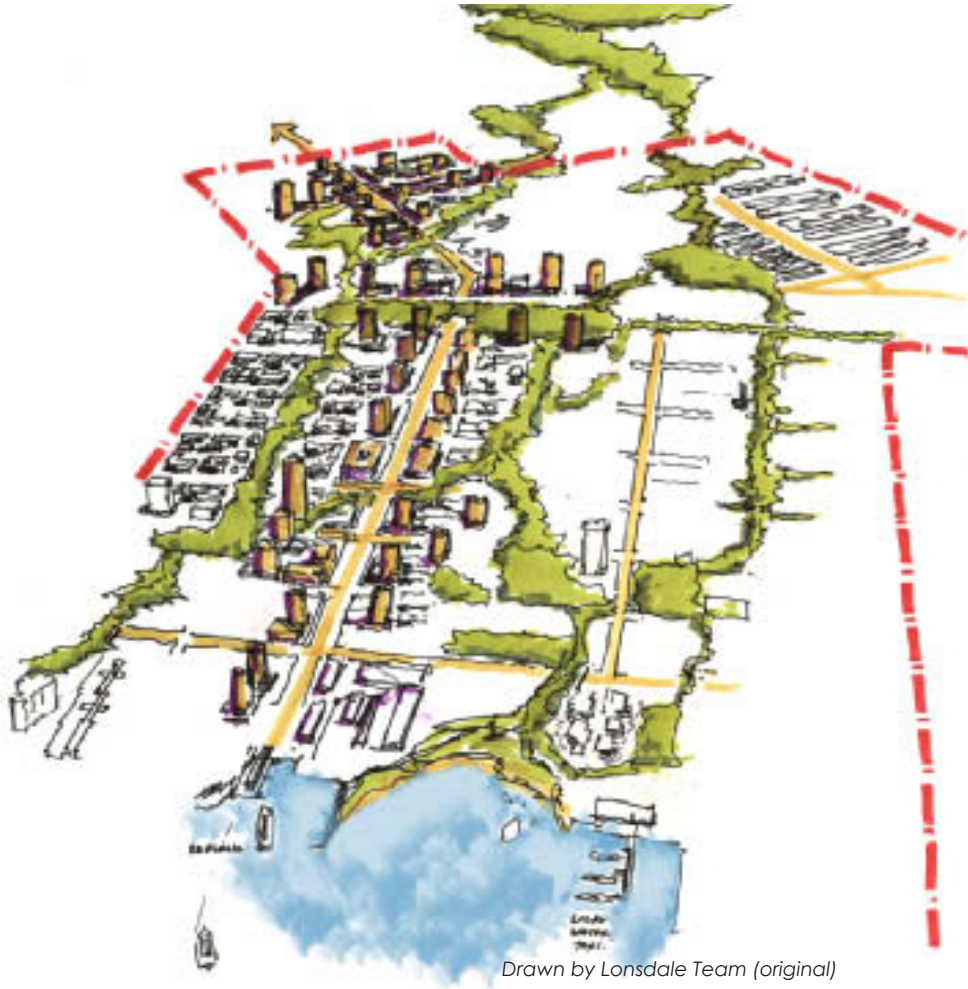
Drawn by Lonsdale Team (original)



The team analysed the main transportation routes from a regional point of view and established the corresponding transportation spines throughout the site: three east-west corridors and four north-south corridors. The existing railway offers opportunities for an underground regional rail connection that surfaces at the Lonsdale Ferry terminal to the south. Lonsdale Avenue would be used as the principal north-south corridor, connecting this public transportation hub with the City of North Vancouver centre, and ultimately the Trans-Canada Highway and mountains beyond. This spine would also serve as the primary public transportation spine with stops at regular intervals.

During the regional analysis, it was also quickly discovered that the site forms a barrier to establishing connections between some prominent parks in the region and the waterfront. It was a key priority to reintegrate nature back into this urbanized area and establish greenway connections between the ocean and larger regional urban open spaces over the long term. The Lonsdale team came to envision the neighbourhood as a green web where buried streams would be daylighted and animals could move through wildlife corridors.

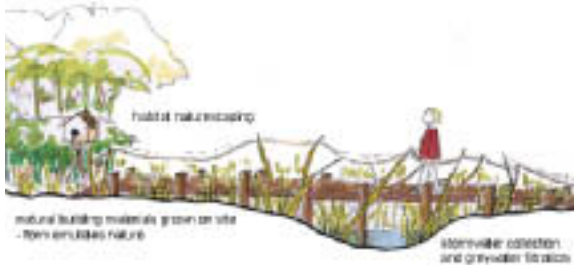
A unique opportunity existed to establish a mayor east-west habitat corridor and greenway along Victoria Park and the Keith Road right-of-way. Similarly the team felt that the oceanfront should incorporate a continuous pedestrian and cyclist route, with nodes of public space (and water access), commercial development, and a naturalized intertidal shoreline.



Drawn by Lonsdale Team (original)



The team then proceeded to re-establish connections between the urban parks and the ocean through a series of ecological greenways. These greenways would cut the existing 100 x 220m blocks in a north-south direction to approximately 100 x 100m blocks. Diagonal modifications to this greenway "grid" were incorporated to allow for more walkable gradients, greater length of prime property greenway edge, as well as better percolation and oxygenation in streams. Stormwater swales and detention ponds would be integrated with habitat movement corridors, and pedestrian / cyclist corridors. The result would be a fine - almost dendritic - network of green corridors and water channels that feed down to the ocean.



These multi-functional greenway corridors would connect the neighbourhood with the sea to the south and the mountains to the north; creating a unique Mountain-to-Sea hiking trail that links the community to other communities and the wilderness beyond.

In addition to creating ecological greenways, the existing grid would be transformed in stages to create a network of urban greenways (primarily for pedestrian and bicycle movement). Transportation targets suggested a reduction in car ownership and a greater demand for pedestrian, and cyclist movement over the next century. This allowed the team to better match projected transportation needs while simultaneously reinforcing social-, habitat- and stormwater targets.



Today

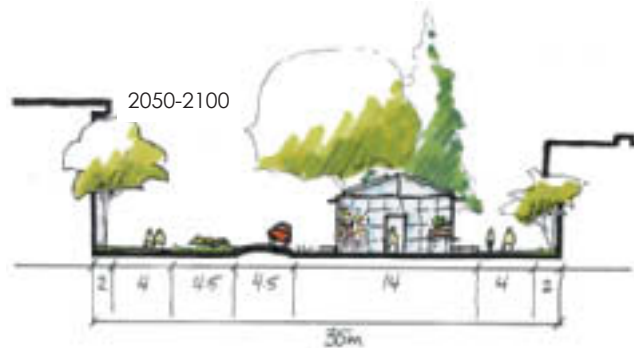
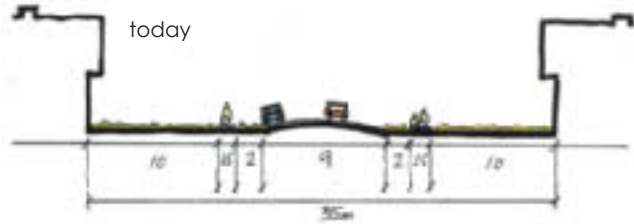


2025



2050

The team proposed a series of east-west urban greenways to complement the ecological greenways. The street grid would start to disintegrate in places to create a distinction between public circulation routes, and more private, localized paths within the residential areas. Streets would be narrowed and greened over time to create a more pedestrian friendly environment. Initially the streets would be narrowed and parking eliminated on one side, allowing opportunities for the meandering of the road alignment. As the demand for parking and car space is further reduced, thru-way movement of vehicular traffic would be limited to every 3rd or 4th street. On all the other east-west streets, cars would be allowed to infiltrate the block only partially to a point where they could park, allowing the centre of the block to become a social focus for community facilities, play area, community gardens, and so on. This would also improve the continuity of the north-south ecological greenways and link up with the north-south walkways.





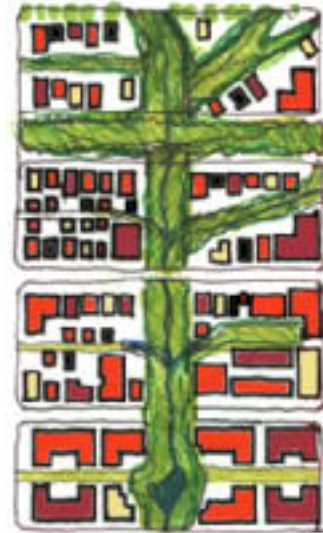
The result of dissolving the grid would be an approximate 220 x 330m block (defined by vehicular streets). This block would be intersected by greenways into smaller pockets of around 100 x 100m. This layout would allow for greater flexibility in building layout and orientation, and would foster a greener, friendlier living environment with greater opportunities for social interaction.

The team recognised that this form of development would require reclaiming many individual lots. It was felt that the requirement for higher densities in this area would invariably mean a conversion of single homes to more cluster type developments, and that through early prioritising and identification, this process of acquiring properties for conversion to greenways or higher density forms of development might be fairly realistic over the 100-year timeframe.

The proposed revamp of the existing block pattern would allow for flexibility and staging in that it could require as little as two properties to make way for the ecological greenway, combined with merely closing off thru traffic along

the urban greenways. Over the long-term, other strategies might be considered, where individual properties could be transformed into higher density developments. Such strategies might include:

- Side yard infill
- Front yard infill
- Rear yard infill
- Street asymmetry within previous road allotment
- House replacements with cluster type developments that achieve greater provision of centralized or underground parking as well as improved building interaction with the public open space.

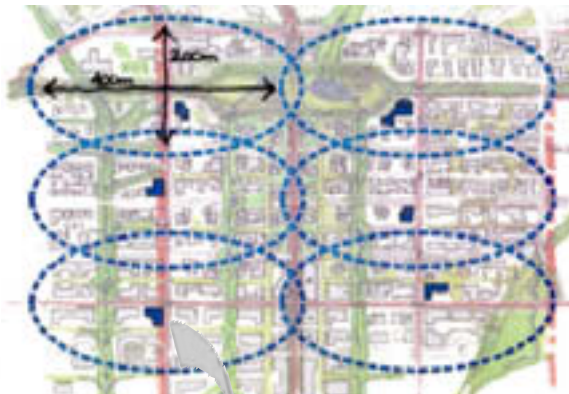


The team felt that through such infill and redevelopment, it was possible to achieve a higher density than the target provided and that this opportunity should be utilised in order to alleviate demands on other less developed areas in Greater Vancouver. Higher densities should specifically be targeted around Victoria Park and adjacent to ecological greenways.

The team envisioned that the district could be made up of a series of distinct neighbourhoods, each of unique identity, containing coherent relationships between established heritage homes, new multi-family and detached housing types, 120-year trees at former mid-blocks, Sea-to-Mountain experience pathways, and community services at a block scale.

The Lonsdale team envisioned a hierarchy of arts and culture opportunities, from a regional to block-level gradient, e.g. theatres, museums, cinemas, classes and displays at community centres, and eventually public and community art at the block level. Similarly, there would be a hierarchy of commercial services from the regional down to the block scale, e.g. major commercial nodes, "high streets," corner stores, shops in mixed use buildings, and neighbourhood pubs, cafes, and restaurants. Even day-care, health care, and urban agriculture facilities would be integrated at the block scale.

Public services and buildings would be provided within walking distance. In this hillside topography however, the walking radius is effectively an oval. The team proposed walking distances directly up or down the slope should be less (200m) that those distances that run parallel to the slope (400m). The green spaces within the block provide ideal locations for public facilities and higher densities could be achieved along these green spines. Buildings would integrate a mixture uses and be producers of resources as much as possible.



The Lonsdale team designed the green spines throughout the community as the backbone for infrastructure, with loops occurring at scales ranging between the building and block level. Larger buildings, including institutional buildings, would be separated from the infrastructure grid and be self-sufficient. Where unfeasible, infrastructure systems would be distributed, rather than centralized, to make them less vulnerable to disruption. At the very least, there would be redundancy built into these systems.

As much as possible, all utilities (e.g. energy, heat, water) would be organized on an input-output model whereby all buildings could be both consumers and producers that can earn credit against future charges. In particular, land uses would be clustered to take advantage of synergies (e.g. feeding excess heat from the hospital into a district heating system).

Each block would have a collection point ("living machine", biofiltration or equivalent) where the majority of sewage would be broken down. Any excess sewage would be distributed to a central community sewage plant.

In addition, each block (or even building) would incorporate a non-potable water system, used for toilet flushing and irrigation. This source would be separate from the potable water system.

Collective water cisterns would supply non-potable water, alleviating local water demands and freeing up reliance on larger grid services. As the demand for parking is reduced over the next century, opportunities might even exist to convert underground parking into cisterns. Furthermore, stormwater runoff would be managed at the block level where it could be harvested as a source of non-potable water supply.

The opportunities for using water to store heat or to contribute to renewable energy through gravity and tidal applications would be explored. There would be systems put in place for every block whereby organic materials would be collected and composted for local agricultural and gardening use. Heat generated from these composting facilities would be used for greenhouses or residential purposes. Other sources of heat might include gas, fuel cells, solar, and geothermal.

Energy conservation principles would be integrated into all buildings. By disintegrating the street grid, greater flexibility in building orientation for passive solar (southern exposure) opportunities would be allowed. On a macro-scale, higher-density buildings in the north Lonsdale area would also be stepped down from north to south to preserve not only the views but also to provide access to sunlight.





Organic waste and heat ~  
4-block catchment area for organic waste collection and treatment. Heat produced from treatment feeds infrastructure hub in each individual block. Hubs feed extra heat back to generate waste breakdown.



Heat and energy -  
Hub supplies heat to buildings in closed loop system. Localized energy production at each building also runs in closed loop, while storing extra energy at the hub.



Stormwater -  
Each block captures and treats all stormwater on site. Roof catchment feeds "streams" in urban and ecological greenways.

Sewage -  
Each block divide into smaller units for localised sewage treatment. Each unit uses reed beds and detention ponds.



# Integrating the results

## Common Outcomes

The three teams concluded that while in the next century our neighbourhoods and region might not look much different from what they do today, they will function very differently from the status quo. The integration of nature back into the city and the connection of our neighbourhoods with a regional open space network was a very striking central theme in all three charrettes. Similarly, the decentralisation of infrastructure and the generation of resources within each neighbourhood (or even building) was also clearly a desirable and achievable outcome for each of the teams.

The outcomes from the three charrettes were integrated and used as a basis for developing a set of 'catalyst strategies' that are intended to stimulate a coordinated transition to our desired future. The catalyst strategies provide a means through which multiple end-state goals and targets can be achieved simultaneously and in an integrated way. Stemming from the output of the design charrette, eight catalyst strategies were selected that provide a comprehensive, and yet simple, list of approaches which can be used to get Greater Vancouver onto the path towards the desired sustainable future.

## Catalyst Strategies



Become Net Contributors



Plan Short Loops & Integrated Infrastructure



Experiment and Learn as we go



Create Shock Resilient Cells



Multi-use spaces and convertible structures



Protect and connect blue ribbons and green webs



Green and Clean the Import & Export Chains



Enhance the Diversity of Choices

**Catalyst Strategy #1:**

Become net contributors ~ Achieve a footprint that is within a fair share of the earth's carrying capacity and that regenerates social, natural, and economic capital.

Net contributors make positive contributions, giving back more than they take away. In the social realm, net contributors are individuals not solely concerned with protecting their rights and lifestyles, but also engaged in community affairs as neighbours and citizens. In the economic realm, net contributors focus on supplying and consuming products and services that support sustainable lifestyles. Wealthy people contribute economic resources to the poorer strata of society. Those with reduced economic wealth look to contribute more substantially through the informal economy. In the natural realm, individuals adopt lifestyles that proudly maximise the amount of benefit received for any resource consumption.

Net contribution translates into greater emphasis on compact urban form. The "growth concentration area" and other areas designated for urban development in past plans now become a growth containment area, in which the region will accommodate an additional 2.8 million more people. It also translates into a region that lives off the interest of its ecological and economic capital. Despite growth, the region will require no additional water reservoirs, landfills, imported energy supplies, or imported fresh produce. Living off the interest means finding sources of revenue to finance urban infrastructure without deficits.

Net contribution requires Greater Vancouver to adjust the efficiency of urban systems, and to reduce environmental impacts. The global footprint is reduced to a more equitable share. Finally, it requires the region to re-invest in natural capital - locally and globally - through remediating damaged land, regenerating lost ecosystems, and enhancing the longterm biological productivity of farms, gardens, parks and forests. As a net contributor, the region protects what we love, preserving a heritage for our children and children's children. In this way, Greater Vancouver will follow the ancient wisdom of the First Nations elders, and plan ahead for seven generations.



**Catalyst Strategy #2:**

Plan short loops and integrated infrastructure networks ~Enhance flows and connectedness so that all pieces of the urban system are finely linked nodes in an integrated network.

Greater Vancouver's distinctive urban form has been guided by a land-use plan based on a network of regional centres where most of the large population nodes are at the centre of the growth concentration areas, connected by transportation corridors. The third catalyst strategy will build upon this form in several ways. First, the nodal network will extend to much finer scales and will ultimately include the block and the parcel. Second, the transportation network will become more effectively integrated with all other components of the urban system. Third, the functionality of the smaller nodes will increase, with many short two-way flows (or loops) that keep much of the activity close to home. This reduces the need for larger nodes

and centralized facilities, while fostering local employment, improved efficiency, and resiliency.

An important characteristic of the short loops and networks is their self-managing and sharing capacity. Storage, conversion, treatment or generation functions will move readily from one scale or location to another. Surpluses will be easily shared from node to node. Each building, for example, will contribute water, electricity, heat, and information flows to the benefit of others in the region. The nodes and networks emulate the complexity and efficiency of a natural food web. In this way, Greater Vancouver becomes an urban ecology.



**Catalyst Strategy #3:**

Experiment and learn as we go ~ Develop the capability to test new ideas, learn from failures and successes, and quickly respond to opportunities and challenges.

Experimentation implies observation and analysis for the purposes of learning. It is about trying out new ideas and using feedback systems to manage change. Greater Vancouver is a region where experimentation comes naturally: a majority of the population are risk-takers who have travelled from faraway places to seek a better life. Catalyst strategy number 5 builds on this capacity and enables the region to plan in the face of uncertainty.

With the increasing complexity of urban systems and the accelerating pace of change, the region must invest in societal learning. At the individual level, this will translate into life-long learning, with many adults regularly involved in local educational programs or virtual instruction. At the regional level, policy and development becomes experimental. Indicators are monitored and evaluated, providing regular feedback on the effectiveness of programs and the state of whole systems. 'Adaptive management' and 'continuous improvement' become intrinsic features of all regional institutions.

The "Experiment and Learn" strategy will require a pro-active approach to investments in urban form and infrastructure. Information and communications technology will need to be integrated into all elements of the built and

natural environment, providing a continuous flow of 'free' data for evaluation. The region will become self-aware and capable of learning how to survive. Demonstrations and pilot programs will be common, engaging all municipalities and many firms in a series of complementary experiments, from planning green buildings and sustainable neighbourhoods, to testing alternative approaches to schooling and the provision of social services. Feedback and evaluations from all this combined experimentation will accelerate learning throughout the region. In this way Greater Vancouver becomes a living demonstration - a prototype of a sustainable urban system.



**Catalyst Strategy #4:**

Create shock resilient cells ~ Use a cellular structure to re-organize land use and critical infrastructure capacity, enhancing local ability to adapt rapidly to unexpected shocks.

Over the century ahead, Greater Vancouver can be expected to experience an increasing variety and frequency of shocks, from the anticipated natural ones such as floods and earthquakes, to unanticipated plagues, droughts, computer viruses, organised crime, economic boycotts, toxic pollution, social unrest, and the loss of key trading partners. Existing regional infrastructure, however, has emerged without attention to this unanticipated range of threats. And with the exception of earthquake resistance, the situation is worsening. A cellular structure will help to reduce the region's vulnerabilities. It begins with a few very large cells or pods characterized by high self-reliance. The structure then sub-divides into a collection of smaller, less autonomous cells. This structure will be used to mitigate threats in a variety of ways.

First, cells can withstand a sudden loss in connectivity by incorporating redundancies and contingencies. This is especially critical for a region where the transportation, water, and

gas distribution systems depend on the structural integrity of a few bridges. Distributed water storage, for example, might allow many parts of the region to function for days despite the loss of connection to the mountain reservoirs. Second, cells provide a means for halting the cascading of problems from one location or system to another. For example, a cell around the north shore community might prevent forest fires from entering neighbourhoods. A cell around the ports might help to contain the sudden arrival of pollutants, or invasive plant species, plagues, and terrorists. Third, cells provide a means for organising a coordinated response by emergency services, as well as an administrative structure for implementing rapid recovery programs. Fourth, the urban cells offer a means for excluding dwellings from especially hazardous lands such as floodplains, flight paths, unstable slopes, soils that liquefy, etc. In this way resilience will increase over the long-term, and Greater Vancouver will become a region prepared for the unexpected.



**Catalyst Strategy #5:**

Design multi-use spaces and convertible structures ~ Increase the capability of all pieces of the urban system to be adaptable to multiple uses, simultaneously and in the short and long-terms.

Multi-use convertibility is already coming to life in many parts of the region. For example, comprehensive zoning and mixed-use buildings are becoming common to Greater Vancouver. The concept has its origins in natural systems, where a single element, like a tree, serves the surrounding community through an amazing number of functions, from creating habitat and microclimate to protecting soils and recycling nutrients. In long-lived natural systems, multiple use is a pervasive feature. Wide-spread multi-use will bring big changes to urban areas like Greater Vancouver, where single-purpose spaces and 'optimized' solutions still typify the landscape.

Multi-use will transform schools, for example, into full-service community schools, offering education, health, culture, or social facilities for young and old. Buildings will become resource structures, where energy generation or water harvesting is integrated into the structural envelope. Urban spaces will acquire a layered functionality, day and night.



Convertibility emphasises the potential for adaptive re-use over the longer term. The region's structures and systems will be designed for adaptability to other uses and functions. Every space or facility will have the capacity to accommodate at least two very different uses. This way, the region can transform over time with greater ease and lower cost and can enhance its economies of scope. Transformations may be required as the economy changes or in response to unexpected migrations, natural disasters, or changing societal preferences. Even the grey infrastructure will be convertible. For example, by connecting all spaces to a low-temperature hot water network, the entire region can easily convert from natural gas heating to other sources of energy. In this way, Greater Vancouver becomes a transforming region.



**Catalyst Strategy #6:**

Protect and connect blue ribbons and green webs ~ Rehabilitate and protect natural and built systems through reconnecting viable networks of blue waterways (ribbons), and green corridors (webs).

This strategy creates a web that connects a hierarchy of green spaces, ranging from protected watersheds and agricultural lands, right down to hedgerows and private gardens. It extends Greater Vancouver's successful existing strategy known as "Protecting the Green Zone" that has guided land-use for the past 30 years. The green web incorporates riparian zones, and extends the region's emerging pattern of ecological and recreational greenways. The green web allows the larger parks and bio-reserves to act as biodiversity reservoirs and provides all residents with the opportunity to easily access and steward a multipurpose system of natural areas.

The strategy also emphasizes restoring the region's hydrology by integrating streams and water bodies both into the green web and into the built environment. Many streams will be daylighted, and the pattern of streams will become a stronger element in the organization of land uses, helping to structure neighbourhood planning and to foster local identity. The streams will perform many functions, from cleansing and cooling to recreating and enlivening. All residents of the region can appreciate the protection and rehabilitation of the salmon stocks that will re-occupy streams, con-

necting the land and marine environments and symbolising the region's Aboriginal history. The streams become a continuous thread, weaving together the built environment, as rainwater is channelled from roofs and treated waste water is used to replenish and enrich the streams. Blue ribbons provide a seamless connection between natural zones and built structures, distinguishing Greater Vancouver as an urban area that emulates and enhances the timeless patterns of blue and green.





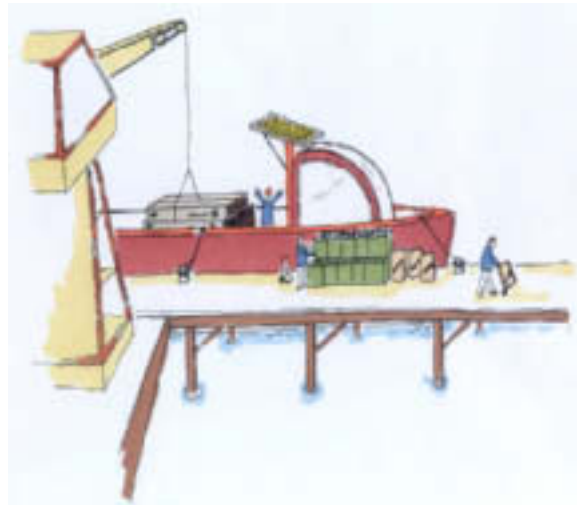
**Catalyst Strategy #7:**

Green and clean the import / export chains ~ Play a strong positive role in the green economy, using imports and exports to help shape a network of sustainable regions.

In today's globalised economy, no city is an island. This is especially true for Greater Vancouver, a gateway region on the Pacific Rim with exceptional social and economic connections to the world community. Catalyst strategy number 8 harnesses these connections, and embraces a strong positive role in shaping the global network. Deterioration in the state of a key partner's economy or environment can threaten Greater Vancouver's access to critical supplies of food, energy, and advanced technology. As an exporter, deterioration can lead to a loss of markets, undermining the region's capacity for generating wealth. The long-term solution to both these challenges is to work with key partners to green and clean their economies, or to give preference to new trading partners who are willing to engage in sustainable practices. The strategy applies to international and national partners and to the region's hinterland within British Columbia. Ultimately this strategy will enhance the long-term success of both the regional economy and the key partners, for mutual benefit.

This strategy will emphasize the benefits of regional economic planning and investment strategies that promote innovations contributing to sustainable lifestyles. This means exporting everything from fuel cells and green electricity to urban planning expertise. To enhance the abil-

ity of local industries to market their goods and services, the region will become a 'showhome'. The region's economy will increasingly service the burgeoning new international market for urban infrastructure now exceeding \$600 billion annually. The strategy will involve public and private sector organizations in activities that promote and standardize sustainable production and management systems as well as equitable and sustainable trading practices. The region's strong connections with all other regions will provide a foundation for new alliances in this emerging green and clean economy. In this way, Greater Vancouver becomes a microcosm of sustainable business practices and an active global citizen.



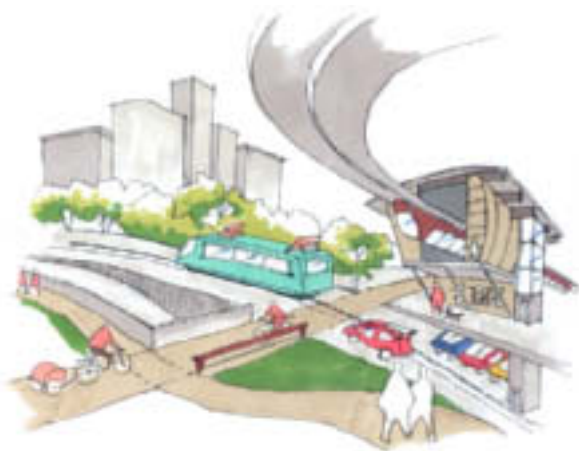
**Catalyst Strategy #8:**

Enhance the diversity of choices ~ Create conditions that allow residents and communities to choose from a variety of sustainable lifestyles and technologies

Many neighbourhoods across North America today are virtually indistinguishable in appearance. Lifestyles, vehicles, and the entire built environment have acquired a 'brand name' uniformity. Such lack of diversity is the cultural equivalent to the loss of biodiversity, and in a similar fashion undermines the health, strength, and capacity for regeneration of our communities. Greater Vancouver's natural setting and ethnic diversity provide a strong basis for combatting a loss in diversity. Lifestyle choices are already varied, as is the mixture of distinct communities and housing types. This strategy consolidates these successes and emphasizes measures to enhance diversity in a number of critical areas.

A diversity of employment opportunities will be created by regional economic plans that emphasize a broad and complementary mix of industries, with a focus on new technologies.

A mix and diversity of housing types and tenures will be encouraged, often within the same block. Ethnic populations will hold festivals, erect community gates, re-design streets and operate centres, allowing others to share in their cultural heritage. Components of the urban system will be intentionally designed to accommodate a diversity of technologies and resources. The diversity of vegetation species will provide a buffer against disease and unpredictable events. Planning and building regulations will become objective-based and friendly towards innovation. Land use and transportation planning will create a mosaic of options across the region, allowing residents a real choice in streetscapes, car ownership, and amenities. In this way, Greater Vancouver becomes a region of choices -- a place where diversity adds both to the quality of life and to the capacity for adaptation and regeneration.



# Last words

The 100-year time horizon is essential to help us to look past immediate preoccupations and vested interests, discover powerful unifying ideas and consider our responsibilities to successions of future generations. However, whether planning for a large urban region or designing a single building, the complexities of taking such a long-term view can be overwhelming. The long-term view requires us to think of many issues simultaneously, it requires us to involve many different people, and it requires us to adapt over time as we learn.

The complexities of taking a long-term view necessitate the use of a framework that can guide us through this overwhelming process. The cities<sup>PLUS</sup> framework provides such a staged framework and it has numerous tools that can help facilitate the process at every stage of the framework. The design charrette is one such tool that assists in the envisioning stages of the framework.

During the cities<sup>PLUS</sup> project the design charrette tool was tested and documented. The cities<sup>PLUS</sup> charrettes demonstrated that using a 100-year planning scenario allows people to stretch beyond present day constraints, and envision a sustainable future that is actually very achievable. This output from the charrettes illustrated the enormous ability for intense sessions to result in effective results that flow out of the interaction between a broad cross-section of people. It also demonstrated the power of drawings to increase the comfort level of people with suggestions for change. Thus in many ways, the cities<sup>PLUS</sup> charrettes affirmed the utility of integrated design charrettes as a superb tool for local engagement and decision-making during the envisioning stages of the framework.

Overall, the cities<sup>PLUS</sup> charrettes was a great success. Both participants and the cities<sup>PLUS</sup> team members expressed a desire for the use of charrettes in the future as a tool for meaningful participation in planning and the design processes. In the words of one participant, this type of integrated approach "should be essential to all city and regional planning processes". The opportunity to engage in a planning exercise alongside a group of diverse experts from various occupations and walks of life resulted in a valuable learning experience for all participants. It also demonstrated that sustainability is both a goal and a process - achieving success will only be possible when multi-stakeholder participatory processes are embedded into our planning, design, and governance systems.

*"What is so exciting about this book is that by reviving an old idea - the design charrette - it becomes possible to add real flesh to the bones of an integrated planning and design process. The cities<sup>PLUS</sup> charrettes proved to be a superb tool for efficiently integrating viewpoints and disciplines, and for communicating new ideas in ways that were positive, fun and persuasive. In the future, I expect charrettes of this type will become an essential tool for planning long-term urban sustainability."*

Sebastian Moffatt

President of The Sheltair Group & National Team Leader for cities<sup>PLUS</sup>

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