



SUSTAINABILITY WORKSHOP REPORT
REGENT PARK REDEVELOPMENT

Metro Hall
Sept 30 – Oct 1, 2003

By
Sustainable Buildings Canada

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INTRODUCTION

On September 30-October 1, 2003, Sustainable Buildings Canada (SBC) hosted a 1.5-day Sustainability workshop focused on providing developing sustainability guidelines for Toronto's Regent Park re-development. The Workshop attracted 70 participants, representing architects, engineers, educators, city planners and a variety of technology specialists.

With key funding support from the Toronto Community Housing Corp., the City of Toronto (Better Buildings Partnership), Enbridge and NRCan, the Workshop attempted to demonstrate that superior environmental design alternatives can be developed through the integrated design process.

Workshops of this nature use the "integrated design process" to create more environmentally friendly and robust designs. The integrated design process is a method used to challenge participants to consider new strategies and products, in this case, for a more sustainable community housing plan. The basic intent is driven by two key concepts:

- An integrated team formed early at the concept stage, can maximize the potential benefits. This is when concepts can change easily as new ideas are considered.
- An integrated team includes members with diverse expertise and experience to inform the process including property managers, energy simulators, costing experts, energy efficiency experts, envelope specialists, municipal engineers and planners and alternative energy specialists along with the design team members. These team members work together to achieve a higher performance, value added building. This multi-disciplinary relationship should continue throughout the design and construction phases.

For this Workshop, four teams were assigned to the project. Each team consisted of approximately 15 core members, with floating experts and guests circulating among the teams. As part of the vision for sustainability at Regent Park, each team was asked to generate one scenario, with specific issues being assigned to each team. At the end of the Day 2, each team prepared and presented the key results and recommendations for their team.

Sustainable Buildings Canada is pleased to provide the following report summarizing the various results and recommendations. We would like to thank all those involved in making this important event happen. In particular, our core funders, the facilitators and experts, and finally the staff at the City of Toronto who not only provided an excellent venue, but also went overboard in covering all the logistical details. Thank you to all.

DESCRIPTION OF THE PROJECT

Regent Park has been the subject of a number of previous discussions over the past two decades regarding revitalization. The age, condition and configuration of the buildings have contributed to this interest. However, for a variety of reasons, these previous attempts did not succeed. The recent transfer of responsibility for assisted housing, from the Province to the City of Toronto's TCHC, offers a fresh opportunity to re-examine the possibility of redevelopment and regeneration.

The proposed plan for Regent Park reintroduces to a large extent the original street network, connecting the new neighbourhood closely with its surrounding neighbourhoods. The street network will re-open all of the earlier streets in the area, such as Sackville, Sumach, Oak and St. David's and add new streets to create a finer grained pattern of blocks. The new pattern provides greater permeability, while creating development flexibility for a variety of building types and heights to create a diverse neighbourhood.

The central feature of the neighbourhood is a large 2.43-hectare (6-acre) park fronting on Dundas Street, approximately the size of St. James Park or Dufferin Grove Park. The street and block pattern is interwoven with a finer network of linear parks and parkettes to create six smaller neighbourhoods around the central park. An additional large park space is proposed through the extension of the area surrounding the Nelson Mandela Park school grounds. The ground floors of buildings along the periphery of the central park on Dundas Street offer the possibility for an exciting array of educational, arts, community service and retail activities, providing an active and vibrant interface between the buildings and the park.

The built form of the neighbourhood acts as a container of public open space, enclosing streets, highlighting corners, defining parks and providing 'eyes on the street' increasing surveillance and safety. The intention of the proposed plan is to encourage the greatest diversity of building types as found in a typical downtown urban neighbourhood, while maintaining a high level of architectural and environmental design and quality of material.

Buildings will be generally mid-rise and mixed-use along the main streets and low-rise and residential within the neighbourhood on internal streets. Inner neighbourhood streets would have townhouses or stacked townhouses, primarily residential in nature, with minimal setbacks to create lively streets that encourage neighbourhood interaction. Higher density, buildings will be designed to create a streetwall condition with a comfortable scale of a 5 to 6 storey base and will be set back above that height. This base-building condition will be especially important around the central park where the built form will define the open-space. Buildings would maximize the opportunity to face onto public open spaces. A few higher point towers would be located along Dundas and River Streets.

The plan proposes a total of 4,500 mixed-income units for the area, compared to 2,087 currently on site. Of the new units, 3,700 are proposed in apartment buildings and 800 are proposed as townhouses. It is assumed that the Rent Geared to Income (RGI) apartment units will be mixed with market units in as many buildings as possible. The plan proposes mixed-use buildings with a wide variety of retail, commercial and institutional uses on the main streets along with different types of housing along the

inner, quieter streets. The plan proposes that the Parliament Street retail area be extended south from Gerrard Street and that additional convenience stores be located throughout the area. There is an amount of about 23,000 m² or 250,000 sq. ft. of space allocated to retail/commercial, community and educational uses.

The plan envisages the provision of space for economic development initiatives that can give birth to and sustain the economic health of the neighbourhood. Activities could include skills upgrading, vocational training, employment counselling, coaching for small business enterprises and start-up efforts as well as direct jobs through employment and capacity building in new local management initiatives and in the redevelopment and building process itself.

The proposed plan provides opportunities to build on the existing educational programs in the neighbourhood as well as develop new linkages to promote new opportunities. Education programs for children in Regent Park are particularly important considering almost 35% of the current Regent Park population is comprised of school age children (5-19 years) compared to 17.5% for the City of Toronto average. The plan proposes building on the success of programs like the York University teacher-training program currently in Regent Park and encouraging the University of Toronto to locate facilities in the area as part of their interest to develop community based programs.

As part of the planning exercise, a series of community engagement consultations were undertaken. These consultations included both residents of the Regent Park community and those from surrounding communities, as well as consultations with area based community agencies, financial experts, developers, architects and City staff. Community workshops and detailed interviews with residents provided valuable feedback regarding residents' opinions and concerns and also served to raise awareness about the revitalization plan.

From a financial point of view, the redevelopment of Regent Park represents a large and complex undertaking, lasting over a 10 to 15 year period from the first demolition until the occupancy of the last new units. The proposed financial plan only deals with the demolition and replacement of the 2,087 TCHC units currently on the site. The responsibility for funding any further new housing on the site will lie with the developers of that housing.

Most of the TCHC funding for the redevelopment would come from savings generated on site. There would be little call on money that TCHC had planned to spend for other parts of the operation. Also, the budget for capital upgrades on the current units would be reduced, not eliminated entirely, while the existing buildings remain occupied. There would still be enough money for necessary work, keeping in mind that all the units would be demolished over the next 10 to 15 years. The main other source of income will be derived from the lease or sale of land on the site not required by TCHC for its housing or for the park or other community uses

As with any major redevelopment of a neighbourhood, one of the key challenges is to develop an approach to relocation that is both fair and effective: fair in that those affected are treated in a manner that is just, respectful and that takes into account the special circumstances of each particular household, without favouritism towards individual households or groups; effective, in that the process is carried out in a way that leads to the overall goals of the proposed redevelopment most efficiently, i.e. in a manner that is within certain budgetary parameters and that, at the same time, fulfils the project goals. The beginning principles relating to the relocation aspects of the

redevelopment, were developed together with the Regent Park Revitalization Committee. This draft strategy is also based on a review of relocation strategies developed for broadly similar redevelopment projects in other jurisdictions.

The phasing plan is based on an approximate 10 – 12 year build-out. In order to allow tenant relocation and new development to be a manageable process, it follows an incremental model, trying in general not to demolish more than 200 RGI units per phase or build more than 400 units per phase. The phasing pattern also attempts to provide sufficient new units in an earlier phase to absorb the RGI units from a later phase and to provide parks at the same times as buildings. It is assumed that phases will be started (and existing buildings demolished) on an annual basis, but new buildings may not be completed for at least 2 years. As such, there will be an initial and continuing need for off-site relocation of a large number of RGI families.

This transformation of Regent Park will be successful only if the entire process is framed and driven by a broad, clear and sustained vision. This vision needs to be one of community building, not just real estate development and housing. The lives of the existing TCHC residents in Regent Park, both now and in the future, would be enhanced by better access to training, employment and economic development opportunities, more immediate retail choices and the enhanced coordination of community services. The emergence of this broader concept of a community will only occur if the overall process is driven by some entity that can continually measure specific phasing and development proposals against this broader vision.

SCENARIOS

All teams were asked to address sustainability in a comprehensive manner with each team also asked to give special attention to specific issues as outlined below.

Team 1: Energy & Air Quality — Facilitator — Bob Bach

- Design strategies to exploit natural advantages of the site, e.g. orientation topography, wind and solar access, day-lighting, etc.

Improved indoor comfort using - natural design, e.g. passive solar, natural ventilation, reduced heating/cooling/ventilation system size reduced urban heat island effect, improved indoor air quality

Energy supply strategy - thermal and electrical–solar hot water - wind turbines – BIPV-district energy – on-site cogeneration – ground source storage and supply - energy management and controls – possible integration with off-site energy systems (e.g. Portlands CHP Plant, Deep Lake Water Cooling).

Team 2: Water and Liquid Waste, Solid waste and Site Biodiversity — Facilitator – Michael Wiggin

Water management – reduce/reuse/recycle; white water retention & recovery; grey water reuse; separate supply for potable water and wash water/gardening water etc. on-site effluent treatment and re-use, green roofs, .

Solid waste management - reduce/reuse/recycles; on-site sorting/compost facilities; construction waste sorting; material selection; Policies for use of non-recyclables or excess packaging on development retail establishments.

Ecological Integrity — Team 3: Doug Pollard

Landscape strategy – vegetative cooling (shading screening, deflection and protection) – vertical gardens – rooftops- enhancing biodiversity – landscaping over parking, drainage vegetation, pervious surfaces. Storm water management, erosion control, reduced net run-off, pervious surfaces, peak flow storage etc. Like Team 2, this Team will need to consider rainwater recovery and re-use in particular as part of the ecological integrity of the site.

Team 4: Sustainable Living Infrastructure — Facilitator — Luigi Ferrera

This team focused on building systems, building product specifications, processes and products that support sustainable living including mobility, dining, cleaning, washing etc.

Non-Negotiable Aspects of the Plan

A number of “non-negotiable” aspects of the Plan were also identified. These were not expected to be changed in the workshop:

- Grid layout of the streets

- Location of major streets
- Townhouses on minor streets
- The Central park
- Base buildings framing the central park.



GENERAL FINDINGS

There were significant general findings that can provide guidance to TCHC as it considers how to proceed with the redevelopment of Regent Park. The findings below are not specific design features that should be incorporated in to the development in all cases, but rather concepts and issues that can be considered in going forward with developing a sustainable community. The teams found that:

1) Goals and targets:

There is the potential to set high sustainability targets for Regent Park. The ideal goal would be for the redevelopment to be self-sufficient in terms of energy, water, waste etc. It is understood that these goals might be too high for a project that has as its first goal the provision of affordable housing. Nevertheless goals such as a 75% reduction below the Model National Building Code, or water use reduction to a third of current consumption were considered potentially achievable and worthy of further study. At a minimum there should be no net impact on existing infrastructure as a result of this project.

2) Holistic design:

That a holistic and integrated design approach for Regent Park has the potential to greatly increase the sustainability of the project and is possible because TCHC is the sole owner of the property.

3) Model community:

There is an opportunity to make this a model community – and demonstrate the potential for sustainable living and communities. This could serve as a showcase for similar projects nationally or internationally.

4) Life cycle costing:

The development should be built on the concept of full life-cycle costing, particularly since TCHC will be responsible for almost half the units after redevelopment and their utility costs. There are significant risks if operating costs are not part of the equation especially given the uncertainty regarding future energy prices .

5) Agency commitment:

TCHC's support and buy-in to the sustainability theme will be crucial. City Council must also take a lead role by instructing the appropriate departments to participate fully with the sustainability theme. A particular problem was identified with City approvals for sustainable infrastructure and buildings which may not fit standard design codes and practices. A design process needs to be created with City involvement that for which would lead to automatic or fast-tracked City staff approvals.

6) Community Involvement

Community involvement in the plan is a must for outcomes to work. The ethnic and economic diversity of the future population must be taken into account.

7) Economic Opportunities

That sustainability can create economic opportunities – through re-cycling, during the demolition phases, through on-site maintenance and through home-based enterprises. Include a market of some kind – perhaps including a “grown on site” organic component

8) Connections to the Larger Community

the redevelopment must be connected to the larger community – the Don ecosystem, Riverdale and the downtown community.

9) Incentives for Conservation

Make it possible to monitor and price use of resources. Use end use meters where possible for all energy and water uses. In the minimum, residents should be individually metered for their energy and water use. Incentives and disincentives to encourage conservation should be explored.

Design Solutions

The results of the teams' efforts are described in detail below. There were a number of sustainability ideas and themes that were common to more than one team. These include:

- 1) District heating, and possibly cooling needs to be given a strong consideration due to the current single ownership of the site. District heating has the potential to be used with a wide variety of heat sources including renewable energy sources such as solar, biofuels and geothermal.
- 2) Waste and waste water, including run-off should be treated on site – there are a variety of proven technologies to accommodate this.
- 3) 100% of the roofs should be working roofs incorporating such features as green roofs, solar hot-water, solar photovoltaics and rainwater collection.
- 4) Green energy solutions should be given a priority and the Plan should strive to have renewable energy play a large role in the development, both through potential on-site generation and/or purchasing practices.
- 5) There are a variety of landscape issues that will have to be considered based upon expected sustainability features and environmental performance. (See Landscape Issues below).
- 6) All potential options will be impacted by the transitional nature of the redevelopment – i.e. demolishing all the buildings and starting from scratch is not an option.

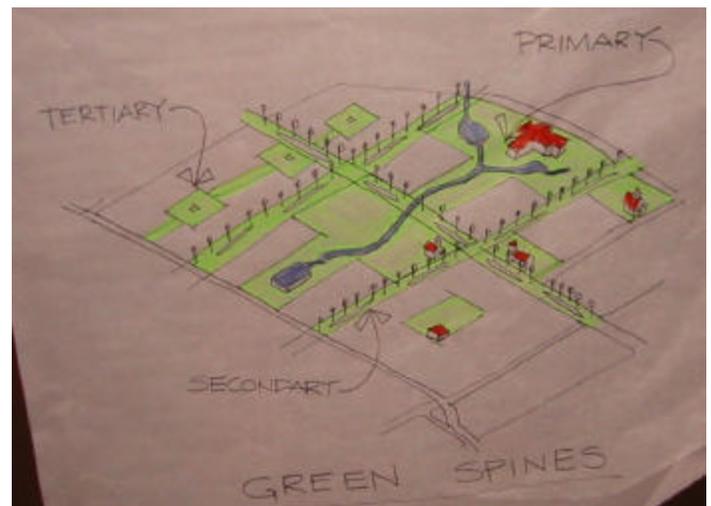
TEAM 1 – ENERGY AND AIR QUALITY

Team 1 started the day focussing on energy and air quality issues. The team decided to split into two groups to accommodate the major design concepts related to building citing for passive solar energy, as a separate issue from specific energy and air quality issues. The two teams results are reported separately:

Team 1a – Design Concepts

The Design Concept sub-team produced a number of drawings to aid them in their consideration of site energy and air quality issues (see below). The Team also identified a number of critical guidelines including,

- Maintain density as per Plan
- Ensure sensible solar orientation
- Consider a variety of passive solar management techniques, including
 - Window fins
 - Moveable P.V.s as awnings
 - Use of vegetation
 - Built-in flexibility
- Target 100% “working” roofs:
 - Green roofs
 - Reflective
 - Energy harvesting
- Maximize daylighting to reduce lighting loads
- Use natural ventilation through building form for public spaces (lobbies, corridors)
 - Develop a community “heart”
 - Accommodate historical “anchors” and context
 - Introduction of “Green links”
 - Retail and commerce on site including an organic market
 - Must be a focus of the community and a means to generate economic activity
- Develop “Green Spines” to primary north/south and east/west routes
- Secondary spines would be tree lined boulevards including traffic calming zones
- Tertiary areas would be semi-private and include internal courtyards, playgrounds, shade areas etc
- The primary spines would serve as integrate waste, water and re-cycling capabilities and would also facilitate access to community services including recreational facilities, churches, schools etc.
- Establish a “phased” built assessment that aims to use 75% less energy than the Model National Energy Code for Buildings (MNECB) standard building



Team 1b – Site and building specific energy and air quality issues

The team identified a number of priorities for consideration:

- The overall goal is to achieve 100% renewable and affordable operating energy
- A 75% energy use reduction from the MNECB should be targeted
- Cooling loads should be very small, and be supplied by building specific systems
- Indoor air quality should not be impacted as a result of any of the energy savings measures used or installed
- Balconies, if present, must be designed in a manner which eliminates heat loss
- Underground parking should be planned to minimize energy use
- All assessment of capital investment for energy measures should use a life-cycle cost approach, including the inclusion of embodied energy
- Individual metering of all utilities per suite should be a norm. Sub-metering by major end use should be considered as well.
- The energy strategy needs to include a commitment to green energy – both off-site through purchasing and on-site through on-site generation.
- The strategy also needs to include all potential forms of energy use on site and identify interdependencies as a way to minimize total use
- District heating as the primary means for heat in the development
 - Advantages include elimination of need for boilers and natural gas distribution system, outsourcing of operational risk, long term price stability, higher efficiency than multiple boiler systems
 - A hot water distribution system would need to be installed at the outset
 - The system could also accommodate other heat sources, including solar, on-site methane from biowaste
- Cogeneration could be a mainstay of the energy strategy and. It could also deal with potential peak load concerns.
- Deep lake water cooling system is capital intensive and does not yet reach to the project. It may be better suited to larger office type buildings
- Ground source heat pumps (geo-thermal) also have significant energy efficiency potential for the site and include both heating/cooling capability. Their cost effectiveness could be affected by soil conditions
- From the perspective of central plant design considerations, a phased approach is preferred which examines boilers, cogeneration for base load etc. This can be expanded as the conditions dictate. All strategies need to incorporate the holistic considerations for the project, including biomass generation on site.

Team 1 concluded that the best energy supply solution could include the following:

- A district heating system using hot water as the medium,
- Co-generation on site using distributed generation system
- Service hot water supplied by the district energy system,
- Cooling by building specific system, but highest efficiency and incorporate EE building design, green roofs etc
- Underground electrical and mechanical systems using tunnels throughout the complex for maximum flexibility
- Individual metering of all units and potentially by end use for major loads
- Renewable energy generated on site where appropriate
- Bottom line is to keep options open and be responsive to price and market signals.

TEAM 2 – WATER & LIQUID WASTE, SOLID WASTE & SITE BIODIVERSITY

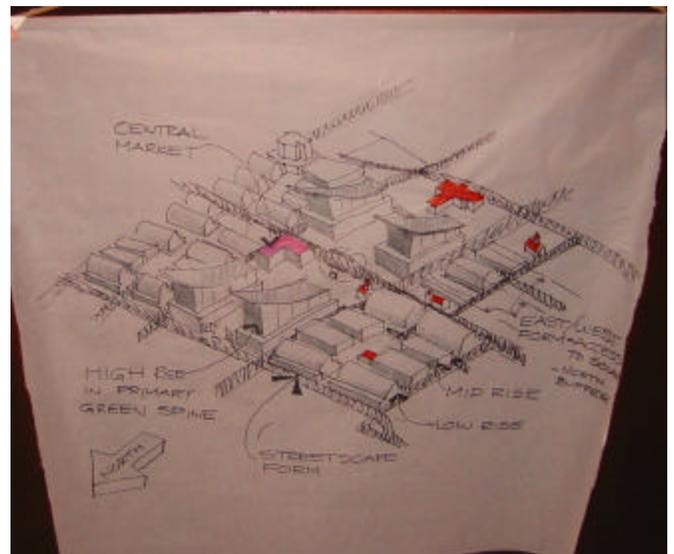
Team 2 started with a specific Vision for the community development:

- Sustainability represents the new Community Identity
- Exemplary for the City/core of marketing strategy for Sustainable Development - Net Contributor to the City – no net impact
- Learning, Education and Engagement of residents
- Focus on developing sustainability case and pre-approvals – sharing risk/development ready
- Transitional process – engage current residents while developing sustainable model for the future
- Create employment opportunities for ongoing conversion
- Use Phase 1 as model for 6 village concepts

Core principles were also identified:

- Create employment opportunities for residents
- Diversity of building types and flexible, adaptable spaces to accommodate range of employment opportunities
- Integrate with rest of City
- Minimize on-site parking and surface parking
- Provide automobile alternatives including car-sharing, car co-ops etc.

Team 2 identified a large number of issues for consideration as part of its investigation into the various waste issues, before attempting to summarize and make recommendations. These are reported “as is”:



- Take community off the grid entirely could be a goal
- Affordable housing economics is an issue and will impact decisions
- Green roofs need serious consideration
- Capital cost vs. Operating cost should be considered for long term savings. Use life-cycle costing.
- Diversity of cultural uses for sustainability. Flexibility to accommodate other uses.
- Create mini industry to recycle materials
- Recommend using LEED and specifying silver level.
- Time period of 10-15 years for full change. Look at which buildings will remain for most of that time period.
- Residual waste to be dealt with by thermal (gasification), etc. Put paper and plastics waste together.
- Waste diversion. MURBs are not performing. 35% for single family vs. 11% for multi-family – needs to be considered in the Plan.
- District heating – space heating can be the garbage dump for energy use. Similarly for water use.
- 100 units will be subsidized housing. How to set a standard which developers will find attractive.
- Generally residents are not prepared to run specialized systems. How to it work?

- People need to be made aware of how these systems work and their responsibilities – requires an education component
- Vision Water issues: permeability of surfaces. Living machine to recycle waste on site vs. Slowing release of water.
- Links to city to show the importance of water.
- No waste water leaves the site dirty.
- No or minimal surface parking.
- Transit requirements: auto share. 25% own cars. Well-served by transit.
- Population density will double. This site will not burden the existing utility.
- Restore runoff to pre-development levels.
- Two stream water systems.
- Recycle low flush toilets vs. finding other ways to recycle high load toilets.
- Design infrastructure to easily repair supply pipe losses, without costly street destruction.
- Ban garbage chutes to encourage recycling. Tri-sorter chutes were tested in Toronto. There are a number of problems with these units and they are not recommended.
- Involve community through local management – Elected representatives.
- Design transitional strategies to integrate them as they come on-stream.
- Interim strategies – gardens, re-cycle depot, goodwill centre etc.
- Stormwater plan: Stress on infrastructure and employment. Can we inter-relate these two as in a village environment.
- Keep money in the community to hire local unemployed.
- Treat waste as a resource.
- Investigate possibility of selling energy and water to City.

Water Use

The Team focused on specifics related to water use:

- Supply : rainwater retention
- Don River connection? Pedestrian and bicycle path to the river. Stormwater or supply Stormwater is dumped into the Don River
- Minimize the use of purchased water in these buildings : Separate potable uses from non-potable. Use lower grade water for irrigation, heating and cooling?
- No rainwater leaves the site in a pipe.
- Reduce use and recycle used water from grey to black to bio-water treatment to irrigation to water table.
- Collect water off roofs
- Permeable surfaces
- Water storage for drought periods; ponds or cisterns
- Cisterns underground to be pumped up by pv source, for example?
- Use water for water cooling – more economical. Green roofs help cool the roof. Evaporative and sprinkler systems
- Fire protection dictates water pipe sizing
- 75000 sf of collector area takes up space for 30 parking spaces for storage
- Meter all water use. Charge for use or provide bonus for lower use. Use flow meters.
- Toilet to use surface water quality.
- Extra cost to developer for double piping system. Can't burden developer with extra costs for affordable housing. Must calculate the savings for the developer, perhaps in operating costs and make business case. E.g. Reduce chiller use through GSHP.
- Use Better Building Partnership. Take first phase to design and develop and cost for life cycle costing to use as case study for others. Use as R&D to eliminate some of the uncertainties. Pre-approved systems with City of Toronto. Eg cistern within block.

- City must be part of the creative team and be proactive. Need City to help change code enforcement questions.
- Need to set new terms of reference for teams who do infrastructure needs and costs. Pick team components to ensure specific expertise is included in precinct planning.
- Test on 6 block area to improve systems for next phase. 6-8 storey buildings, includes small commercial and ground floor retail.
- First look at the phase 1 site: Recycle materials from the existing buildings.
- Need to look at how the buildings are dismantled: brick, concrete, drywall, Use local labour and develop a business.
- Design ideas should be tied to communication strategies :
- Design phase one from the ground up. Max. of about 200 market units/yr.

The Team identified key considerations under 10 sub-headings:

1. Demolition:

- What is the breakdown of demolition costs? Where can the community benefit? Where do the profits go? A community fund for features which are not normally covered? Deal with liability issues now.
- What can be reused and where – on or off site. (Discuss with the Recycling Council of Ontario, who are carrying out a study now.) Brick for interior walls? Copper piping? A solid demolition waste plan needs to be developed. What % of concrete can be crushed and reused on site? Can it be used in other projects?
- Topsoil : Save for future gardens and to increase rainwater retention potential e.g. reuse from 4 inches to 8 inches. Where to store it?
- How to process demolition products? Where would the material be placed?
- Block 1: Use as a staging area for recycling brick etc. Noise and dust from demolition and crushing should be limited to this area. Reuse or store on site or invite a proposal for recycling on site. Shuter and River will be the new face and be the first construction. Park to be built early in the process. Protect trees and stockpile top-soil for reuse for stormwater retention.

2. Existing infrastructure:

- How to integrate with new systems? What needs to be removed? Can the future system be designed to avoid costly roadworks when repairs, additions are required? (A study should be done to determine the potential.
- Relocate tenants and commerce before any demolition.

3. Positioning of Buildings: Orientation for solar

- avoid western exposure for windows. Wind: take advantage of summer prevailing for cooling, and reduce winter storm exposures for walking and open spaces. E.g. parks Design trees to be easily replaced. Use canal system for tree roots, rather than container? (Oberlander – Vancouver) Design buildings so that systems can be easily removed or repaired. Design for deconstruction. Position to create social units. Allow garden and park space close to family units.

4. Flexibility and Accessibility:

- Design for universal access/different needs. Ensure potential for change over time.

5. Water Systems:

- How can they integrate with other systems such as heating and cooling? Beautifying? Play? Need to verify technical feasibility and life cycle and impact on City infrastructure and benefits for different departments.

6. Green roofs:

- For flat roofs as terraces. For sloped roofs, just collect the water for reuse. The water could be stored for on-site use or as thermal storage.

7. Surfaces:

- Paved surfaces to be permeable either asphalt or pavers. Green curbs and swales to retain water and allow it to infiltrate the ground. Use pv to pump irrigation water from below. Dry stormwater basin in the park area and roads around the park for large storms. Water feature in park. Use landscape to filter water.

8. Water Uses:

- Reduce water use on site: Living machine can recycle water. Where to place it? Roof or away from the building. Appliances, horizontal washers, GFX heat exchange. Possibility of clothes lines. Lines in bathrooms? Individual metering of water as it is used. Green wall which is irrigated by rain water. Step down of water use from highest quality to living machine. Dishwasher ? Use of water saving appliances? Energy star products. Use water cisterns as a heat sink for heating and cooling of the building.
- Green car washing facility using rain or grey water which is filtered and cleaned by living machine.

9. Solid waste recycling.

- City trying deep container recycling. Composting on site.

10. Utility corridor:

- avoiding disruption of digging and repaving and save on maintenance costs
- Use central corridor system for all services (tunnels)

These key issues were consolidated into a series of recommendations.

A phased approach was recommended:

- For Phase 1, establish recycle/re-use centre – possibly with private partnership (focus on on-site re-use and sale as a business)
- Inventory and protect trees and topsoil
- Demolish low density parts so that disruption is minimal and space is available for relocation
- Include public spaces early to create visible commitment for community use and service
- Original project will create infrastructure for subsequent parts of Phases 1

Specific water and waste targets were identified:

- Reduce water consumption to 1/3 of current
- Specify low water use fixtures and appliances (Energy Star)
- Metering all services for all customers
- Incentives for reduced use
- Establish full costing for resources
- Point of use hot water heating
- Heat recovery from sewage discharges
- Green car wash and community garden irrigation
- Two pipe systems
- Living machines and other on-site treatment

A number of stormwater strategies were also identified:

- Storm water will be retained and used on site
- Water will not leave site “dirty”
- Flat roofs will be greened to collect water (cisterns or on roof)
- Sloped roofs will collect water for cisterns for re-use
- Central green spaces will collect surface stormwater run-off during severe storms
- Use pervious surfaces for roads etc.
- Increase topsoil permeability and depth
- Use collected water for thermal heat sink, evaporative cooling, source of non-potable water, irrigation, toilets, laundry
- Connection to the City storm sewers as last resort

Solid waste strategies included:

- Waste is a resource
- Space in kitchens for recycling
- Space on-site for recycling and composting
- On-site compost factories
- Alternative collection strategies
- On site market gardens as market for compost

Process recommendations were also identified:

- Sustainability will be the primary theme of redevelopment
- Engage consultant to elaborate sustainability theme, develop business case and identify code priorities
- Establish a design review panel

TEAM 3 – ECOLOGICAL INTEGRITY

Team 3 developed a Vision Statement to guide the discussions:

Vision: Regenerate this area of Toronto, by adding: units, opportunities, and neighbourhood amenities. At the least without adding to current infrastructure demands, at the best by reducing them

The team focused on two main components related to ecological integrity and infrastructure demands:

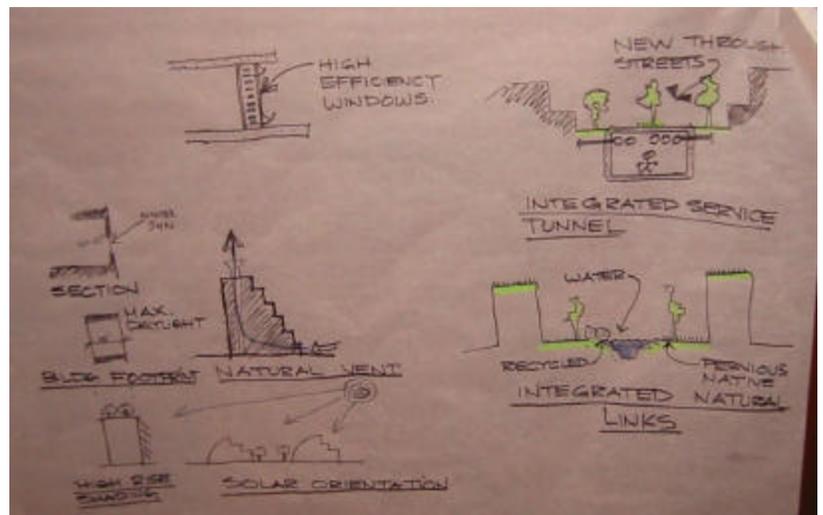
Landscape strategy,
Storm water management

The Team identified a number of major issue areas. Under each, a target was developed and ideas generated for meeting the target:

1. Identity

Target – turn negative image into a positive

- Balance between integration into broader community and creating unique identity, neighbourhood scale.
- Maintain identity in building expression, open space (courtyard design and scale)
- Create an atmosphere that supports public ownership of the space.



2. Energy Self Reliance

Target – No post development increase in reliance on grid.

- Consider on-site generation for peak shaving and some level of protection against complete loss of power during grid failure.
- Production may be from co-gen, methane (green waste digester), solar.
- Also consider district heating/cooling and the use of ground source for heating/cooling
- Reduce consumption through efficiency measures (green roofs, proper orientation, shading with vegetation). A significant reduction in energy use should be possible.
- Investigate opportunities for capital re-allocation from resulting reduction in the requirement for increase in local grid capacity.

3. Stormwater Management

Target – No storm water leaves the site.

- Team 3 recognized that the target may not be achievable at all times, however the intent would be to have the capability to treat 100% of the storm water in all conditions and at all times.

- Minimize impervious surfaces, incorporate green roofs, open spaces to act as temporary storm water retention, cisterns for rainwater capture.
- There are large open spaces for storm water filtration etc – possibility to make these multi-purpose, including sports, recreational areas etc.
- There should be an attempt to integrate storm water treatment with the Don Watershed. Flood controls may need to be built.
- Plumbing systems should treat grey water and black water separately. Grey water can be treated on-site and used for gardening purposes. – User awareness will be paramount in this kind of water treatment strategy.
- Conveyance of water using swales, ditches etc.
- Use of an exfiltration pipe system
- There may be an opportunity to treat storm water from surrounding buildings or neighbourhoods as well.
- The stormwater management strategy and discussion led to the development of a biodiversity strategy:
 - Green ways connecting to Don River and nearby parks and lake
 - Plant to establish habitat, food, pleasure, cooling, wind protection and water retention
 - Planting strategy integration with movement strategy, waste strategy, water strategy and energy strategy

4. Roads/Parking/Circulation

Target – to integrate traffic calming, connecting neighbourhoods and stormwater control in roadway design.

- Eliminate curbs and gutters where possible, use grassy swales, maximize on street parking, maximize vegetation along streets, and keep facades close to street.
- Use permeable paving for on-street parking.
- Small streets are expected to be one-way, while larger streets are two-way – two-way is preference for traffic calming and one-way require calming.
- No rear lanes.
- Bike routes/lanes should be given a priority.
- There is expected to be pressure on the City to minimize parking requirements.
- Parking should be available on all streets, however parking supply should be matched with need.
- Mixed vegetation, facades and fuzzy edges will be both pleasing and should act as natural calming zones

5. Solid Waste

Target – Retain and utilize nutrients on site

- Waste represents a significant opportunity and a key component of the energy strategy – will require a methane extractor
- The planning and costing of the system needs to be undertaken as part of a holistic plan that includes the energy strategy
- Intent is to have a small localized plant that serves the community (only). There is however the recognition that a methane extraction system could serve a broader community.
- Develop a black-water treatment capability, including living machine and polished leachate
- On-site composting for gardening

- Consider a small-scale market garden as an economic opportunity – assign a steward to manage it
- Incorporate the use of rooftop gardens wherever possible
- Also include a permanent greenhouse that will allow winter production as well.
- Integrate these ideas with the desire to realistic on-site economic activities that also recognize the ethnic diversity of the neighbourhood.

6. Building Form

Target – Establish a diversity of expression with visual cohesion

- Re-orient courtyard buildings to maximize the solar gain
- Shift the corridor on double-loaded apartment buildings to maximum number of units on south/west side and minimum (but larger) on north-east side. Re-orientation in and of itself will not necessarily result in a better energy use configuration. Individual suite design changes need to be made in concert with the building re-orientation.
- All roof areas should be used for solar collection or green roofs
- Scale the buildings to suit the locations within the development (park, street etc)
- Buildings should be considered sub-systems of the entire ecosystem of the site
- Buildings support vegetation physically while vegetation supports the buildings functionally (cooling, wastewater etc)

7. Economic Activity

Target – Increase economic activity on site

- Create market garden and grow products on-site
- Market tailored to ethnic needs, home based business etc.
- Consider some light industry
- Need to have retail on-site

TEAM 4 – SUSTAINABLE LIVING INFRASTRUCTURE

Team 4 started with a definition of sustainable development which was intended to provide context for the discussions:

“Meeting the needs of the present without compromising the ability of future generations to meet their own needs”
(World Commission on Environment and Development)

The Team initiated their discussions with a brainstorming session, prior to critiquing and developing propositions and recommendations.

Brainstorming:

- **SUSTAINABLE RELATIONSHIPS**
Community building spaces, integrative worship centre, common heart spaces
- **SUPPORTING EMPLOYMENT**
Tax Incentives: to business to employ locally, for business to relocate, companies (tech) incubators, support local small business
- **SUPPORTING TRAINING AND INSTITUTIONS**
Provide higher presence to Colleges and Universities
- **SUPPORTING LARGER FAMILIES**
Housing that acknowledges large aggregate families
- **RESPECTING DIVERSITY**
Provide flexible retail spaces, different ways of living
- **BUILD TO LAST MORE THAN 50 YEARS**
For communities to be truly sustainable, they should be capable of lasting at least 50 years, and preferably longer
- **FLEXIBLE HOUSING**
Housing that is built for long term use, different uses, growing and shrinking families, alternative living arrangements and financing models
- **THERMOSTAT WITH DOLLARS SPENT**
Users to understand the value of the energy spent to promote responsible energy usage
- **GARDENS**
Green roofs, allotment gardens, and a community greenhouse,
- **MARKETS**
What brings people together around common needs
- **BIKE TRANSPORT**
a system of bike paths through the neighbourhood and connecting to other neighbourhoods and to the Don River

- **PEDESTRIAN MOVEMENT**
a system of pedestrian paths through the neighbourhood and connecting to other neighbourhoods and to the Don River
- **CAR-FREE COMMUNITY**
Rental car service, co-op car ownership, shared car usage, and maintenance, community free-shuttle service
- **MAINTAIN EXISTING INFRASTRUCTURE**
Retain as much as can be maintained

Critique

- **DUNDAS STREET**
To be the HEART of the neighbourhood
- **REDESIGN OF THE PARK SYSTEMS**
To be community building
- **APPROVALS REDESIGN**
Design guidelines
- **TAX RESTUCTURING**
Incentives
affordability
- **SUSTAINABLE DESIGN GUIDELINES**
- **BUILDING INNOVATION**
international competition for building parcels
- **LONG-TERM MAINTENANCE**
Incentives
contracts
- **NEW DEVELOPMENT STRUCTURES**
Not-for-profit developers
international

Proposition

A new sustainable development requires commitment of funds dedicated for these goals and includes:

- **NEW DEVELOPMENT PROCESS**
- **NEW PRODUCT SPECIFICATIONS**
- **ECONOMIC SUSTAINABILITY**

A New Development Process would incorporate the following:

PHASED LONG TERM DEVELOPMENT

- Development not done all at once
- Standards for development which grow in complexity over time

APPROVALS REDESIGN

- Design guidelines

TAX RESTRUCTURING

- New loan structures

LONG-TERM MAINTENANCE

- Neighbourhood scale solutions

DEVELOPMENT STRUCTURES

- Not-for-profit developers
- International developers

DESIGN GUIDELINES

- Contractual arrangements

BUILDING EXPOSITION

- international competition for building parcels

New Product specifications would include the following

MATERIALS

- Non-toxic material
- Low voc
- High efficiency glass

HEATING/COOLING SYSTEMS

- Design with natural ventilation
- Low temperature heat radiation systems
- Integrative heating (co-generation)

CENTRAL SYSTEMS

- Integrated into the street allowance

NEW PARKING STANDARDS

- Unit/car ratio guidelines to limit cars on site

WASTE MANAGEMENT SYSTEMS

- Garbage collection
- Recycling
- Neighbourhood-centered wet disposal system

UNIT DESIGN

- Low temperature heat radiation systems
- Integrative heating (co-generation)
- New kitchens that allow bulk buying storage
- Flexible unit design to allow small to large and extended families
- Roof gardens or common allotment gardens
- Streets and driveways using permeable materials

Economic Sustainability, encompassing the tendering process includes:

INNOVATIVE FINANCING GOALS

- Forgivable loans

TAX STRUCTURE

- Lower taxes
- Reward reduction of taxes over long-term ownership/development

MARKET AND SALE OF PRODUCT

- Scale approach to development, fragmented development where land purchase, building construction and selling approach which minimize risk for developers

LAND OWNERSHIP

- Sell vs. lease land
- Condo vs. landownership

INVESTMENT INCENTIVES

- Attract buyers to the site “guilt-free community”
- Healthy living
- Existing residents
- Sustainable product developers, companies

DEVELOP SUSTAINABILITY TENDER

- Contractual agreements
- Evaluation criteria based on sustainability
- Local and international participants

LAND PRICE

- The land price is set and should not be part of the tender
- Quality vs. speculative land value

INNOVATION INCENTIVE

- Points for being innovative
- Density bonus
- Points for being sustainable

COMMUNITY SELF-DEVELOPMENT

- Existing inhabitants organizing a development
- Builders getting points for building for existing inhabitants (pre-sold groups)

SPECULATION PROTECTION

- Avoiding resale
- Speculative developments

Economic sustainability encompassing potential new management structures includes:

LAND TRUST CORPORATION

- Long-term management of the development process from beginning to end
- Benchmarking standards inherent in the mandate of the Land Trust Corporation
- Self-regulatory structures

CO-OPERATIVE INVOLVEMENTS

- Build on the success of the St. Lawrence Community – Building for groups

CONDOMINIUM STRUCTURES

- Common groups maintaining common areas

Team 4 developed a number of recommendations, representing their “to do” list:

Leadership required: appoint a Board and give them direction to take on the sustainability guidelines

- 1/3 Recruit knowledge-rich people on sustainability
- 1/3 Community members growing from existing to future residents
- 1/3 city, province, feds, TCHC, implementers
- Resources to obtain resources and educate the board
- Sustainable resource infrastructure
 - group of architects/designers/engineers
 - group of manufacturers
 - group of product designers
 - Community consultation on an on-going manner

Political Connectivity

- Connect to power structures
- Maintain direct connectivity between City and Board

Develop principles / standards

- Board must do this first
- Needs a coordinated vision
- Must have allocated funds

Set strategy and objectives in Funding, Buying, Selling

- Required by phasing approach

Establish “the project”

- What is the size of the developments
- How many people are involved
- Diversity of developers and community involvement

- Use precedents
 - International examples
 - Local examples



POTENTIAL LANDSCAPE STRATEGIES

Four major landscape themes emerge at Regent Park: Energy and Resource Use Efficiency, Working Landscapes, Cultural Amenity Landscapes and Natural Landscapes. The multi-functional nature of landscape elements frequently results in cross-over between the various themes, but for simplicity each will be described individually.

Energy and Resource Use Efficiency in architectural design is brought to fruition with smart integrated site planning and wise choice and use of appropriate landscape elements. Solar orientation and siting for protection against prevailing winter winds is important, as is deflection into the site of cooling summer breezes. Individual shade trees grown on the south side of buildings, with vines growing on walls and other forms of vertical gardens, planters and green roofs serve to protect buildings from climatic extremes. Buildings and landscape must be designed together to achieve optimum energy saving and resource use benefits in the use of fuel and water.

Working Landscapes result in local production and waste assimilation. The liquid waste stream includes storm water and household waste water. The use of many landscape elements from green roofs, vertical gardens, permeable hard surfacing, fine (micro) grading for bio swales, self-watering gardens, shallow sunken meadows that double as play fields, and leaky overflow storm pipes all contribute to enhanced infiltration with the ultimate goal of zero runoff. Cisterns and rain barrels, ideally placed as high as possible play an important role in providing high quality and efficient irrigation, with a potential added benefit for use in heat exchange.

On site treatment of household waste water can be achieved safely and efficiently by any number of treatment systems that process any or all of household greywater or blackwater.

The solid waste stream includes compostable organics (kitchen and garden waste), inorganic recyclables and other waste. Neighbourhood-scale composting is practical, efficient and completes the nutrient cycle by returning nutrients to gardens and landscape. This does not preclude the use of backyard composts by individual home owners.

Landscape production, usually for food biomass, typically takes place in community gardens. Economic opportunities should be further made available to entrepreneurial urban market gardeners to product good-tasting organic produce for a local community supported agriculture (CSA) or market. A community store could assist with distribution and selling of the produce. Further consideration should be given to allowing small numbers of urban-friendly small stock such as chickens, geese, rabbits, or Guinea pigs and the immeasurable benefits they provide in the form of garden cultivation, manuring, pest control, fresh food and education.

Landscape production need not be restricted to public gardens. Landscape plantings in parks and private areas can serve multiple purposes when fruit and nut trees are grown

for shade, micro climate control, wildlife habitat, and food production. Many different types and sizes of fruit and nut trees, shrubs, vines, perennial vegetables and herbs, annual vegetables and flowers, root crops and cover crops can be grown to contribute to a healthy, diverse edible landscape.

Cultural Amenity Landscapes typically refer to passive and recreational parklands and include special features such as markets, spiritual or healing landscapes, community gardens and trail systems. Local residents will shape such areas according to their preferences in accordance with local needs and bylaws.

Natural Landscapes are very important to provide refuge for native species and their supporting ecosystems. Two forms of **biodiversity** are recognized: natural and horticultural. Local core areas for natural biodiversity reside in the Don River corridor and its conjoining links back up into urban neighbourhoods. Native biodiversity can also be celebrated in urban settings in specialized habitat gardens and other landscape design. It is important that invasive exotic species be monitored and removed when managing natural habitats. Horticultural biodiversity is found in urban and agricultural settings. In both cases it is desirable to either create or manage existing landscapes that are diverse, self-managing, resilient and stable 'ecosystems'.

The design and orchestration of landscape as a whole must be given careful consideration at every level. Integrated design philosophies such as permaculture used in conjunction with user designs and adaptive management frameworks will provide a safe, efficient and productive landscape.

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