The Regional Municipality of York

Showcasing Water Innovation

INNOVATIVE SUSTAINABLE DEVELOPMENT APPROVALS PROJECT

A Market-based Approach to Stimulate Innovative Water-Conscious Design / Build in New Development.

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Executive Summary

Water conservation is a priority for the Regional Municipality of York, which to date has saved about 25.8-million litres per day through its *Water for Tomorrow* program. Building on the success of this program, the York Region embarked on the development of a Long Term Water Conservation Strategy (LTWCS) in 2011 that sets out ambitious water saving targets for the next 40 years. Innovative and progressive programming for water conservation is critical to creating a sustainable water supply and treatment system to meet a projected population growth of about 800,000 people by 2051.

Through the Ontario Ministry of the Environment's Showcasing Water Innovation initiative, York Region, in partnership with the Town of Newmarket, Lake Simcoe Region Conservation Authority (LSRCA), Toronto Region Conservation Authority (TRCA) and Mosaik Homes tested a fast-track municipal review and approvals process as a market-based incentive for water conservation and stormwater quality and quantity management practices in new construction. The project, titled Innovative and Sustainable Development Approvals (ISDA), set targets for indoor water use reduction and energy conservation above the current requirements of the Ontario Building Code (OBC) and site-level stormwater quality and quantity management beyond current standards for development within the Lake Simcoe region, as indicated in Table 1 below.

Table 1: Performance Targets

CATEGORY	CURRENTLY REQUIRED	FAST TRACK REVIEW AND APPROVAL MINIMUM TARGET
Stormwater:		
Quality – Phosphorous	Level 1 / post ≤ pre phosphorus Pre=4.2 kg/yr and Post=1.8 kg/yr	Further 10% reduction
Quality – Total Suspended Solids	80% removal of TSS	Further 10% reduction
Quantity – Runoff	2 to 200 year post- to pre- control	Same
Quantity – Erosion	5mm Rainfall runoff criteria	25mm Rainfall runoff criteria
Quantity - Infiltration	Water balance – maintain existing infiltration	Same
Water Conservation	Ontario Building Code	Minimum 25% reduction over Ontario Building Code standard
Energy Conservation	Ontario Building Code	Minimum 25% reduction over Ontario Building Code standard

Motivating the Market

Motivating water conservation and green building beyond provincial and municipal requirements must involve incentives. Through a literature review, interviews with builders/developers and research into leading North American jurisdictions in green building, fast track approvals was consistently identified as a highly effective means of stimulating innovative and beyond-code development.

The ISDA Residential Home Development

The Mosaik Home site is on the western edge of the Town of Newmarket which is located about an hour north of the City of Toronto and in the central portion of the Regional Municipality of York. The location of the Mosaik Home site at the western entrance way to Newmarket was a significant factor in the design of the site, most specifically, the elimination of a stormwater management (SWM) pond and the use of alternative Low Impact Development (LID) applications to infiltrate and treat stormwater.

The ISDA Process

A fast track review was provided for the Mosaik Home development application up to engineering submission. The fast track portion of the project was made possible by the following:

- Establishing performance targets for water and energy conservation within the homes and stormwater quantity and quality management on a site-level.
- An integrated design process that involved all the key review and approval agencies and the developer and his consultants in a working session to discuss options and approaches for meeting the targets.
- Establishment of an ISDA project committee comprised of key staff from the primary review and approval agencies that met on a bi-monthly basis to discuss options and to collectively resolve any issues that arose.
- Committee chairperson and 'expediter' who help shepherd the project through the review and approvals process and set the agenda for each ISDA committee meeting, ensuring the necessary individuals were present as needed.

ISDA committee members worked co-operatively to bring the Mosaik Home development application through to the first engineering submission in March 2013.

Home and Site Features

The Mosaik development is comprised of 185 total lots with 123 single-family detached homes and 62 single-family semi-detached homes. The homes themselves will be outfitted with water and energy saving fixtures and appliances. A summary of the site and individual home features that are beyond OBC, conservation authority and municipal building requirements is included in Table 2 below.

Table 2: Home and Site Features

In-Home Water & Energy Conservation	Stormwater Management
3.8 litre toilets	Bioswales – capture stormwater flows from some of the streets
Water saving, whole-home, furnace-mount humidifier	Rain gardens – located on the corner lots of some of the homes and designed to capture roof leader runoff and showcase the beauty of rain gardens
ENERGY STAR rated front-load clothes washers as an option	Exfiltration system – sub-surface perforated pipe under the storm sewer within the roadway that allows for the retention and slow infiltration of stormwater below ground
On-demand hot water recirculation system	Natural wetland feature – the natural wetland replaces a conventional SWM pond and incorporates habitat for local plant and animal species.
Programmable thermostat	Soil management – specialized top-soil removal and grading process to capture and preserve topsoil for reapplication to the site. 30 cm of top-soil will be reapplied to the site with a 5% organic content, improving stormwater infiltration and providing an improved growing media for vegetation
Drain water heat recovery system	
Additional insulation	

ISDA Project Results

Successes of the ISDA project may be summarized as follows:

- Establishing performance targets – This approach puts the onus on the builder to develop strategies and approaches to meet targets and reduces the burden on the municipality to prescribe specific measures for each new development.
- Integrated design process – having all key review and approval agencies represented at one design session creates a co-operative situation where all parties can work together to come up with innovative and viable options and approaches to meeting performance targets.
- ISDA committee – provided a mechanism to move the development project forward as having all key players at the table enabled a more expedient resolution of any issues that arose.

ISDA Project Challenges

As with any new venture there were challenges encountered and lessons learned. Below is a summary of the key challenges encountered with the ISDA project:

1. Fast track process (post first engineering submission) – Once the Mosaik Home application reached engineering approvals, the review and approval process that had been moving forward expeditiously, slowed significantly. A degree of inertia entered the process following engineering submission that may be attributed to the following factors:
    a. End of the regular bi-monthly meetings of the ISDA committee. At this point in the process, the Town of Newmarket, the developer and their collective consultants entered into the standard back and forth process of multiple engineering submissions and reviews.
    b. The site design employed LID and non-conventional stormwater management approaches. The limited exposure of Newmarket review and approval staff and consultants to these non-conventional techniques resulted in multiple iterations of the engineering design and re-design. This issue speaks to the problem posed by lack of

experience of review and approval agency staff and/or their consultants with non-traditional approaches as discussed in the first bullet below and the need for provincial guidance, support and resources for green building and innovative development.

- Perception of "unproven" or "innovative" approaches – There are entrenched perceptions amongst some key individuals involved in the review and approval process that non-conventional technologies and approaches are un-proven and therefore ineffective or worse, represent an unacceptable level of risk.

- Voluntary targets – Voluntary targets allowed for more discretionary approaches by the developer but also were not a requirement for the fast track review and approval and as such, several of the original performance targets will not be met. The voluntary approach was selected as it was a pilot project, site-specific conditions were not yet known and there was limited experience within some review agencies and their consultants with LID technologies and practices.

- Provincial policy and regulatory environment – The regulatory environment in Ontario is not conducive to innovative building practices beyond the minimum OBC requirements. Current regulations and processes contribute to a more adversarial approach which differs significantly from leading jurisdictions in green building where state policy and regulation encourage and foster green building and associated innovations.

Background and Context

York Region is one of the fastest growing regions in Canada with a current population of over 1 million people. The population is projected to increase by approximately 500,000 by 2031 and 800,000 by 2051. Without concerted efforts in water efficiency programming, demand on water supply and wastewater treatment systems is expected to increase in concert with population growth.

In 1997, York started developing a Long Term Water Supply Master Plan. The Plan was first implemented in 1998 and, since this time, water efficiency has been an integral part of the Region's long-term drinking water supply strategy.

The Region has no direct access to the Great Lakes. About 80% of York's water supply is provided through long-term agreements with City of Toronto and Peel Region. The remaining 20% of the Region's water supply is obtained from Lake Simcoe and local well fields.

Unfortunately, Lake Simcoe has been victim of significant eutrophication. The lake has seen a dramatic decline in some fish species, along with an increase in algae blooms and aquatic weed growth. As such, efforts must be made to mitigate the negative impacts associated with drawing water, discharging wastewater, and discharging stormwater into the lake.

York Region's *Water for Tomorrow* Program

York Region initiated the *Water for Tomorrow* program in 1998 in an effort to advance water efficiency in the Region, the idea being that the water we save today can help service the customers of tomorrow. Using less water contributes to a healthier watershed, provides energy savings (about 58% of the Region's entire energy demand is related to operating their water and wastewater systems), lowers GHG emissions, and helps defer or downsize future water treatment infrastructure needs.

Measures implemented as part of the *Water for Tomorrow* program include:

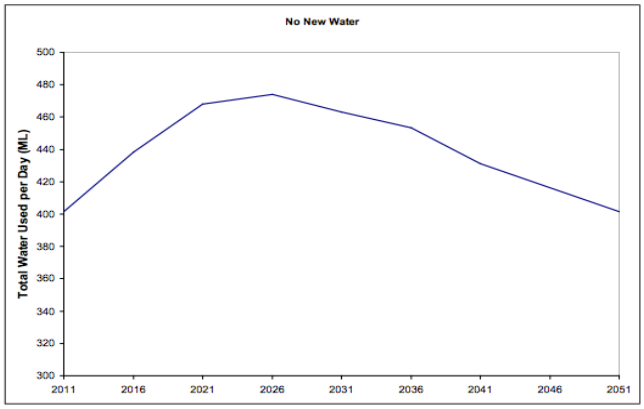
- replacing 106,000 inefficient showerheads with low-flow models
- installing 245,000 early-closing toilet flappers in existing toilets
- replacing more than 95,000 inefficient toilets with efficient WaterSense®-certified models
- providing free landscape water audits to more than 12,000 homes
- providing free garden design seminars to more than 10,000 homeowners
- offering a Regional Children's Water Festival to more than 65,000 Grade 4 students, and
- reducing system leakage by more than 8 million litres per day.

York Region estimates the measures implemented as part of their *Water for Tomorrow* program have saved a total of 25.8 million litres per day or an average of almost 24 litres per capita per day (Lcd). But, while the Region's *Water for Tomorrow* program has been highly successful, recent changes in the marketplace, such as an increasing market share for water-efficient WaterSense®-certified toilets, ENERGY STAR-certified clothes washers, ENERGY STAR-certified dishwashers, and efficient low flow-rate showerheads, have prompted the Region to re-direct their programming. The new direction involves market segmentation and targeting high water users across all sectors and market-based initiatives to foster market transformation – entrenching water conservation practices in the marketplace.

In 2010, York Region undertook best in class research of water efficiency and conservation programming in leading jurisdictions across the globe. This research informed the development of the Region's Long Term Water Conservation Strategy (LTWCS). The LTWCS builds on the success of the *Water for Tomorrow* program and provides overarching guidance for Regional water efficiency programming until 2051.

New water efficiency targets were established as part of the LTWCS, including residential demands (including indoor and outdoor) of no more than 150 Lcd by 2051 and non-residential demands of no more than 90% of current per customer demand by 2051. In fact, the Region has set an aspirational water saving target of using no more water in 2051 than was used within the Region in 2011 (Chart 1).

Chart 1 – "No New Water by 2051"



Showcasing Water Innovation

In 2011, York Region applied to the Ontario Ministry of the Environment's Showcasing Water Innovation (SWI) project – a provincial program to fund leading edge, innovative and cost-effective solutions for managing drinking water, wastewater and stormwater systems in Ontario. York's submission focused on Innovative and Sustainable Development Approvals (ISDA) - a project to test the effectiveness of offering a fast track municipal review and approval process as a driver for innovative, water-conscious design and build for a new residential development. York's submission was one of the 32 projects selected by the Ministry for inclusion in SWI.

York's ISDA Project began in March 2012. A project team was established with representatives from the reviewing agencies (York Region, Town of Newmarket, Lake Simcoe Region Conservation Authority (LSRCA), the Toronto Region Conservation Authority (TRCA) (not a reviewing agency for this project but providing low impact development (LID) expertise) and the developer, Mosaik Homes and its consultants.

One of the initial project tasks involved collecting and reviewing various green building criteria specifically pertaining to water conservation, stormwater mitigation and LID, and associated best technologies and practices. With the performance targets established, an integrated design process (IDP), held in conjunction with Enbridge's *Savings-by-Design* charrette, was held to scope the project and identify design and technology options for meeting the established targets. Drawing on research and the results of the design charrette, and with consideration to the site conditions, the project team developed water conservation and stormwater quality and quantity management targets above standard Lake Simcoe Protection Plan requirements to be met by the developer (Mosaik Homes). The original performance targets are presented in Table 3.

Table 3 – Performance Targets

CATEGORY	CURRENTLY REQUIRED	TARGET
Stormwater	Phosphorus: POST equal to or less than PRE	Further 10% Reduction
	Total Suspended Solids: 80% removal	Further 10% Reduction
	Runoff: 2 to 200 year POST to PRE control	Same
	Erosion: capture 5mm precipitation on site	Capture 25mm precipitation on site
	Infiltration: maintain existing levels	Same
Water Conservation	Ontario Building Code	Minimum 25% reduction over OBC
Energy Conservation	Ontario Building Code	Minimum 25% reduction over OBC

In addition to water savings, other shared goals of all public partners in the ISDA project were to:

- eliminate the need for a stormwater management pond
- protect watersheds and surface waters throughout the Region
- mitigate nutrient loadings to surface waters, specifically phosphorus loadings to Lake Simcoe, and
- reduce stormwater overland flows through enhanced at-source infiltration.

Subsequent to the IDP session, regular bi-monthly meetings of the ISDA project committee were held to track the project, address issues as expeditiously as possible and to ensure that all reviewers were aware of changes or modifications to the development application. Regular monthly meetings of the project team have been held to monitor the process, address any issues as they arise and secure early feedback from core reviewing agencies. The ISDA project organization and process is presented in Chart 2.

A Market-Based Approach

Market-based programming is the cornerstone of new water conservation efforts in York Region and the impetus for testing the fast track municipal review and approval process. Several different options were reviewed to incent beyond Ontario Building Code 'Green' construction for new development:

1. Reduced development charges
2. "Bonusing" – increased servicing allocation
3. Tax rebates / reduced property taxes
4. Fast track review and approval

The leading jurisdictions in green building in North America employ a fast track municipal review and approval process in combination with other incentives and supporting policy and regulations. San Francisco, considered the leading jurisdiction in green building and progressive integrated water management practices, was the first city in the United States to use fast track approvals to drive beyond code and regulation sustainable building and development. A summary of five of the leading green building jurisdictions in North America is included in Appendix A. It is worth noting that all employ a fast track municipal review and approval process.

Through subsequent interviews with builders/developers, a review of the Canadian Water and Wastewater Association's market transformation study[1] and research into leading North American jurisdictions in green building, fast track municipal approvals were consistently identified as the most

[1] Canadian Water and Wastewater Association and the National Water Efficiency Committee; *Water Conservation & Efficiency Market Transformation Study*. Prepared by Freeman Associates. June 2010.

effective means of stimulating innovative, beyond-code development. The advantages for municipalities and conservation authorities far outweigh the costs of implementing such a process. In conjunction to specific benefits of more sustainable development, lower demand on municipal infrastructure and enhanced protection of watersheds and surface waters, the economic benefits to the municipality are significant. As a study by the Architect Institute of America found, communities with a more efficient building permitting process can gain millions of dollars in tax revenues and significantly bolster their economic development. Further, the study found that implementation of a more responsive permit process over a five-year period could result in a 16.5 percent increase in property taxes and a 5.7 percent increase in construction spending.[2]

A summary of the advantages of a fast track review and approval process for municipalities, conservation authorities and builders/developers is provided in Table 4 below.

Table 4 - Advantages of a Municipal Fast Track Review and Approval Incentive

Municipality and Conservation Authority	Builder/Developer
• Drives sustainable building • Supports competition for green building within the industry • Supports innovation in the marketplace • Reduces onus of prescriptive management from government agencies • Places onus on the marketplace to develop solutions that are acceptable and approvable • Encourages development that create socially and ecologically vital communities • Generates economic return for the municipality	• Reduces approval times and associated carrying costs, liabilities, project management and administrative costs • Competitive advantage with early-to-the-market return on investment • Reduced time means fewer regulation and political changes over the course of a project

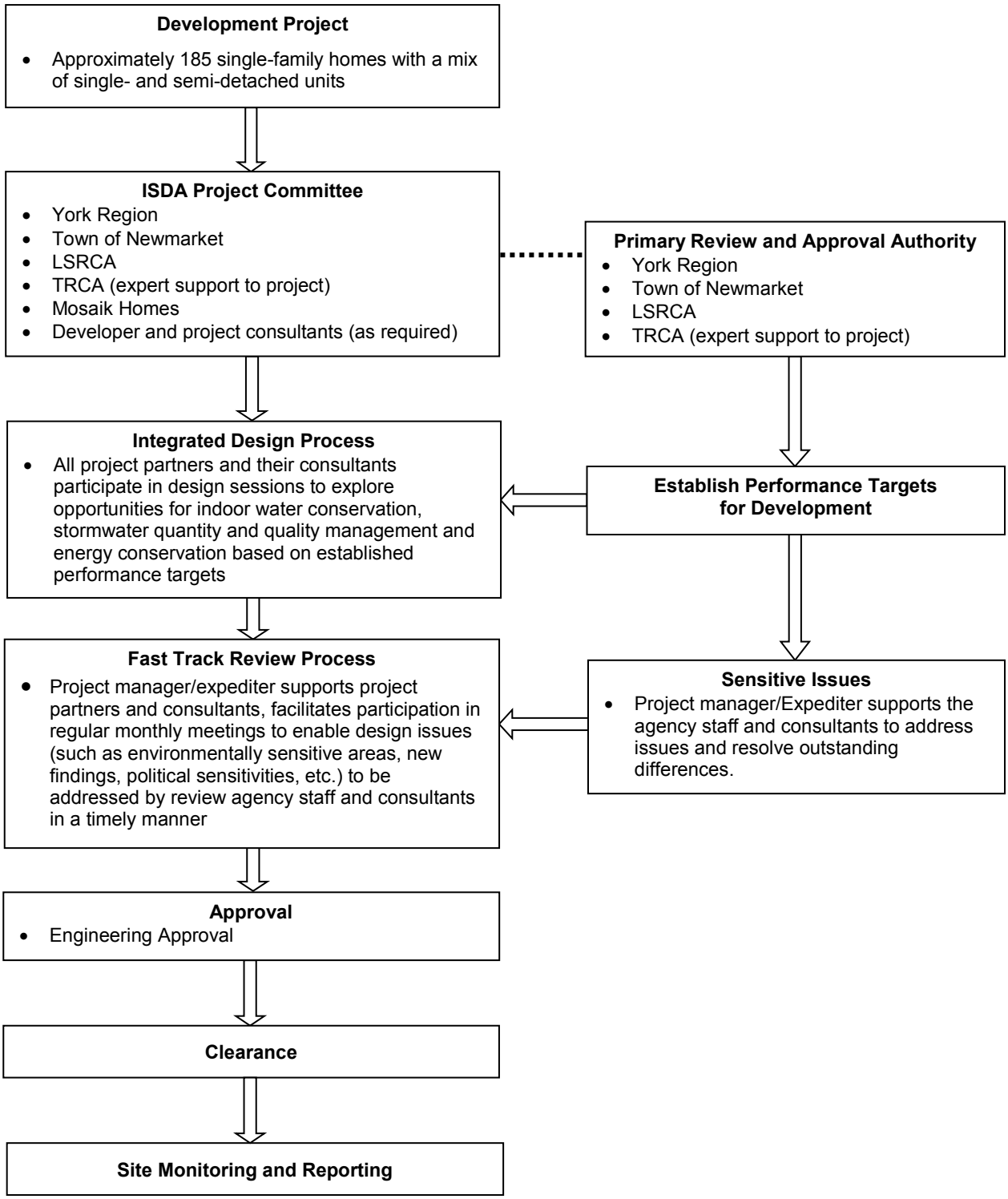
Project Organization and Process

Securing a development in the pre-application submission stage and the local municipal partner were the first steps in organizing the ISDA process. In order to have an effective process and provide a fast track review and approval, the participation of other key approval agencies, specifically the Lake Simcoe Region Conservation Authority (LSRCA) and the Toronto Region Conservation Authority (TRCA), was needed. The Town of Newmarket identified the Mosaik Home development as a possible project and subsequently the developer was brought on board.

The Town of Newmarket is the primary review and approval agency and is the recipient of all development applications for their municipality. York Region has specific review and approval responsibility for servicing allocation and Regional road related matters. The LSRCA and TRCA have responsibility for reviewing applications with consideration for watershed protection and specific requirements pertaining to the Oak Ridges Moraine and the Lake Simcoe Watershed. Representatives from these organizations, along with supporting project consultants, formed the ISDA Project Committee. Chart 2 illustrates the ISDA project organization and process.

[2] The Architect Institute of America; "*The Economic Impact of Accelerating Permit Processes on Local Development and Government Revenues". 2009*

Chart 2: ISDA Process and Organization



The key municipal approval agencies, specifically, the Town of Newmarket, LSRCA, York Region and TRCA[3], developed performance targets for water conservation, stormwater quality and quantity management and energy conservation (in conjunction with Enbridge). Table 3 provides a summary of the performance targets for the Mosaik Home residential development.

With performance targets established, the ISDA project committee and supporting project consultants participated in an Integrated Design Process (IDP) session in conjunction with Enbridge's "*Savings by Design"* charrette. The goal of this session was to scope the project and identify design and technology options for meeting the established project targets. The process allowed a review of the developers proposed approaches and a fulsome discussion of opportunities for meeting performance targets, identifications of potential issues or concerns and options for addressing the issues or concerns.

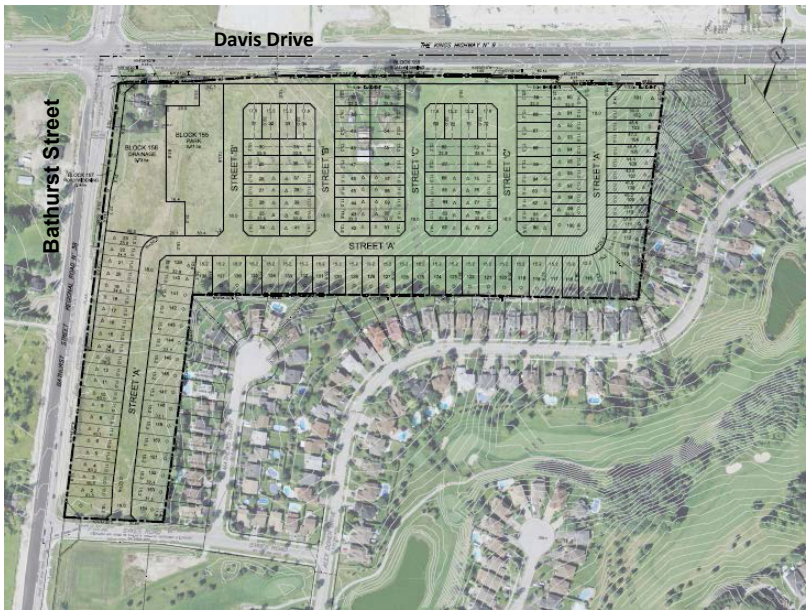
Subsequent to the IDP session, regular bi-monthly meetings of the ISDA project committee were held to track the project, address issues as expeditiously as possible and to ensure that all reviewers were aware of changes or modifications to the development application. The chairperson for the committee was responsible for setting meeting agendas, ensuring minutes were taken and circulated and keeping the development application moving through the review and approval process.

The Mosaik Home development application is now pending engineering approval following a fourth engineering submission to the Town of Newmarket.

Description of the Mosaik residential development

The Mosaik development is located in the Town of Newmarket, on the southeast corner of Davis Drive and Bathurst Street. Davis Drive is the main east-west arterial running through Newmarket and Bathurst Street parallels the western border of the Town (Figure 1). The location is the western gateway to Newmarket – a significant factor in the design of site.

Figure 1: Mosaik development site and location



[3] Although TRCA has no approval authority for this project, they provided expert guidance on stormwater management approaches and technology.

The Mosaik development is comprised of 185 total lots with 123 single-family detached homes and 62 single-family semi-detached homes. The homes with be outfitted with the following water and energy saving features:

- 3.8 litre toilets
- Water saving, whole-home, furnace-mount humidifier
- ENERGY STAR rated front-load clothes washers as an option
- On-demand hot water recirculation system
- Programmable thermostat
- Drain water heat recovery system
- Additional insulation

The site itself includes a 3.3-acre open space block that incorporates a 'natural wetland feature' in place of a conventional stormwater management (SWM) pond (Figure 2). A SWM tank has been added as a back-up system to mitigate risk of flooding from high volume 100-year storm events.

Figure 2: Natural Wetland Feature and Park

Several low impact development (LID) features have been incorporated into this development to help eliminate the need for a conventional SWM pond and to meet project targets for stormwater quantity and quality. The LID features incorporated into the site are as follows:

- Bioswales (bio-filters) - located at the northern end of the streets abutting/look onto Davis Drive, eliminating the need for storm sewers on these streets (referred to by the developer as "window streets"). Bioswales help remove silt and pollution from surface water runoff. They consist of a slightly depressed drainage course with gently sloped sides. They are typically filled with vegetation, compost and or riprap. The bio-swale is designed to maximize the time water spends on site, which helps trap silt. Biological factors in the bio-swale can also contribute to the breakdown of certain pollutants (Figure 3).

- Rain gardens - eight rain gardens are located at the corner of each window street. A rain garden is a depressed area of a property that captures rainwater runoff from impervious areas such as roofs, driveways, sidewalks, and compacted lawn areas. Stormwater entering the rain garden is allowed to soak into the ground as opposed to flowing into storm drains or over ground surfaces and potentially causing erosion, water pollution or flooding. Native plants are recommended for rain gardens because they generally do not require fertilizer and they are more tolerant of the local climate, soil and water conditions. The plants help take up excess water flowing into the rain garden and their root systems enhance infiltration, augment soil permeability, provide moisture redistribution and sustain diverse microbial populations involved in bio-filtration (Figure 4).

- Exfiltration system – The exfiltration system is a sub-surface, engineered detention and infiltration pipe located below the storm sewer/frost line with sufficient volume storage to control site runoff captured in the catch basins. The underground perforated pipe will discharge and infiltrate captured stormwater at a controlled rate into the gravel trench, whereby the stormwater will then infiltrate into the surrounding native soil. The exfiltration system will help reduce the volume of surface run-off that is discharged from the site, as well as assist in recharging groundwater tables. (Figure 5).

- Soil management – Topsoil management on the site will be accomplished via a two-step process. The first step will involve stripping and storing the nutrient rich topsoil to a depth of about 30 cm; the second step will involve stripping/moving subsoil layers as required to reach grade. The topsoil will be stored in small windrows (vs. a traditional large pile) to reduce nutrient degradation and maintain the health of the topsoil. The topsoil will be tested prior to reapplication on the site and nutrient levels will be improved if necessary. Topsoil will be reapplied on site to an average depth of 30 cm, twice the standard depth of application. The added depth and improved quality of the topsoil will enhance infiltration and provide an improved growing media for planted vegetation.

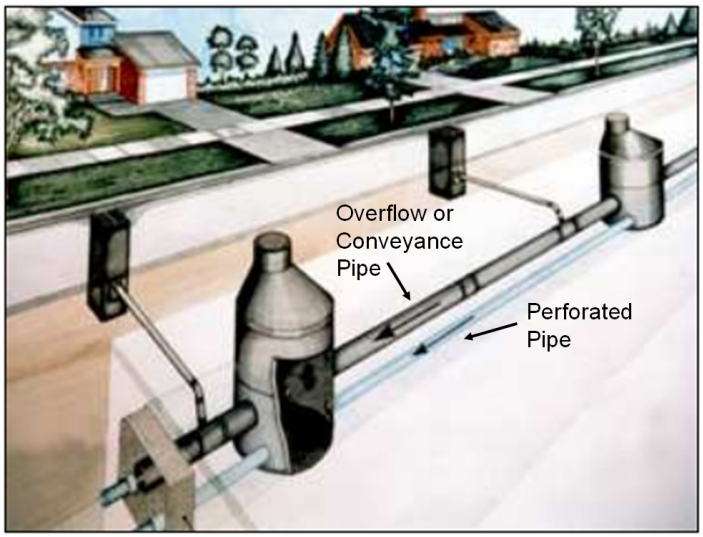
Figure 3 – Bio-swale

http://water.epa.gov/infrastructure/greeninfrastructure/gi_what.cfm

Figure 4 – Rain Garden

http://www.ci.burnsville.mn.us/DocumentCenter/Home/View/449

Figure 5 – Exfiltration System



Source: Sustainable Technologies Evaluation Program 2013

Figure 6 provides a site-wide schematic of the LID features and conventional stormwater management elements to be incorporated into the development.

ISDA Project Results

The ISDA pilot project has resulted in a single-family housing development with features that will take the homes beyond OBC requirements and enhance the stormwater quality and quantity management of the site.

Performance Targets

The 25% water and energy conservation targets of the homes are expected to be met, and in the case of energy, an additional 3% savings is expected. Performance targets for stormwater capture established at the outset of the project were revised due to limitations imposed by site topography and soil conditions.

The current requirement as identified by the Toronto Regional Conservation Authority is the capture of the first 5mm of precipitation on site. The original target was the capture of the first 25mm of precipitation on site; however, the target has been reduced to the capture of only the first 10mm of precipitation on site. The following table identifies the original efficiency targets established at the project outset and the current projected achievement.

Table 6: Expected Stormwater Quantity and Quality Achievements

CATEGORY	ORIGINAL TARGET	PROJECTED ACHIEVEMENT
Stormwater	Phosphorus: 10% Reduction Post vs. Pre	8% Reduction Post vs. Pre
	TSS: Further 10% Reduction beyond current requirement of 80% removal	16% Reduction beyond current requirement of 80% removal
	Runoff: Same as current requirement	Runoff: Same as current requirement
	Capture first 25mm precipitation on site	Capture first 10mm precipitation on site
	Infiltration: maintain existing levels	Exceed pre-development infiltration rate

ISDA Process Challenges

The Mosaik development project has moved forward and the project committee overall has been pleased with the usefulness of the process and the willingness of the developer to explore innovative solutions, albeit with the encouragement of team members. Challenges faced during the ISDA process may be summarized as follows:

- A viewpoint that a fast track review process is not viable, particularly in a two-tier system with multiple review agencies (regional, municipal and conservation authority).
- A viewpoint that the current review and approval process is effective and that the provision of a fast track review and approval for green building applications would create a significant cost and administrative burden for municipalities and an unfair or undemocratic review process.
- The lack of dedicated review and approval agency personnel with specific expertise in green building. The demand on human resources within review agency departments is significant and despite the expertise of staff within these agencies, overall they have limited knowledge and experience with many of the green development technologies, equipment and approaches, leading to an understandable resistance towards them.
- The flexible and voluntary nature of the program, allowing targets and design/development approaches to be adjusted as required to meet specific site conditions. There was significant opportunity for program partners to "reconsider" their original commitment to the program and to opt to take a more conventional approach. Many of the more innovative elements originally included in the program have been excluded from the final program design, such as the site-wide use of rain gardens on home properties and on the municipal right-of-way, the use of permeable hardscapes, and the use of drought-tolerant grass seed in place of sod.

Effective Elements of the ISDA Project

There were several key components of the ISDA process that proved effective and resulted in faster resolution of issues as they arose and led to more innovative design solutions. The effective elements of the ISDA project may be summarized as follows:

- Establishment of performance targets placed the onus on the builder/developer to determine the design, technology, approaches and equipment needed to meet the targets and the responsibility to prove the efficacy of the solutions proffered. This approach is less prescriptive that requiring specific measures with assigned point scores as is common in municipal and third-

party green building programs and represents a reduced administrative burden for municipalities.

- The integrated design process (IDP) at the beginning of the project resulted in the identification of potential issues with the development and a collective discussion and exploration of possible solutions.
- The ISDA Committee comprised of key review agency core staff and consultants meeting on a bi-monthly basis throughout the project (up to first engineering submission) kept the project moving through the process and ensured any issues or concerns were addressed expeditiously. Having key decision-making parties at the table enabled quick resolution of problems and avoided the typical "back and forth" that occurs between review agencies in the current process.

Lessons Learned

Innovation and high performance green building will become a standard only with significant provincial and municipal investment in change. Proven and innovative green building technologies and approaches are in use in leading jurisdictions throughout the world. Many leading jurisdictions in the United States and a few in Canada have recognized that in the 21st Century, green building is the only viable option for new development. Cost is a factor of supply and demand and as San Francisco, Chicago, Seattle, New York, Berkeley, and Portland, to mention a few, have proven, create the opportunity for growth in green building and the market will respond with amazing results. A review of leading jurisdictions in green building and integrated water management identified key drivers for green building, including the following:

- Visionary leadership is the common element within all top performing green building jurisdictions in North America and indeed, the world over. The commitment to green building starts at the top and is fostered throughout the organizations
- Investment in personnel, training and skills development, and access to external experts is a consistent theme amongst leading jurisdictions in green building
- In the United States, state-level support - financial, policy and regulatory, and guidance – provides a foundation and in some cases, impetus for the green building initiatives in leading local jurisdictions
- Innovation is encouraged and associated risks are evaluated and managed. Resources are brought to bear, for expert evaluation, testing and monitoring. Innovation committee comprised of experts representing a broad range of fields with access to external expertise are utilized by several of the leading jurisdictions.
- Fast tracking of municipal review and approvals is the most effective non-regulatory mechanism for driving beyond jurisdictional requirement building. A review of leading jurisdictions in both green building and integrated water management in North America indicates that 9 out of the top 12 (New York City represents 2 as it is divided into downtown and mid-town), provide an fast track review and approval process for green buildings[4]. Over 45 jurisdictions in the US offer fast track or priority review and approval for green buildings. In Canada, only Ottawa has established a formalized fast track process for green buildings. It is worth noting that San

[4] Cushmans and Wakefield's Green Building Opportunities Index
[2] San Francisco's Mayor's Energy Task Force Recommendation Report (2011)

Francisco was the first city in the US to establish a fast track review and approval process for green building and is considered the leading jurisdiction in North America and was identified as the top city in the world for green building policy by the World Green Building Council. San Francisco was also the first jurisdiction to establish specific, site-based water conservation and LID requirements for all buildings.[5]

Summaries of research finding from market research involving the leading jurisdictions in North America in green building are included in Appendix A.

Summary

Green building and innovative integrated water management should be viewed not as a challenge to be met but as an opportunity yet to be realized in Ontario. Green building provides for healthy, more sustainable communities, economic growth, and more vital natural systems A vibrant green building marketplace translates to higher employment in skilled and unskilled labour, specialized manufacturing needs, requirements for technology education and training, more opportunities for innovation and research and development in the manufacturing and service sectors.

With growth in York Region projected to increase by 800,000 people over the current level of approximately 1 million in the next 40 years; green building represents a significant opportunity to drive economic prosperity through the development of markets for green building products and services (water, energy, transportation, etc.), lower the burden on Regional and local municipal infrastructure and resources, and create vigorous and more sustainable neighbourhoods. Green building demands the use of new technology and approaches and impels innovation, which in turn creates vast opportunities within the manufacturing and service sectors and the post-secondary institutions which supply the workforce. Achieving green development may challenge current thinking and resources, but the opportunities it represents are undeniable and substantial.

Appendix A

MARKET RESEACH: LEADING NORTH AMERICAN JURISDICTIONS IN GREEN BUILDING AND INTEGRATED WATER MANAGEMENT

MARKET RESEACH: LEADING NORTH AMERICAN JURISDICTIONS IN GREEN BUILDING AND INTEGRATED WATER MANAGEMENT

CRITERIA	CHICAGO
1. When Program Started	In 2001, the Chicago City Council passed the Chicago Energy Conservation Code, an amendment to the Municipal Code of Chicago, establishing minimum energy conservation standards for new construction and renovations. In 2004, the Chicago Standard was announced adopting selected points from the LEED Green Building Rating system applicable to building in Chicago. In, addition, it required all municipal building to be designed to meet LEED certification or higher. The code was updated again in 2008 establishing minimum regulations for the **design** of energy-efficient buildings and systems. The code provides multiple paths for demonstrating code compliance including prescriptive, performance, and acceptable practice approaches.
2. At the municipal level, what was the impetus for the green building program?	Chicago's original interest in sustainability stems from Mayor Daley's keen interest in beautification which evolved into more sustainable initiatives due to growing concern about and understanding of the urban heat island effect, stormwater overflows and basement flooding, climate change and remaining globally competitive.
3. Key drivers for green building in their jurisdiction. i.e. defined by LEED, Municipality or Other	A key driver behind the number of green roofs and LEED certified buildings in Chicago is the Sustainable Development Policy. This policy was implemented in June 2004 and applies to all projects receiving financial assistance from the City and all projects that are Planned Developments and located within the Lakefront Protection Area. A recent study concluded that 82% of the green roofs that have been constructed were due to this policy. A similar percentage may be applicable to the number of LEED certified buildings. **City of Chicago Sustainable Development Policy Matrix**: This policy applies to all new Redevelopment Agreements, Planned Developments, Site Plan Approvals and Amendments to existing Planned Developments reviewed by the Department of Housing and Economic Development and the former Department of Zoning and Land Use Planning's weekly Design Review Committee after December 1, 2007. http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/GreenMatrix2010.pdf **City of Chicago Building Codes** are divided into 3 key components: 1) The Municipal Code, 2) Chicago Zoning Ordinance and Land use Ordinance and 3) Building Code and related excerpts of the Municipal Code
4. Significant program components or key strategies used to transform marketplace (i.e. LEED, regulations, ordinances, incentive for builders, building code changes etc.)	**Green Permit Program**: Qualified projects can receive permits in less than 30 business days or in as little as 15 business days. The number of green building elements included in the project plan and project complexity determines the length of the timeline. In addition, projects which meet the most stringent sustainability guidelines (green roofs, rainwater harvesting, solar panels, solar thermal panels, wind turbine and geothermal systems) may also qualify for a partial waiver of consultant code review fees, up to $25,000. **Developer Services Permits:** The Developer Services permit process is designed to meet the special needs of large and complex construction projects. The process is designed to be predictable and flexible. A DOB Project Administrator (PA) is assigned to manage the permit process, perform the zoning review and provide a single point of contact during the entire process. The plan reviews can

4. Cont'd.	be performed by DOB plan examiners or third party consultant architectural and engineering firms. Each project is evaluated for conflicts of interest prior to assignment of a consultant reviewer. Eligible projects include high-rise buildings, mercantile buildings with more than 150,000 square feet, other occupancies with more than 80,000 square feet, buildings with foundations deeper than 12 feet, and residential projects that contain more than 25 units. **Chicago Green Homes program:** A checklist-based rating system for measuring a green building's elements developed by the Chicago Department of Environment. Training and education materials are available through the Green Homes program free of charge. Program is currently suspended. **E-Plan Program:** Implemented in 2012. E-Plan is a web-based electronic plan and document workflow solution that allows citizens and City staff to initiate and complete the building permit plan submission, review and approval process on-line. **Self-Certification:** Program for eligible projects. Self-certification simplifies the building permit review process by having a licensed architect or structural engineer of record take full responsibility for code compliance. Plan reviews are eliminated by allowing the Processional of Record to certify that the project complies with the Chicago Building Code. **Green Roof Initiative and the Green Roof Grants Program**: In 2003, The Chicago Department of Planning and Development began actively encouraging green roofs through the "green roof policy matrix" (any project that receives public financial assistance or is in a Planned Development or Lakefront Protection Ordinance Development has to contain certain design elements, including a green roof). In 2005, the Chicago Department of Environment began awarding $5000 grants to residential and small commercial building (less than 10,000 sq. ft.) owners who installed a green roof. Since 2005, 72 green roof grants have been awarded. Although the program has been exceptionally successful, it is no longer being funded because of City budget constraints. **Retrofit Chicago –** This program supports the "*National Better Buildings Challenge"* and is intended to reduce building energy use in Chicago by 20 percent in 24 million square feet within the next five years. The initiative targets Commercial, Residential and Municipal buildings and provides many incentives such as free energy assessments and reports of cost-effective energy-saving recommendations, low-cost financing, rebates from utilities to reduce up-front cost, construction oversight and building performance tracking to ensure savings. The program is funded through the Chicago Infrastructure Trust, an innovative way to leverage private investment for transformative infrastructure projects. The Chicago Infrastructure Trust will provide advantaged financing, enabling each project to customize a financing structure using taxable or tax-exempt debt, equity investments and other forms of support. Each project will be coordinated with the City and its sister agencies' long-term plan for transformational infrastructure investments. The Chicago Infrastructure Trust was created in concert with the private sector, non-profit organizations, and union leaders. **Chicago Green Bungalow Initiative.** A pilot project to determine if Green Building Principles could be applied to existing homes. **Chicago GreenWorks Award** - bi-annual awards program created to recognize outstanding examples of green building in Chicago's private sector. **Chicago Center for Green Technology** promotes and advances sustainable homes, workplaces and communities through innovative offerings including: Green Tech U seminars and the Green Building Resource Center. CCGT is free, open to the public and continues to serve as the most comprehensive green design educational resource in the Midwest. **Small Business Improvement Fund:** The fund utilizes revenue from Tax Increment Financing (TIF)

4 Cont'd.	and supports commercial and industrial properties, as well as tenants, within specific TIF districts to upgrade their facilities. Certain energy efficient upgrades, such as energy efficient windows, HVAC systems, and roofs may qualify for funding under this program and are encouraged. The grants can cover up to 75% of the costs of the upgrades and are paid after the work is completed and expenses paid-up. SomerCor 504 Inc. administers the Small Business Improvement Fund for the City of Chicago. **Clean Energy Community Foundation Grants**: (State) Grants support both energy efficiency and renewable energy projects, like wind, solar (both solar thermal and solar electric applications), biomass, fuel cells and other forms of distributed generation. Award amounts will be considered on a case-by-case basis, taking into account cost-effectiveness of the project, project innovation, simple project payback, other sources of funding and owner contribution. The Illinois Clean Energy Community Foundation (ICECF) was established in December 1999 as an independent foundation with a $225 million endowment provided by Commonwealth Edison. **Renewable Energy and Energy Efficiency Project Financing:** (State Bond Program). The Illinois Finance Authority (IFA) is a state conduit issuer of tax-exempt bonds & credit enhancement for projects in Illinois. The IFA funding is available to commercial as well as non-profit entities as long as those entities meet strict eligibility criteria. In 2012, the legislature also added schools and community colleges to the list of eligible entities for energy conservation funding. Entities seeking funding must demonstrate that their projects provide a significant public benefit for the citizens of Illinois. **Community Solar and Wind Grant Program**: (State) The Illinois Department of Commerce and Economic Opportunity (DCEO) offers grants for community-scale solar and wind projects located in Illinois. Eligible businesses can apply for up to 30% of project costs for solar thermal and wind and 25% for solar PV, and government and nonprofit entities can apply for up to 40% of project costs. **Efficient Living Construction Grant:** (State) The Department of Commerce and Economic Opportunity (DCEO) provide grants through the Energy Efficient Affordable Housing Construction Program. Under this program, grants are provided to Illinois based non-profit and for-profit housing developers to include energy efficient building practices in the rehab or new construction of affordable housing units. This grant helps offset the incremental cost of going from typical construction to energy-efficient construction. **Public Sector New Construction and Retrofit Program:** (State) Public sector grants for new construction and major renovation projects that exceed 15,000 square feet and produce electrical or natural gas savings through efficiency improvements in buildings, equipment, and processes. **School Energy Efficiency Grant Program: (**State) The Illinois State Board of Education (ISBE) is offered $50 Million in Energy Efficiency Matching Grants for Illinois Schools. The initial round of grants opened on October 12, 2010 and concluded with applications due on or before January 15, 2011. The grants were a dollar-for-dollar state matching grant program for energy efficiency projects in schools. All state funded educational institutions within the state of Illinois were eligible. Grant awards were available up to $250,000 and can be used for insulation, windows, doors, energy controls, lighting, energy recovery, energy conservation, alternative energy systems and other projects designed to reduce energy consumption. **Green Energy Loans:** (State) **Business** owners, non-profit organizations, and local governments seeking loans for certain energy efficiency and renewable energy upgrades may apply for a rate reduction, in partnership with eligible banks in the state. Loan amounts range from $10,000 to $10 million. To qualify, the project must meet certain criteria.

	Energy Impact Illinois Rebates: (State) The Energy Impact Illinois program offers rebates for implementing energy efficient measures. Commercial, industrial, and multifamily residencies can receive up to $100,000 per project based on performance and energy efficiency savings.
5. Major program component costs & resources	**City of Chicago Sustainable Development Policy Matrix**: http://www.cityofchicago.org/content/dam/city/depts/zlup/Sustainable_Development/Publications/GreenMatrix2010.pdf
6. Verification & Monitoring of Green Building Program	**Verification:** 3rd party Building Certification can be LEED, Energy Star or Chicago Green Homes. **City of Chicago Building Codes** are divided into 3 key components: 1) The Municipal Code, 2) Chicago Zoning Ordinance and Land use Ordinance and 3) Building Code and related excerpts of the Municipal Code. The code provides multiple paths for demonstrating code compliance including prescriptive, performance, and acceptable practice approaches. **Self-Certification Program** for eligible projects. Self-certification simplifies the building permit review process by having a licensed architect or structural engineer of record take full responsibility for code compliance. Plan reviews are eliminated by allowing the Processional of Record to certify that the project complies with the Chicago Building Code. **Compliance with the Energy Code** is mandatory and is enforced. Plans submitted with a compliance statement by a Registered Energy Professional proceed through the permit process without delay. Plans subject to the Energy Code must be submitted with either a Compliance Statement or a Statement that Compliance is Not Required. **Building Energy Use Benchmarking Ordinance of the City of Chicago** becomes effective June 1, 2014. The ordinance requires building owners to benchmark their buildings' energy usage for the previous calendar year. Owners must have energy usage data verified by a licensed engineer or architect, and must be retained for three years. Energy-usage data is to be compiled to a report to the commissioner and chief sustainability Officer, and will likely be made available to the public.
7. Metrics	Metrics to illustrate the success of Developer Service Permits, Green Building Permits and Standard Permits: https://data.cityofchicago.org/Administration-Finance/Performance-Metrics-Buildings-Time-to-Issue-Develo/u4s8-ksjj https://data.cityofchicago.org/Administration-Finance/Performance-Metrics-Buildings-Time-To-Issue-Green-/z2qz-687z https://data.cityofchicago.org/Administration-Finance/Performance-Metrics-Buildings-Time-to-Issue-Standa/9nwg-eewc
8. What has worked well & why?	*Our experience has been that policy has worked better for incentives, especially when it involves emerging technologies like green roofs and LEED certification. This was especially true when both were relatively unknown. Now, there tends to be more demand for these items and there is also a lot more knowledge and sophistication in the design industry, especially in Chicago where these technologies/strategies have been required for almost a decade.* In June 2001, the City of Chicago signed an agreement with Commonwealth Edison and the Environmental Resources Trust to purchase 20% of its electricity from clean, renewable resources by the end of 2005. The city reached this goal in 2008, the city with a purchase of 215 million kWh of wind and biomass energy from MidAmerican Energy. The city's plan is to maintain that 20% level for the foreseeable future. As of October 2011, the City was purchasing 20% of their power from renewables.

9. What has not worked well & why?	**The Chicago Climate Exchange:** a pilot program for the trading of greenhouse gases in the U.S., shut down in 2012 for lack of legislative interest. The Chicago Climate Exchange is a voluntary North American carbon cap and trade system with hundreds of private and public sector members. As a member of the Chicago Climate Exchange (CCX), the City participants are obligated to reduce greenhouse gas emissions associated with municipal operations, including consumption of natural gas, electricity and motor fuels. If the City does not achieve the required reductions, it must purchase carbon credits from other members that have exceeded their targets. **Contractual Assessments for Renewable Energy and/or Energy Efficiency**: Property-Assessed Clean Energy (PACE) financing effectively allows property owners to borrow money to pay for energy improvements. The amount borrowed is typically repaid via a special assessment on the property over a period of years. *Note: The Federal Housing Financing Agency (FHFA) issued a statement in July 2010 concerning the senior lien status associated with most PACE programs. In response to the FHFA statement, most local PACE programs have been suspended until further clarification is provided.*
10. Future Direction	Continue to advance work on the **Chicago Climate Action Plan.** The plan is a set of strategies intended to guide efforts for reducing greenhouse gas emissions. The strategies focus on improving energy efficiency and conservation in homes and businesses. **Energy Efficient Buildings: MITIGATION STRATEGIES FOR 2020** **1. Retrofit Commercial and Industrial Buildings:** Retrofit 50 percent of commercial and industrial building stock, resulting in a 30 percent energy reduction = 1.3 MMTCO2e reduction **2. Retrofit Residential Buildings:** Improve efficiency of 50 percent of residential buildings to achieve a 30 percent reduction in energy used = 1.44 MMTCO2e reduction **3. Trade in Appliances:** Expand appliance trade-in and light bulb replacement programs = .28 MMTCO2e reduction* **4. Conserve Water:** Improve water use efficiency in buildings as part of retrofits = .04 MMTCO2e reduction* **5. Update City Energy Code:** Align Chicago's Energy Conservation Code with the latest international standards = 1.13 MMTCO2e reduction **6. Establish New Guidelines for Renovations:** Require all building renovations to meet green standards = .31 MMTCO2e reduction **7. Cool with Trees and Green Roofs:** Increase rooftop gardens to a total of 6,000 buildings citywide and plant an estimated 1 million trees = .17 MMTCO2e reduction* **8. Take Easy Steps:** Encourage all Chicagoans to take easy steps to reduce their emissions by one metric ton of CO2e per person = .8 MMTCO2e reduction*
Contact/Guidance	**A Quick Guide for Municipalities and Entities Tracking Sustainability Performance:** Lessons learned from Chicago, 2012 http://www.chicagoclimateaction.org/filebin/pdf/report/CCAP_PM_Lessons_Learned.pdf

MARKET RESEACH: LEADING NORTH AMERICAN JURISDICTIONS IN GREEN BUILDING AND INTEGRATED WATER MANAGEMENT

CRITERIA	BERKELEY CALIFORNIA
1. When Program Started	Green Building Policy established in 2003. The goal of the City's green building policy as identified in the Green Building Initiative and the Climate Action Plan (CAP) has been to "make green building business as usual" by maximizing green opportunities for all building projects.
2. At the municipal level, what was the impetus for the green building program?	In 2006, Berkeley voters issued a call to action on the climate change challenge by overwhelmingly endorsing ballot Measure G. (Greenhouse Gas Emissions). The mandate was simple but bold: Reduce our entire community's greenhouse gas emissions by 80% below 2000 levels by 2050. The Berkeley Climate Action Plan was written through a community-wide process and was adopted by City Council on June 2, 2009. The community's target for the year 2020 is to reduce community-wide GHG emissions 33% (below 2000 levels).
3. Key drivers for green building in their jurisdiction. i.e. defined by LEED, Municipality or Other	1. Increase and enforcement of minimum standards in energy performance. (RECO & CECO) 2. Remove barriers through process improvements (permitting requirements, zoning changes, technical assistance & voluntary one-on-one green building consultations. 3. Supporting market transformation by taking a leadership role in energy rating by benchmarking municipal buildings. 4. Cal Green has helped to propel green building forward.
4. Significant program components or key strategies used to transform marketplace (i.e. LEED, regulations, ordinances, incentive for builders, building code changes etc.)	**Climate Action Plan**: Adopted by the Berkeley City Council on June 2, 2009, the Berkeley Climate Action Plan is the result of the community-based climate action campaign that the Berkeley voters set in motion. The plan is rooted in the vision for a sustainable Berkeley that not only reduces greenhouse gas emissions but also creates a local vibrant, healthy community. **Building Codes**: Berkeley follows the California Building codes for Residential, Mechanical, Electrical, Plumbing, Energy, and Green Building. **Ordinances, Rules and Regulations:** Berkeley has a comprehensive list of requirements to drive all types of green building and construction. These rules apply to new building (all types), renovations, landscape, and transfer of property ownership. Key ordinances & requirements are noted below: **Green Building Checklist**: required in the planning and construction phases for Large Scale Development Projects and new buildings with one or more dwelling unit. **Commercial Energy Conservation Ordinance (CECO):** CECO requires commercial property owners to complete certain energy conservation measures in their buildings upon transfer of property ownership or when additions or renovations are made. CECO requires all commercial properties undergoing renovations of more than $50,000 or additions which will increase the conditioned area of your commercial property by more than 10% must demonstrate compliance with CECO requirements. Permits, audits and inspections are done through the City Building Inspections. **Residential Energy Conservation Ordinance (RECO):** Any home or apartment building undergoing sale or transfer of property or renovations valued at $50,000 or more must comply. Applies to all homes, residential areas of mixed-use buildings, tenants-in-common, condominiums, multi-family properties, live-work spaces and boarding houses (including the common areas/common systems). **Energy Conservation Analysis:** Required for large commercial (10,000 square feet or greater) projects and recommended for multifamily and mixed-use projects with 3 or more units. An energy conservation analysis is required in the planning and construction phases. The Energy Conservation Analysis is available at no cost from PG&E's Non-Residential New Construction program, Savings By Design, or can be provided by a qualified consultant. **Construction & Demolition Debris Diversion Requirements:** Building Permit applicants are required

4. Cont'd.	to divert Construction and Demolition waste and debris from landfill disposal. (Applies to newly constructed buildings, renovations valued over $100,000 and demolitions valued over $3,000. Construction or demolition projects shall divert 100% of asphalt, concrete, excavated soil and land clearing debris for previously undeveloped lots, and 50% of construction and demolition debris by recycling, reuse, compost, or other approved method. This requirement is part of the **Zero Waste Program** implemented in 2006. The program goal is to eliminate all materials sent to landfill by the year 2020. **Reduction of Stormwater Pollution:** All construction projects must manage both the site and materials. Creating or replacing impervious surfaces may also require onsite stormwater treatment. **Creeks Ordinance:** Requirements and restrictions for a project vary depending on project scope and distance from the creek. **Water Efficiency**: Landscaping requirements are in compliance with State requirements - California Water Efficient Landscape Ordinance (WELO). Local jurisdiction provides water efficiency regulations through East Bay Municipal Utility District (EBMUD) and there is an extensive mandatory water efficiency checklist. **Private Sewer Lateral Compliance Policy:** Under federal law, the City of Berkeley must reduce the amount of water flowing into its sewer system. The city ordinance applies to remodeling projects that cost more than $100,000 OR cost more than $50,000 and involve replacing or relocating two or more plumbing fixtures. **Accelerated Plan Check Application:** Berkeley offers an enhanced service for expediting the plan review process for projects with minimum valuations of $100,000. The accelerated plan check is intended to reduce the review period to 8 to 20 workdays for the initial review and 6 or 15 workdays for subsequent re-submittals. An additional 80% of the regular plan check fee will be applied if a project is approved for Accelerated Plan Check. **Rainwater Harvesting:** Rainwater catchment systems over 100 gallons require permits and approval from the City of Berkeley Building Department. **Graywater Collection Systems**: Zoning, plumbing and electrical permits are required for the installation of complex systems. **Green Roof Permitting**: Permits are required for all green roofs and depend on roof type, use of green roof, and the structure of the building. **Solar Programs:** The economic stimulus funding of 100k in 2009 from the United States Department of Energy (DOE) to support and enhance two existing Berkeley solar programs that provide education and technical assistance directly to residents interested in implementing solar at their homes and businesses. • Smart Solar**:** is a program of the nonprofit Community Energy Services Corporation. • Berkeley SolarMap: is a City of Berkeley online map that analyzes the solar potential of building in Berkeley. **California FIRST:** (Financing Initiative for Renewable and Solar Technologies - note: while this pilot program has been replaced with the two solar programs noted above, it provided a pioneering financing mechanism). In 2008, Berkeley launched the Berkeley Financing Initiative for Renewable and Solar Technology (CaliforniaFIRST), to promote solar photovoltaic installations. The program provided property owners an opportunity to borrow money from the City's Sustainable Energy Financing District for the installation of solar photovoltaic electric systems. The program served as a model for Property Assessed Clean Energy (PACE) programs across the country. **(**Implementation of this initiative required an amendment to the Berkeley Municipal Code to Establish Special Tax Financing Law). **EV Pilot Program:** to encourage the adoption of EVs by streamlining the permitting process for home

4 Cont'd.	charging systems, encourage businesses to add parking stations in their parking lots and assessment of electrical capacity at a variety of municipal locations to pursue new public charging stations. **Financial Incentive Program**: Money for Energy Efficiency Program, 2010 Berkeley offers financial incentives with American Recovery and Reinvestment Act (ARRA) funds to tenants and owners of residential, commercial and industrial properties. These funds can be used to conduct comprehensive energy audits and make energy efficient improvements. Free or subsidized direct services or rebates (depending on income eligibility) are available to single-family and duplex homes for audits and improvements. Multifamily and non-residential buildings can also receive rebates for audits as well as competitive grants or improvement incentives for energy improvements. http://www.cityofberkeley.info/Planning_and_Development/Energy_and_Sustainable_Development/ME2_Program_Summary_Chart.aspx **Energy Upgrade California**: is rebate program that allows homeowners to make energy efficiency upgrades. Rebates range from $1,000 - $4,000 and many are compatible with RECO. In addition, Berkeley provides several rebate and incentive programs targeted towards residential energy efficiency improvements. **Tax Incentives for Electric Vehicles & Charging Stations**: PEV Charging Station Federal Tax Credit (Alternative Fuel Infrastructure Tax Credit) ,Electric Vehicle Federal Tax Credit and Electric Vehicle California State Rebate (Clean Vehicle Rebate Project). In conjunction with these incentives, Berkeley is running a **Non-Residential Plug-In Electric Vehicle (PEV) Charging Station Pilot Program**. The program offers a pathway for obtaining City of Berkeley permit approval in a fast, coordinated, and low-cost manner. **Programs for Residents:** Through their Climate Action Plan, Berkeley offers a wide range of programs with financial incentives to encourage residents to adopt energy efficiency and sustainability improvements. **Chicago Climate Exchange:** The Chicago Climate Exchange is a voluntary North American carbon cap and trade system with hundreds of private and public sector members. As a member of the Chicago Climate Exchange (CCX), the City of Berkeley is obligated to reduce greenhouse gas emissions associated with municipal operations, including consumption of natural gas, electricity and motor fuels. If the City of Berkeley does not achieve the required reductions, it must purchase carbon credits from other members that have exceeded their targets**.** The CCX has independently verified that the City of Berkeley reduced its emissions by 7-10% in 2003, 2004 and 2005 and that emissions rose only slightly in 2006. Berkeley has chosen not to trade the excess credits it has accumulated since 2003 thereby ensuring that all Berkeley residents enjoy the reduction in greenhouse gasses.

5. Major program component costs & resources	2012 - The City of Berkeley awarded over a quarter of a million **federal stimulus dollars** in grants to local businesses and multifamily property owners to encourage major energy upgrades. The businesses and properties competed for funding based on their ability to leverage the award funding, provide local green jobs and maximize energy savings. The goal of the grant program was to stimulate the local economy and help meet Berkeley's Climate Action goal to reduce energy usage by 33 percent by 2020. **PG&E Savings By Design**: Program offers no-cost design assistance, analysis and resources to help building owners and design teams with energy-efficient building design. Incentives up to $150,000 for owners and $50,000 for design teams are available for projects that meet ambitious energy efficiency goals.
6. Verification & Monitoring of Green Building Program	**Energy Conservation Measures:** Compliance with conservation measures (CECO and RECO) is required in the plan check phase. City Auditors or Inspectors ensure compliance.
7. Metrics	http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=70982 http://www.cityofberkeley.info/uploadedFiles/Planning_and_Development/Level_3_-_Energy_and_Sustainable_Development/COB%20Infographic.pdf
8. What has worked well & why?	
9. What has not worked well & why?	The following incentives were considered and rejected by Berkeley in April 2012: **Fee Waiver/Deferrals:** lack of funding to support this type of incentive. A deferral program is seen to complex and time consuming to administer. **Density Bonuses:** seen to be a complex issue and is being reviewed by the Planning Dept.
10. Future Direction	**Implement Cal Green**: Effective July 1, 2012, Cal Green application will be expanded to commercial additions over 2,000 s.f. and alterations over $500,000. Effective January 1, 2014, its application will be further expanded to commercial additions over 1,000 s.f. and alterations over $200,000. In this way, green building standards are gradually making their way into the main stream construction practices. **Continued implementation of the Climate Action Plan**
Contacts	**Planning & Development Director** Eric Angstadt Phone: (510) 981-7400 Email: eangstadt@ci.berkeley.ca.us **Sharon Crosby is the Permit Center Coordinator - (510) 981-7501** **email: scrosby@cityofberkeley.info.**

MARKET RESEACH: LEADING NORTH AMERICAN JURISDICTIONS IN GREEN BUILDING AND INTEGRATED WATER MANAGEMENT

CRITERIA	SAN FRANCISCO
1. When Program Started and Brief Description	The first green building ordinance for municipal properties was enacted in 1999, amended to LEED Silver in 2004 and amended again in 2011 to require LEED Gold for all municipal projects. In 2008, San Francisco established green building requirements for all new residential and commercial buildings, as well as renovations to existing buildings. The Green Building Ordinance was updated in 2010 to combine the mandatory elements of the 2010 California Green Building Standards Code with stricter local requirements, and merge them in Chapter 13C of the San Francisco Building Code. All new construction in San Francisco must meet all applicable California codes, beat California's energy code (Title 24 Part 6) by at least 15% and provide on-site facilities for recycling and composting. New residential and many common types of new non-residential buildings (such as office, retail, assembly, and institutional buildings), as well as certain major alterations and first time tenant improvements, must also be built to LEED or GreenPoint Rated standards.
2. At the municipal level, what was the impetus for the green building program?	*San Francisco has a long history of environmental awareness, responsibility and action. The city's first Resource Conservation Ordinance was passed in 1996 and one of the provisions was a ban on the city's purchase of PVC materials. At the time this was very revolutionary and influenced thought processes on toxic materials in the build environment.*
3. Key drivers for green building in their jurisdiction	*Overall, our Climate Protection Initiatives would be the key driver. We are driving our carbon footprint down and over half of that footprint in San Francisco is due to construction and operation of buildings. We take that pretty seriously and realize that we have the potential and opportunity to address energy efficiency in buildings and other resource issues that can have a positive effect on our climate model.* **Climate Action Plan** : A plan to reduce overall greenhouse gas emissions to 20% below 1990 levels by 2012.

4. Significant program components or key strategies used to transform marketplace (ie LEED, regulations, ordinances, incentive for builders, building code changes etc) 4. Cont'd.	**City of San Francisco Green Building Code**: A succinct summary of the code and applicability: **http://www.dsireusa.org/incentives/incentive.cfm?Incentive_Code=CA56R&ee=1** **Green Building Ordinance:** combines the 2010 California Green Building Standards Code with stricter local requirements. All new construction in San Francisco must meet all applicable California codes, beat California's energy code (Title 24 Part 6) by at least 15% and provide on-site facilities for recycling and composting. New residential and many common types of new non-residential buildings (such as office, retail, assembly, and institutional buildings), as well as certain major alterations and first time tenant improvements, must also be built to LEED or GreenPoint Rated standards. **City of San Francisco Project types requiring LEED or GREEN POINT RATED CERTIFICATION OR EQUIVALENCY*:** •New Large Commercial Construction (at least 25,000 sq ft) •New High-Rise Residential (5+ units and at least 75' height) •First-time Commercial Fit-outs •Commercial Major Alterations** (at least 25,000 sq ft) •Residential Major Alterations (at least 25,000 sq ft) *Equivalency requires "Green Building Compliance Professional of Record" sign off. **Major alterations" must include interior renovations, structural upgrades, and some degree of MEP improvements New Large Commercial or New High-Rise Residential must also demonstrate compliance with specific LEED credits AND CALGreen mandatory and voluntary requirements: •75% Construction and Demolition Waste Diversion •15% Energy savings over T24 2008 •30% water use reduction •Stormwater Management (SSc6.1 and/or SSc6.2) •Designated LEV/carpool parking for 8% of parking capacity (CALGreen) •Outdoor irrigation sub-metering (CALGreen) •Low-emitting materials Major Commercial Alterations have similar but less stringent additional credits and requirements. **Existing Commercial Buildings Energy Performance Ordinance**: Non-residential buildings must benchmark energy use every year, and are required to have an energy audit every five years. The energy audit must meet or exceed ASHRAE, with larger facilities required to receive a more rigorous evaluation than smaller facilities. **Commercial Lighting Ordinance:** Requires that fluorescent lighting in non-residential commercial buildings meet a specific efficiency standard. This standard will typically be met with T8 fluorescent tube lamps and electronic ballasts. The Ordinance will be enforced by the Department of Building Inspection. **Commercial Water Conservation Ordinance:** Requires all commercial property owners to provide certain water conservation measures for their facilities by 2017. The building must be inspected, retrofitted and have a Certificate of Compliance on file with the Department of Building inspection. **Stormwater Management Ordinance:** *R*equires new development and redevelopment disturbing 5,000 square feet or more of the ground surface to manage stormwater on-site. Compliance with the ordinance is managed through the San Francisco Public Utilities Commission. The Commission provides guidelines, tools and resources to ensure compliance. **Construction Site Runoff:** The Construction Runoff Control Program was established to ensure that

4. Cont'd.	all businesses comply with all appropriate Federal, State and City stormwater laws and requirements. Contractors, site supervisors and property owners found to be negligent in applying Best Management Practices (BMPs) aimed to reduce pollutants at the source and/or not adhering to stormwater rules can be held responsible for violations, which may lead to a civil penalty of up to $25,000 per day and reimbursing the City for all expenses associated with clean up. **Water Efficient Irrigation Ordinance:** applies to owners of residential, commercial, municipal, and mixed-use properties with a new construction or modified landscape project greater than or equal to 1,000 square feet. The SFPUC provides technical assistance and free plan review to assure the project's landscape and irrigation plans comply with the ordinance. **Commercial Water Conservation Ordinance:** This law requires commercial property owners to repair plumbing leaks and install water efficient plumbing fixtures to obtain a Certificate of Compliance either upon major improvements or by January 1, 2017. Compliance must be completed through the Department of Building Inspection. **Recycled Water Ordinance:** applies to properties located within the designated 'recycled water use areas', under the following circumstances: New construction or major alterations to a building totaling 40,000 square feet or more, All subdivisions, New and existing irrigated areas of 10,000 square feet or more. Buildings and facilities that are located within the 'designated recycled water use areas' are required to use recycled water for all uses authorized by the State of California. These include: Landscape Irrigation, Toilet and Urinal Flushing, Cooling or Air Conditioning Involving a Cooling Tower, Decorative Fountains, Industrial Process Water, Industrial Boiler Feed Commercial Laundries, Commercial Car Washing. **Non-potable Water Program**: Installation of an on-site non-potable water system is voluntary. However, if owners choose to install a system, then the requirements of the Non-potable Water Program apply. In September 2012, the City adopted an Ordinance allowing for the collection, treatment, and reuse of alternate water sources for non-potable applications, such as toilet flushing and irrigation. The alternate water sources include rainwater, stormwater, foundation drainage, graywater, and blackwater. Compliance is managed through a combination of SFPUC inspections and third-party certified testers. **Use of Potable Water for Soil Compaction and Dust Control Activities Ordinance:** Restricts the use of potable water for soil compaction and dust control activities associated with any construction or demolition project in the City and County of San Francisco. The SFPUC operates a recycled water truck-fill station that provides recycled water for these activities at no charge. **Green Landscaping Ordinance:** A planning code amendment to address screening, greening, street tree, and permeability requirements; creating definitions for vehicle use area, ornamental fencing, and permeable surface. For the most part the new requirements are triggered upon new construction or an addition, or the paving or repaving of more than 200 square feet of a front setback. **Construction and Demolition Ordinance:** Affects all construction projects such as new construction, remodels, tenant improvements, and full or partial demolitions, and requires the building permit holder or the property owner to make sure that all C&D debris materials removed from the project are properly recycled or reused**.** The Ordinance requires that all mixed C&D debris must be transported off-site by a registered transporter and taken to a registered facility that processes mixed C&D debris and has demonstrated to San Francisco that it diverts a minimum of 65% of the material from landfill. **Resource Conservation Resource:** The Resource Conservation Ordinance, the Universal Recycling and Composting Ordinance, Surplus Disposal Ordinance and the 75% Waste Diversion Resolution for

4. Cont'd.	City Departments require all City government departments, facilities and parks to conserve resources by implementing several programs. Each department must also conduct an audit annually to determine the types of waste generated, how best to divert this material from landfill, and report annually on waste and diversion statistics. These provisions have been reinforced by subsequent administrative and legislative action, including the Mandatory Composting and Recycling Ordinance. **Residential Energy Conservation Ordinance –** prior to selling a residential property, residents must obtain a valid inspection, install basic energy and water conservation devices or materials and obtain a certificate of compliance. **Residential Water Ordinance:** This law requires residential property owners to repair plumbing leaks and install certain water and energy conservation measures to obtain a Certificate of Compliance through the Department of Building Inspection prior to transfer of title or when performing major improvements. **Priority Permitting:** Applications for building construction resulting in structures that will meet or exceed a Gold Rating plus fifteen percent using the LEED Building Rating System® or other design program that achieve equivalent high sustainability standards approved by the director qualify. Prior to acceptance or rejection of the project for Priority Processing, the applicant is required to meet with the SF Green Team, comprising technical Staff from the agencies reviewing the application, to describe the project. Target timelines to approval are 4 weeks in total. Typical permitting time in San Francisco is 6-9 months. The program requires that the project's site permit application be accompanied by a Design Phase Certification from the USGBC, and that final LEED Certification be obtained with a Gold Rating within six months of issuance of the first Certificate of Occupancy or Certificate of Final Completion. If the project fails to achieve a LEED Gold Rating, developers would be required to attend hearings with the Planning Commission and offer a mitigation strategy to offset their failure to comply with their project's green building commitments. **Small Business Priority Processing Pilot Program:** Implemented in April 2013, the2 year pilot program guarantees qualifying projects a Commission hearing within 90 days of application, a process that can otherwise take as long as six months. The program also includes dedicated City staff, and a shorter, simpler internal review process. **GreenFinance SF Program:** Under San Francisco's commercial PACE program, "GreenFinanceSF," property owners can secure 100% financing from an investor of their choice, and repay the cost of the upgrade over time through a special line item on their property tax bill. San Francisco is using federal grant funds to cover administrative costs for participants for a limited time. Additional grant funds are being used for a debt service reserve fund that can cover delinquent payments to investors; this additional security may result in more favorable financing terms and rates, and broaden access to capital. **Energy Services Agreements, or ESAs:** ESAs closely resemble solar power purchase agreements, where a private entity finances, installs, owns, and maintains certain energy installations, and through special agreements with the owner, receives payments set at or below their pre-retrofit utility costs. This unique structure makes it possible to finance deeper retrofits at minimal liability to the property owner, and may allow for favorable accounting treatment. **"On Bill" financing:** Under this model, applicants are screened by the utility company for credit through payment history and other indicators, and if approved, can borrow funds to install energy saving equipment and other upgrades. The customer then pays it back with a level, amortized charge on their normal bill. Projects are designed to generate savings and corresponding financing payments that match pre-retrofit utility bill charges. The California Public Utilities Commission, which regulates the State's utility companies, is planning to launch new programs to offer a wide range of enhanced financing options to residential and commercial customers in 2013.

	Stop Waste Rebate Program: (Almeda County) Targets small green commercial projects. "StopWaste" rebate program is offering up to $5,000 in rebates for purchasing green materials in conjunction with other building upgrades. **SF Energy Watch Multifamily Plus Program**: Offers free comprehensive energy assessments for qualifying multifamily building owners. Energy Upgrade California in San Francisco offers $750 per unit in rebates to help multifamily property owners (5+ units) lower the cost of energy efficiency upgrades and provides the support, advice and technical assistance needed to undertake these upgrades. Funds collected from utility ratepayers under the auspices of the California Public Utilities Commission are used to subsidize the overall cost of energy efficiency upgrades. **California Solar Initiative:** The CSI program has a total budget of $2.167 billion between 2007 and 2016 and a goal to install approximately 1,940 MW of new solar generation capacity. The CSI-Thermal portion of the program has a total budget of $250 million between 2010 and 2017, and a goal to install 200,000 new solar hot water systems. The CSI program is funded by electric ratepayers and the CSI-Thermal portion of the program is funded by gas ratepayers. The CSI program is overseen by the California Public Utilities Commission and rebates are offered through the Program Administrators. **GoSolar San Francisco Program:** The City and County of San Francisco, through the San Francisco Public Utilities Commission (SFPUC), are providing incentives to residents and businesses who install photovoltaic (PV) systems on their properties. Systems must be at least one kilowatt (kW) in capacity, and there is no maximum size limit to participate. Different incentive levels are available whether the property is residential, commercial, low-income residential, non-profit, or multi-family residential owned and operated by a non-profit. **Residential: Schedule EZ20/20: The "20/20 Program**" rewards customers a twenty percent (20%) discount for achieving a twenty percent (20%) or more average reduction in energy usage during the summer season compare to the previous year. Sponsored by Pacific Gas & Electric. **Green Tenant Toolkit:** includes best practices for tenants and building management to engage in win-win environmental initiatives, a guide to integrating green lease language into negotiations, and a scorecard to summarize key sustainability metrics for any property – whether or not it has a green certification. **Existing Commercial Buildings Newsletter:** Via the City's web site, interested parties can sign up to receive periodic emails about existing building policies, incentives and news. **The Municipal Green Building Task Force:** Meets monthly and advises SF Environment on matters of policy and reviews municipal projects in design and construction to ensure compliance with San Francisco Environment Code Chapter 7 (LEED Gold certification). The Task Force enables communication about green building issues across City Departments and project teams, and provides an educational forum to increase knowledge and share project related successes and lessons learned. **Public Outreach & Education:** A key to success in green building has been the close participation and full support of the Building and Planning Departments, and the numerous public stakeholder meetings held to discuss the development of the policy and its implementation strategy.
5. Major program component costs & resources	**Costs:** *Program costs are essentially the salaries of 4 people who are responsible for :* *Municipal Projects* *City Wide Energy Benchmarking Program* *Commercial Greenbuilding Financing Program* *Associates that help with specific projects from time to time*

	These individuals work with the various departments to ensure that the City's requirements are being administered and implemented properly. **Resources:** The green building program is administered through the Department of the Environment. Funding: *1) they collect a very small percentage of funds through the City's Zero Waste Program* *2) they receive transfers from other departments (ie municipal utilities and department of inspection) because they act as advisors or consultants for those departments.* *3) they also receive grants and administer those to help fund their energy efficiency and green building programs*
6. Verification & Monitoring of Green Building Program	*Verification is done through the City Benchmarking Program and LEE, and at present the focus is EUI (Energy Use Intensity).* *Certification in private sector requires measurement of energy, water use and waste to prove that LEED for existing buildings standards are being met.* *LEED for new construction provides a snapshot at the end of construction and there is not an on-going performance measurement.* Verification and labeling by a neutral third party confirms a building has met a credible and meaningful standard. San Francisco recommends: LEED, Greenpoint Rated, Green Communities Criteria, and Bay Friendly Landscape Guidelines. San Francisco relies on the administering entities (USGBC and Build It Green) to provide and maintain the third-party verification infrastructure and quality assurance for compliance with green building requirements, thus they require no new permit application review staff.
7. Metrics	The United States Green Building Council (USGBC) has certified 58 million square feet of Leadership in Energy and Environmental Design (LEED) buildings in San Francisco as of April 2012. Resource Conservation Ordinance –2012 Annual Report Metrics http://www.sfenvironment.org/sites/default/files/fliers/files/sfe_zw_annual_rco_report_2012.pdf
8. What has worked well & why?	**Stakeholder Input** *has been a key component in the success of San Francisco's green building program. (facilitates 'buy-in' and reduces 'push-back')* *Specific examples include:* *Municipal Green Building Task Force where representation of 12 City departments meet monthly to review projects that are coming through the pipeline. While this committee does not have approval authority, they provide project overview and direction.* *Mayor's Greenbuilding Task Force was comprised of City staff and stakeholders (architects, building owners, engineers, project managers, bankers, insurance reps) to create the private sector Green Building Ordinance. This ordinance was largely stakeholder driven.* *Existing Commercial Buildings Energy Performance Ordinance was created through the collaborative efforts of City staff and stakeholders (i.e. building owners and building owner associations BOMA, contractors etc.).* ***The "positive power of peer pressure**" has helped San Francisco to become a leader in Green Building. There is a sense of friendly competition within departments, other cities, design teams etc., to surpass previous project results and this has helped to spur a culture of forward thinking.*

9. What has not worked well & why?	*The complexity of big buildings (rating systems, codes and enforcement) can be challenging to implement because inspectors are mostly concerned with (and rightly so) health and safety issues. There is a lot of training in terms of energy, water and waste materials etc. that they don't normally come up against. That is one of the reasons why the City has leaned on LEED for 3rd party verification to ensure implementation. Our building inspectors may not have the necessary expertise or knowledge. We do provide training and over time they are increasing their skills and knowledge but at present it presents a challenge.*
10. Future Direction	**The Climate Action Plan** will provide goals, policies, and programs to reduce greenhouse gas emissions, climate change adaptation and support the goals of Assembly Bill (AB) 32 and Senate Bill (SB) 375**.** **San Francisco Mayor's Renewable Energy Task Force Recommendations Report, September 2012** provides key recommendations to guide San Francisco's goal of meeting 100% of its electricity demand with renewable power within 10 years.
Other	

MARKET RESEACH: LEADING NORTH AMERICAN JURISDICTIONS IN GREEN BUILDING AND NTEGRATED WATER MANAGEMENT

CRITERIA	SEATTLE, WASHINGTON
1. When Program Started	**Seattle's Sustainable Building Policy** was originally adopted in 2000 and significantly expanded in scope in October 2011. This policy calls for new City-funded projects and major renovations with over 5,000 square feet of occupied space to achieve a Gold Rating using the US Green Building Council's (USGBC) LEED Rating System. To achieve certification, one must register the project with the USGBC and submit a project application which documents all attempted credits for review and approval by the USGBC technical staff and LEED Steering Committee. In addition, these projects must meet additional energy efficiency, water, waste, and bicycle parking requirements.
2. At the municipal level, what was the impetus for the green building program?	*Original impetus was a commitment to environmental responsibility. At that time green building was gaining momentum on a national level, LEED was emerging, and within the City of Seattle, there was a group of individuals that believed in the concept and formed a team to examine and promote green building in their capital facilities.* Currently, the state building codes are based on US *Green* Bldg Code of 2011 which is mandatory but does not cover single family dwellings. The International Green Construction Code IgCC is mandatory for Building Officials but does provide room for jurisdictional adoptability and flexibility.
3. Key Drivers for green building in their jurisdiction.	*Key Drivers:* *1) Green permitting, zoning incentives and a comprehensive, rigorous set of building codes. Because of state law, they don't have the capacity to provide feebates or adjust development fees, but they can give extra floor area.* *2) Implementing green building within capital facilities helped get the ball rolling for the 'professional capacity'.* *3) At present, their role tends to focus on facilitating what the building industry and developers in Seattle are doing to push the market. An example is the "Living Building Challenge "Project.* The Sustainable Building Policy and Green Building programs are part of a larger Environmental Management System created by the City's Office of Sustainability and Environment. One of the key priorities of the City's Sustainable Building Program is to trigger market transformation of the construction industry.
4. Significant Program Components (i.e. LEED, regulations, ordinances, incentive for builders, grants, loans, tax incentives etc)	**The Green Building program's strategic approach** is to steer planned construction activity toward increased conservation and other benefits not normally realized through code/standard practice. The program 'Communication Plan' targeted specific audiences that were positioned to implement change (i.e. Developers, Financial & Commercial Real Estate sectors). **The Living Building Challenge and Deep Green Pilot:** allows developers to request additional departures from the Seattle Land Use Code through Design Review. The Living Building Challenge is a green building certification program that defines the most advanced measure of sustainability for buildings and landscapes possible today. The Living Building Challenge acts to close the gap between current limits and ideal solutions. **Seattle's Sustainable Building's and Sites Policy, 2011:** for municipal facilities in Seattle calls for new construction and major renovations 5,000 square feet or greater to meet LEED Gold, as well as key performance requirements for energy and water efficiency, waste diversion and bicycle facilities; for

4. Cont'd.	Tenant Improvements 5,000 square or greater (with MEP) to meet LEED Gold, as well as water efficiency and waste diversion requirements; for small projects, either new construction, renovations or tenant improvements, to utilize Capital Green in project planning and development; and for all new and existing sites projects to follow best management practices. **Building Energy Benchmarking & Reporting Ordinance:** a standard for regular energy performance benchmarking, disclosure and reporting for non-residential and multi-family buildings. The ordinances requires large non-residential and multi-family property owners in Seattle to annually measure, or benchmark, energy use and provide the City with ratings to allow comparison across different buildings. Building owners will be required to share energy usage and ratings with prospective buyers, tenants and lenders during the sale, lease or financing of properties. **Deconstruction Ordinance** – to incentivize deconstruction as a viable means for building demolition. To receive a deconstruction permit in Seattle, applicants must come up with a waste diversion plan. The plans must show that all asphalt, brick and concrete from a deconstruction project are recycled and that at least 50 percent of the remaining building materials will be diverted from landfills. Of that, at least 20 percent of the materials have to be salvaged and 30 percent recycled. Plans are being made to modify the city's land-use code to allow a deconstruction permit to be issued while an application for a construction permit is processed. **Green Permitting Incentives:** a suite of permitting **incentives** designed to support applicants by addressing potential green building code barriers and streamline the permit review process. While some programs receive fast track permit review, others provide facilitated review or land use departures for highly innovative projects. The 3 main programs are: Priority Green, Green Q and Innovation Advisory Committee. **The Density Bonus Incentive, 2006**: offers downtown commercial, residential and mixed-use developments greater height and/or floor area if a green building standard of LEED™ Silver or higher is met. **Built Green Incentive:** The King County/Seattle Built Green® incentive provides funding for single-family, townhome, and multi-family residential and community development projects to help offset the cost of certifying and designing innovative green projects in King County. Eligible projects may receive up to $20,000. Grants are offered twice a year. **Incentive Programs:** LEED™/Built Green™ have been successful to leverage a larger group of sustainable building innovators. **Federal Tax Deductions - Energy Policy Act of 2005 (EPACT2005)**: New commercial buildings or reconstructed buildings that achieve a 50% reduction in energy use qualify for a range of tax deductions up to $1.80 per square foot. Partial deductions are also available for lighting, HVAC and building envelope improvements. **Renewable Energy Tax Credits:** Applicants can receive 30% of cost with no upper limit in federal tax credits for installing photovoltaic (solar electric) and solar hot water systems or small wind turbines on homes through December 31, 2016. Additionally, photovoltaic systems sold in Washington state are exempt from sales tax. **Energy Efficiency Financial Incentives and Technical Assistance**: for both existing facilities and new construction projects offered through Energy Smart Services to help medium and large businesses reduce electricity use and save money. Incentive amounts can range as high as 70% of the installation cost, and are based on energy savings. http://www.seattle.gov/light/Conserve/Business/2013Incentives.pdf

4. Cont'd.	**Stormwater Reduction Program**: SPU's Stormwater Facility Credit Program is a credit program for property owners with stormwater systems that help reduce the impact of stormwater on the City's system. Systems that provide stormwater flow control and/or provide water quality treatment are eligible for the program. **Water Smart Technology Program:** a water conservation program for regional commercial, industrial and institutional customers. Supported by local water providers in the Saving Water Partnership, including Seattle Public Utilities. The program provides financial assistance for both technical studies and project installation. It offers an array of financial incentives for qualified water conservation projects completed by small and large businesses alike, which often reduce participant paybacks from over three years to two years or less. The program also offers technical information on water-efficient technologies, bill analysis, on-site water audits, life cycle cost analysis. **Neighborhood Matching Fund Program:** Neighborhood groups, businesses and individuals can receive over $3 million a year from the Seattle Department of Neighborhoods for a variety of neighborhood improvement projects. Neighborhood- and community-based organizations and ad-hoc neighborhood groups are eligible to apply. Types of projects include both physical and non-physical improvements and community organizing. **Green Up Program:** Voluntary green power program for residential and business customers. Offered through "Seattle City Light". Customers purchase green power for a portion of their electricity use and demonstrate their support for wind power and other new renewable energy projects in the Northwest. The Green Up program is Green-e Energy certified and fulfills LEED™ Project green power requirements. **Cash Rebate Programs:** Multifamily new construction incentives for projects of four or more units are available from Seattle Public Utilities (multifamily is defined as projects being developed under the same permit number). Incentives are available for water-efficient clothes, toilets, irrigation systems, showerheads and aerators, as well as innovative technologies with proven water savings. **Facility Assessment Audit**: (for large and medium-size commercial and industrial customers): Free program offered through "Seattle City Light" offers assessment audit services. It is designed to help monitor, manage and control electricity and other utility costs, and improve operating efficiencies. **Residential Home Energy Audits**: State-of-the-art diagnostics to analyze a home's heating and cooling systems. Funded through a partnership with Puget Sound Energy (PSE) and Seattle City Light, the audits will be available at $95, a steep discount from the $600 cost. **Residential Energy Efficiency Loan Program:** To encourage residents to make energy-saving home improvements. The public-private partnerships would be funded, in part, by $1.2 million of federal stimulus money from the Federal Energy Efficiency and Conservation Block Grant. **Innovation Advisory Committee**: A collaborative venue in Seattle's Department of Planning & Development to develop solutions to issues raised by innovative energy-efficiency proposals that are not addressed by existing code requirements. **Resource Center: "Urban Green":** A One Stop Shop concept for sustainable development was created in 2005 in partnership with the private sector. **Encourage Innovation -** Expand the role of the Construction Codes Advisory Board (CCAB) to create a new venue for early permit review guidance of innovative projects meeting certain energy performance standards. **Strategic partnerships** were formed with: Private Sector/Businesses, Academic Institutions, Non Profit Organizations, Professional Organizations and Government.

5. Major program component costs & resources	**Costs:** *Internal city staffing is the major program cost. a) permit reviewing and tracking of projects. b) policy development. (i.e. at present staff are reviewing and redeveloping the pilot program for the Living Challenge Project and are re-evaluating zoning initiatives. Time and resources are necessary to develop policy and engage the community for input and feedback.* **Resources***:* *The program is largely financed through city funds. There are some initiatives that receive grant funding (i.e. Energy Benchmarking) and stimulus funds received for the 2030 District Project. Private sector support is gained through 'time & advice" (i.e. Architects, Mechanical Engineers etc. serve on Boards and Advisory Groups).* **Green Building Capital Initiative, 2009** Through its Five Year Conservation Plan, Seattle City Light will provide $1.5 million for the initiative. In addition, the city of Seattle will use part of its $6.1 million allocation from the Energy Efficiency and Conservation Block Grant program. The city may also seek further federal stimulus funds.

6. Verification & Monitoring of Green Building Program	*The ability to provide on-going monitoring is a gap that Seattle struggles with. Generally, the city is 'done' with the building once they get their 'certificate of occupancy'. They are starting to look at methods to facilitate monitoring, and one of the challenges is "how to staff that enforcement".* 1) **Verification is mostly done through 3rd party** (i.e. LEED, Built Green, Energy Star), but in some cases is done by the Department of Planning and Development (DPD). DPD Alternative Path is available for single family and town-house projects and provides an option for applicants who choose not to use a third party rating system. These projects require documentation that is verified by DPD staff. 2) **Building Energy Disclosure Ordinance**, issued in 2010 - regular energy performance benchmarking, disclosure and reporting for commercial and multi-family buildings. Requirement to annually track & report energy performance. Effective November 15th, 2013 fines will be assessed to owners of buildings missing 2012 energy performance data. Utilities are providing whole building consumption data to building owners upon request. 3) **Sustainable Development Scorecards** allow tracking and measurement of goals and objectives. A scorecard is used for Seattle's Parks and Recreation.
7. Metrics	http://www.seattle.gov/dpd/GreenBuilding/docs/dpdp022009.pdf
8. What has worked well & why?	*The method of starting with pilot programs and re-assessment and revision of the pilots where necessary.* *The city of Seattle is approaching sustainable building using a multi-faceted approach and this has proved successful.* *Seattle has a history of a strong climate action agenda and that has helped to set the stage for green building.*
9. What has not worked well & Why?	
10. Future Direction	In 2012 the Department of Planning & and Development (DPD) will remain focused on growing green permitting, on supporting the Living Building Challenge pilot and on evaluating the International Green Construction Code (IgCC) for potential adoption in Seattle. Planning staff will work closely with the Office of Sustainability and Environment (OSE) to implement land use policies that advance green building. Green building staff in OSE will be working on implementing the Sustainable Building and Sites policy, development of a city Resource Conservation Plan, and providing ongoing management and support of the energy benchmarking program and the 2030 District.

10. Cont'd.	The Seattle 2030 District is a groundbreaking high-performance building district in Downtown Seattle that aims to dramatically reduce environmental impacts of building construction and operations through education and collaboration across every sector of the built environment. This type of collaborative action is a strategic undertaking to help the City of Seattle meet its goal of carbon neutrality by 2030 and represents a major investment in Seattle's future.
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