

# Benefits of Green, Transit-Oriented Development

Summary of Best Practices and Green Building Standards

## PHASE 2 REPORT



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Otak, Inc.  
In association with:  
BAE Urban Economics and  
Nelson\Nygaard Consulting Associates  
Puttman Infrastructure



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# The Benefits of Green Transit-Oriented Development and Summary of Green Building Standards

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## Preface

### THE REGIONAL VISION

VISION 2040 is the central Puget Sound region's long-range vision for maintaining a healthy region and is a guiding premise for all regional planning and implementation. VISION 2040's cornerstone is its emphasis on development of vibrant, mixed-use centers where people can live, work, and play. Integrating affordable housing in mixed-use centers throughout the region contributes to achieving a jobs-housing balance that increases access to opportunity, lowers households' combined cost of housing and transportation, and helps ensure that infrastructure investments enhance equity across the region.

### SUMMARY OF THE GROWING TRANSIT COMMUNITIES PARTNERSHIP

In keeping with the regional vision described above, the central Puget Sound region is investing more than \$25 billion dollars in high-capacity transit over the next twenty years, providing a once-in-a lifetime opportunity to capitalize on these investments by growing and strengthening communities around stations. The Growing Transit Communities Partnership (Partnership), funded by a grant from the US Department of Housing and Urban

Development's Sustainable Communities Regional Planning Grant Program and administered by Puget Sound Regional Council (PSRC), has been designed to help make the most of this investment by locating housing, jobs, and services close enough to transit so that it is a viable option for many people. If done right, more people will have a faster and more convenient way to travel.

The Partnership was formed through a coalition of city and county governments, housing authorities and affordable housing interests, transit agencies, public health agencies and departments, real estate and development interests, social justice and community development groups, economic development and business interests, community based organizations, educational interests, environmental advocacy groups, and the public. This coalition of the Partnership has been supporting neighborhood planning for more connected, livable, and sustainable communities around more than 74 high-capacity transit centers in the region—covering three counties in sixteen cities—including existing, new, and future station areas.

Through these efforts, the Partnership has been working to shape the region and station areas in ways that benefit current and future residents, local businesses, and the wider region. Working within the framework of existing plans, policies, and goals of local governments and guided by VISION 2040, the Partnership has been helping local communities bring their visions to reality and to make the most of

new light rail service, bus rapid transit, and other transit investments, including identifying unique roles and opportunities for community development associated with high-capacity transit investments. For more information about the Growing Transit Communities Partnership and PSRC, visit [www.psrc.org](http://www.psrc.org).

## THREE CORRIDORS/THREE TASK FORCES

Planning activities of the Partnership have focused along the three light rail corridors from Seattle north to the city of Everett, south to Tacoma, and east to the city of Redmond. Based on the premise that change can happen at the local level through tools and solutions that address similar challenges shared by communities in the region, the Partnership has provided a big-picture perspective so that people can see both local and regional benefits, and local entities can apply lessons learned in other places in the region. Corridor task forces for the North, East, and South corridors were charged with analyzing and reviewing existing conditions and identifying unique opportunities and challenges for development of existing and future transit station areas.

In development of its work plan and specific assignments for each task force, the Partnership felt that it was important to focus implementation activities in specific station areas of the region's transit corridors to serve as models for other parts of the region. In the case of the East Corridor, the intention was to work with the East Corridor Task Force to identify what catalyst project, or projects, were most appropriate. This evolved into the defined scope of work for the East Corridor Implementation Support Project.

## EAST CORRIDOR CONTEXT

In 2011, the Sound Transit Board of Directors made its final decision about the East Link light rail transit (LRT) corridor alignment and station locations. Also in 2011, King County Metro began operation of its Bus Rapid Transit service (BRT) RapidRide line B. In order to help areas around LRT and BRT stations transform into more transit-oriented communities, the four cities participating in the East Corridor Task

Force (Seattle, Mercer Island, Bellevue, and Redmond) and other Task Force members were interested in developing focused implementation strategies and tools for specific East Corridor station areas. Seattle and Mercer Island had already completed extensive planning for the station areas in their jurisdictions, so the Task Force decided to focus on stations in Bellevue and Redmond

Staff from the cities of Bellevue and Redmond indicated that the station areas in the Bel-Red Corridor and Overlake were in most need of implementation support. Given these considerations, the Task Force determined that the East Corridor Implementation Support Project should focus on the following subset of East Corridor station areas in the cities of Bellevue and Redmond, along East Link and King County Metro's RapidRide Route B stations:

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### East Link Light Rail Station Areas (Future) Selected for the East Corridor Implementation Support Project:

- Hospital Station Area in Bellevue
- 120th Avenue NE/Spring Creek Station Area in Bellevue
- 130th Avenue NE Station Area in Bellevue
- Overlake Village Station Area in Redmond
- Overlake Transit Center Station Area in Redmond

### King County METRO RapidRide B Line Station areas (Existing) Selected for the East Corridor Implementation Support Project:

*Located in Bellevue's Crossroads Neighborhood:*

- NE 10th Street Station Area
- NE 15th Street Station Area

The Partnership funded and guided the East Corridor Implementation Support Project to examine opportunities for TOD along Sound Transit's East Link Light Rail and King County Metro RapidRide Line B alignments through the Eastside cities of Bellevue and Redmond in these station areas initially as part of Phase 1 of the project, and then to provide more focused analysis and strategies for selected station

areas as part of Phase 2. Portions of the project area are located within the areas known as the Bel-Red Corridor and Overlake.

## FOUR FOCUS AREAS FOR EAST CORRIDOR IMPLEMENTATION ACTIVITIES

Through a series of meetings, the East Corridor Task Force examined key issues and identified barriers to transit-oriented development in the East Corridor, along with particular challenges to implementing equitable TOD in station areas. In its discussion of how to incent and accommodate equitable transit-oriented development in station areas, the Task Force determined four areas of focus for the East Corridor Implementation Support project. The Task Force identified the need for detailed strategies and action steps to implement existing local plans, particularly in the areas of:

- Affordable Housing
- Business Retention and Attraction
- Public and Private Partnerships
- Transportation Access and Connectivity

## EAST CORRIDOR PROJECT PURPOSE AND OVERVIEW

The East Corridor Implementation Support project has identified pivotal opportunities to transform Eastside station areas into more vibrant, economically healthy neighborhoods that offer equitable housing choices, more convenient access to jobs and jobs-to-housing balance within the high-capacity transit corridors and region, and better connectivity to goods and services.

The project is supporting immediate advancement of the implementation of visions and plans that have already been developed by participating jurisdictions on the Eastside, and the project team has leveraged other products developed by PSRC and the Growing Transit Communities Partnership, including affordable housing and opportunity mapping, existing conditions reports, market analyses, station area typologies, Center for Transit-Oriented Development (CTOD) market strength index, and other information as a base of reference for the project.

## IMPLEMENTATION SUPPORT PROJECT GUIDANCE AND TIMELINE

All phases of the East Corridor Implementation Support Project have been informed by representatives of the East Corridor Task Force. The Task Force identified a subset of members, called the Project Management Team (PMT), to advance the project and bring back matters to the Task Force for direction and decisions. PMT members were selected from the general membership of the Task Force (including representatives from the cities of Bellevue and Redmond) and confirmed by the Task Force co-chairs. See the Acknowledgements page for PMT members.

Growing Transit Communities staff and the PMT members of the Task Force retained a consultant team with expertise in affordable housing, urban design, transportation planning and policy, real estate and economic development, and other areas to assist in identifying actions and strategies to address these issues and help to catalyze TOD.

## OVERVIEW OF PHASES 1 AND 2

The scope of work for the East Corridor Implementation Support Project was completed in two phases. Phase 1 included best practices research, a high level assessment of seven East Corridor station areas, screening and selection of station areas for further analysis in Phase 2, and development of the scope of work for Phase 2. See the *Phase 1 Best Practices Research Report* for a detailed description of initial tasks. Go to: <http://www.psrc.org/about/pubs> to download the report.

Phase 2 involved more intensive analysis and development of specific recommendations for TOD implementation for two station areas: 130th Avenue NE in Bellevue and Overlake Village in Redmond. Phase 2 explored innovative approaches to leverage opportunities and incent TOD implementation in the short- and long-term in these station areas. Phase 2 developed recommended actions, strategies, and products to address specific issues in each station area per the scope of work that was developed by the Task Force and overseen by the PMT.



## PHASE 2 PRODUCTS

Products developed in Phase 2 supporting these four focus areas are listed in the chart below.



	Affordable Housing	Business Retention and Attraction	Partnerships	Transportation Access and Connectivity
<b>Housing, Development, and Infrastructure Funding</b> <i>Analysis and Recommendations</i>	✓	✓	✓	✓
<b>Vibrant Urban Neighborhoods</b> <i>Creating Transit-Oriented Communities for All Ages</i>	✓	✓	✓	✓
<b>Business Retention and Attraction</b> <i>Analysis and Recommendations</i>		✓	✓	
<b>Overlake Village District Energy Concepts and EcoDistrict Applicability</b> <i>Potential District Energy Value Proposition and Implementation Recommendations</i>	✓	✓	✓	✓
<b>130th Avenue NE Transit-Oriented Development</b> <i>Opportunity Study and Financial Assessment</i>	✓	✓	✓	✓
<b>Benefits of Green Transit-Oriented Development</b> <i>Summary of Best Practices and Green Building Standards</i>	✓	✓	✓	✓
<b>Stakeholder Involvement and Outreach</b> <i>Summary of Project Outreach Activities and Recommendations for Ongoing Engagement</i>	✓	✓	✓	✓
<b>Transit Integration and Parking Management</b> <i>Analysis and Recommendations</i>	✓	✓	✓	✓
<b>Bicycle and Pedestrian Connectivity</b> <i>Analysis and Recommendations</i>	✓	✓	✓	✓

These products have been completed as stand-alone, but complementary documents and reports. All reports are available for download at <http://www.psrc.org/about/pubs> (look for Growing Transit Communities Partnership, East Corridor information).



## East Corridor Implementation Support



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### PARTNERSHIP FOR SUSTAINABLE COMMUNITIES LIVABILITY PRINCIPLES

The Growing Transit Communities Partnership supports the livability principles of the Partnership for Sustainable Communities. The US Department of Housing and Urban Development (HUD), US Department of Transportation (DOT), and the US Environmental Protection Agency (EPA) have joined together to help communities nationwide improve access to affordable housing, increase transportation options, and lower transportation costs while protecting the environment through the Partnership for Sustainable Communities. The Partnership for Sustainable Communities works to coordinate federal housing, transportation, water, and other infrastructure investments to make neighborhoods more prosperous, allow people to live closer to jobs, save households time and money, and reduce pollution. The Partnership agencies incorporate the following six principles of livability into federal funding programs, policies, and future legislative proposals.

**Provide more transportation choices**—Develop safe, reliable, and economical transportation choices to decrease household transportation costs, reduce our nation's dependence on foreign oil, improve air quality, reduce greenhouse gas emissions, and promote public health.

**Promote equitable, affordable housing**—Expand location- and energy-efficient housing choices for people of all ages, incomes, races, and ethnicities to increase mobility and lower the combined cost of housing and transportation.

**Enhance economic competitiveness**—Improve economic competitiveness through reliable and timely access to employment centers, educational opportunities, services, and other basic needs by workers, as well as expanded business access to markets.

**Support existing communities**—Target federal funding toward existing communities—through strategies like transit-oriented, mixed use development and land recycling—to increase community revitalization and the efficiency of public works investments and to safeguard rural landscapes.

**Coordinate and leverage federal policies and investment**—Align federal policies and funding to remove barriers to collaboration, leverage funding, and increase the accountability and effectiveness of all levels of government to plan for future growth, including making smart energy choices such as locally generated renewable energy.

**Value communities and neighborhoods**—Enhance the unique characteristics of all communities by investing in healthy, safe, and walkable neighborhoods—rural, urban, or suburban.

The Focus of this Phase 2 Report:

# The Benefits of Green Transit-Oriented Development

and Summary of Best Practices and Green Building Standards

This Phase 2 report of the East Corridor Implementation Support Project presents an overview of the benefits of Green Transit-Oriented Development based on recent studies and research and summarizes the latest best practices and green building standards applicable to development projects. A list of resources and reference materials is also provided at the end of the report .

The information in this report, developed for the Growing Transit Communities Partnership, will be helpful to those implementing redevelopment and transit-oriented development projects in the East Corridor as well as for those working in other station areas undergoing transformation throughout the region.

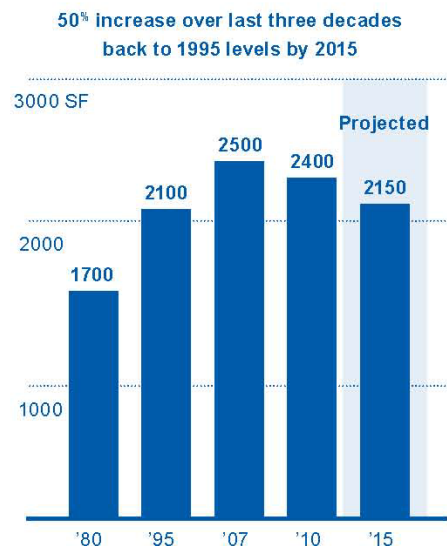
## BACKGROUND AND INTRODUCTION

One of the key objectives of the Growing Transit Communities Partnership is to support redevelopment of transit-oriented communities in a sustainable manner. By locating housing, jobs, and services close enough to stations and improving pedestrian and bicycle connectivity in station areas many people will have the opportunity to travel more sustainably. By promoting and incentivizing sustainable building and site development practices, there is an opportunity to increase the green value of transit-oriented communities even more and realize triple bottom line advantages environmentally, socially, and economically.

There is a growing market interest in living in green communities and neighborhoods. Many of today's homebuyers are looking for places where they can walk and bicycle for their daily trips. Many are seeking more economical, energy smart homes with lower utility costs over the long term. Residents in the Pacific Northwest in particular often make a strong connection between the built and natural environments and are aware that the more sustainably they live in an urban setting, the more they are helping to improve the environment, natural resources, fish, and wildlife of the surrounding natural lands and waters.

Recent studies have found more Americans are interested in more compact living and smaller homes. For example, research by The Demand Institute in a May 2012 study, *"The Shifting Nature of US Housing Demand"* indicates a growing demand for smaller homes as the Baby Boom generation ages and younger home buyers show interest in more urban living. The charts below illustrate these trends.

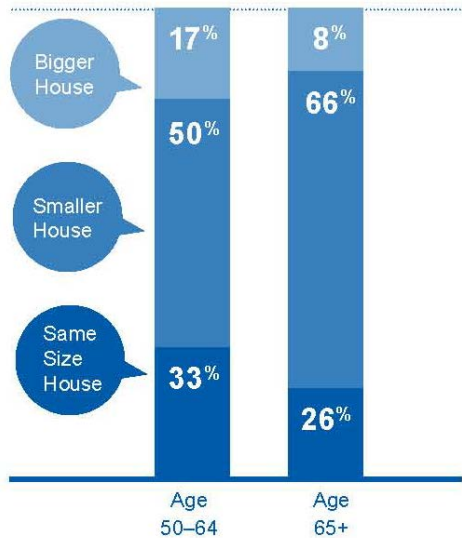
Average New Home Size



Source: The Demand Institute, US Census Bureau, National Association of Homebuilders, and the Conference Board, May 2012



## Older Americans' Intentions Among Those Planning to Move



Source: The Demand Institute, US Census Bureau, National Association of Homebuilders, and the Conference Board, May 2012

In response to the growing interest and demand in sustainable choices, energy conservation, and smaller homes, some developers and home builders are finding more economical ways to offer green solutions.

## Defining a Sustainable Community

The King County GreenTools Green Building Task Force, which provided review and input for this report and includes representatives from cities and industry organizations throughout King County, defines a sustainable community as:

*"...one that works harmoniously to create a balance between equity for people, economy, and environment. The community uses its resources to meet current needs while benefiting future generations. We conserve natural resources and their richness through prioritizing human health, eliminating waste, preventing pollution, maximizing conservation, and*

*promoting prosperity in our local living economy."* Earth Day 2010

The region's investment in light rail and the changing context of the East Corridor reinforce the regional commitment to sustainability. And while traditionally the East Corridor has been predominantly automobile oriented, as new station areas at Overlake Village and in the Bel-Red Corridor emerge into new urban neighborhoods in the coming years, these areas are planned to transform into vibrant and walkable mixed-use neighborhoods where people can walk to shopping and services and can have access to frequent, reliable transit service. People will have more choices about where to live and how to travel.

The region's commitment to sustainability is also evident in planning, community development, and regulatory practices. Both the Cities of Redmond and Bellevue have integrated green building provisions and incentives into their codes. Requirements related to the State Environmental Policy Act and state water quality protection and stormwater management provisions help drive sustainable practices in planning and site development. There is a strong commitment to programs and initiatives such as Built Green, Salmon Safe, Living Building Challenge, Evergreen Standard, and 12,000 Rain Gardens for Puget Sound, all locally developed.

The best results in creating sustainable communities can happen when green building is an integral part of transit-oriented development. Green transit-oriented developments that address all scales—district, neighborhood, infrastructure, street, site, and building—will result in the most benefits.

## ENVIRONMENTAL BENEFITS OF GREEN TRANSIT-ORIENTED DEVELOPMENT

By its nature transit-oriented development (TOD) is already a sustainable approach to urban planning because concentrating households and jobs near transit significantly reduces the number and length of trips made by motor vehicles. This reduces greenhouse gas emissions and the related effects of climate change.

The compact nature of transit-oriented development with a diverse mix of land uses located within walking and bicycling distance and an emphasis on providing well-connected pedestrian and bicycle facilities are also factors that reduce vehicle use in transit-oriented communities.

Implementing TODs that follow green building standards and integrate sustainable measures exponentially increasing the value of these new urban communities and neighborhoods as sustainable places because in addition to reducing vehicle miles traveled, these areas have the potential to offer:

- Energy conservation and district energy systems (reduced energy costs means lower household costs for residents);
- District energy systems;
- Low impact development through the application of green building standards and sustainable site development practices;
- Provision of trees, green space, and landscaping;
- Places to grow healthy food;
- Vehicle sharing and bike sharing facilities for neighborhood shopping and errands and to help increase final mile connections to and from high-capacity transit systems;
- Permeable surfaces and green stormwater infrastructure; and
- Other eco-friendly elements.

According to research completed by Robert Cervero and Cathleen Sullivan and presented in their paper *Toward Green TODs*, sustainable transit-oriented development has the potential to create carbon footprints that are 35 percent less than those of conventional developments, and sometimes more. Incorporating green urbanism and architecture in community designs and TODs creates a number of advantageous synergies as an outcome of:

- Increased densities that promote transit usage and conserve heating/cooling expenses;
- Mixed land uses that promote walking and bicycling and use of limited-range electric vehicles for trip making;
- Reduced impervious parking services matched by increased open space and community gardens; and
- Opportunities for generating solar power from photovoltaic systems located on transit shelters.

## GREEN BUILDING IS GREEN IN MORE WAYS THAN ONE

The economic benefits of green building were the focus of recently published report by the World Green Building Council, *The Business Case for Green Building, A Review of the Costs and Benefits for Developers, Investors, and Occupants*, 2013. Research has long shown that there are compelling benefits from building green, such as energy savings that are realized by the owners throughout the building life cycles. However, identifying other financial benefits of green buildings has been somewhat controversial. The World Green Building Council report synthesizes credible evidence from around the world into one definitive resource and investigates the business costs and benefits of green building answering key questions such as:

- Do green buildings attract a financial premium in terms of rental and sales value?
- Are green buildings more attractive to tenants and occupiers?

- Are employees occupying greener buildings more productive?

Five major topics related to business benefits are examined and presented in the report:

1. Design and Construction Cost
2. Asset Value
3. Operating Cost
4. Workplace Productivity and Health
5. Risk Mitigation

The report points to an increasingly compelling business case for green buildings—evidence presented clearly shows that green building makes smart business sense. Key findings of the report include the following.

## Design and Construction Costs

Research shows that building green does not necessarily need to cost more, particularly when cost strategies, program management, and environmental strategies are integrated into the process right from the start.

## Asset Value

As investors and occupants become more knowledgeable about and concerned about the environmental and social impacts of the built environment, buildings with better sustainability credentials enjoy increased marketability.

## Operating Costs

Green buildings have been shown to save money through reduced energy and water use and lower long-term operations and maintenance costs.

## Work Place Productivity and Health

Research shows that green design attributes of buildings and indoor environments can improve worker productivity and occupant health and well-being, resulting in bottom line benefits for businesses.

## Risk Mitigation

Sustainability risk factors can significantly affect the rental income and the future value of real

estate assets, in turn affecting their return on investment.

The report further addresses the economic potential of scaling up green building from the single site to the neighborhood and city scale, allowing the opportunity to deliver much larger scale economic and environmental benefits related to mitigating climate change, reduced dependence on fossil fuels and increased energy security, resource conservation, job creation, long-term resilience of our communities, and enhanced quality of life. See Resources and References for how to access this report as well as Cervero's and Sullivan's research paper. The table below highlights various sustainable elements that can be integrated into Green TOD, adapted from Cervero's and Sullivan's work.

### POTENTIAL GREEN TOD FEATURES

TOD (Mobile Sources)	Green Urbanism (Stationary Sources)
<b>Transit Design (world class transit trunk and distribution system with station as hub)</b>	Energy self-sufficient (renewably powered; use of wind turbines, solar, and energy conserving systems)
<b>Non-motorized access (bike paths bike lanes, shared use paths, pedestrian ways/ sidewalks)</b>	Zero-waste (recycling, re-use, methane digesters, rainwater collection for irrigation, and gray water use)
<b>Bike sharing and car sharing</b>	Community gardens (compost, canopies)
<b>Minimal parking (reduced land consumption, building massing and impervious surfaces)</b>	Buildings (optimally oriented for energy conservation and solar access, green roofs, materials (recycled/low impact)
<b>Compact mixed-uses</b>	Low impact development on site such as impervious/porous surfaces, rain gardens, green stormwater infrastructure, and preservation of natural areas



## STUDIES POINT TO GROWING MARKET DEMAND FOR GREEN HOMES

While the World Green Building Council is making the case for a full range of economic benefits to green building, the market value of sustainable development is further underscored by recent studies of home buyers, particularly those of the millennial generation, which includes the most recent and upcoming generation of potential owners and renters.

In a study published by McGraw-Hill Construction in 2012, based on a survey conducted in 2011 (the McGraw-Hill Construction's Green Home Builders and Remodelers Survey), green construction represented 17 percent of the overall residential construction market in 2011, which was over double the figure from 2008 and a major jump from a 2 percent level in 2005. This construction activity related to eco-friendly single family homes represented \$17 billion of the overall residential construction market in America, and the increasing level of green building is projected to continue, rising as high as 38 percent by 2016 and representing a market share of \$87 billion to \$114 billion. Based on the follow-on study by McGraw Hill, [New and Remodeled Green Homes: Transforming the Residential Marketplace](#), this five-fold increase in new green home construction between 2011 and 2016 indicates the green home market accounts for an incredible \$114 billion opportunity in the coming years.

As the construction industry plans for the future, up to one-third of builders believe they will be dedicated to green building by 2016. The study also showed that the West Coast is seeing higher than average growth compared with the rest of the nation. An important excerpt from the study examines the growing buyer interest in green built homes:

*"Key factors driving these numbers upwards include interests in higher quality and concerns about*

*increases in energy costs, while obstacles include lack of consumer education and higher perceived first cost. These obstacles have become less of an issue between 2008 to 2011, signaling that green home building is significantly more mainstream.*

*Additionally, 61 percent of building firms surveyed report that homeowners are willing to shell out more for green features while 66 percent of remodeling firms surveyed find the customers are comfortable with green-related premiums. This is believed to be the result of the energy- and money-saving features of green homes and eco-friendly = higher quality associations." (Source: Matt Hickman, Mother Nature Network, February 2012)*

Another recent study based in California showed that certifying a residence as sustainable can add 9 percent to its value. On a \$300,000 property, that is \$27,000. The paper, [2012 Values of Green Labels in the Californian Housing Market](#), authored by Nils Kok and Matthew Kahn focused on homes in the Golden State that had achieved [LEED for Homes](#) or [GreenPoint Rated](#) status. These properties, close to transportation routes and shopping centers, were constructed with non-toxic building materials and contained water efficient features. Green homes are consistently valued more highly by purchasers who are willing to pay more.

According to a recent Better Homes and Gardens Real Estate Survey of 1,000 adults aged 18-35, the group designated as Generation Y (Gen Yers) also known as millennials, are interested in forging a new path when it comes to home ownership and choice of home, whether buying or renting. This study found that millennials prefer urban living such as in-fill and transit-oriented development and walkable communities. As the second largest generation in the country, born between 1977 and 1994 and numbering 76 million, many millennials are either currently in college or recently graduated and leaving the nest, and a high proportion of millennials want to live in vibrant, compact, and walkable communities with a full range of economic, social, and recreational opportunities.

According to the study, 77 percent of millennials plan to live in America's urban cores. The largest group of millennials began graduating from college in 2009, so if this group rents for the typical three years, from 2013 to 2018, there will be more aspiring first-time homebuyers in the American marketplace than ever before. This trend is converging with the aging of the largest generation of Americans, the baby boomers. As boomers retire, many are looking for complete communities where they can age in place. They will want to drive less and walk or take transit to appointments, for shopping and errands. With limited incomes, they'll be interested in spending less household costs on transportation and energy. With the last of the boomers hitting sixty-five in 2029, this generational convergence is set to last decades. Another important note is that the Census Bureau estimates that America is going to grow from 310 million people today to 440 million by 2050. With all these factors coming forward, new urban neighborhoods that provide the qualities these generations are seeking should be successful.

Beyond the interest by homeowners in sustainable communities and green building, investors are becoming attracted by the increased value achieved through official recognition (via compliance with green building standards). Even when the [\\$2500 to \\$3000](#) cost of LEED residential certification is factored in, the increased value achieved through official recognition is very attractive to investors. The Urban Land Institute and PWC's recent 2013 paper, [Emerging Trends in Real Estate 2013](#), focuses much of its efforts on real estate investment and says that green building is playing an increased role in both the residential and commercial markets. While they believe overall new development will be limited, they state that "trends point to more environmentally friendly, sustainable buildings and a more efficient use of space. Green developers continue to embrace this pursuit and to adapt and conform to new demands from consumers." (Source: Matt Courtland [www.triplepundit.com](http://www.triplepundit.com), September 2013).

A report published by Environmental Leader/EL Insights states that from 2010 to 2015, the total US green building market value is projected to increase from \$71.1 billion to \$173.5 billion. The explosive projected growth can be attributed both to a growing recognition of green building's potential cost-savings as well as increasing levels of government incentives.

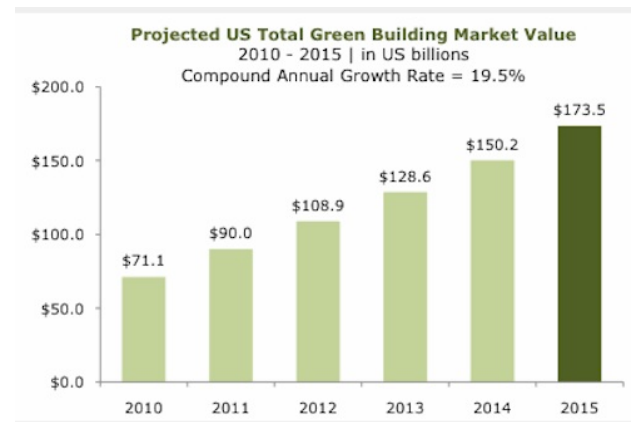


Chart from EL Insights article

## SUMMARY OF BEST PRACTICES AND GREEN BUILDING STANDARDS

With the increasing emphasis on green building for both public and private sector development, it is important to understand the standards that are formally recognized in the United States, and regularly applied in the Pacific Northwest region.

While a variety of green building standards are currently applied in this country and abroad, the Leadership in Energy and Environmental Design (LEED) is the most commonly referenced standard and often required for government buildings. Standards for site development and infrastructure are also guiding the industry. The table below summarizes several standards and how they apply to green building and site development projects.

## GREEN BUILDING STANDARDS

Rating/ Certification System	Type or Standard of Certification	Administering Organization or Agency	Applicability/Notes
<a href="#"><u>Built Green</u></a>	Built Green (R) is an environmentally-friendly, non-profit residential building program of the Master Builders Association of King and Snohomish Counties, developed in partnership with King County, Snohomish County, and other agencies in Washington state to set standards of excellence that can make a significant impact on housing, health, and the environment, and that are readily "do-able" today	Master Builders Association of King and Snohomish Counties	Voluntary program with both self-certification and third party verification elements requiring builders and developers to follow specific criteria to attain status as Built Green home or community; a checklist gives credit for: <ul style="list-style-type: none"> <li>Green Code applicability</li> <li>Site and Water</li> <li>Energy Efficiency</li> <li>Indoor Air Quality</li> <li>Materials Selection</li> </ul> Also the Built Green Multi-family Checklist, which would have applicability to TOD projects
<a href="#"><u>Envision Sustainable Infrastructure Rating System</u></a>	Envision TM is the product of a joint collaboration between the Zofnass Program for Sustainable Infrastructure at the Harvard University Graduate School of Design and the Institute for Sustainable Infrastructure; provides holistic framework for evaluating and rating the community, environmental, and economic benefits of all types and sizes of infrastructure projects.	Institute for Sustainable Infrastructure	Evaluates, grades, and gives recognition to infrastructure projects that use transformational, collaborative approaches to assess sustainability indicators over the course of the project's life cycle. Program categories: <ul style="list-style-type: none"> <li>Quality of Life</li> <li>Leadership</li> <li>Resource Allocation</li> <li>Natural World</li> <li>Climate and Risk</li> </ul>
<a href="#"><u>Evergreen Sustainable Development Standard</u></a>	Green building criteria required for any affordable housing project applying for state funds through the Washington State Housing Trust Fund  Loosely based on the Enterprise Green Communities Criteria and localized to the Washington state climate and regulatory environment	Washington State Department of Commerce	Point system awards points for a variety of sustainable building practices as part of affordable housing projects including: <ul style="list-style-type: none"> <li>Site location and neighborhood planning</li> <li>Water conservation</li> <li>Energy efficiency and incorporation of renewable energy technologies</li> <li>Environmentally-conscious</li> </ul>

			<p>construction practices, building materials, and improved indoor air quality</p> <p>New construction projects must comply with all mandatory measures and earn 50 points from optional measures; rehab projects must earn 40 points from optional measures</p>
<a href="#">Green Globes</a>	<p>Green building guidance and assessment program for:</p> <p>Existing buildings</p> <p>New construction</p>	<p>Green Building Initiative in the US</p> <p>BOMA Canada</p>	<p>Multiple attributes applied/measured</p> <p>Environmental assessment areas to earn credits in:</p> <ul style="list-style-type: none"> <li>Energy</li> <li>Indoor Environment</li> <li>Site</li> <li>Water</li> <li>Resources</li> <li>Emissions</li> <li>Project/Environmental Mgmt.</li> </ul> <p>No prerequisites</p>
<a href="#">King County Sustainable Infrastructure Scorecard</a>	<p>Flexible tool that can be applied to all phases of a project and works well for projects that don't fit well into LEED or other systems; uses basic concepts of the LEED rating system adapted to apply to infrastructure projects in King County</p>	<p>King County Green Building, GreenTools</p>	<p>Scorecard addresses nine categories including a set of prerequisites, seven sets of credits (optional items) organized by key topics of sustainability and an additional set of credits (also optional) for enhanced performance. An online guide provides information for achieving prerequisites and credits. Categories:</p> <ul style="list-style-type: none"> <li>Planning and designing for sustainable development</li> <li>Construction Best Management</li> <li>Preserve and maintain natural site amenities</li> <li>Social Benefits</li> <li>Reduce energy use and promote the use of renewable energy</li> <li>Water Management</li> <li>Use of Sustainable Materials</li> <li>Enhanced Performance</li> </ul>

<a href="#"><u>Leadership in Energy and Environmental Design (LEED)</u></a>	Green building rating and certification system through independent third-party verification for: New Construction (NC) Existing Buildings, Operations & Maintenance (EB O&M) Commercial Interiors (CI) Core & Shell (CS) Schools (SCH) Retail Healthcare (HC) Homes Neighborhood Development (ND)	US Green Building Council	Multiple attributes applied to measure performance in: Sustainable Sites  Water Efficiency  Energy & Atmosphere  Materials & Resources  Indoor Environmental Quality  Locations & Linkages  Awareness & Education  Innovation in Design  Regional Priority through a set of prerequisites and credits  LEED for Homes Midrise is an evolution of the LEED for homes rating that applies well to TOD, mixes use buildings
<a href="#"><u>Living Building Challenge</u></a>	Performance-based standard, and certification program for: Landscape and infrastructure projects Partial renovations and complete building renewals New building construction Neighborhood, campus and community design	International Living Future Institute	Multiple attributes applied/measured  Performance areas include: Site  Water  Energy  Materials  Health  Equity  Beauty  All areas are requirements
<a href="#"><u>Northwest Energy Star and Energy Star</u></a>	Government certification using a benchmarking method	US EPA and US DOE	Focused on building energy and water use



<a href="#"><u>Salmon Safe</u></a>	Salmon-Safe offers a series of peer-reviewed programs linking land management practices with protection of agricultural and urban watersheds; also introducing new programs focused on site design and development ; as well as pollution prevention in large-scale construction management	Independent 501(c)3 nonprofit based in Portland, OR	Certification programs for:  Vineyards  Farms  University and Corporate Campuses  Green Infrastructure  Large Scale Residential Development  Parks Systems and Natural Areas  Golf Courses  Pollution Prevention with Large Scale Construction Management
<a href="#"><u>Sustainable Sites Initiative™</u></a>	Voluntary national guidelines and performance benchmarks for sustainable land design, construction, and maintenance practices	American Society of Landscape Architects, the Lady Bird Wildflower Center at the University of Texas at Austin, and the United States Botanic Garden	Interdisciplinary best practices; multiple attributes applied/measured

The US Department of Energy (DOE) conducted a review of Green Building Certification Systems in 2012, and the table below represents a summary of the Green Globes, LEED, and Living Building Challenge certification systems. The US DOE review document includes detailed descriptions of each certification system. See Resources and References for a link to this document.

**Summary of Green Building Certification Systems**

Certification System	Owner	Whole-building sustainability	Building Types	Third-party Certification
<b>Green Globes®</b>	Green Building Initiative (GBI)	Green Globes is comprised of seven key areas: energy, indoor environment, site, water, resources, emissions, and project/ environmental management.	Green Globes certifies new buildings and significant renovation, existing buildings, building emergency management, building intelligence, and fit-up.	Green Globes Assessors provide third-party certification services.
<b>LEED®</b>	U.S. Green Building Council (USGBC)	LEED is comprised of five key areas: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.	LEED certifies new construction and major renovations, existing buildings, commercial building interiors, core and shell construction, schools, retail, healthcare, and homes.	The Green Building Certification Institute (GBCI) provides third-party certification services.
<b>Living Building Challenge™</b>	International Living Building Institute (ILBI)	Living Building Challenge is comprised of seven performance areas: site, water, energy, health, materials, equity and beauty.	Living Building Challenge certifies development at four scales: building, neighborhood, village/campus, and city.	A third-party auditor is responsible for performing document review and onsite verification.

Source: US Department of Energy

## THE IMPORTANCE OF A COLLABORATIVE AND INTEGRATIVE PROCESS

Many of the green building standards and rating programs require or give particular credit to design and development processes that have been collaborative and have involved interdisciplinary expertise. This process also includes setting goals at the start of projects and defining best practices that will be applied by the team to meet the selected rating system(s). The Integrative Process is also defined as a standard by the American National Standards Institute (ANSI).

Early planning and coordination are often key to the success of sustainable projects. For development projects, taking a master plan approach can be advantageous in that it allows developers to set a vision and guiding principles, including sustainable practices, at the beginning and then to budget for and design towards for these from the outset. Master planning also typically involves taking a holistic approach to an entire site, which then can provide flexibility in design, including preserving natural areas on the site, locating buildings for optimal energy use, enhancing access and connectivity, and other factors.

## RESOURCES AND REFERENCES

There are many helpful resources and reference materials available to practitioners and designers working to develop sustainable projects. Many of these have been developed locally to guide the industry in this region.

- [Built Green](#), Master Builders of King and Snohomish Counties
- [Built Green Multifamily Checklist](#)
- *Built Green and LEED, A Comparative Analysis*, King County GreenTools, City of Seattle city green building, November 21, 2008
- [Energy Star](#)
- [Envision Sustainable Infrastructure Rating System](#)
- [Evergreen Sustainable Development Standard](#)
- [Green Globes](#)
- GreenWorks Realty, MLS Report/Environmental Certification Report, conducted every three years to track certification trends of single family homes in the region (most certified through the Built Green program)
- [Integrative Process ANSI Standard](#)
- [King County Sustainable Infrastructure Scorecard](#)
- [Leadership in Energy and Environmental Design \(LEED\)](#)
- [LEED for Homes](#)
- [Living Building Challenge](#)
- [Northwest Energy Star](#)
- [City of Redmond Green Building and Green Infrastructure Program](#)
- Review of Green Building Certification System, [http://www.gsa.gov/graphics/ogp/Cert\\_Sys\\_Review.pdf](http://www.gsa.gov/graphics/ogp/Cert_Sys_Review.pdf), US Department of Energy, March 2012
- [Salmon Safe](#)
- Seattle Built Green Portfolio Analysis, Single Family Housing Analysis and Projections: Strategies and Resource Savings, City of Seattle Department of Planning and Community Development, city green building, 2008-2011
- South Kirkland Park & Ride Certification Analysis, Green Building Certification Feasibility Report, King County GreenTools, January 2012
- [New and Remolded Green Homes: Transforming the Residential Marketplace](#), McGraw Hill Construction, 2012
- [Sustainable Sites Initiative™](#)
- *Toward Green TODs* by Robert Cervero and Cathleen Sullivan, UC Berkeley Center for Future Urban Transport <http://www.its.berkeley.edu/publications/UCB/2010/VWP/UCB-ITS-VWP-2010-7.pdf>
- US Green Building Council, [www.usgbc.org](http://www.usgbc.org)
- [The YWCA Family Village: Affordable Housing Meets Sustainable Design](#), Patti Southard, published in TrimTrab, Fall 2010