



# **Performance Audit of the Green Building Ordinance**

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**May 13, 2014**

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## **Executive Summary**

While King County has exhibited leadership in promoting cost-effective sustainable development, ambiguities in the Green Building Ordinance and inconsistent reporting may prevent decision-makers from being able to take proactive steps to ensure the County is meeting its environmental and financial goals. Clarifying requirements in the Ordinance and improving project tracking and reporting could provide better information to meet these goals.

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## Performance Audit of the Green Building Ordinance

## Report Highlights

May 13, 2014

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### Purpose

The County Council requested this audit to help determine how well the current Green Building Ordinance has been carried out before changes go into effect in August 2014. The revised Ordinance will apply cost limits to all projects under the Ordinance and change the goal for LEED certification from Gold to Platinum.

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### Key Audit Findings

King County is committed to responsible environmental stewardship; however, the current implementation of the Green Building Ordinance may not fully leverage its intended impacts. Among the county's initiatives, several related to the Green Building Ordinance are noteworthy, such as the creation of a Green Building Team, centralized project reporting, the provision of training in sustainable practices, and promoting the use of life cycle cost analysis.

King County's leadership in responding to climate change depends on its ability to proactively guide green building project managers in making cost-effective decisions that contribute to achieving countywide climate action goals. A key finding of this performance audit is that ambiguity in the Ordinance, coupled with how limits in LEED costs have been established, may lead to outcomes unanticipated by policy-makers and contrary to the intent of promoting cost-effective sustainable development. These outcomes may include foregoing the pursuit of some green building alternatives that may be environmentally beneficial and financially responsible. In addition, incomplete reporting and inconsistent interpretation of key elements of the Ordinance make it difficult to assess program impact.

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### What We Recommend

Our recommendations focus on clarifying requirements in the Ordinance and ensuring better project tracking, reporting, and alignment with countywide sustainability goals. The report also offers an alternative for setting limits to LEED-associated costs that would be consistent among projects.

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# I. Ambiguity in the Ordinance

## Section Summary

County agencies interpret the Green Building Ordinance in various ways due to ambiguous language and the challenges involved in applying the most literal interpretations of the Ordinance.<sup>1</sup> We found that ambiguity in the Ordinance, coupled with how limits in LEED-related costs have been established, may lead to outcomes unanticipated by policy-makers and contrary to the intent of promoting cost-effective sustainable development.

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### How does the Ordinance balance environmental sustainability with financial stewardship?

To balance the county's strategic goals of environmental and financial stewardship, the Green Building Ordinance specifies that capital projects should achieve LEED Gold certification but places limits on costs related to environmental certification. Leadership in Energy & Environmental Design (LEED) is a program that provides third-party verification of green buildings. Building projects earn points by incorporating green features to achieve different levels of certification. The basic level is "certified," followed by progressively higher levels of Silver, Gold, and Platinum. The Ordinance requires capital projects to incorporate sustainable building features through LEED certification when eligible or through a county-developed Sustainable Infrastructure Scorecard for projects that are not eligible for LEED.<sup>2</sup> The scorecard was developed by the Green Building Team using concepts that are the basis of the LEED rating system; projects can also earn Bronze, Silver, Gold, and Platinum ratings based on points earned for various sustainable practices. Scorecard projects make up the bulk of the projects impacted by the Ordinance (166 scorecards and five LEED projects in 2012 according to the county's 2012 Annual Sustainability Report). In comparison to a project not seeking a LEED rating, the Ordinance requires projects to achieve LEED Gold certification with no extra cost to the general fund over the life of the asset and extra costs of no more than two percent to other funds over the life of the asset.<sup>3</sup> These elements are shown as a process in Exhibit A.

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<sup>1</sup> Many of the findings in this report relate to how the Ordinance was written and has been carried out as it was enacted in 2008 and 2013. If we are referencing a specific version, we will note this.

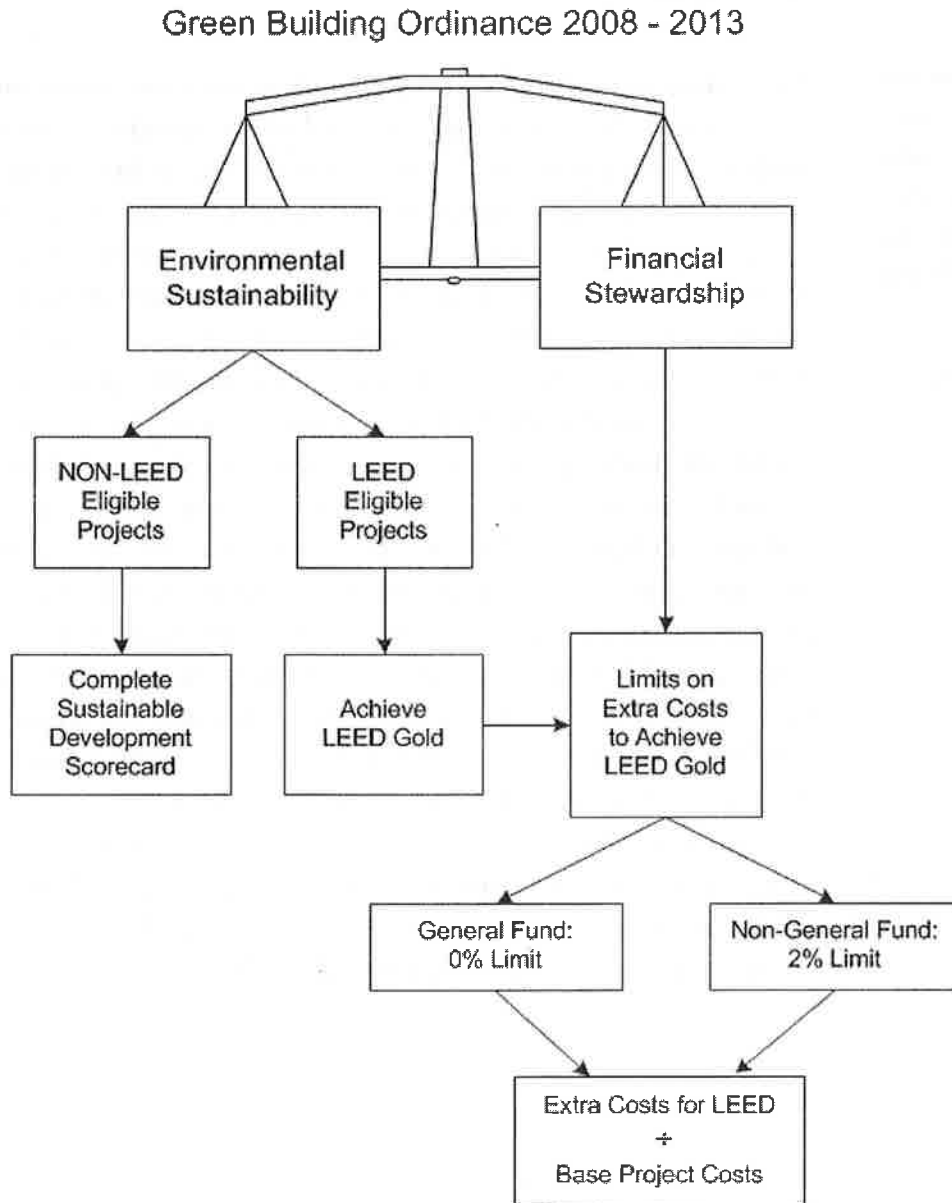
<sup>2</sup> LEED eligibility is defined in the 2008 Ordinance in Section 2, Subsection G as "a new construction project larger than five thousand gross square feet of occupied or conditioned space as defined in the Washington State Energy Code, which is chapter 51-11 WAC, or a major building remodel or renovation project."

<sup>3</sup> King County Code 4A.10.325 describes the general fund as "a governmental fund that is required under RCW 36.33.010 and that is used to account for all financial resources of the county not accounted for and reported in some other fund." Ord. 17527 § 170, 2013 distinguishes non-general funds from the general fund in that they have dedicated revenue sources, such as utility rates that are used strictly to support a particular service, like Solid Waste and Wastewater.

# I. Ambiguity in the Ordinance

In the lowest box of Exhibit A, project managers apply the Ordinance’s cost limits by dividing the extra costs associated with achieving LEED by the base project costs without LEED-Gold related costs.<sup>4</sup>

**Exhibit A: The Ordinance is Structured to Balance King County Strategic Goals of Environmental Sustainability and Financial Stewardship**



Source: King County Auditor’s Office

<sup>4</sup> What we describe as base project costs is what the Ordinance refers to as a project that is not seeking a green building certification.

# I. Ambiguity in the Ordinance

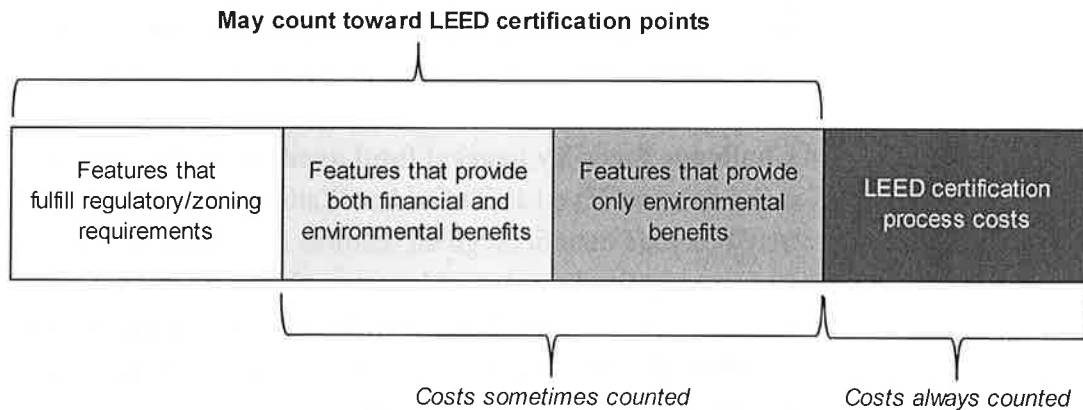
**What changes in the updated Ordinance are related to this balance?**

**The King County Council updated the Green Building Ordinance to include higher environmental certification standards and broaden financial stewardship requirements.** For example, the required LEED level increases from Gold to Platinum as of August 2014. It also requires non-LEED eligible projects to achieve a Platinum scorecard rating subject to the same zero and two-percent cost limits. These changes were passed in December 2013 upon the expiration of the most recent version of the Ordinance, which was enacted in June 2008 and expired in December 2013.

**How much are agencies spending on extra costs related to LEED Gold certification?**

**Lacking clear guidance, county agencies calculate LEED Gold certification costs in different ways, which precludes a meaningful total of the reported costs.** Both the 2008 and 2013 versions of the Ordinance are ambiguous regarding which elements should be included when calculating the extra cost related to LEED certification. They directed project teams to determine the extra costs for achieving a LEED Gold rating as compared to a building that is not seeking a LEED rating. We found that agencies interpret this directive in a variety of ways. Exhibit B below illustrates how different project costs can be counted in determining the extra cost associated with LEED certification. Some green features need to be included to fulfill regulatory requirements or make economic sense by reducing life cycle costs. Others may not make strict financial sense, but may provide environmental benefits.

**Exhibit B: All Categories of Features That Generate LEED Points Have Costs; The Ordinance is Unclear on Which Costs Agencies Should Count As “Extra” Costs of LEED Certification**



**Extra costs of LEED certification may include some or all of these**

Source: King County Auditor’s Office

A similar problem exists with how agencies estimate the base cost of a project. This is required in order to determine whether the project exceeds the zero or two-percent cost limit in the Ordinance (see the bottom box in

# I. Ambiguity in the Ordinance

Exhibit A). These difficulties of interpretation are explained in more detail in Appendix 1.

**Is the Ordinance working as intended to encourage green building while ensuring cost-effectiveness?**

**The Ordinance may not be working as intended. It may have increased some project managers’ awareness of sustainable development and green features, but ambiguities in the Ordinance may discourage the use of beneficial green building features in some cases and may result in missed opportunities for cost-effectiveness.** Interviews with project managers suggest that the Ordinance has created an awareness of the importance of green building, and that LEED and scorecard requirements generate discussion of green features between project teams and managers that might not have previously occurred.

However, our analysis of the Ordinance and review of case studies found that ambiguity in the Ordinance could lead to outcomes contrary to cost-effective sustainable development.<sup>5</sup>

- **Reduced LEED achievements** – Ambiguity in how to define extra costs associated with LEED certification could result in more projects exceeding the cost limits for LEED and therefore choosing a lower level of LEED certification. For example, one county agency adds the costs of *all* features that earn LEED points, including the cost of features that lower operational costs. Another agency counts only the costs of those features that add operational costs. The zero-percent and two-percent limits will be reached much more quickly when a project counts the costs of all the features that earn points even when those features reduce the cost of operating the facility.
- **Challenge faced by general fund agencies** – The zero-percent limit on costs to achieve LEED Gold or Platinum for general fund projects may preclude beneficial green features that would be allowed for non-general fund projects. Moreover, the only way for a general fund project to achieve certification while falling under the cost limit established in the Ordinance is to compare the LEED-seeking project to a more expensive, hypothetical project. The comparison, hypothetical project not seeking certification would be

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<sup>5</sup> The four agencies responsible for most of the LEED certified projects are Transit, Facilities Management, Solid Waste, and Wastewater. We asked each of these agencies to provide LEED project examples, and we followed up with interviews and a review of their life cycle analyses and other project related materials.



## I. Ambiguity in the Ordinance

one with features that do not save costs or save fewer costs, thereby rendering the project of questionable economic merit.

- **Uneconomical elements** – For non-general fund projects, there is a risk that the Ordinance could be interpreted to allow for the inclusion of uneconomical elements, or elements that cost more, as long as the two-percent limit on extra costs is not surpassed.
- **Missed opportunities** – There may also be unintended consequences in terms of missed opportunities to pursue the most cost-effective alternatives. This is especially the case for project features that may have environmental benefits, such as reductions in greenhouse gas emissions. In a smaller project, such a feature might push the total cost over the LEED cost limits; whereas on a more expensive project, that same feature might be allowable within the limits.

The following exhibit gives an example of how the Ordinance could direct project staff to forgo opportunities to use the most cost-effective green features. The example compares two different hypothetical projects that could introduce green features to reduce CO<sub>2</sub> emissions. The particular green features in the two projects cost the same amount, but one reduces twice as many metric tons of CO<sub>2</sub> as the other. One might expect that the Ordinance would direct project staff to pursue achieving certification with more cost-effective green features, but that would not necessarily be the result based on how we saw project staff interpret and apply the Ordinance. The example shown in Exhibit C below assumes the projects are funded with non-general fund dollars and are therefore subject to the two-percent limit.

# I. Ambiguity in the Ordinance

## Exhibit C: Potential Unintended Consequences Include Selection of Project Features That Are Not as Cost-Effective

	<u>PROJECT A</u>	<u>PROJECT B</u>
Denominator Cost NPV	\$50 million	\$100 million
LEED Certification Process Cost	\$0.1 million	\$0.1 million
Green Element Cost NPV	\$1.0 million	\$1.0 million
Numerator Cost	\$1.1 million	\$1.1 million
Annual CO <sup>2</sup> Emissions Reduction Metric Tons	100	50
NPV Cost per Metric Ton	\$725	\$1,449
Numerator/Denominator	2.2%	1.1%
Under Non-GF 2% Limit?	NO	YES

*Period of Analysis = 50 Years*

\*Net Present Value

Source: King County Auditor's Office

This example not only looks at the cost of reducing units (tons) of CO<sub>2</sub>, but also takes into consideration the time value of receiving that benefit. The NPV \$725 as compared to the NPV \$1,449 cost per metric ton reduction takes into account the cost per ton reduced in each year of the analysis. Time value is the concept that a benefit received sooner has a higher value than a benefit received later. If either of the projects in the example were to achieve relatively more of its reduction sooner, the comparative analysis would shift more in favor of that project. Taking into account the time value of pollution is now becoming standard in economic analyses of alternatives for addressing greenhouse gas emissions.

The potential for unintended consequences is explained in more detail in Appendix 1.

Challenges related to ambiguities in the Ordinance may be exacerbated by a new requirement that went into effect in December 2013 requiring non-LEED eligible projects to adhere to the cost limits as well.

# I. Ambiguity in the Ordinance

**Will requiring LEED Platinum certification cost more than LEED Gold?**

**The cost of requiring Platinum is unknown and will be difficult to estimate in the future until inconsistencies in how agencies report the costs of LEED are resolved.** The 2013 Green Building Ordinance requires new construction projects to pursue LEED Platinum certification as of August 2014 unless costs would exceed available project funding, or the project is unable to achieve the rating. Any additional costs of LEED Platinum certification are uncertain at this time for two reasons: (1) insufficient, reliable, and comparable data to compare LEED costs across divisions, and (2) professional literature does not provide an estimate that can be applied to King County's diverse projects.<sup>6</sup>

**What can be done to mitigate unintended consequences related to ambiguities in the Ordinance?**

**Problems stemming from ambiguity in the Ordinance can be resolved.** One approach to resolving the ambiguities and definitional issues in the Ordinance and for treating projects on an equal footing regardless of funding source would be to incorporate the following elements:

- **Set allowances for costs of certification processes** – Instead of placing limits on the costs of the project features that can earn LEED points, set allowances for how much can be spent on LEED or other certification processes (fourth box in Exhibit B). Allowances could be graduated based on the size of the project as described by the construction component of the project baseline budget established at 30-percent design.<sup>7</sup> This would recognize potential economies of scale for larger projects. Allowances could apply to all projects seeking LEED or other certifications regardless of funding source.<sup>8</sup> Set allowances could encompass the range of required fees for LEED and alternative rating systems and be adjusted as the fees for the rating systems change over time.
- **Provide a funding contingency for features that can earn points for LEED or other certifications** – As the baseline budget is established, incorporate a percentage-funding contingency for the

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<sup>6</sup> The GreenTools Team commissioned a study that reviewed some of the existing literature on the cost of going to Platinum in 2012, but the evidence within the document was inconclusive, particularly since there is a new version of LEED.

<sup>7</sup> KCC 4.04.245.A8. "Project baseline" means the scope, schedule, and budget set at the conclusion of the preliminary design phase when the preferred alternative has been selected and design has progressed adequately to make reasonable and informed commitments at 30- to 40-percent design. Project baselines are used as bases for variance reporting and performance measurement.

<sup>8</sup> For example, WTD already provides placeholder costs for project managers to achieve sustainability ratings based on cost ranges for projects. This is part of WTD's two percent Sustainability Guidance Document for Budget and Rate Development, January 6, 2014. [http://wtdweb/www/wtd/unit/CI/pm6/2\\_Predesign/6\\_DevelopAlts/Activity/Sustain.html](http://wtdweb/www/wtd/unit/CI/pm6/2_Predesign/6_DevelopAlts/Activity/Sustain.html)

## I. Ambiguity in the Ordinance

initial costs of green features (second and third boxes in Exhibit B).<sup>9</sup> During further project design, the contingency funds could be prioritized based on potential for lowering operational costs over the life cycle of the project. However, any remaining green features whose costs would exceed the contingency amount, but which are nevertheless economically sensible, should be considered for inclusion in the project even if they increase the budget over the baseline.

- **Conduct management review of features with only environmental benefits** – For projects with features that do not produce financial benefits but do provide environmental benefits, (third box in Exhibit B) apply the same budget decision-making process applied to any project where the benefits of desirable elements must be weighed against their costs. This kind of decision-making already occurs when the county chooses to mitigate or eliminate odor from transfer stations or wastewater treatment plants or when the County decides on the quality of a building’s finishes. Green building features that reduce energy usage, water consumption, and greenhouse gas emissions can be compared on a unit-cost basis in order to judge their cost-effectiveness.

We expect that the Green Building Team, comprised of the agencies that engage in green building projects, will want to offer additional suggestions and refinements to the approach outlined above.

### **Matter for Council Consideration I**

The County Council could consider amending the Green Building Ordinance to clarify the issues related to definitions and cost limits as identified in this report.

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<sup>9</sup> Wastewater Treatment Division has already embarked on the contingency concept and has established a Sustainability Contingency Reserve. Ibid.

## 2. Reporting Inconsistencies

### Section Summary

**Agencies' lack of consistent data limits analysis of Green Building Ordinance impacts.** Opportunities exist to improve data tracking, streamline reporting requirements, and better align green building performance targets with countywide strategic goals and related sustainability programs in order to take advantage of potential reporting efficiencies and related programmatic goals. Improvements in data reporting are also important for tracking project performance.

### Who manages the implementation of the Ordinance and reports on its achievements?

**The Green Building Team, with the assistance of the Solid Waste Division's GreenTools Team, manages the implementation of the Ordinance.** It is charged by the Ordinance with:

- supporting project staff through guidance and trainings
- developing tools for life cycle cost analysis
- evaluating the performance of projects
- tracking and reporting progress on the implementation of green building and sustainable development practices

The GreenTools Team collects information required by the Ordinance through annual project reporting forms completed by project managers. Staff report to the County Council in the Green Building section of King County's annual combined sustainability report.

The Green Building Team, comprised of representatives from the divisions that engage in green building projects, provides the bridge between the GreenTools Team and the implementing agencies by giving input on green building policies and strategies to GreenTools and offering technical support and project review to project teams.

### Exhibit D: The GreenTools and Green Building Teams Are at the Center of the Flow of Green Building Information from Project Teams to the King County Council



Source: King County Auditor's Office

## 2. Reporting Inconsistencies

**Are decision-makers receiving required information about the impact of the Ordinance?**

**Most of the data elements required in the Ordinance were either omitted or only partially reported in all of the annual reports to the County Council, thus obscuring both the overall costs and benefits of the Ordinance.** Only one of the 11 required elements has been fully reported in annual sustainability reports over the duration of the Ordinance (number of LEED and scorecard projects). Financial information such as costs of LEED certification, projected operations and maintenance (O&M) costs, and fiscal performance has been omitted from these reports. Instead, reports presented a variety of detailed examples of sustainable development in the County. Our assessment of annual reports found that for some of the required reporting elements, the GreenTools Team provided information on some but not all projects. We characterized this as partially meeting the specifications of the Ordinance.

As shown in Exhibit E below, the only required element fully reported was the number of sustainable development projects in the annual sustainability reports. However, the number reported is limited to a current year snapshot. The total number of LEED and scorecard projects under the Ordinance is unknown, because the GreenTools Team does not track projects from year to year. Specifically, it cannot differentiate between new projects and projects that have previously been reported under the Ordinance. In Exhibit E, the reported percentage of construction waste recycled (row 9) only includes projects that provided data in units that could be aggregated. The GreenTools Team indicated that this was a subset of the total number of projects under the Ordinance, but could not easily quantify the exact percentage.

## 2. Reporting Inconsistencies

### Exhibit E: Most Data Elements Required in the Ordinance Are Not Included in Annual Sustainability Reports

	Reporting Requirement	2008	2009	2010	2011	2012
1	No. Capital Projects by Division	No	No	No	No	Partial
2	No. Sustainable Development Projects	Yes	Yes	Yes	Yes	Yes
3	Status of Each Project	Partial	Partial	No	No	No
4	Extra Costs of LEED Certification	No	No	No	No	No
5	No. of Completed Scorecards	N/A	N/A	No	Partial	No
6	Green Strategies Employed	Partial	Partial	Partial	Partial	Partial
7	Projected O&M Costs	No	No	No	No	No
8	Reductions in GHG Emissions <sup>10</sup>	Partial	Partial	Partial	No	No
9	Construction Wastes Recycled	Partial	Partial	Yes	Yes	Yes
10	Green Materials Used	Partial	Partial	Partial	Partial	No
11	Fiscal Performance	No	No	No	No	No

Source: King County Auditor's Office

#### Why is required information left out of Green Building reports to County Council?

**Confusion about reporting requirements results in project managers reporting incomplete and inconsistent information to the GreenTools Team, which in turn, makes it difficult for the team to report aggregate information.** The GreenTools Team faced challenges in aggregating inconsistent data stemming from varying interpretations of the reporting questions and the varying completeness of project reports. According to GreenTools officials, this is one reason the team did not report aggregate data on the implementation and impact of the Ordinance to decision-makers. When possible, the GreenTools Team provided information on some of the projects. The GreenTools Team's approach to improve the completion and consistency of reporting has been to do outreach to divisions and project managers by providing trainings and one-on-one assistance, working with the Green Building Team to make improvements on increasing reporting of quantitative data, and reminding project managers to complete reporting forms.

Of the project-specific reporting forms submitted to the GreenTools Team in 2012, most were missing at least some information that is required by the

<sup>10</sup> GHG is greenhouse gas emissions.

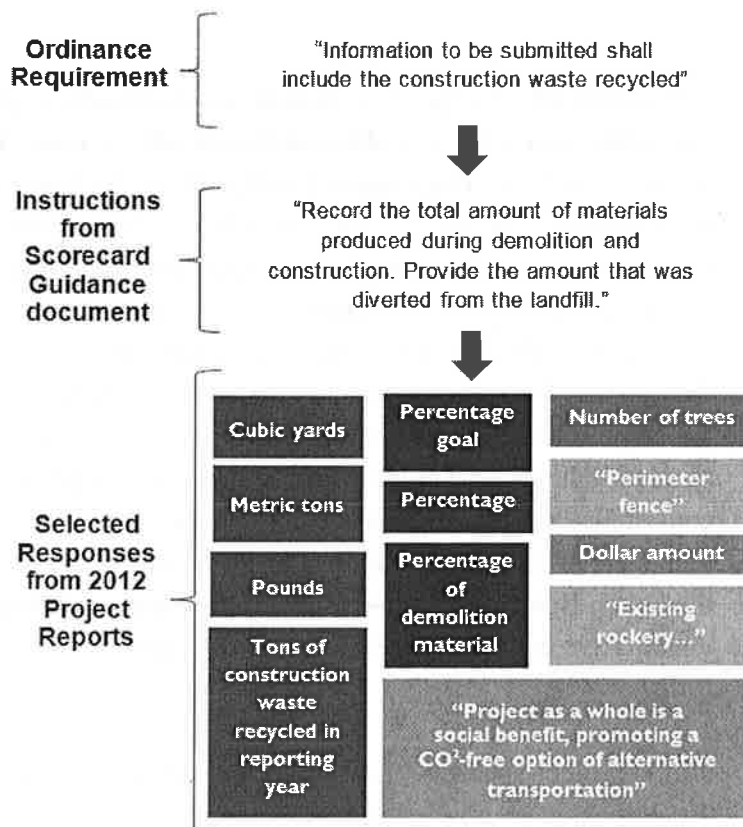
## 2. Reporting Inconsistencies

Ordinance.<sup>11</sup> In response to a short questionnaire we sent to a sample of the project managers who completed these forms, we learned that required information was not reported for a number of reasons, including:

- lack of direct experience with the project
- lack of understanding of reporting requirements
- not all reporting elements are applicable to every project

When information was included in the reports, it was presented using different units. This makes aggregation and analysis difficult and, unless corrected, may limit the ability of decision-makers to make improvements to the program and county practices. Exhibit F below shows an example of the varying ways project managers reported on one requirement, the amount of construction materials recycled.

**Exhibit F: Project Staff Reported the Amount of Construction Waste Recycled in at Least 12 Different Ways**



Source: King County Auditor's Office

<sup>11</sup> At the time of analysis, 2013 data had not yet been reported.



## 2. Reporting Inconsistencies

While the number of projects reporting has increased between 2009 and 2012, a lack of consistent data limits the GreenTools Team's ability to track and report on Green Building Ordinance impacts. Gathering data in consistent units can be challenging as the types of projects vary from new construction to small repainting jobs. However, reporting form questions do not require specific units and are open to interpretation as shown in Exhibit F, resulting in data that cannot be aggregated into useful information.

**How could reporting processes better facilitate the goals of the Ordinance?**

**A data tracking and analysis system would assist the GreenTools Team to report useful data to decision-makers.** The GreenTools Team does not yet validate, aggregate, or analyze the data submitted in the annual reporting forms. The analytical and reporting requirements in the Ordinance require effort from project managers, but as shown in Exhibit F, the GreenTools Team is not able to communicate the data generated to decision-makers. Moreover, it does not take steps to verify the accuracy of data, except in isolated instances. The GreenTools Team does attempt to improve data collection informally. For example, GreenTools officials stated that they have encouraged division representatives to emphasize better communication to project managers when annual reports are not fully complete or responses are not clear.

**Electronic data collection, on its own, is unlikely to improve data quality and thus, the County's ability to evaluate impact.** One positive step is that the GreenTools officials indicated that they are working with King County's Office of Performance, Strategy and Budget (PSB) to expand the capital Project Information Center (PIC) to include reporting requirements in the Ordinance. The goals of this effort are to (1) increase reporting compliance by leveraging project management tools already in place, making reporting less cumbersome for project managers and (2) facilitate data analysis and performance measurement by the GreenTools Team. However, collecting data electronically does not address the issue of inconsistent units and incomplete reporting that currently thwarts data analysis or the inability to confirm the accuracy of the data. It also does not guarantee that reporting requirements will be included in the annual report to the County Council. In addition, the green building element of PIC is still in the planning stages, and it is unclear when it will become available.

**Standardizing units for reporting requirements could increase consistency and generate meaningful, reportable data.** If standardized units for reporting were in place, data collected through PIC would be of

## 2. Reporting Inconsistencies

better quality for use by decision-makers.<sup>12</sup> The Ordinance originally directed the Green Building Team to develop consistent measurement units applicable to diverse businesses. No units are specified on the reporting form. One entity that might be able to assist the Green Building Team in facilitating the development of standard reporting requirements is the Capital Project Management Work Group (CPMWG). CPMWG has successfully liaised among capital project agencies to develop and implement standardized reporting terms for PIC. Utilizing CPMWG would build on relationships that are already in place and leverage understanding of variations in types of capital projects.

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**Recommendation 1**     The GreenTools Team should implement a system for collecting, verifying, analyzing, and communicating data reported under the Green Building Ordinance.

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**Recommendation 2**     As directed in the Green Building Ordinance, the Green Building Team should create standardized units for reporting requirements.

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**Does the Ordinance support county climate and strategic goals?**

**The revised Ordinance may not sufficiently support King County strategic goals, including objectives related to environmental sustainability.** It is important for agency goals to contribute to countywide strategic goals, and for targets to align with their measures. Since the Ordinance does not have this alignment, the County may miss opportunities to advance its environmental goals. Further, without sustainability targets (and data to support them), the GreenTools Team will not have a solid foundation on which to build performance measurement and reporting efforts.

**Other jurisdictions set specific targets to focus LEED activity toward meeting larger jurisdictional goals.** For example, the green building resolution for the city of Portland, Oregon requires project managers to attain 30-percent energy savings beyond what is required in the LEED baseline and 30-percent water savings beyond what it required in the federal Energy Policy Act of 1992. This directly links to overarching citywide goals for energy and water savings.

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<sup>12</sup> Currently, although the reporting requirements for the County's four sustainability programs (Green Building, Strategic Climate Action Plan, Energy Plan, and the Environmentally Preferable Product Procurement Policy) are collated in Chapter 18 of the King County Code, they appear to lack continuity and structure to yield information useful to decision-makers. Further, as a whole, they do not capitalize on possible efficiencies in reporting.

## 2. Reporting Inconsistencies

The revised Green Building Ordinance provides some linkages to King County Strategic Climate Action Plan goals related to energy and water savings, but does not specifically set green building targets that help propel the County towards achieving these goals. One example is shown in Exhibit G below.

**Exhibit G: The Green Building Ordinance Does Not Provide Sufficient Measures or Indicators to Optimize Progress toward King County Strategic Planning and Climate Action Goals**

	<b>King County Strategic Plan, 2010 to 2014</b>	<b>Strategic Climate Action Plan, 2012</b>	<b>Green Building and Sustainable Development Ordinance, 2013</b>
<b>Goals</b>	Environmental Sustainability Goal, Objective 4: Minimize King County's operational environmental footprint by (a) incorporating sustainable development practices into...county facilities and county funded projects and (b) measuring energy usage in county facilities.	King County will reduce the amount of energy used in government operations.	The ordinance directs users to meet goals in the Strategic Climate Action Plan and to ensure high performance in energy, water, and waste reduction.
<b>Measures/Indicators</b>	King County government's levels of carbon emissions, energy, and water use.	Reduction in normalized net energy use from government operations: <sup>a</sup> <ul style="list-style-type: none"> <li>• 10 % by 2012</li> <li>• 15 % by 2015</li> <li>• 20 % by 2020.</li> </ul>	No specific measures, targets, or indicators to direct progress toward goals.

<sup>a</sup> Compared to a 2007 baseline.

Source: King County Auditor's Office

**Opportunities exist to direct green building efforts in a manner that furthers county strategic plan priorities.** For example, the Ordinance indicates that the Green Building Team is responsible for developing a set of both "mandatory and recommended green building operational guidelines" that will "provide direction on the use of green practices in...water and energy conservation, waste reduction, and recycling." The Green Building Team also maintains a set of sustainable infrastructure scorecard guidelines. The 2010 versions of these guidelines indicate they will be updated annually; however, they have not been updated since 2010.

## 2. Reporting Inconsistencies

Updating the guidelines would provide an opportunity for the Green Building Team to explicitly align program targets and some reporting requirements with overarching county goals, such as those in the Strategic Climate Action Plan.<sup>13</sup> For instance, the Green Building Team could provide guidance to project managers on which types of “green features” most directly contribute to achieving countywide energy and water savings goals. Reporting requirements, such as tracking greenhouse gas emissions using standardized units, would efficiently inform both the Green Building Ordinance and the Strategic Climate Action Plan.

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**Matter for Council  
Consideration 2**

The County Council could consider better aligning targets in the Green Building Ordinance with the goals and targets in the county’s sustainability plans.

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**Recommendation 3**

The Green Building Team should update the Green Building operational and sustainable infrastructure guidelines in a manner that advances county sustainability goals.

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**Recommendation 4**

The Green Building Team should ensure standardized units developed for relevant reporting requirements in the Green Building Ordinance align with reporting requirements in the county’s sustainability plans.

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<sup>13</sup>Other King County plan and programs related to the Strategic Climate Action Plan include the King County Energy Plan and the King County Environmentally Preferable Product Procurement Policy.

### 3. Life Cycle Cost Analysis

#### Section Summary

Following best practice principles for life cycle cost analysis (LCCA) can help to improve the cost-effectiveness of LEED and other sustainability-oriented projects. The county's GreenTools Team provides tools to assist agencies in conducting LCCA and is in the final design phase of a new LCCA model.

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#### What is life cycle cost analysis in the context of the Green Building Ordinance?

The Ordinance promotes the use of LCCA to enhance the cost-effectiveness of LEED and other sustainability-oriented projects by analyzing the full costs of operating and maintaining assets instead of only initial costs. The GreenTools Team provides a variety of technical resources and assistance, including a life cycle cost model and accompanying guidance for its use. As described by the GreenTools program,

*Life Cycle Cost Analysis (LCCA) is an economic methodology for selecting the most cost-effective design alternative over a particular time frame. The methodology is beneficial as it addresses not only typical owner concerns of design effectiveness and construction cost, but also reflects future costs associated with maintenance, operation and replacement. LCCA looks at the value of a building or capital project over time, overcoming "first cost" limitations.*

Currently, the GreenTools Team is in the process of developing a new model with additional functionalities to assist users in quantifying and comparing the relative merits of projects based on standardized metrics for resource usage and costs. The GreenTools Team has been sharing the model for beta testing and feedback with other county agencies, including the Auditor's Office.

#### How can the GreenTools LCCA model be more fully utilized?

The model's utility going forward will depend on the changes that are made to the Ordinance to address the definitional issues we have identified in this report. As presently designed, the model lends itself to comparison of strategies or elements within a project to determine the most cost-effective option. The outcomes from such an approach can be particularly useful in some, but not all, interpretations of the Ordinance. It would work well in conjunction with the LEED cost calculation and reporting criteria we have suggested in Section 1 of this report. The model is not well suited for an interpretation of the current Ordinance where the incremental costs of LEED features are compared to the life cycle costs of the entire project over its useful life. This is not a problem with the model

### 3. Life Cycle Cost Analysis

itself, but simply reflects the fact that the model was designed primarily to carry out a different kind of analysis.

**What principles should guide the design of a new model?**

**Best practice principles can help shape final design of the new LCCA model.** In 2006, through a collaborative process involving executive branch agencies and council staff involved with capital decision-making, the Auditor's Office developed guidelines and a set of principles aimed at achieving more consistency, transparency, and validity in the capital planning process.<sup>14</sup> These principles, based on best practices, were agreed upon by the executive branch agencies and have stood the test of time by improving the quality of analyses and the results made available to county policy-makers. These best practices include

- all of the costs of each alternative over its useful life should be included in the analysis.
- if the project is financed, include the cash flows related to debt service payments.
- cash flows should be discounted to present values to reflect the time-value of money.
- if alternatives reviewed have different useful lives, an appropriate methodology, such as the use of annual equivalents, should be used to make a fair comparison.
- if costs and benefits are subject to different inflation rates, the analysis should be based on inflated cash flows discounted to present values.

In addition to laying out principles for analysis, the guidelines also list desirable features that any model should include, such as:

- instructions for how to use the model
- identification and listing of the major assumptions and variables (such as the discount rate, financing rate, inflation rate(s))
- the ability to easily conduct sensitivity analysis by making changes to the major assumptions

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#### **Recommendation 5**

The GreenTools Team should ensure that the final design and use of the new life cycle cost analysis model follows best practices.

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<sup>14</sup> 2006 Follow-up on Economic Analysis of Capital Projects.

# Appendix I

## How Ambiguity in the Ordinance Can Cause Unintended Consequences

As part of our audit, we reviewed the implementation of the 2008 Green Building Ordinance. Our finding that ambiguity in the Ordinance can cause unintended consequences contrary to policy intent also applies to the 2013 Ordinance.

We asked a selection of county agencies that had pursued LEED Gold certification how they interpret the cost limits in the Ordinance. We found that there are dozens of possible interpretations. Exhibit H below shows nine of the basic ways the Ordinance can be interpreted using some examples from our case studies for non-general fund projects.<sup>15</sup> This chart could be expanded if, for example, project financing were to be included. Additional interpretations are possible, because the ordinance does not specify whether the debt service payments should be included in the numerators (LEED costs) and/or denominators (project costs).

**Exhibit H: Non-General Fund Agencies Interpret the Ordinance in a Variety of Ways**

LEED Costs	Project Costs		
	Construction Costs	Total Project Costs	Project Life Cycle Costs
LEED process costs plus costs of some features		Transit	
LEED process costs plus initial cost of all green building features	SWD*		
LEED process costs plus life cycle costs of green building features that have additional costs			WTD†

\*Solid Waste Division

†Wastewater Treatment Division

Source: King County Auditor's Office analysis of case study examples.

<sup>15</sup> In the case of non-general fund projects, the Ordinance requires the numerator costs divided by the denominator costs to be less than or equal to two percent.

## Appendix I (continued)

As shown in Exhibit I, WTD interprets the Ordinance to mean that the numerator includes the cost of green features that may provide *environmental* or other benefits but do not necessarily result in *economic* benefits in the form of cost savings. WTD also includes the cost of going through the LEED certification process. This interpretation of the Ordinance to count only those green features that do not pay back, instead of the costs of all green features, keeps the numerator at a minimum.

Also as shown in the exhibit, WTD interprets the denominator as the total life cycle cost of the project, or the cost to build, operate, and maintain the asset for the duration of its useful life. If a green feature provides economic benefits, for example in terms of electricity savings, it then lowers the life cycle costs of owning the asset, thereby reducing the denominator as well.

Differences in interpretation also mean that a very similar project carried out by different county agencies could be portrayed quite differently in terms of the costs of pursuing LEED certification.

### ***Exhibit I: Wastewater Treatment Division's Interpretation: Green Features that Make Economic Sense Should Not Be Counted against the LEED Cost Limit***

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A green roof system for a building has a higher initial cost by \$100,000 over an alternative roof system, but produces \$200,000 net present value (NPV) offsetting savings over the useful life of the building.<sup>16</sup> The green roof feature results in a total NPV savings of \$100,000, so the decision to choose this alternative adds no life cycle costs to the project, and in fact reduces them. Although the choice of this alternative may help to obtain LEED points, WTD would not consider it an added cost of pursuing LEED.<sup>17</sup>

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Source: King County Auditor's Office

In contrast to the example above, SWD would count the \$100,000 but would not offset the cost by the life cycle savings.

One of the difficulties in using project life cycle costs as the denominator (as WTD does) is that agencies may not have all of the information available to estimate the total costs of owning and operating an asset over its useful life, either earlier or later in the design process. Instead of incurring the costs of generating the information needed and completing a full, life cycle cost analysis, some agencies substitute known costs or cost estimates, such as total project cost, which includes planning and design, or more simply just construction costs.

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<sup>16</sup> Net present value refers to the value in today's dollars of a payment or asset in the future, taking the time value of money and the original cost into account.

<sup>17</sup> WTD is currently reviewing its approach in order to address how the agency might acknowledge and account for credit on those sustainable elements accomplished as a standard of its business.



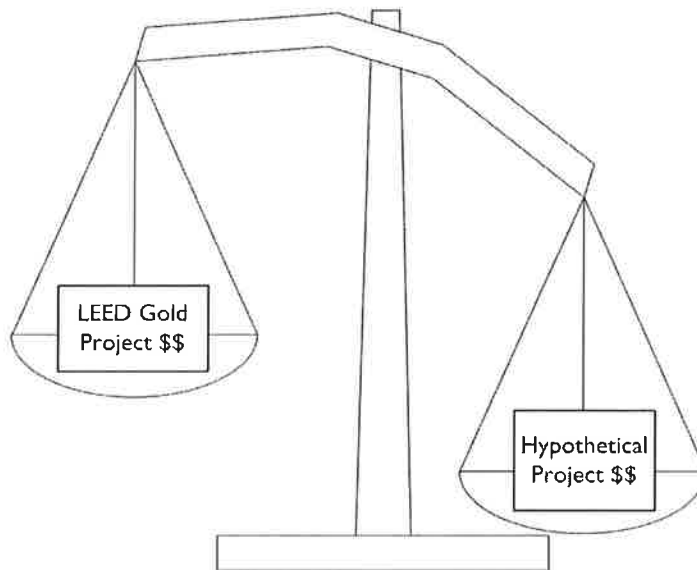
## Appendix I (continued)

**It is a challenge for general fund agencies to achieve LEED Gold and comply with the Ordinance as written.** Such agencies are supposed to plan to achieve Gold for a project as long as it can be achieved with no additional costs as compared to a project that is not seeking Gold certification.

Under any circumstance, the only way for a general fund project to meet the Ordinance's cost limit is to ensure that the numerator is less than or equal to zero. This can be accomplished by including green building features that generate enough life cycle savings to offset the costs of the LEED certification process plus the costs of any features that do not generate life cycle savings. If the numerator is a savings (negative number) then the cost of pursuing LEED will be less than zero percent no matter how much the cost of a project not seeking Gold certification. This may have been the original intent of the Ordinance with respect to general fund projects, but can pose a high bar for such projects.

Another way for a general fund project to achieve Gold certification while within the cost limit established in the Ordinance is to compare the Gold-seeking project to a more expensive, hypothetical project.

### ***Exhibit J: A Hypothetical Project Must Be Designed to Be More Expensive than the Actual LEED Project in Order to Comply with Cost Limits***



Source: King County Auditor's Office

The comparison, hypothetical project not seeking Gold certification would be one with features that do not save costs or save fewer costs, thereby rendering the project of questionable economic merit. In addition, a hypothetical project could be defined in a variety of ways with different features and costs, adding a very subjective element in the determination of whether the project meets the Ordinance cost criterion.

## **Appendix I (continued)**

While adherence to the Ordinance could pose challenges to pursuing Gold for general fund projects, for projects receiving funds from other sources, the Ordinance could be interpreted to allow for the inclusion of uneconomical elements as long as the two-percent limit was not surpassed.

# Executive Response



**King County**

**Dow Constantine**

King County Executive  
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KING COUNTY AUDITOR

MAY 07 2014

RECEIVED

May 7, 2014

Kymber Waltmunson  
King County Auditor  
Room 1033  
COURTHOUSE

Dear Ms. Waltmunson:

Thank you for the opportunity to review and comment on the 2014 Performance Audit of the County's Green Building Ordinance. I appreciate your office's professional and collaborative approach throughout the process. I concur with report's recommendations. They will make the Green Building Ordinance even more effective, and work to implement the recommendations is already under way.

As the audit recognizes, King County is a national leader in environmental sustainability. The County's 2008 Green Building Ordinance has raised awareness of sustainability throughout the region, while significantly increasing the use of green building practices throughout County agencies. These green building practices protect our environment, save money for our residents and businesses, and provide a model for private-sector development.

Under the framework of the Green Building Ordinance, the County has developed numerous tools to promote sustainability, including a Sustainable Infrastructure Scorecard, a Green Operations and Maintenance Guidelines Handbook, and a Greenhouse Gas Emissions Calculator. Since the adoption of the Green Building Ordinance, the County has completed 16 LEED-certified projects. For projects that LEED does not cover, the County has used its Sustainable Infrastructure Scorecard to increase sustainability on hundreds of other capital projects. For example, using the LEED rating system will save energy and water at the Maleng Regional Justice Center. On the South Park Bridge replacement project, the Sustainable Infrastructure Scorecard resulted in the re-use of historically-significant materials from the existing bridge, energy-efficient drawbridge equipment, and additional neighborhood open space, among other sustainable features.



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## Executive Response (continued)

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My comments below correspond to the audit's key findings and recommendations. Attachment A provides additional comments and an implementation plan.

### **Ambiguity in the Ordinance**

Matter for Council Consideration I: *The County Council could consider amending the Green Building Ordinance to clarify the issues related to definitions and cost limits as identified in this report.*

As the audit recognizes, there can be differing interpretations regarding the cost calculations related to LEED compliance. I welcome the ongoing dialogue to ensure that the Green Building Ordinance maximizes sustainability in a cost-effective way. To achieve these goals, it is important to allow for a range of sustainability approaches and to consider the broad array of benefits from sustainable strategies. If the Council would like to address these ordinance provisions, I am happy to convene a working group to collaborate in developing recommendations.

### **Reporting Inconsistencies**

Many of the audit recommendations relate to improving reporting, and I concur with the recommendations. As discussed below, much of the work to improve reporting has been underway for some time, as part of the ongoing work to make the Green Building Ordinance implementation more effective. Since the Green Building Ordinance was first adopted in 2008, reporting has consistently improved, and the Auditor's recommended strategies should make reporting even more effective. Implementing certain recommendations will require additional resources.

Consistent with direction from the County Council, reporting under the Green Building Ordinance is included in the King County Annual Report on Climate, Energy, Green Building and Environmental Purchasing Programs. This report is produced by the Departments of Transportation (DOT), Executive Services (DES), and Natural Resources and Parks (DNRP). I understand that these reports have included essentially all of the required information, and Attachment B to this letter includes a revised reporting matrix reflecting the Green Building Team's interpretation of reporting compliance.

Recommendation 1: *The GreenTools Team should implement a system for collecting, verifying, analyzing, and communicating data reported under the GBO.*

This effort is under way and can be fully implemented with additional resources. The Green Building Team has recommended that an online database be used to collect, verify, and analyze data and to improve reporting under the Green Building Ordinance. Having a database will provide significantly improved information for policy-makers, including the

## Executive Response (continued)

KyMBER WalTMunson  
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ability to track trends, better identify areas for improvement, and better quantify countywide accomplishments.

Work to implement a computerized database began in 2010. To date, the necessary IT refinements have not been funded. I included a funding request in my proposed 2014 budget, and given the importance of the database, I anticipate resubmitting a request for the 2015-2016 budget cycle. That funding is necessary to fully implement this recommendation.

Even without the database, the Green Building Team has taken steps to increase the reliability and usefulness of the data reported. For example, based on recommendations from the Green Building Team, my 2013 Green Building Ordinance revised reporting criteria to include projected and actual data on energy, water use, and emissions. There will still be challenges, because it can be difficult to estimate this information for projects that comprise only a portion of a building. However, within available resources, the Green Building Team has also committed to additional data verification procedures.

*Recommendation 2: As directed in the Green Building Ordinance, the Green Building Team should create standardized units for Green Building reporting requirements.*

I concur with this recommendation and included it in my 2013 Green Building Ordinance update, based on recommendations from the Green Tools Team and the Green Building Team. As a result, developing standardized reporting units is already part of the 2014 Green Building Team work plan, and the work is scheduled to be completed by October of this year. Certain reporting requirements call for information that may be unique to particular projects (such as the environmentally-preferable products used), but standardized units are being developed for most reporting criteria. The standardized units will improve reporting by themselves, but to be most effective, the new measures need to be incorporated into the computerized database that has been proposed for funding.

*Recommendation 3: The Green Building Team should update the Green Building operational and Sustainable Infrastructure Guidelines in a manner that advances county sustainability plans.*

This work is part of an ongoing effort for continuous improvement in reporting under the Green Building Ordinance. Since 2008, just some of the work to improve reporting has included: formal training, discussion and feedback on reporting protocols, revisions to reporting guidelines, customized instructions to meet unique division needs, and checklists to facilitate reporting.

Despite the improvements that have resulted from this work, I concur that more could be accomplished. I have requested that the Green Building Team update reporting instructions consistent with this recommendation to improve the quantitative and qualitative data in reporting forms. In addition, the Green Building Team is working collaboratively with the

## Executive Response (continued)

KyMBER Waltmunson  
May 7, 2014  
Page 4

Energy Task Force, the Interdepartmental Climate Team and others, to further align specific environmental targets with overarching county environmental goals.

Recommendation 4: *The Green Building Team should ensure standardized units developed for relevant reporting requirements in the GBO align with reporting requirements in the county's sustainability plans.*

This was another priority in the 2013 Green Building Ordinance, based on the ongoing work of the Green Building Team. For example, based on recommendations from the Green Building Team, I included the following reporting criteria in the 2013 Green Building Ordinance:

- “Projected and actual energy savings measured” for the Energy Plan;
- “Actual environmentally preferable products” for the Environmental Purchasing Program; and
- “Projected and actual greenhouse gas emission savings from energy and water usage, transportation impacts and construction and demolition diversion” and “projected and actual transportation impacts, including the transportation-related greenhouse gas emissions associated with the project” for the Strategic Climate Action Plan.

I welcome a continuing dialogue on ways to ensure that there is synergy among our numerous environmental protection and sustainability programs to maximize their benefits to our region.

### **Life Cycle Cost Analysis**

Recommendation 5: *The GreenTools Team should ensure that the final design and use of the new life cycle cost analysis follows best practices.*

I concur with this recommendation, and I have appreciated the time and work that your office has invested to provide input on the Life Cycle Cost Analysis Tool that the Green Building Team developed. The Green Building Team is working to incorporate recommendations from your office and welcomes ongoing collaboration to make the tool as useful as possible. I have also asked the Office of Performance Strategy and Budget to assist with this work.


With respect to implementation, training in the use of the tool has already occurred and will continue through workshops as well as a new video. Understanding the life cycle costs of the County's sustainability projects is extremely important, and I appreciate your office's contribution to this work.

## Executive Response (continued)

Kymber Waltmunson  
May 7, 2014  
Page 5

I strongly support the County's leadership in sustainable infrastructure, and I appreciate the support of the Auditor and the Council. I am committed to continuing to work with you to implement your office's recommendations.

Sincerely,



Dow Constantine  
King County Executive

Enclosures

cc Rhonda Berry, Chief of Operations, King County Executive Office (KCEO)  
Lauren Smith, Land Use & Unincorporated Area Relations Manager, KCEO  
Christie True, Director, Department of Natural Resources and Parks  
Harold Taniguchi, Director, Department of Transportation  
Caroline Whalen, County Administrative Officer, Department of Executive Services (DES)  
Dwight Dively, Director, Office of Performance, Strategy and Budget  
Carol Basile, Deputy Director, Finance and Business Operations Division, DES

## Executive Response (continued)

Attachment A - Executive Response to Green Building Ordinance Performance Audit, 2014

No.	Recommendation	Agency Position (State whether you concur, partially concur, or do not concur with the recommendation)	Schedule for Implementation (Indicate your plan and a date for implementation)	Comments (Briefly summarize your reasons for partial or non-concurrence. Concurrence does not require comment.)
1	The GreenTools Team should implement a system for collecting, verifying, analyzing, and communicating data reported under the Green Building Ordinance.	Concur	<p>Complete modifications to and utilize the Sustainability Tab in Project Information Center (PIC) database to collect data</p> <p><u>Timeline:</u> Work has already started. Development of Sustainability Tab in the PIC started in Q4 2010. Sustainability Tab (beta version) included in PIC in 2012. In 2013, the PIC Modifications Project was included in Executive Proposed 2014 Budget. This included scope for refinements and necessary IT work to update reporting criteria fields in Sustainability Tab. Sustainability scope was not included in the final adopted 2014 Budget. An appropriation request for the Sustainability Tab in PIC was resubmitted in March 2014 to KCIT for the 2015-2016 budget cycle. Without additional resources, it will not be possible to fully implement this recommendation.</p> <p>All reporting forms will be reviewed for content for required reporting criteria. Verifying data will be done by spot checking and auditing two (2) individual projects to ensure reported data is accurate. Analyzing data will be done by identifying trends from available data reported. Communicating data will occur in 2014 Annual Report of King County's Climate Change, Energy, Green Building and Environmental Purchasing Programs.</p> <p><u>Timeline:</u> June 30, 2015 date the Annual report is due to Council.</p>	<p>The GreenTools Team, Green Building Team, and county divisions have established a system for collecting and communicating data reported under the Green Building Ordinance, and are continuously making improvements by developing the Sustainability Tab in the Project Information Center database starting in 2010.</p> <p>In regards to verifying data, if we find the two reporting forms are not accurate from the spot checking we will seek to correct those or audit two additional annual reporting forms.</p>
2	As directed in the Green Building Ordinance, the Green Building Team should create standardized units for Green Building reporting requirements.	Concur	<p>Standardized units will be established. Certain reporting requirements call for information that may be unique to particular projects (such as environmentally preferable products used). The development of standardize units will factor in the reporting requirements in the county's sustainability plans.</p> <p>This is part of the 2014 Green Building Team work plan.</p> <p>As directed in the 2013 GBO update, the Green Building Team</p>	<p>The 2013 Green Building Ordinance included this action as a priority.</p>



## Executive Response (continued)

### Attachment A - Executive Response to Green Building Ordinance Performance Audit, 2014

	<p>along with other relevant sustainability programs, the Office of Performance, Strategy and Budget, and the CPMWG will develop and determine standardized measurement units that reflect the diverse line of businesses across county capital projects. <u>Timeline:</u> Oct. 31, 2014</p>		
3	<p>The Green Building Team should update the Green Building operational and sustainable infrastructure guidelines in a manner that advances county sustainability goals.</p>	<p>Concur</p> <p>Instructions on green building reporting will be updated in the Scorecard Guidelines for clearer direction. The GreenTools Team and Green Building Team started working with county divisions in January 2014.</p> <p>Additional work will be done to provide further direction on intermediate efforts to meeting sustainability plan targets. For example, develop a list of energy saving strategies that individual projects can employ toward meeting the King County Energy Plan's goal of reducing energy use by 15% by 2015 and 20% by 2020. <u>Timeline:</u> In coordination with 2015 SCAP</p>	<p>Since the adoption of the 2008 Green Building Ordinance, the GreenTools Team, Green Building Team and county divisions have put measures in place to continuously improve on reporting practices and connecting green building with other county sustainability goals. For example:</p> <ul style="list-style-type: none"> <li>• Formal trainings on reporting</li> <li>• Discussion and feedback on reporting protocols</li> <li>• Revisions to reporting guidelines</li> <li>• Customized instructions to meet unique division needs</li> <li>• Checklists to facilitate reporting</li> </ul>
4	<p>The Green Building Team should ensure standardized units developed for relevant reporting requirements in the Green Building Ordinance align with reporting requirements in the county's sustainability plans.</p>	<p>Concur</p> <p>This was another priority in the 2013 Green Building Ordinance, based on the ongoing work of the Green Building Team. For example, the following reporting criteria are included in the 2013 GBO:</p> <ul style="list-style-type: none"> <li>• "projected and actual energy savings measured" for Energy Plan;</li> <li>• "actual environmentally preferable products" for the Environmental Purchasing Program;</li> <li>• "projected and actual greenhouse gas emission savings from energy and water usage, transportation impacts and construction and demolition diversion" and "projected and actual transportation impacts, including the transportation-related greenhouse gas emissions associated with the project" for the Strategic Climate</li> </ul>	<p>The 2013 Green Building Ordinance aligns with the Sustainability Plans through its reporting criteria and minimum performance measures.</p>

## Executive Response (continued)

### Attachment A - Executive Response to Green Building Ordinance Performance Audit, 2014

5	<p>The GreenTools Team should ensure that the final design and use of the new life cycle cost analysis follows best practices.</p>	Concur	<p><u>Action Plan.</u>  <u>Timeline:</u> In coordination with 2015 SCAP</p> <p>Green Building Team members and GreenTools staff are working with the Auditor's Office to integrate the suggestions to refine the Life Cycle Cost Analysis tool, as applicable to best practices and anticipated use of the tool by county staff.  <u>Timeline:</u> Sept. 30, 2014</p>	<p>The GreenTools Team and Green Building Team have provided trainings on using LCCA since 2011, in addition to updating the LCCA tool in May 2013 and again in early 2014.</p>
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## Executive Response (continued)

### Attachment B – Annual Reporting Matrix

**Exhibit E: Most Data Elements Required in the Ordinance are included in the Annual Green Building Report or Annual Report on Climate, Energy, Green Building, and Environmental Purchasing Programs.**

	<b>Reporting Requirement</b>	<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>
1	No. Capital Projects by Division	Partial	Partial	Partial	Partial	Partial
2	No. of LEED Projects	Yes	Yes	Yes	Yes	Yes
3	Status of Each Project	Partial	Partial	Partial	Partial	Partial
4	Extra Costs of LEED Certification	No	No	No	No	No
5	No. of Completed Scorecards	N/A	N/A	Yes	Yes	Yes
6	Green Strategies Employed	Yes	Yes	Yes	Yes	Yes
7	Projected O&M Costs	Partial	Partial	Partial	Partial	Partial
8	Reductions in GHG Emissions <sup>1</sup>	Partial	Partial	Partial	Partial	Partial
9	Construction wastes recycled	Partial	Partial	Yes	Yes	Yes
10	Green materials used	Yes	Yes	Yes	Yes	Yes
11	Fiscal performance	Partial	Partial	Partial	Partial	Partial

<sup>1</sup> GHG Emissions refers to Greenhouse Gas Emissions.

## **Statement of Compliance, Scope, Objective & Methodology**

### **Statement of Compliance with Government Auditing Standards**

We conducted this performance audit in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

### **Audit Scope and Objectives**

The objectives for the performance audit of King County's Green Building Ordinance were to:

1. Review the implementation of the Green Building Program, including incremental costs and benefits realized by projects since the adoption of the Green Building Ordinance in 2008.
2. Assess whether the application of the life cycle cost analysis model used to evaluate potential green building features provides reasonable assessments of cost effectiveness.
3. Determine the extent to which expanding the types of projects subject to green building requirements and increasing the required LEED rating could affect implementation of the program.

### **Methodology**

To achieve the first objective noted above, we conducted case studies to learn how county agencies have interpreted and implemented the requirements of the Green Building Ordinance related to achieving LEED ratings. We reviewed case studies from the four agencies responsible for most of the LEED certified projects: Transit, Facilities Management, Solid Waste, and Wastewater. We asked each of these agencies to provide LEED project examples, and we followed up with interviews and a review of their life cycle analyses and other project related materials. We also surveyed a purposive sample of project managers to gain an understanding of their experience with the requirements of the Sustainable Infrastructure Scorecard process and reviewed the green building guidance provided in departmental project management manuals.

In addition to collecting and analyzing data provided by county agencies, we conducted interviews with key staff from a variety of county agencies involved with the county's initiatives concerning green buildings, sustainability, and environmental stewardship. We also obtained information and interviewed staff from other jurisdictions to learn how they have structured and implemented their green building ordinances.

To assess the application of life cycle cost analysis, we reviewed the models and methods used in our case study projects, and we critiqued the current LCCA model offered as a resource by the

## **Statement of Compliance, Scope, Objective & Methodology (continued)**

GreenTools Team. For the new version of the LCCA model that is under development, we, along with other county agencies, have engaged in beta testing and will remain involved throughout the development process.

We reviewed the professional literature on the costs of LEED Platinum certification to ascertain if it can be helpful in determining the potential cost implications of requiring LEED Platinum in King County.

### **Scope of Work on Internal Controls**

We assessed internal controls relevant to the audit objectives. This included review of the data collection efforts employed by the GreenTools Team. We tested the reliability of data using a variety of techniques depending on the data and our purposes. These included in-depth reviews and critiques of LCCA models in order to detect conceptual and technical errors, and follow-up contacts and a survey to understand the reasons for incomplete and inconsistent reporting. The survey was conducted with a purposive sample of ten project managers selected for participation based on a number of criteria. We determined that the data used was sufficiently reliable for our intended purposes.

## List of Recommendations & Implementation Schedule

**Recommendation 1:** The GreenTools Team should implement a system for collecting, verifying, analyzing, and communicating data reported under the Green Building Ordinance.

**Implementation Date:** June 30, 2015 date the annual report is due to Council.

**Estimate of Impact:** Regardless of when or if the automated Project Information Center (PIC) is expanded to collect green building data, a comprehensive system will ensure that the GreenTools Team has a thorough and accurate understanding of green building activities and impact and communicates this understanding to decision makers.

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**Recommendation 2:** As directed in the Green Building Ordinance, the Green Building Team should create standardized units for reporting requirements.

**Implementation Date:** October 21, 2014

**Estimate of Impact:** Standardized units would enable data collected under the Ordinance to be aggregated so that the impact of the Ordinance could be evaluated with respect to sustainability goals.

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**Recommendation 3:** The Green Building Team should update the Green Building operational and sustainable infrastructure guidelines in a manner that advances county sustainability goals.

**Implementation Date:** In coordination with 2015 SCAP update.

**Estimate of Impact:** Updated guidance will allow project teams to prioritize sustainable strategies to contribute the greatest impact towards county sustainability goals.

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**Recommendation 4:** The Green Building Team should ensure standardized units developed for relevant reporting requirements in the Green Building Ordinance align with reporting requirements in the county's sustainability plans.

**Implementation Date:** In coordination with 2015 SCAP update.

**Estimate of Impact:** Because green building projects contribute to the county's overarching sustainability goals, standardized reporting units are critical to understanding the impact of these projects on achieving sustainability goals.

---

**Recommendation 5:** The GreenTools Team should ensure that the final design and use of the new life cycle cost analysis model follows best practices.

**Implementation Date:** September 30, 2014

**Estimate of Impact:** A properly designed and applied life cycle cost model will assist project managers in selecting the most cost-effective green building alternatives.

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