



CITY OF CAMBRIDGE

Community Development Department

To: Louis A. DePasquale, City Manager

From: Iram Farooq, Assistant City Manager for Community Development

Date: December 3, 2019

Re: **Green Building Requirements Zoning Petition Supplemental Information**

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Overview

At the November 12, 2019, public hearing on the proposed amendments to Article 22.000 of the Zoning Ordinance, the Ordinance Committee requested that staff from the Community Development Department (CDD) provide supplemental information to the City Council on the following four key points.

Total Square Footage of Green Building Projects by Use

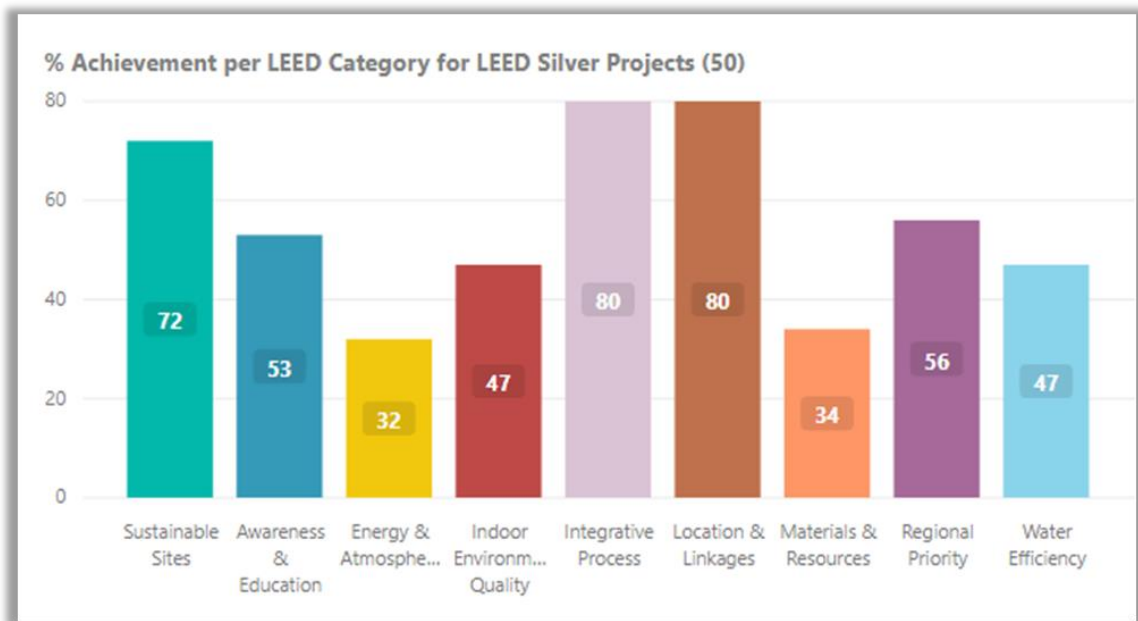
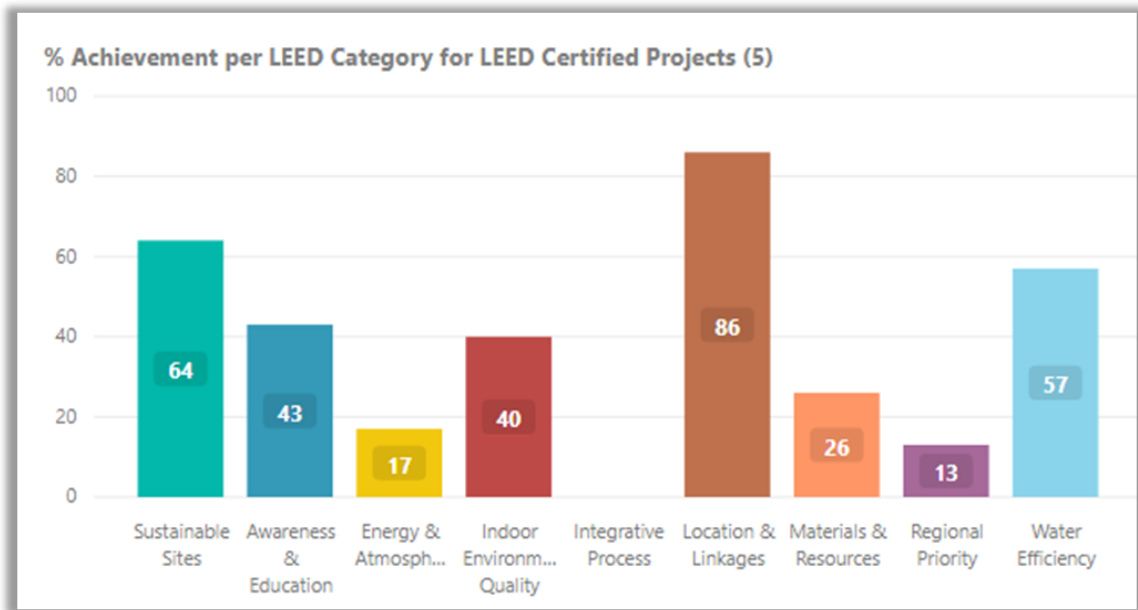
The 95 projects that have been subject to Section 22.20 since August 2010 total over 17 million square feet of development. That development can be broken down into the following primary uses:

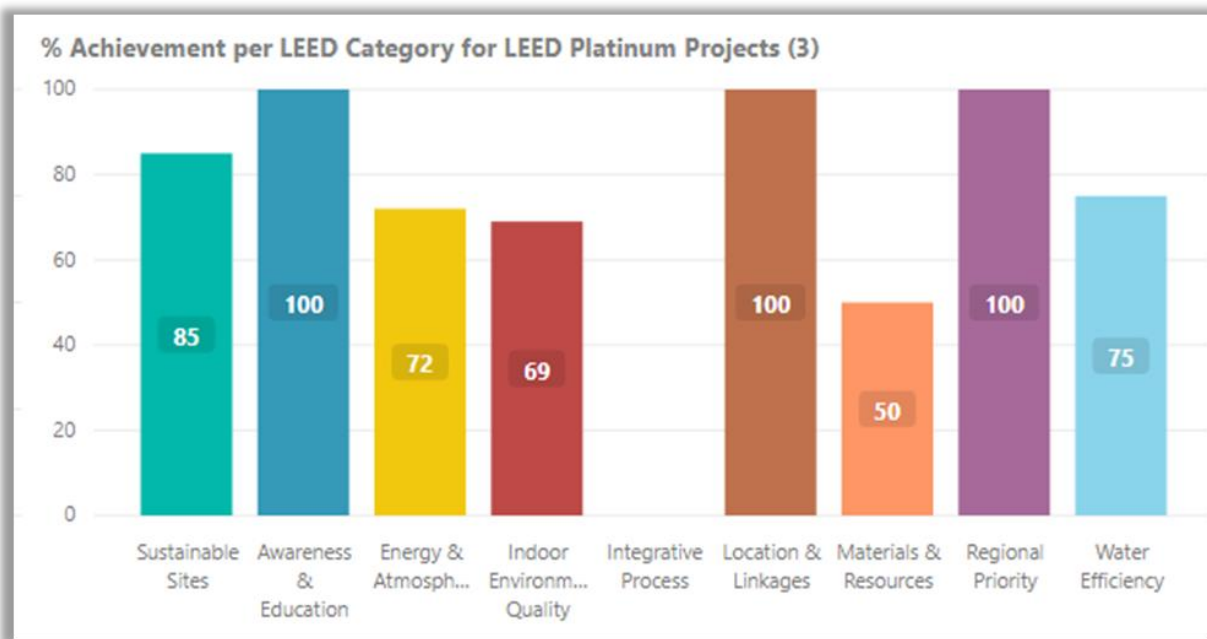
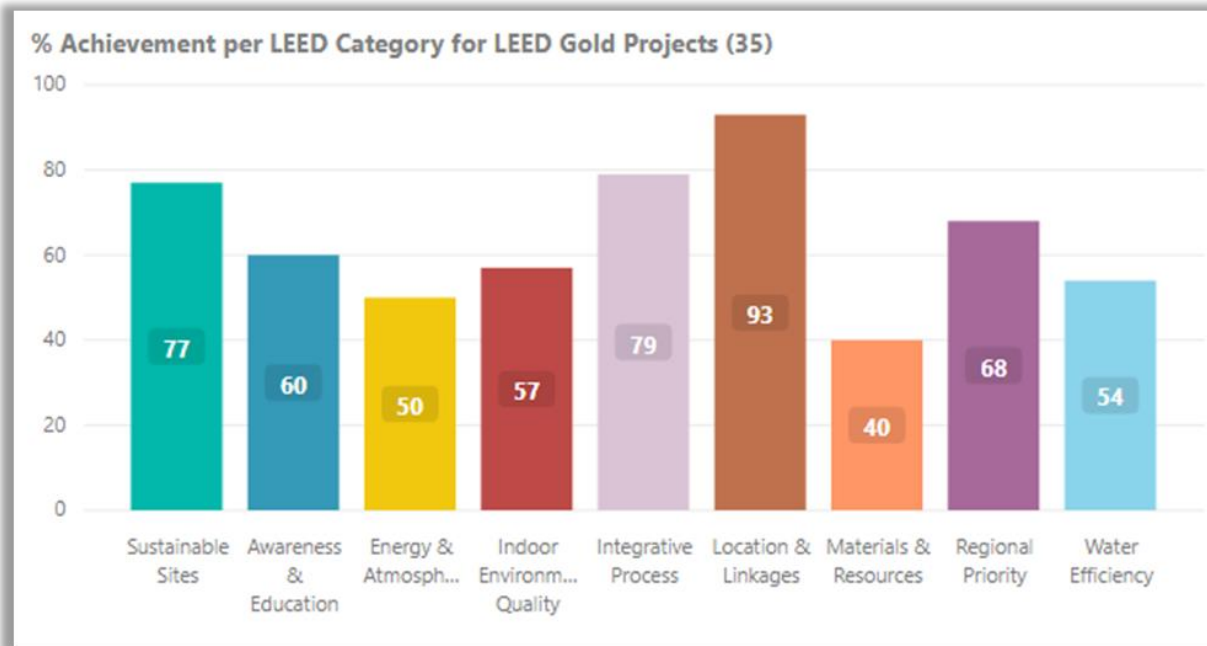
Use	Total Square Footage	Percent of Total Square Footage
Residential	7,756,712	45%
Office + Lab	7,247,578	42%
Educational + University	1,735,066	10%
Hotel	336,138	2%
Retail	149,903	0.8%
Government	110,276	0.6%

Points Achieved by LEED Certification Level

LEED Rating Systems are comprised of categories which focus on a different aspect of a project's design and construction and how that project responds to and interacts with its surrounding environment. There are four certification levels in LEED Rating Systems – Certified, Silver, Gold, and Platinum – which are determined by point thresholds. These points are achieved by meeting the requirements for a variety of credits in any of the categories.

The following charts illustrate the percent of points achieved by Article 22 projects in each certification level by each category:





These charts demonstrate that projects at the Gold and Platinum levels tend to achieve more points in the Energy and Atmosphere category. These projects have a significant, positive impact on the City's Net Zero goals.

Comparison of Building Energy Efficiency Standards

The current zoning petition proposes amending Section 22.000 to allow projects to seek compliance using the Passive House and Enterprise Green Communities standards as alternatives to the LEED standards. Because these three standards are structured in different ways, it is not possible to meaningfully compare them. However, a brief description of each may illustrate why CDD suggests providing all three as options for developers.

LEED is governed by the U.S. Green Building Council (USGBC) and is one of the most widely used green building rating systems in the world. It includes options for a range of building types (e.g. schools, hotels, warehouses) and phases (e.g. new construction, interior fit outs, operations and maintenance, and core and shell). Developers can choose the rating system that best fits their project, then follow the required prerequisites and optional credits to achieve accreditation. Because there are alternative compliance paths to LEED credits, developers have more options to address the unique needs of their projects. This makes it possible for a wide variety of development projects to become LEED certified.

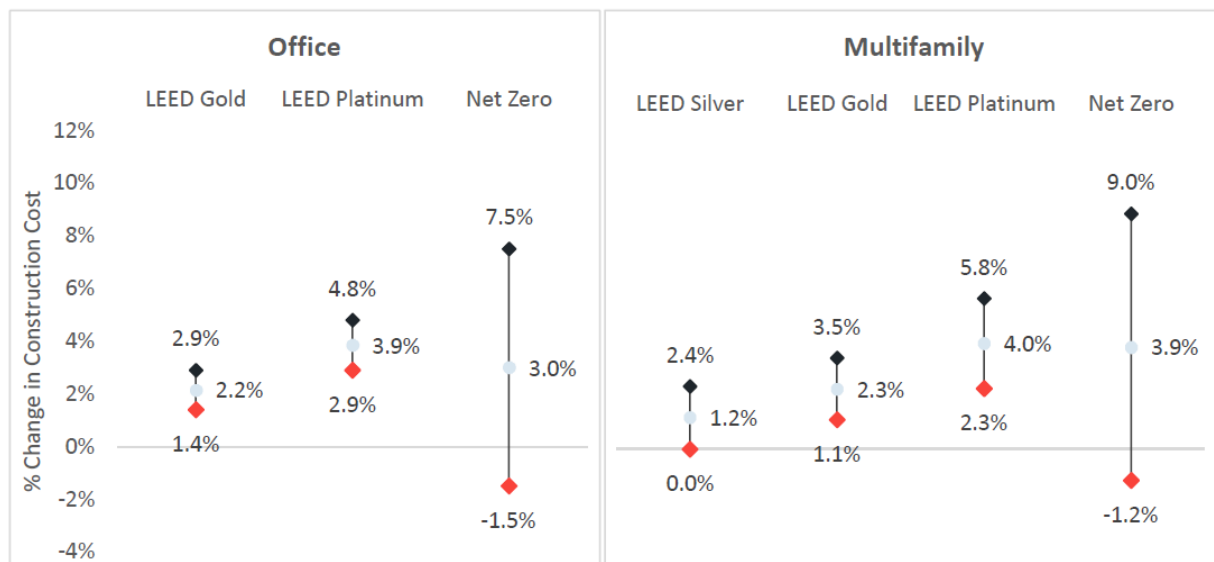
The PHIUS+ rating system governed by the Passive House Institute U.S. is the primary passive building certification program in North America. Passive building refers to a set of design principles that aim to maximize energy efficiency while enhancing occupant comfort. It focuses on leveraging key aspects of building science to limit thermal bridging, regulate air flow, and target space conditioning while employing high-performance windows, managing solar gain, and balancing heat- and moisture-recovery ventilation. Passive building principles can be applied to all building typologies, though to date it has most frequently been used for residential buildings. Unlike LEED, PHIUS+ only certifies buildings based on their energy efficiency. It is also different from LEED in that it is a pass-fail standard and does not offer a flexible menu of strategies. In addition, the standards articulated in PHIUS+ are climate-specific, whereas LEED's standards are universal regardless of geographic location. Buildings that are PHIUS+ certified are not precluded from seeking LEED certification; however, because the Passive House approach is strongly encouraged, it is reasonable not to impose an additional burden by also requiring a project to meet LEED standards.

The Green Communities criteria were developed by Enterprise, a national nonprofit that focuses on local affordable housing development. The criteria have been in practice for 15 years and were the first in the United States to address the needs of the affordable housing sector. Like LEED, Enterprise Green Communities takes a holistic approach to green building development, including Location and Neighborhood Fabric, Water Conservation, and a Healthy Living Environment. It is suitable for a range of development types, including new construction and moderate and substantial rehabilitation, as well as both single-family and multifamily housing developments. All projects must achieve compliance with mandatory criteria as well as a baseline number of points, both of which are tailored to the type of construction. Since Enterprise Green Communities is similar to LEED, Enterprise notes that a project that meets the 2015 version of its criteria would likely meet the Silver tier of LEED v4 Homes (the opposite is not necessarily true), but staff finds that the Enterprise Green Communities criteria are particularly well aligned with the City's energy goals. While it is less widely known than LEED or even PHIUS+, all affordable housing developments in New York City that receive municipal funding must comply with the Enterprise Green Communities Criteria.

Comparison of Cost of Compliance to Cost of Savings

It is challenging to directly compare how the costs of a building change once the developer seeks to meet standards for sustainable construction because construction costs depend on a variety of complex, interrelated factors. However, this topic is addressed in some outside research.

One helpful example is a cost analysis of green building strategies prepared by engineering firm WSP for the City of Alexandria, VA. While the analysis was tailored to that city's Green Building Policy, it provides a useful comparison of the construction and operating costs of various LEED and net zero building standards to a LEED Silver v.2009 baseline (the existing Cambridge standard is LEED Silver v.4). The report found that construction costs increase by an average of 2.2% from the LEED Silver standard when projects seek LEED Gold v.4 certification. The report also found that construction costs increase by an average of 3% from the LEED Silver standard when projects meet net zero standards, though there is a possibility of cost savings. The following chart from the report demonstrates the range of incremental construction costs for both new office and multifamily buildings using different green building standards.



The report is available following this link:

<https://www.alexandriava.gov/uploadedFiles/planning/info/WSPFinalTechnicalReport030819.pdf>.