GREEN BUILDING TRENDS

How Green Building Impacted the National Capital Region Between 2003 and 2009

Image from Fairfax County

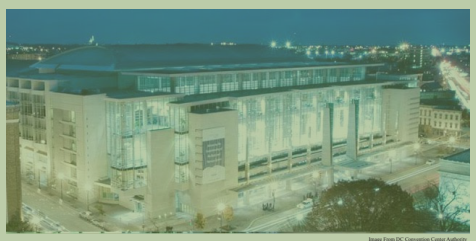


Image From DC Convention Center Authority

Image from localism.com

Spring 2011
Metropolitan Washington Council of Governments
www.mwcog.org

OVERVIEW

The Study

GREEN BUILDING TRENDS is the first metropolitan region-wide analysis of green building in the National Capital Region. This report represents spatial trends of green building by analyzing where Leadership in Energy and Environmental Design (LEED) certified projects have been constructed.

Over the past decade, the U.S. Green Building Council's (USGBC) LEED rating systems have become the dominant green building certification system in the region and the nation. While other green building evaluation systems exist, LEED's widespread implementation makes it the best source for consistent analysis across jurisdictions and time.

This report is based almost entirely on the spring 2010 USGBC Public Project Directory, which includes a number of confidential projects listed without specific locations. This study focuses on publicly listed certified projects with specific location information.

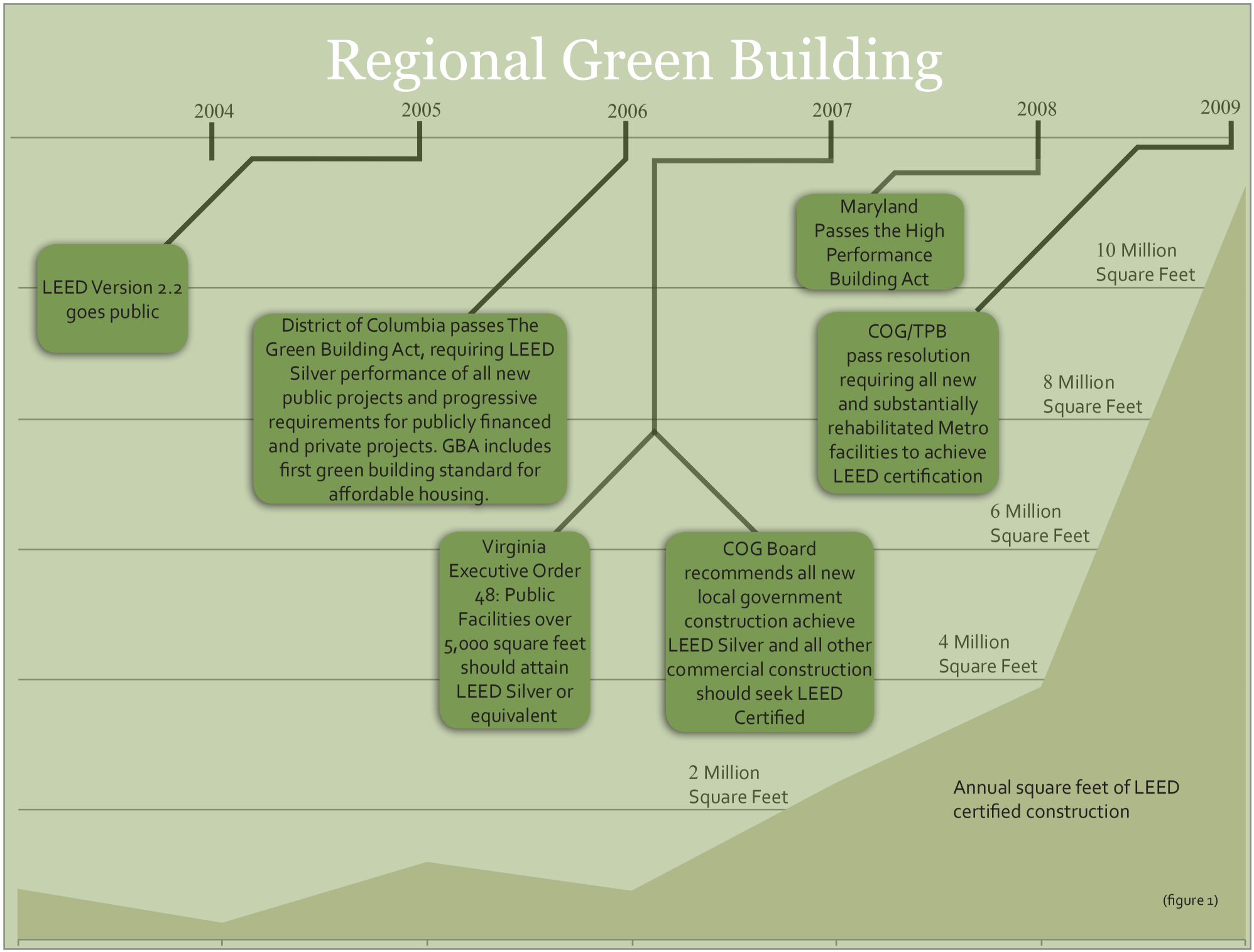
Over the past decade, green building has become a mainstream practice implemented through regulations and voluntary incentive programs. Recent discussions with local green building experts indicate that a new era of green building is emerging as green building standards shape state and local building codes.

To address these changes, a policy matrix summarizing local green building policies throughout the region has been developed as a tool for tracking changes in green building implementation. This matrix targets likely instruments for green building implementation, such as building code integration, reduction in commercial certification, and alternative certification programs.

This report is designed to contribute to a better understanding of recent green building activity in the National Capital Region. Green building is a major regional sustainability trend and will have lasting impacts on the region's built environment.

Image from chi-urbanmesh.org

Regional Green Building



(figure 1)

Regional Green Building Policy

The Metropolitan Washington Council of Governments green building policy is encapsulated in three policy frameworks. These policies have been built upon one another over the past four years to integrate green building into programs of varying scope.

Region Forward (2010)

- All new commercial and public buildings to be LEED® Silver or equivalent by 2020
- Reduce 2020 greenhouse gas emissions to 20% below 2005 levels
- Reduce 2050 greenhouse gas emissions to 80% below 2005 levels

National Capital Climate Change Report (2008)

- Set energy performance goals for new and existing government buildings
- Develop incentives for retrofitting existing commercial and residential buildings
- Revise state and or local building codes to promote energy efficiency
- Greenhouse gas emissions targets (2012 = 2005, 2020 = 20% below 2005, 2050 = 80% below 2005)

Greening the Metropolitan Washington Region's Built Environment (2007)

- Establish LEED as the region's preferred rating system for new commercial construction and high-rise residential projects
- Establish LEED Silver certification as the goal for all local government facilities constructed in the National Capital Region
- Establish the COG Regional LEED certified standard* for private commercial and high-rise residential development

*The COG Regional LEED certified standard is defined as achieving a LEED Certified rating with at least 4 credits addressing issues of energy and renewables, stormwater management, heat island impacts, and waste management.

** The Region Forward, Climate Change Report, and Greening the Metropolitan Washington Region's Built Environment reports can be accessed at http://www.mwcog.org/publications/all_alpha.asp

LEED Rating Systems

The U.S. Green Building Council (USGBC) has a suite of rating systems designed to promote many different types of green building. The same project can attain multiple certifications encouraging comprehensive implementation of green building principals.

LEED for New Construction™	is designed to guide and distinguish high performance commercial and institutional projects
LEED for Existing Buildings: Operations & Maintenance™	provides a benchmark for building owners and operators to measure operations, improvements and maintenance
LEED for Commercial Interiors™	is a benchmark for the tenant improvement market that gives the power to make sustainable choices to tenants and designers
LEED for Core & Shell™	aids designers, builders, developers and new building owners in implementing sustainable design for new core and shell construction
LEED for Schools™	recognizes the unique nature of the design and construction of K-12 schools and addresses the specific needs of school spaces
LEED for Retail™	recognizes the unique nature of retail design and construction projects and addresses the specific needs of retail spaces
LEED for Healthcare™	promotes sustainable planning, design and construction for high-performance healthcare facilities
LEED for Homes™	promotes the design and construction of high-performance green homes
LEED for Neighborhood Development™	LEED for Neighborhood Development™ integrates the principles of smart growth, urbanism and green building into the first national rating system for neighborhood design

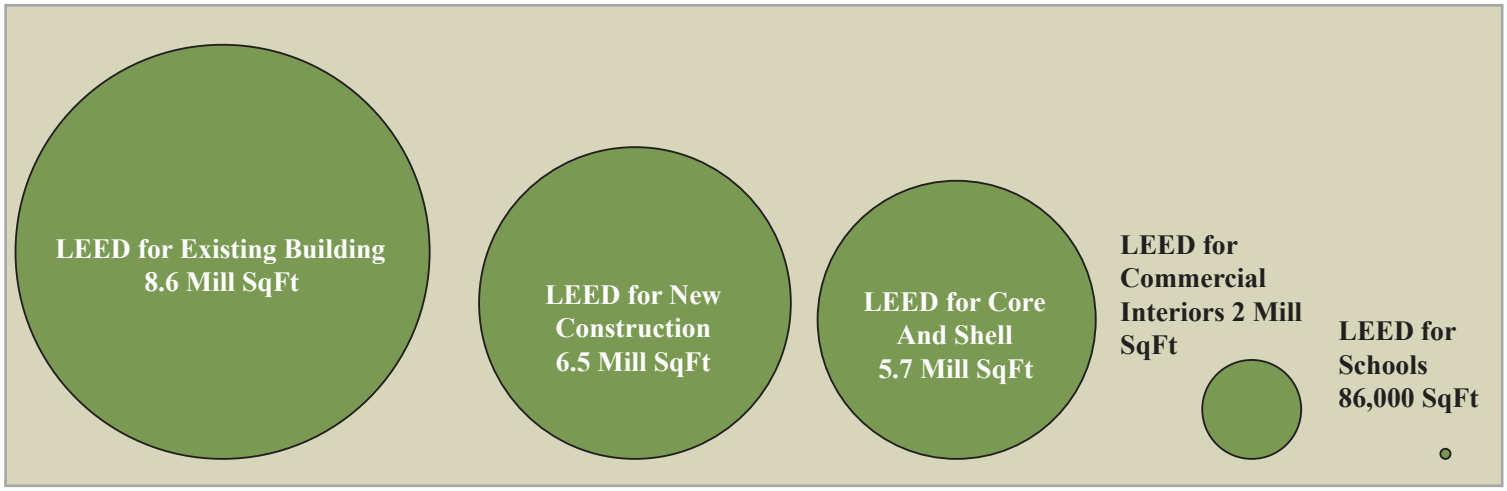
Projects by Category

LEED® certified projects completed between 2003 and 2009 in the National Capital Region totaled 22.9 million square feet

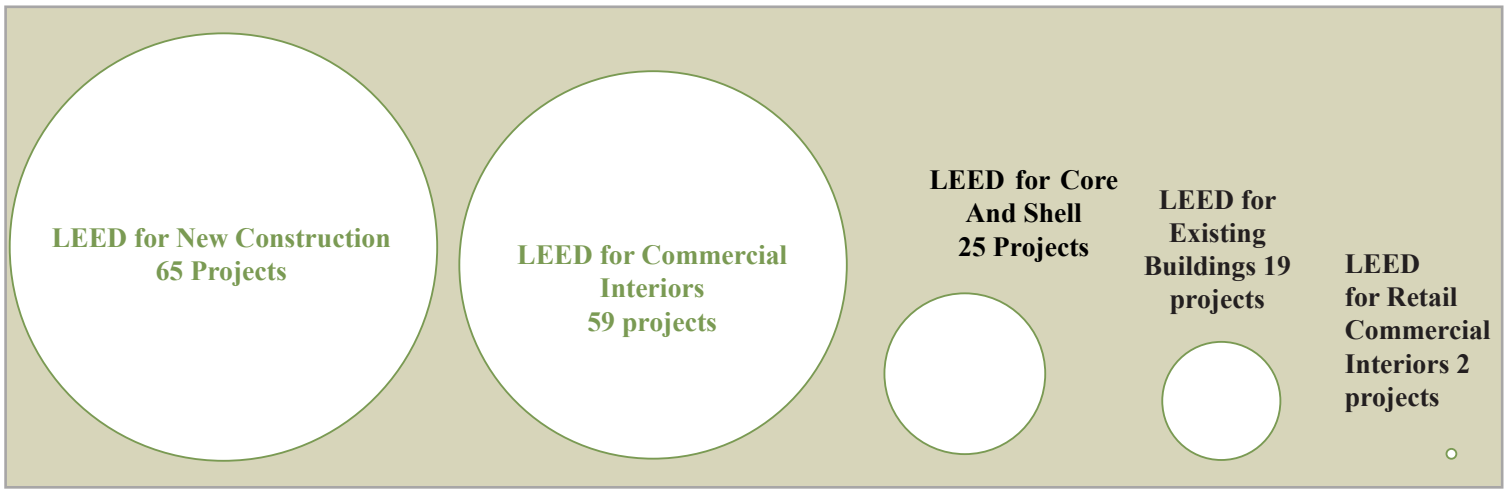
The majority of the region's LEED certified square feet can be attributed to reuse, maintenance, and operation of existing buildings. The suite of ratings systems developed by the USGBC seeks to promote the most efficient buildings possible. This means that efficient reuse, maintenance, and operations are just as important as new construction. Among LEED certified square footage in the National Capital Region, LEED for Existing Buildings is the single largest category.

The number of projects completed for each LEED rating system is also important because some rating systems such as LEED for Commercial Interiors are likely to attract more projects with smaller footprints. Additionally, the difference in the number of projects completed between LEED for New Construction and LEED for Core and Shell show important differences in the implementation between rating systems.

Total Square Feet of LEED certified Projects by Rating System (figure 2)



Number of LEED certified Projects by Rating System (figure 3)



* LEED for Retail, LEED for Homes, and LEED for Neighborhood Development Square Footages were not significant as of 2009
** LEED for Schools, LEED for Homes, and LEED for Neighborhood Development project numbers were not significant as of 2009
***Source: USGBC

LEED in The National Capital Region

Between 2006 - 2009 the number of LEED® certified projects grew substantially

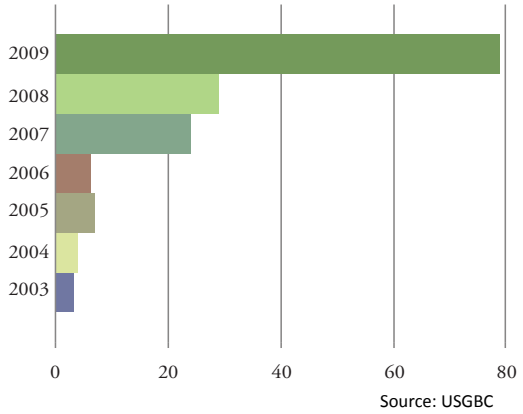
Green building is becoming a major construction trend in the National Capital Region. Since 2007, the number of LEED certified green buildings constructed in the region has grown substantially. Combining this trend with government incentives, policy, and regulations requiring LEED certification, green building practices are quickly becoming common design and construction practices in our region.

Examining the acceleration of LEED registered building projects further suggests more LEED certified green buildings are in the pipeline. Comparing registration rates with certification rates provides a sense of scale for potential green buildings that may someday become a reality.

Registration is the first step in attaining official certification signifying the developer's intent to pursue LEED certification. It is important to note that not all registered building projects will achieve LEED certification. Some projects may have encountered problems during the development process or stalled due to the economic downturn.

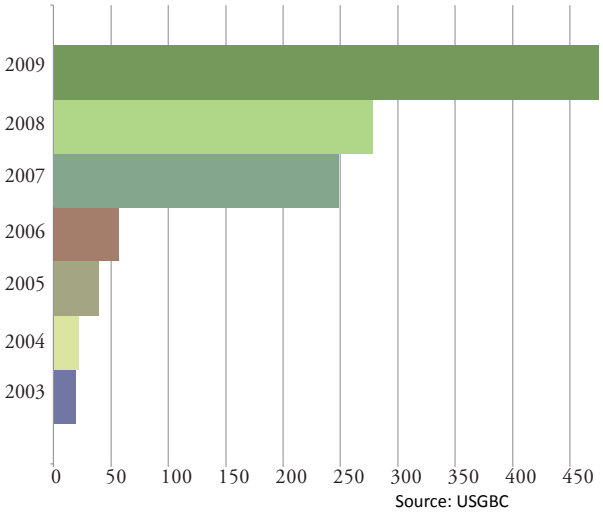
A further examination of the USGBC data reveals trends in the average project size which provide insights into green building implementation from year to year. The average size of a LEED certified project in the National Capital Region region completed between 2003 and 2009 is about 134,000 square feet. While the project sizes varied from year to year, a description of the average project size is important to note due to the fact that larger projects can more easily justify the additional costs associated with LEED certification. Between 2006 and 2009, when the region experienced a greater share of buildings achieving LEED certification, the average project size was 126,000 Square Feet. As green building continues to become increasingly common, it is likely that more small projects will be certified.

Total Number of Projects LEED Certified Per Year (figure 4)



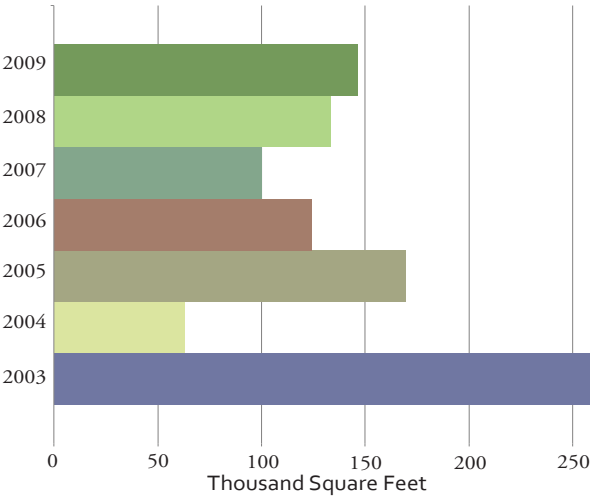
Source: USGBC

Number of LEED Registered Projects Per Year (Figure 5)



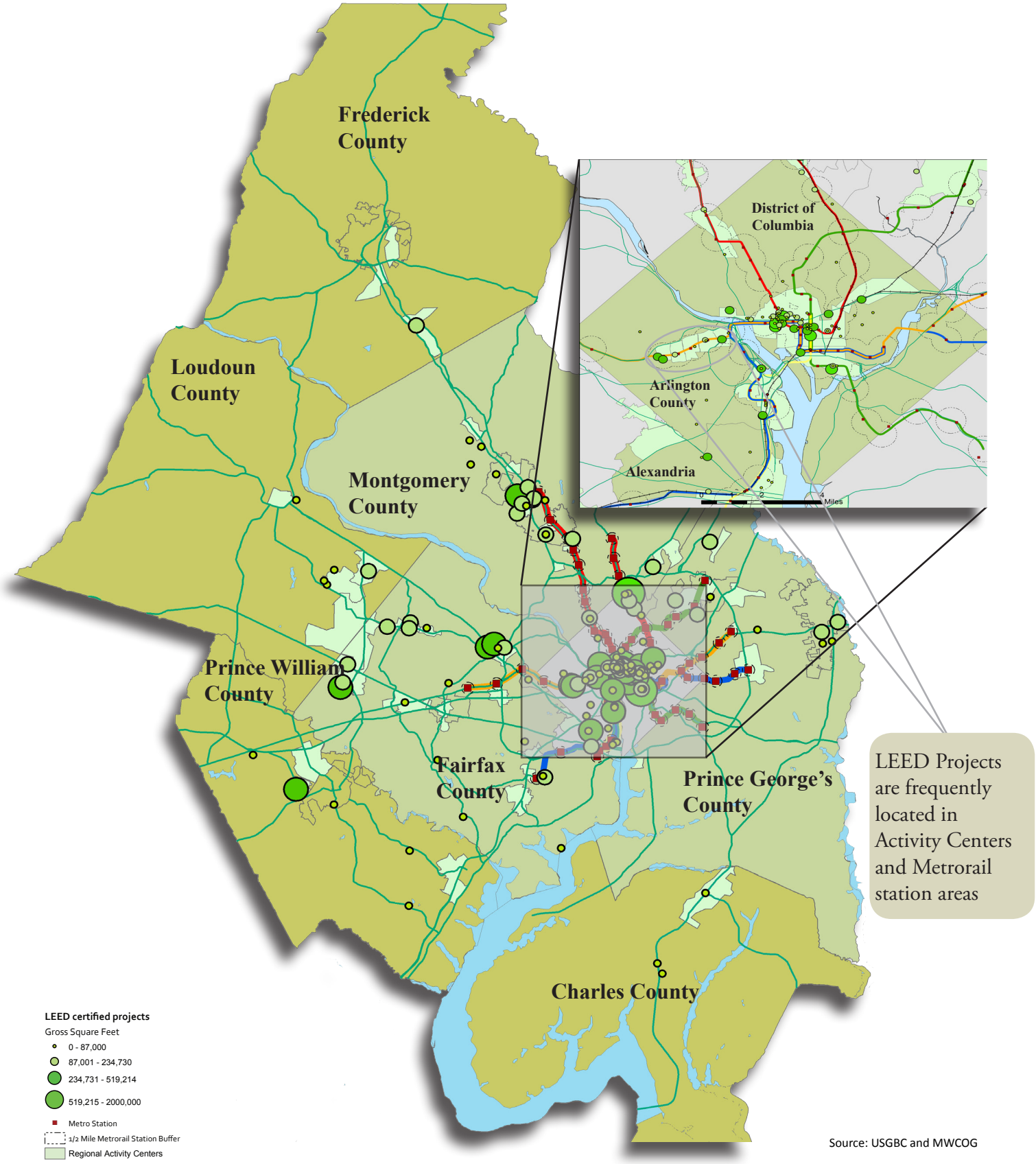
Source: USGBC

Average LEED Certified Project Per Year (figure 6)



Source: USGBC

LEED in The National Capital Region



LEED Projects are frequently located in Activity Centers and Metrorail station areas

Source: USGBC and MWCOG

(figure 7)

Sustainable Development

70 percent of all LEED® certified projects are located in Regional Activity Centers

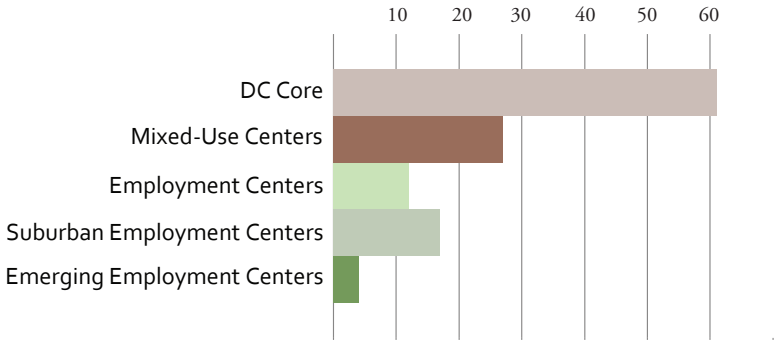
A majority of the region's LEED certified green buildings are located in Regional Activity Centers. A spatial analysis of USGBC's data found that 86 percent of all LEED certified square feet and 120 out of 171 LEED certified green buildings, certified between 2003 and 2009, are located in Regional Activity Centers. The large number of LEED certified buildings found in Regional Activity Centers may be a product of the large commercial orientation of LEED certified construction and that the Regional Activity Centers are largely based on employment concentrations.

In addition to the high number of projects completed within Regional Activity Centers the quality of those projects was also higher. Notably, projects certified Gold or Platinum were much more likely to be located within Regional Activity Centers than other locations in the region.

Moreover, several Regional Activity Centers* farther from the central city have emerged. These include the activity centers that comprise the Ballston/Rosyln corridor, Tysons Corner, and Rockville. These places demonstrate the relevance of LEED certification in suburban jurisdictions.

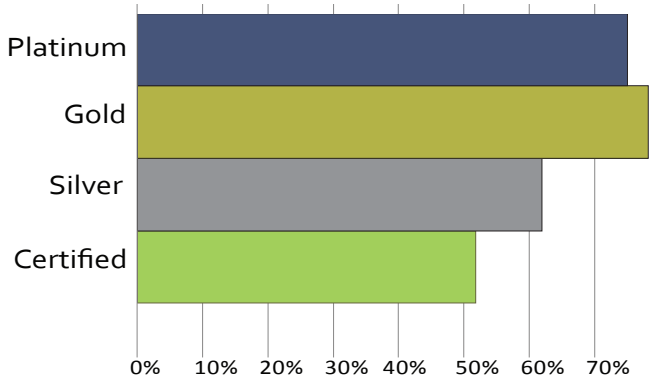
Furthermore, 64 percent of LEED certified space is located within one-half mile of a Metrorail station. These findings suggest that Metrorail access and places with higher employment concentration are two common factors for determining where LEED certified green building will occur. These findings are important because it presents a clearer understanding of the common locations either attracting or accommodating a large majority of LEED certified buildings in the National Capital Region. Promoting green building and locating development in Regional Activity Centers and around Metrorail stations are both essential for the region to meet its goals and targets outlined in Region Forward, the region's vision.

Number of LEED Certified Projects
in Regional Activity Centers 2003-2009 (figure 8)



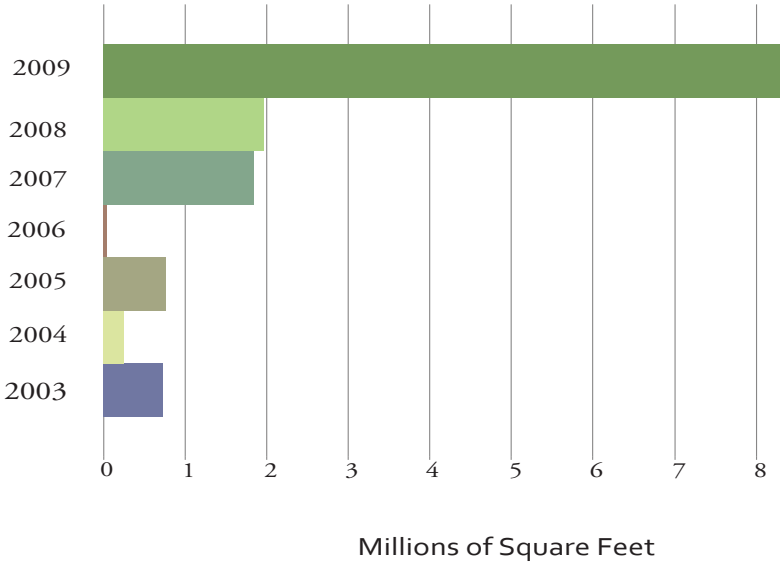
Source: USGBC and MWCOG

Percent of Each LEED Classification Attained
within Regional Activity Centers (figure 9)



Source: USGBC and MWCOG

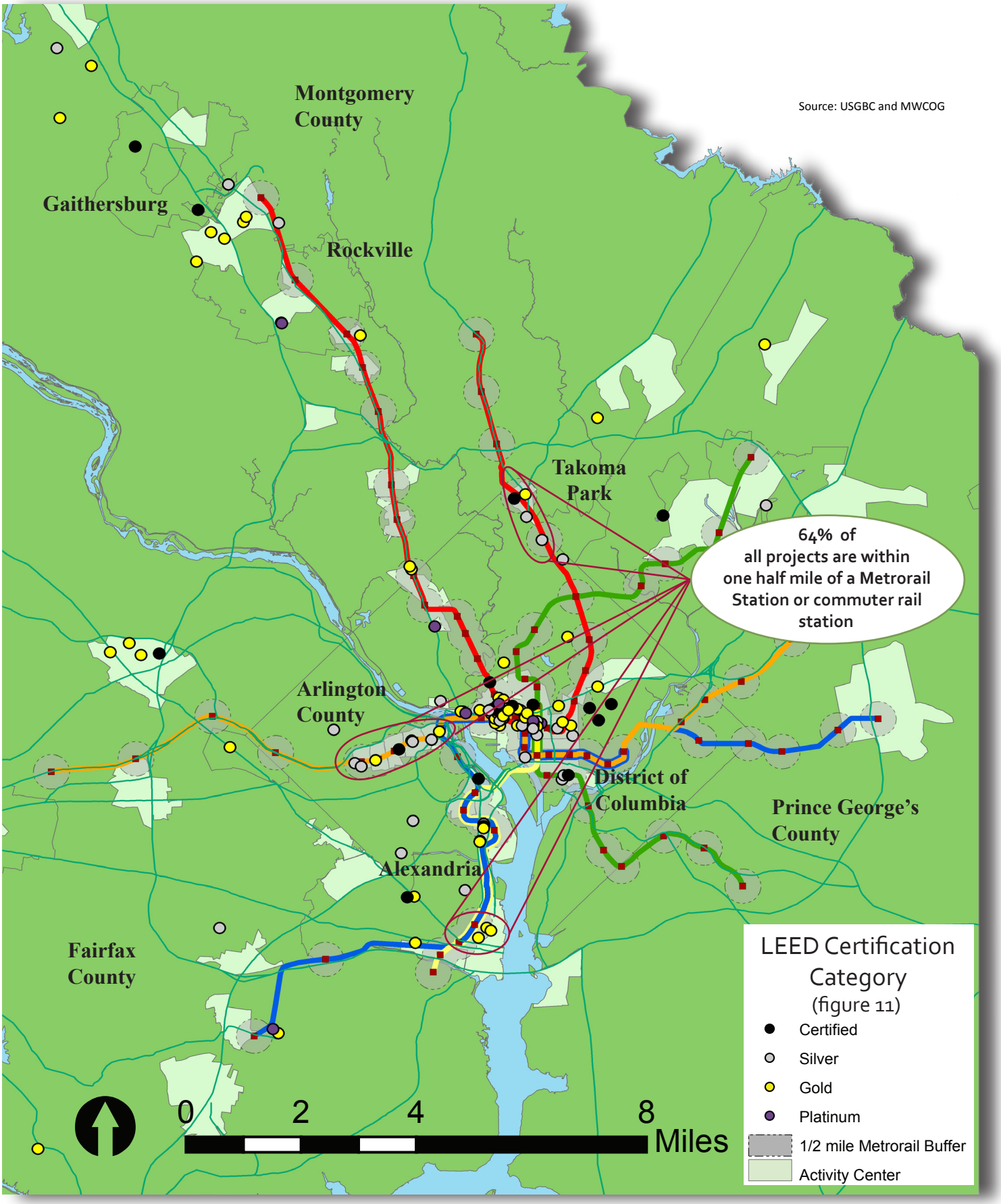
Total Square feet of LEED Certified Projects
Within 1/2 mile of a Metrorail Station (figure 10)



Source: USGBC and MWCOG

* Specific Definitions for Regional Activity Centers are available at www.mwcog.org/store/item.asp?PUBLICATION_ID=299

Sustainable Development



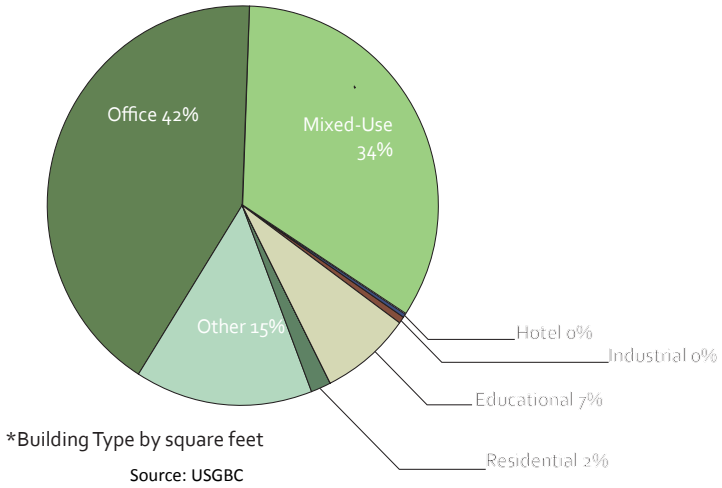
Building Type

Office space comprises the largest share of LEED® construction building types

Between 2003 and 2009, 47 percent or 81 out of 171 LEED certified buildings were considered office space. The second largest share of LEED certified space includes mixed-use buildings. The large share of mixed-use buildings achieving LEED certification aligns with USGBC's scoring criteria that recognize a building's impact on the environment from where it's located to how it fits into the community. Some projects can achieve LEED certification easier if a project improves the neighborhoods access to goods and services, smart transportation choices and walkability.

The most common LEED certification classification achieved in the National Capital Region is LEED Gold followed by LEED Silver. Figures 13 and 14 show the number of projects and the square feet for each LEED certification level. Between 2003 and 2009, a remarkable 84 percent of LEED projects attained LEED Silver certification or higher. The LEED classification designations are ordinal, ranking buildings that incorporate more green measures into their design meet higher standards.

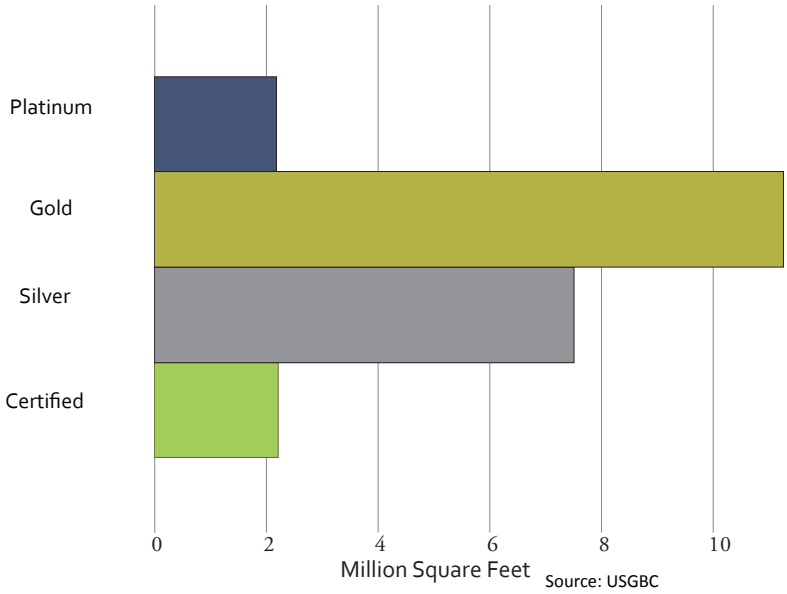
Green Building by Project Type (figure 12)



*Building Type by square feet

Source: USGBC

Square Feet by LEED Classification (figure 13)



Source: USGBC

LEED certification Attainment (figure 14)

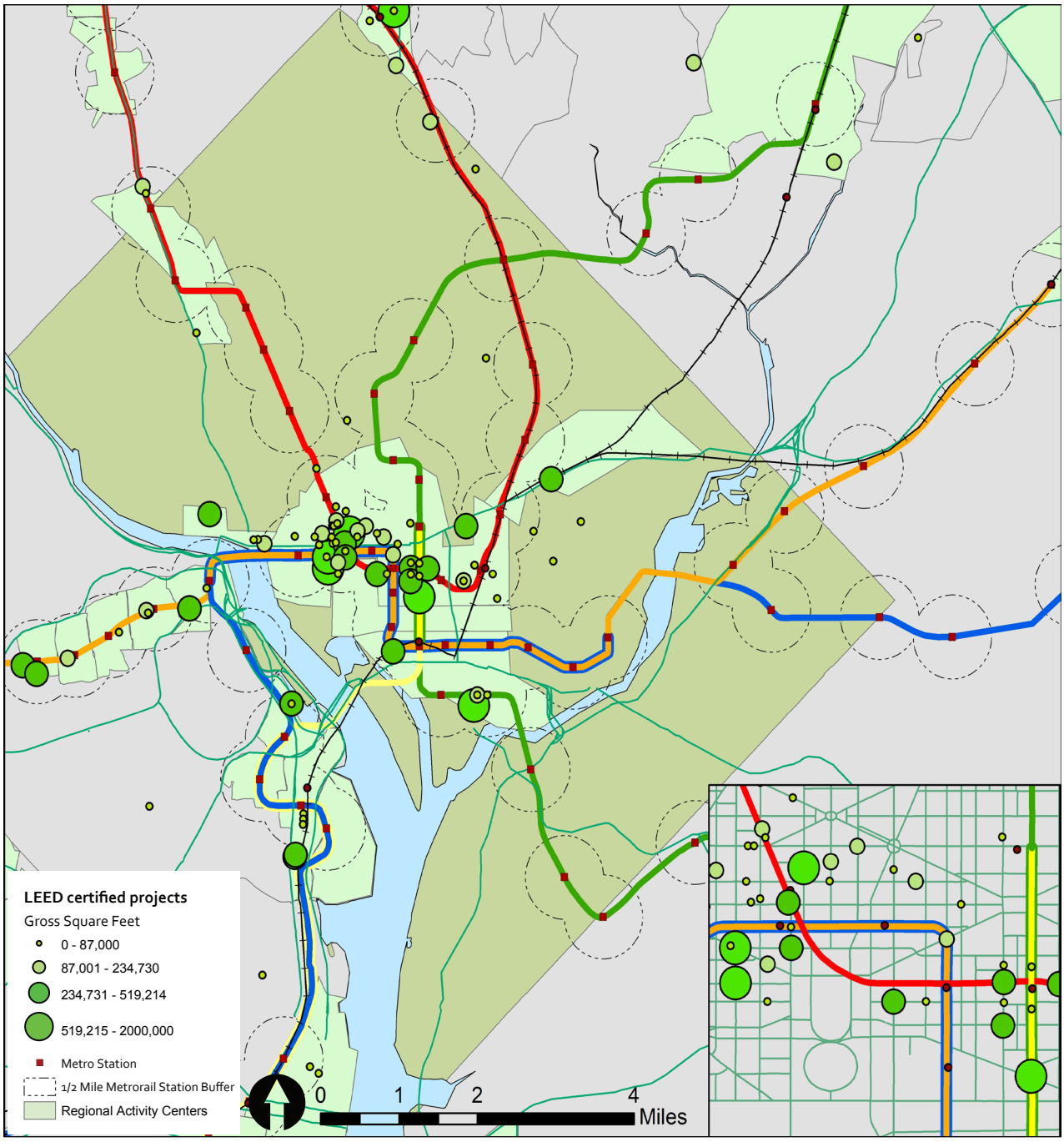
Certification	Number or Projects	Total Square feet
Platinum	12	2,190,578
Gold	69	11,262,249
Silver	63	7,320,108
Certified	27	2,210,604
Total	171	22,983,539

Source: USGBC

The District of Columbia

Key Trends

- 72 LEED® certified projects from 2003-2009
- 12.5 million square feet of LEED certified projects
- 64 Projects in Regional Activity Centers
- The largest project was the International Monetary Fund Center



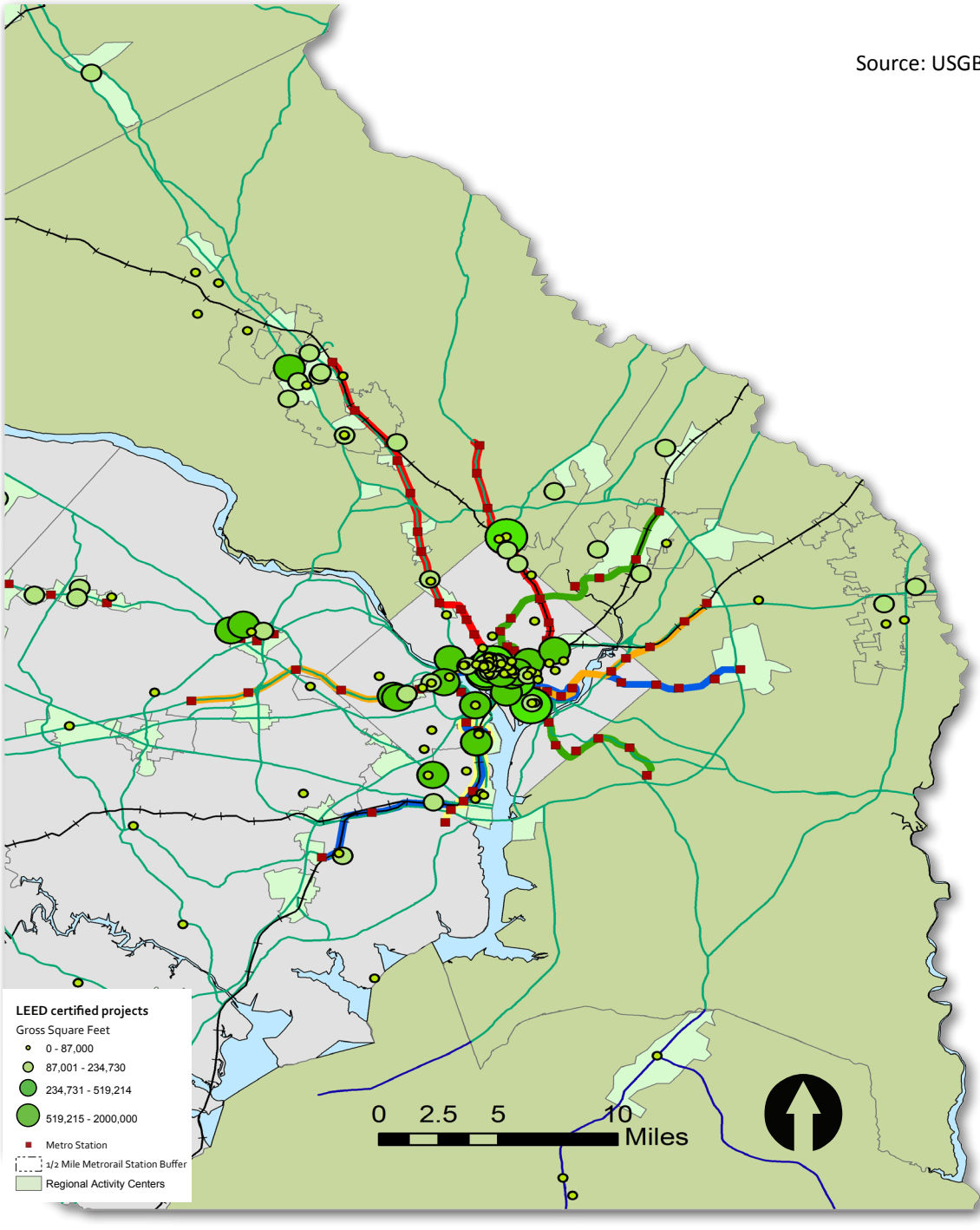
(figure 15) Source: USGBC and MWCOG

Maryland

Key Trends

- 40 LEED® certified projects from 2003-2009
- 3.8 million square feet of LEED certified projects
- 15 Projects in Regional Activity Centers
- The largest project in Maryland was the Discovery Communications Global Headquarters

Source: USGBC and MWCOG

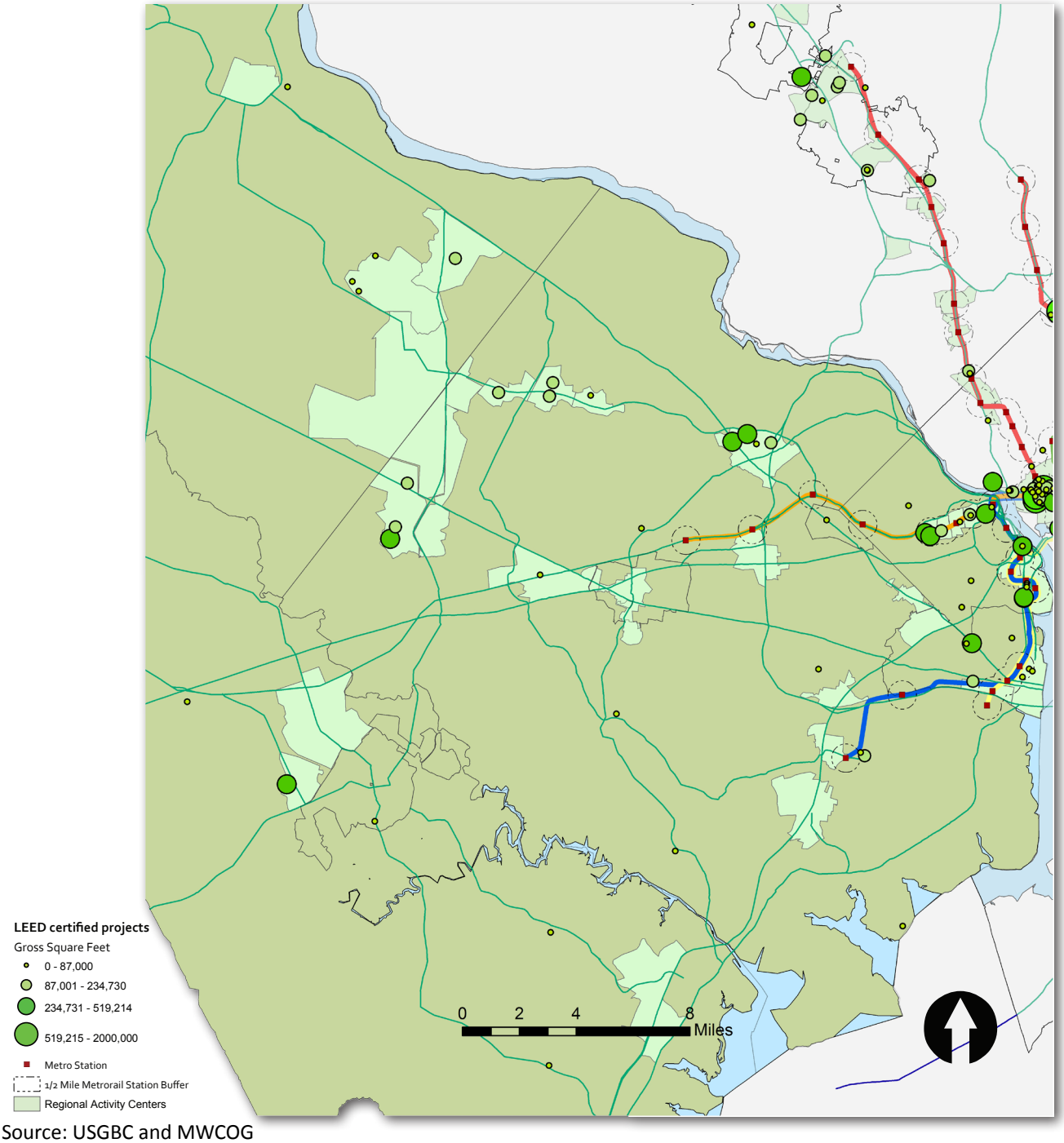


(figure 16)

Virginia

Key Trends

- 59 LEED® certified projects from 2003- 2009
- 6.6 million square of feet LEED certified projects
- 41 projects in Regional Activity Centers
- The largest project was T.C. Williams High School



(figure 17)

Source: USGBC and MWCOG

Jurisdictional Totals (figure 18)

Jurisdiction	Office	Retail	Mixed Use	Education	Medical	Other	Residential	Industrial	Hotel	MWCOG Region Unconfidential Subtotal	State Wide Confidential / Unconfidential
City of Alexandria											
Square Feet	55,618	0	183,950	462,000	0	160,178	0	0	0	861,746	N/A
Number	2	0	4	2	0	1	0	0	0	9	N/A
Arlington County											
Square Feet	997,420	0	1,115,560	50,000	0	522,000	267,470	0	0	2,952,450	N/A
Number	10	0	6	1	0	3	1	0	0	21	N/A
District of Columbia											
Square Feet	3,821,557	3,710	5,856,705	447,039	0	2,313,453	136,000	0	0	12,578,464	N/A
Number	41	1	16	3	0	10	1	0	0	72	N/A
Charles County											
Square Feet	0	6,600	0	0	0	14,000	0	0	0	20,600	N/A
Number	0	2	0	0	0	1	0	0	0	3	N/A
City of Falls Church											
Square Feet	0	0	43,992	0	0	0	0	0	0	43,992	N/A
Number	0	0	1	0	0	0	0	0	0	1	N/A
City of Fairfax											
Square Feet	0	0	0	0	0	0	0	0	0	0	N/A
Number	0	0	0	0	0	0	0	0	0	0	N/A
Fairfax County											
Square Feet	1,729,472	3,300	145,885	17,000	0	39,850	0	0	0	1,935,507	N/A
Number	9	1	2	1	0	4	0	0	0	17	N/A
Frederick County											
Square Feet	0	0	0	0	0	220,000	0	0	0	220,000	N/A
Number	0	0	0	0	0	1	0	0	0	1	N/A
Loudoun County											
Square Feet	411,862	3,200	3,500	0	0	73,319	0	0	0	491,881	N/A
Number	2	1	1	0	0	2	0	0	0	6	N/A
City of Manassas											
Square Feet	0	0	249,000	0	0	3,600	0	0	0	252,600	N/A
Number	0	0	1	0	0	1	0	0	0	2	N/A
Montgomery County											
Square Feet	2,058,782	4,700	108,745	0	560,847	27,400	0	0	124,786	2,885,260	N/A
Number	11	2	3	0	4	3	0	0	1	24	N/A
City of Gaithersburg *											
Square Feet	515,929	0	0	0	0	7,400	0	0	0	523,329	N/A
Number	2	0	0	0	0	1	0	0	0	3	N/A

Jurisdictional Totals (figure 19)

Jurisdiction	Office	Retail	Mixed Use	Education	Medical	Other	Residential	Industrial	Hotel	MWCOG Region Unconfidential Subtotal	State Wide Confidential / Unconfidential
City of Rockville *											
Square Feet	676,072	1,400	1,613	334,423	0	0	0	0	0	1,013,508	N/A
Number	7	1	1	2	0	0	0	0	0	11	N/A
City of Takoma Park *											
Square Feet	0	0	0	0	0	0	0	0	0	0	N/A
Number	0	0	0	0	0	0	0	0	0	0	N/A
Prince George's County											
Square Feet	423,576	1,400	26,885	198,710	0	10,909	0	19,345	0	680,825	N/A
Number	4	1	1	2	0	3	0	1	0	12	N/A
Town of Bladensburg *											
Square Feet	0	0	0	0	0	0	0	0	0	0	N/A
Number	0	0	0	0	0	0	0	0	0	0	N/A
City of Bowie *											
Square Feet	43,992	0	0	0	0	10,909	0	19,345	0	74,246	N/A
Number	1	0	0	0	0	3	0	1	0	5	N/A
City of Greenbelt *											
Square Feet	0	0	0	0	0	0	0	0	0	0	N/A
Number	0	0	0	0	0	0	0	0	0	0	N/A
Prince William County											
Square Feet	53,614	6,600	0	0	0	0	0	0	0	60,214	N/A
Number	1	2	0	0	0	0	0	0	0	3	N/A
Totals											
Square Feet	**9,551,901**	**29,510**	**7,734,222**	**1,174,749**	**560,847**	**3,384,709**	**403,470**	**19,345**	**124,786**	**22,983,539**	N/A
Number	**80**	**10**	**35**	**9**	**4**	**29**	**2**	**1**	**1**	**171**	N/A
DC Total											
Square Feet	**3,821,557**	**3,710**	**5,856,705**	**447,039**	**0**	**2,313,453**	**136,000**	**0**	**0**	**12,578,464**	
Number	**41**	**1**	**16**	**3**	**0**	**10**	**1**	**0**	**0**	**72**	**24/72**
Virginia Total											
Square Feet	**3,247,986**	**13,100**	**1,741,887**	**529,000**	**0**	**798,947**	**267,470**	**0**	**0**	**6,598,390**	
Number	**24**	**4**	**15**	**4**	**0**	**11**	**1**	**0**	**0**	**59**	**27/122**
Maryland Total											
Square Feet	**2,482,358**	**12,700**	**135,630**	**198,710**	**560,847**	**272,309**	**0**	**19,345**	**124,786**	**3,806,685**	
Number	**15**	**5**	**4**	**2**	**4**	**8**	**0**	**1**	**1**	**40**	**20/81**

* Maryland Cities included in County Totals

** Data for LEED certified unconfidential projects unless otherwise noted

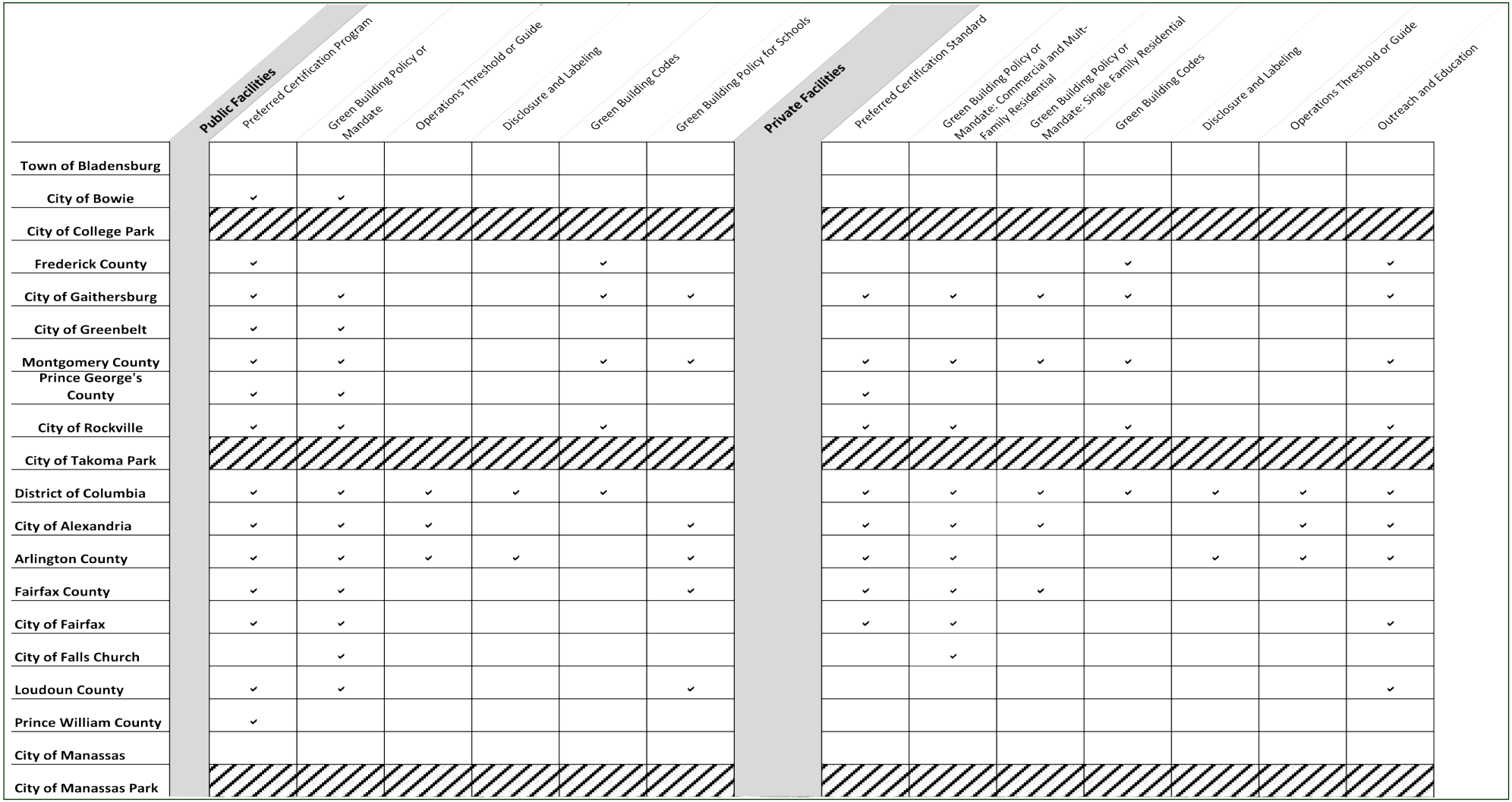
*** Data in these tables only reflects unclassified LEED certified projects between 2003 and 2009

Regional Green Building Initiative Comparison

Public Facilities:	Facilities owned or operated by a government.
Private Facilities:	Facilities owned and operated by private persons or organizations.
Preferred Certification Program:	Designation a preferred certification system such as LEED and Green Globes.
Mandatory Green Building:	The municipality requires green building or design techniques.
Operations Threshold:	The municipality requires that public facilities meet an operating standard such as LEED Maintenance and Operations or Energy Star.
Disclosure and Labeling:	The municipality requires that public facilities disclose their green building certification status, energy consumption or other similar indicators.
Green Building Policy for Schools:	The local school district has a green building policy.
Residential Green Building Threshold:	The municipality has designated a threshold which residential facilities should attain such as LEED Silver.
Multi-family Green Building Threshold:	The municipality has designated a threshold which Multi-family facilities should attain such as LEED Silver.
Green Building Codes:	The municipality has developed its building code to incorporate green building principals such as adoption of IECC 2009, net metering allowance, cool roof requirements and more stringent requirements for energy performance and stormwater management.
Outreach and Education:	The municipality has developed any kind of outreach and education program designed to aid the implementation of green building principals.

(figure 20)

Regional Green Building Initiative Comparison



	Public Facilities						Private Facilities						
	Preferred Certification Program	Green Building Policy or Mandate	Operations Threshold or Guide	Disclosure and Labeling	Green Building Codes	Green Building Policy for Schools	Preferred Certification Standard	Green Building Policy or Mandate: Commercial and Mult-Family Residential	Green Building Policy or Mandate: Single Family Residential	Green Building Codes	Disclosure and Labeling	Operations Threshold or Guide	Outreach and Education
Town of Bladensburg													
City of Bowie	✓	✓											
City of College Park													
Frederick County	✓				✓					✓			✓
City of Gaithersburg	✓	✓			✓	✓	✓	✓	✓	✓			✓
City of Greenbelt	✓	✓											
Montgomery County	✓	✓			✓	✓	✓	✓	✓	✓			✓
Prince George's County	✓	✓					✓						
City of Rockville	✓	✓			✓		✓	✓		✓			✓
City of Takoma Park													
District of Columbia	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓
City of Alexandria	✓	✓	✓			✓	✓	✓	✓			✓	✓
Arlington County	✓	✓	✓	✓		✓	✓	✓			✓	✓	✓
Fairfax County	✓	✓				✓	✓	✓	✓				
City of Fairfax	✓	✓					✓	✓					✓
City of Falls Church		✓						✓					
Loudoun County	✓	✓				✓							✓
Prince William County	✓												
City of Manassas													
City of Manassas Park													

* Local Initiatives data is based on self reporting from each jurisdiction

** Data was not available for Manassas Park, Takoma Park, and College Park.

(figure 21)

Green Building Trends

How Green Building Impacted the National Capital Region Between 2003 and 2009

Metropolitan Washington Council of Governments

Department of Community Planning and Services
with the Department of Environmental Programs

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