

**FAIRFAX COUNTY PLANNING COMMISSION
ENVIRONMENT COMMITTEE
THURSDAY, NOVEMBER 29, 2012**

COMMITTEE MEMBERS PRESENT:

Frank A. de la Fe, Hunter Mill District
Jay P. Donahue, Dranesville District
Earl L. Flanagan, Mount Vernon District
James R. Hart, At-Large, Chairman
Kenneth A. Lawrence, Providence District
Timothy J. Sargeant, At-Large

COMMITTEE MEMBER ABSENT:

Walter L. Alcorn, At-Large

OTHER COMMISSIONER PRESENT:

Ellen J. Hurley, Braddock District

FAIRFAX COUNTY STAFF PRESENT:

Pamela G. Nee, Chief, Environment and Development Review Branch (EDRB), Planning Division (PD), Department of Planning and Zoning (DPZ)
Noel H. Kaplan, Senior Environmental Planner, EDRB, PD, DPZ
Maya P. Dhavale, Planner III, EDRB, PD, DPZ
Ellen N. Eggerton, Green Building Ombudsman, Land Development Services Division, Department of Public Works and Environmental Services
Christopher B. Remer, Communications Specialist II, Planning Commission Office
Kara A. DeArrastia, Clerk to the Planning Commission

OTHERS PRESENT:

Andres Ploompuu, Member, Friends of Accotink Creek
Flint Webb, Chairman, Fairfax County Federation of Citizens Associations' Environment Committee
Inda Stagg, Senior Land Use Planner, Walsh, Colucci, Lubeley, Emrich & Walsh, PC
Jeffrey Saxe, Practice Builder, Kimley-Horn and Associates
Todd Magiera, Engineer, Kimley-Horn and Associates

ATTACHMENTS:

- A. "Electric vehicle charging infrastructure recommendations to Fairfax County: Task 5 of sustainability study under Proffer Number 9, RZ 2008-PR-011" report, dated July 19, 2011, by The MITRE Corporation
- B. "Ready for Electric Vehicle (REV) Program" – eVgo presentation
- C. "Planning Commission Environment Committee review of the MITRE report: Possible approach to the Committee review" document, dated November 29, 2012
- D. "Green Building Policy Review – Comment Compilation, Staff Response, and Planning Commission Environment Committee Response, revised November 29, 2012" matrix
- E. Green Building Comprehensive Plan Policy Review Strawman, dated November 29, 2012

- F. “Comprehensive Plan policy – Green Building guidance (general), Draft as of October 4, 2012” table

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Chairman James R. Hart called the meeting to order at 7:06 p.m., in the Board Conference Room, 12000 Government Center Parkway, Fairfax, Virginia 22035.

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Commissioner Flanagan MOVED THAT THE ENVIRONMENT COMMITTEE MINUTES OF JULY 19, 2012, BE APPROVED.

Commissioner Lawrence seconded the motion which carried unanimously.

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DISCUSSION OF REVIEW OF THE MITRE ELECTRIC VEHICLE CHARGING INFRASTRUCTURE REPORT

Noel Kaplan, Senior Environmental Planner, Environment and Development Review Branch (EDRB), Planning Division (PD), Department of Planning and Zoning (DPZ), provided background information on The MITRE Corporation’s report on electric vehicle charging infrastructure recommendations to Fairfax County, as shown in Attachment A. He called attention to a presentation prepared by eVgo on the Ready for Electric Vehicle (REV) Program, as shown in Attachment B. He also reviewed staff’s proposed timeline for the Committee’s review of the MITRE report and Attachment C.

Chairman Hart pointed out that the Planning Commission did not have a deadline for making a recommendation on this issue to the Board of Supervisors. He explained that at the conclusion of this process, he envisioned that the Committee would make a recommendation to the Planning Commission that the Board of Supervisors adopt one of four options: 1) authorize a Policy Plan Amendment, 2) direct staff to develop prototype proffer language for use on a case-by-case basis, 3) direct staff to prepare and distribute educational materials on electric vehicle supply equipment, or 4) not pursue any action at this time.

Chairman Hart said he anticipated that the Committee would also need a briefing soon on the collaboration between Fairfax County Public Schools and the Stormwater Planning Division of the Department of Public Works and Environmental Services (DPWES) on stormwater management plans and possibly an update on the implementation of watershed management plans in the County. Mr. Kaplan replied that the proposed meeting schedule could be adjusted as necessary.

Answering a question from Commissioner Flanagan, Mr. Kaplan explained that staff had recommended to the Board of Supervisors that MITRE’s policy recommendations to the County

regarding electric vehicle charging infrastructure, with a particular focus on opportunities associated with redevelopment in Tysons, was an appropriate issue for the Planning Commission to consider. He noted that the Board of Supervisors had accepted this recommendation without any caveats or additional requests. Chairman Hart pointed out that Providence District Supervisor Linda Smyth's motion was that the MITRE report be referred to the Planning Commission for review and recommendation (*Note: On September 13, 2011, this motion carried by a vote of nine, with Sully District Supervisor Michael Frey not present for the vote*).

It was the consensus of the Committee to accept Mr. Kaplan's proposed approach to the Committee review of the MITRE report, as outlined in Attachment A.

In response to a question from Chairman Hart, Mr. Kaplan said he would contact MITRE representatives to find out if they could meet with the Committee in January 2013 to provide an overview of the MITRE report. He added that he would also contact Kambiz Agazi, Fairfax County Environmental Coordinator, to find out if he could meet with the Committee in February to provide an overview of planning efforts at the Metropolitan Washington Council of Governments.

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NEW STORMWATER MANAGEMENT ORDINANCE

Replying to a question from Commissioner Hurley, Mr. Kaplan stated that the new Stormwater Management Ordinance was anticipated to become effective on July 1, 2014. He noted that DPWES staff would continue to meet with stakeholders to gather information that would be used in developing the new Ordinance. He said he anticipated that this matter would take a considerable amount of attention from the Planning Commission when it was scheduled for public hearing in July 2013.

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DISCUSSION OF GREEN BUILDING POLICY REVIEW COMMENTS/RESPONSE DOCUMENT

Answering a question from Chairman Hart, Mr. Kaplan explained that the next steps in this process would be for the Committee to: 1) discuss the updated version of the Green Building Comprehensive Plan Policy Review strawman document, and 2) vote to recommend that the Planning Commission recommend that the Board of Supervisors authorize the advertisement of a Policy Plan Amendment to implement the recommendations contained in the strawman and public hearings before the Commission and the Board.

Maya Dhavale, Planner III, EDRB, PD, DPZ, said she had distributed a large matrix outlining the existing Plan text, associated draft strawman proposal, commenter's name and comment, staff analysis/response, and the Committee's response, as shown in Attachment D. She added that this matrix also described all the changes that had been made between the first and second

versions of the strawman. She next reviewed the latest version, dated November 29, 2012, as shown in Attachment E, noting that it reflected stakeholder input and Committee discussion and recommendations thus far.

Responding to a question from Commissioner Flanagan, Ms. Dhavale clarified that the first new sentence in the first paragraph under “RESOURCE CONSERVATION AND GREEN BUILDING PRACTICES” on page 3 of the latest strawman should begin, “Recent events and trends....” She pointed out that a clean copy of the strawman text was on pages 8 through 11.

Chairman Hart said he envisioned that the Committee would vote on the strawman proposal this evening and staff would finalize the document for presentation to the Planning Commission in advance of its meeting on Wednesday, December 5, 2012. He also recommended that the advertisement of a Policy Plan Amendment to implement the recommendations provide flexibility to consider a range of options during the public hearing process.

Referencing the third bullet near the top of page 9, Commissioner Sargeant expressed concern about specifying historic structures as a type of existing building to be considered for reuse because of the difficulty of implementing modern energy efficiency measures in such structures. He also suggested revising the next bullet to read, “Retrofitting of existing structures to be preserved, conserved, and reused with other green building practices.”

Chairman Hart pointed out that the bullets listed under Policy a simply denoted some of the energy conservation, water conservation, and other green building practices that could be applied in the design and construction of new development and redevelopment projects but it was not intended to be an exhaustive list. He said such practices should be encouraged on a case-by-case basis where appropriate.

Commissioner Flanagan noted that he was comfortable with leaving the proposed strawman text as it was currently written, adding that the advertised Policy Plan Amendment would be a working document for further consideration through the public hearing process. Commissioner Sargeant agreed, but said he simply needed to raise issues regarding green building practices in historic structures.

Commissioner de la Fe commented that it was greener to reuse a structure rather than to tear it down, regardless of its historic value.

Answering questions from Commissioner Lawrence, Chairman Hart stated that the Board of Supervisors could request that the County Attorney incorporate maximum flexibility in the advertisement language for the Policy Plan Amendment. He also confirmed that the Planning Commission could recommend that the advertisement language be reviewed by the County Attorney to ensure sufficient flexibility to permit the maximum freedom to consider and incorporate additional public comments.

Ms. Dhavale pointed out that the Committee had engaged in a number of discussions about whether historic structures should be addressed separately from existing buildings and the reuse,

preservation, and conservation of existing buildings, including historic structures, should be encouraged on a case-by-case basis.

Chairman Hart said he did not want to make more edits to the strawman other than to correct any typos so that the document could be presented to the entire Commission before its vote next week.

Ms. Dhavale stated that the Policy a green buildings concepts were not intended to be exhaustive and projects were not expected to incorporate every concept. She added that the concepts could be further refined during the public hearing process.

In reply to a question from Mr. Kaplan, Chairman Hart said he believed that the bracketed and italicized language in Policy b regarding the geographic areas of expectation should remain in the strawman to help solicit public feedback on this issue.

Commissioner de la Fe recommended that staff capitalize “ensure” following the two asterisks under Policy b on page 9 of the strawman.

Commissioner Hurley pointed out that the phrase, “to best use available resources,” at the end of the last sentence in the first paragraph on page 8, contained a split infinitive.

Commissioner Lawrence MOVED THAT THE ENVIRONMENT COMMITTEE FORWARD A CLEAN VERSION OF THE GREEN BUILDING COMPREHENSIVE PLAN POLICY REVIEW STRAWMAN II DOCUMENT, TO INCLUDE CORRECTIONS OF TYPOS, TO THE PLANNING COMMISSION ALONG WITH A RECOMMENDATION THAT THE COMMISSION RECOMMEND TO THE BOARD OF SUPERVISORS THAT IT AUTHORIZE THE ADVERTISEMENT OF A POLICY PLAN AMENDMENT TO IMPLEMENT THE RECOMMENDATIONS IN THE STRAWMAN DOCUMENT BASED ON THE INPUT RECEIVED AND AUTHORIZE THE SETTING OF PUBLIC HEARINGS FOR THIS AMENDMENT.

Commissioner Lawrence further MOVED THAT THE ADVERTISEMENT LANGUAGE BE REVIEWED BY THE COUNTY ATTORNEY TO ENSURE SUFFICIENT FLEXIBILITY TO PERMIT THE MAXIMUM FREEDOM TO CONSIDER AND INCORPORATE ADDITIONAL PUBLIC COMMENTS.

Commissioner Flanagan seconded the motions which carried unanimously.

At the request of Chairman Hart, Ms. Dhavale confirmed that staff would correct any typographical errors in the strawman text and provide the Commission with a clean version within the next few days.

Chairman Hart thanked staff for all their work and guidance throughout this process.

Mr. Kaplan noted that per the request of Commissioner Hurley, he had prepared a draft document, dated October 4, 2012, summarizing some of the Area Plan guidance that specifically addressed green building design, as shown in Attachment F.

Chairman Hart said the scheduling of the next Committee meetings would be determined once Mr. Kaplan confirmed dates with the presenters and informed Christopher Remer or Barbara Lipka with the Planning Commission Office next week.

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The meeting was adjourned at 7:56 p.m.
James R. Hart, Chairman

An audio recording of this meeting is available in the Planning Commission Office, 12000 Government Center Parkway, Suite 330, Fairfax, Virginia 22035.

Minutes by: Kara A. DeArrastia

Approved: February 7, 2013

Kara A. DeArrastia, Clerk to the
Fairfax County Planning Commission



**Electric vehicle charging
infrastructure recommendations to
Fairfax County**

**Task 5 of sustainability study under
Proffer #9, RZ 2008-PR-011**

July 19, 2011

Approved for Public Release: 11-2916. Distribution Unlimited.

Executive Summary

Plug-in vehicles feature prominently in the vision for a livable, sustainable Tysons Corner. They promise cleaner, quieter transportation that is less dependent on the political stability of other parts of the world, but they come at the price of being a fundamentally different way of powering the automobile fleet. Charging will largely be done over long periods of time at distributed locations, rather than at particular fueling stations. As Tysons Corner evolves from a suburban office park to an urban center, the evolution to an electric automotive fleet will affect urban layout, building design, and utility services.

Fairfax County is attempting to determine the effects of widespread plug-in vehicle adoption on infrastructure requirements and to determine design approaches that can be considered through the county's zoning process to encourage appropriate investment. MITRE, in support of the County's sustainability objectives, has considered the problem under Proffer #9, RZ 2008-PR-011. This document is the result.

We present a background for plug-in vehicles, charging stations, and other estimates of plug-in vehicle market penetration. We emphasize the impossibility of a demonstrably accurate estimate of market penetration, the fact that vehicle charging will be done primarily at home, and that modifications to initial parking area construction can reduce the overall cost and risk of installing charging stations. Four primary recommendations result:

1. The County should strongly encourage developers to include the conduit infrastructure – space, conduit banks, conduit, and access points – for relatively easy and inexpensive installation of charging stations in the future. The County should encourage, but place less emphasis on the full installation of electric vehicle supply equipment (EVSE) – the transformers, switches, wiring, and charging stations themselves – at the time of initial construction given the uncertainties surrounding electric charging station demand.
2. The fraction of parking slots for which the infrastructure should be included should represent a fully plug-in fleet for the groups of users that would use charging infrastructure at the facility. This means all parking spaces for a residential building (single- or multi-family). At commercial and retail facilities, this means the fraction of vehicles that arrive from locations geographically situated to require a charge before the return trip.
3. The County can most appropriately seed charging station supply by negotiating for the installation of full charging stations at the lowest expected adoption rate in the near future. Any supply seeding is best done at apartment buildings and should be limited to a maximum of 2% of all parking spaces.
4. The County should coordinate with its peer jurisdictions to encourage charging station manufacturers to form a standard defining the connection of the charging station to the facility in which it is installed. The standard should define both the electrical connection and physical mount with the purpose of making it possible to move charging stations to a new facility relatively easily and quickly.

The objective is to prepare Tysons Corner for widespread plug-in adoption, but to do so as inexpensively as possible so as to encourage the desired population and job growth that will sustain Tysons Corner as a livable urban center.

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1 Introduction

MITRE fully supports Fairfax County’s sustainability objectives for Tysons Corner. As part of Proffer #9, RZ 2008-PR-011, we are conducting an analysis of emerging building, automotive, and energy technologies – specifically, how they may affect future Tysons Corner development and how they can best be harnessed to aid the transformation of Tysons Corner in to a sustainable, livable urban center.

This document concerns plug-in vehicles and plug-in vehicle charging infrastructure. It satisfies Task 5 of the study that MITRE is performing per the aforementioned proffer commitment. The specific components of Task 5 are:

“Describe the following as they relate to the establishment of electric vehicle charging stations:

- a. Guidance regarding the anticipated future need for electric vehicle charging stations in Tysons Corner, including an estimate of the number of charging facilities that may be needed in the future and concentrations relating to broad land use categories (e.g., number of multifamily dwelling units per charging station; office and retail square footage per charging station)
- b. Guidance regarding impacts to infrastructure in Tysons Corner that would occur as a result of full implementation of electric vehicle charging stations in Tysons Corner per 5.a above
- c. A general overview (not site-specific details) of infrastructure (including voltage requirements and amperage reserves) and site design elements that would be necessary for the establishment of electric vehicle charging stations at typical redevelopment sites in Tysons Corner (including design accommodations that could be made for the possible future establishment of charging stations on sites).”

MITRE’s response to this guidance is a series of building construction recommendations that would, if implemented, lower the overall cost for future installation of a full plug-in vehicle charging infrastructure. We show the course of reasoning from which they were derived. We first provide some background information to set the context of the discussion. Population and employment forecasts for Tysons Corner are referenced. We note the various types of plug-in vehicles, and we discuss multiple other studies that have attempted to estimate future plug-in vehicle market penetration. An overview of the current state of charging technology concludes the background review. From the background section, we move into the discussion of recommendations. We make explicit our underlying assumptions and then present their consequences on Tysons Corner charging infrastructure. Finally, we present specific recommendations to the County.

We have excluded from this document a discussion of the effects that plug-in vehicle adoption will have on the electrical grid in general. That analysis is best done in conjunction with the other part of the proffer study on general energy use and system level effect.

2 Background

2.1 Demographics

2.1.1 Fairfax County

Fairfax County currently is home to more than 1 million people and 580k jobs (Fairfax, 2011).

Figure 1 shows the Mid-Atlantic area centered in Tysons Corner. The concentric rings show driving distances (not straight-line distances) from Tysons Corner and are spaced twenty miles apart. Each ring shows estimates of both resident population and the source of commuters into Tysons Corner. The figure shows the data on a map. Table 1 summarizes the data.

Table 1: Total resident and Fairfax County commuter populations living within given distance from middle of Tysons Corner

Driving distance from Tysons Corner	Resident population (millions)	Inbound Fairfax commuters (x100k)	Percent of inbound Fairfax commuters
< 20 miles	3	367	67%
20 – 40 miles	5.4	496	91%
40 – 60 miles	8	526	97%
60 – 80 miles	9.1	539	99%
80 – 100 miles	10.4	540	99%
> 100 miles		545	100%

Sources: Total population – US Census, 2010; Commuters – AASHTO, 2011; Driving distances – ESRI Network Analyst.

Two points should be noted about the commuter data. First, the total number of commuters in this table does not match the current 580k jobs because it is a result of statistical sampling done 2006 through 2008. We assume for the sake of this study, that even as the number of commuters increases, the geographic distribution of their homes remains constant. Also, we assume that the geographic distribution of commuters' homes is the same for Tysons as for the entirety of Fairfax. Second, the data is a total count of workers traveling within and to Fairfax County for work. There is no attempt to determine the frequency of those trips.

2.1.2 Plan for Tysons Corner Urban Center

Focusing more specifically on Tysons Corner itself, the 2007 Fairfax County Comprehensive Plan, with the 2010 Tysons Corner Urban Center Amendment, plans a more livable area with a sustainable integration of work, play, and home. The plan provides, "... a framework for growth beyond 2030." 17,000 people currently live in Tysons Corner, but studies upon which the amendment are based estimate 31,000 residents in 2020 and up to 86,000 by 2050. Likewise, there are currently 105k jobs in Tysons Corner. In 2020, a forecast suggests that this number may be as high as 140k and by 2050, 210k. The Comprehensive Plan for Tysons Corner indicates goals of 100,000 residents and 200,000 jobs by 2050 (George Mason, 2008).

The recommendations below are made in the context of these projections and in the context of constructing buildings that will stand for the next forty years or more.

Population At 20, 40, 60, 80, and 100 Mile Driving Range's

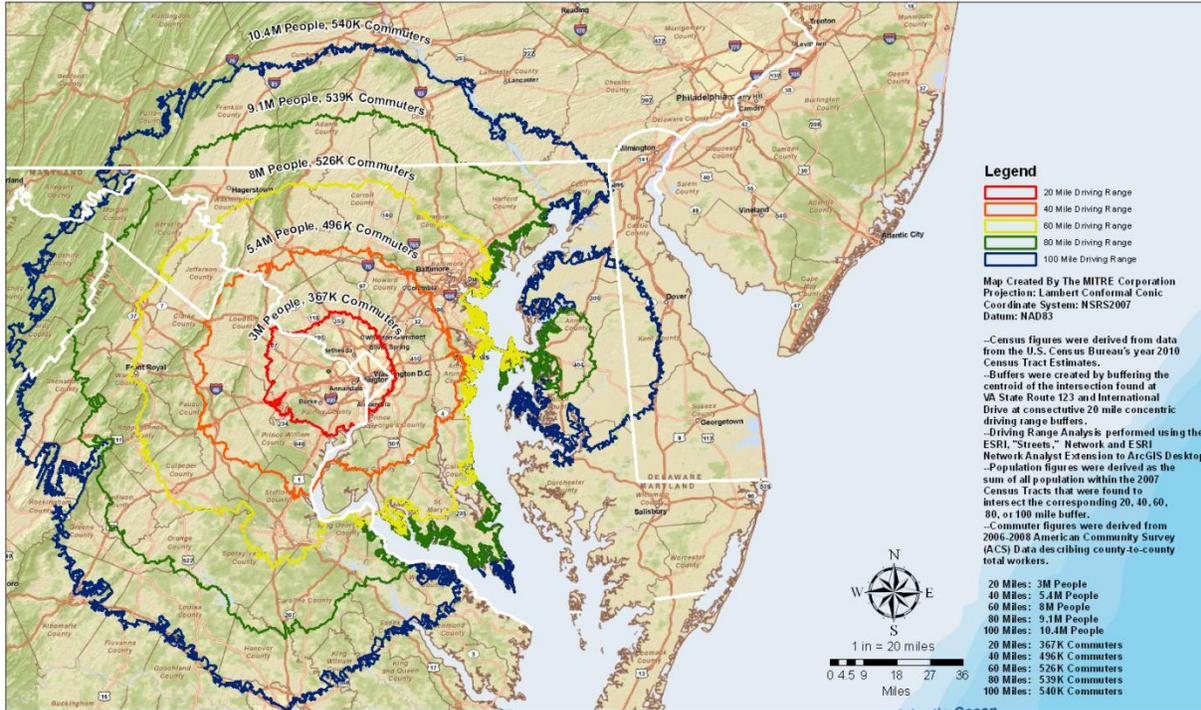


Figure 1: Driving distances from Tysons Corner

2.2 Battery electric and plug-in hybrid vehicles

2.2.1 Models

We consider two types of vehicles in this document: battery electric vehicles (BEV) and plug-in hybrid electric vehicles (PHEV). As its name implies, a BEV's sole power source is its on-board battery. The Nissan LEAF is the current most visible mass market BEV with a nominal range of 100 miles, although some estimates place a more realistic expected range at 80 miles. A PHEV has both a battery and an internal combustion engine. It operates on a combination of electric and gas or diesel power in a proportion determined by its electronic control system in response to such factors as power demand, temperature and state of charge of the battery. During the first portion of a trip, the battery, which has been charged from the grid prior to the trip, bears a greater burden for moving the vehicle. When the battery charge is used down to a predetermined level, the car automatically reverts to a "charge sustaining" mode and continues to operate just like a non-plug-in hybrid. In this mode, the battery's electrical charge is alternately used for propulsion and replenished by engine power (directly or through regenerative braking) and is "sustained" in a relatively narrow range. The Chevy Volt, the currently most visible example of a PHEV, is designed in such a way as to use only battery power (no engine power) during the "charge-depleting" portion of the trip. Both BEVs and PHEVs, of course, plug into the electrical grid for the bulk of their charge.

Throughout this document the terms *electric vehicle* or *plug-in vehicle* will refer to both PHEV and BEV without distinction. If we need to differentiate between the two, the appropriate acronym is employed.

2.2.2 Adoption

2.2.2.1 Market forces

Estimates of plug-in vehicle market penetration are highly varied, but do cite common factors both pushing and hindering adoption. As we show in the following, each factor includes significant estimates and guesses. We present the list to emphasize the lesson that estimating future electric car adoption is an inexact art and that any such estimate is likely wrong.

2.2.2.1.1 Encouraging adoption

Factors encouraging adoption can generally be boiled down to two: financial and convenience. More altruistic mechanisms certainly exist, but they are not widespread enough to greatly affect aggregate market penetration of plug-in vehicles.

Financial encouragement for electric adoption comes in the form of rising gasoline prices. Average gasoline price has more than doubled in real terms since the late 1990s (US EIA, 2011). As world demand increases, this general upward trend for gasoline will likely continue. This trend will be exacerbated in the face of any future turmoil in oil producing countries. US electricity prices over the same term have not seen the same increases (US EIA, 2011), and locally, if a vehicle is charged at night using time-of-day pricing, even at current prices, gasoline can be an order of magnitude more expensive per mile than electricity delivered from the grid (Dominion, 2011).

Financial encouragement also derives from government policy. At a national level, tax rebates have been offered for the purchase of hybrid vehicles. Should this become a national priority, similar such programs will again be offered. In time, should greenhouse gas regulation come to pass, plug-in vehicles will likely have additional fuel cost advantage over traditional vehicles as greenhouse gas intensity of grid generation is less than that of distributed gasoline-burning engines (EPRI, 2007).

Convenience comes also in the form of government policy. Locally, high occupancy vehicle (HOV) exemptions for hybrids have been a primary force for their adoption by commuters seeking to bypass heavy traffic without the hassle of finding and coordinating with other passengers.

2.2.2.1.2 Discouraging adoption

Factors discouraging adoption are many. We begin with concerns closest to the driver and proceed to more general constraints.

The first concern is general to all new technologies, not specifically those of plug-in vehicles. PHEV and BEV are new to the mass market, and as with the introduction of any new technology, early adopters will have to demonstrate the technologies' fitness before general adoption will begin.

The most obvious car-specific concern is vehicle range. BEVs cannot be driven beyond charging station range. PHEVs can but upon the switch to gasoline, lose the price per mile advantage over a traditional hybrid. Thus the economic benefit of PHEVs is only apparent if they remain close to charging infrastructure.

Vehicle initial cost is the next inhibitor. Include the cost of a charging station and its installation in the home, and plug-in vehicles require a larger up-front investment for the buyer than do

internal combustion vehicles. Adoption will only become widespread if the ownership costs of such vehicles (fuel, maintenance, government levies) generally decrease to the point that the return on investment offsets the larger up-front cost.

This initial cost disadvantage for plug-in vehicles will likely fall over time as automakers increase investments in research and development. The ability and willingness of automakers to make such investments, however, depends heavily on the general economic climate, the rate of adoption, and targeted government subsidies, each of which presents its own difficult estimation problem.

A subset of the cost disadvantage is specific to a collection of difficulties in the battery supply chain that limit production. Currently battery manufacturing is constrained by simple production under-capacity, raw material availability, and technical immaturity.

Finally, the electrical grid itself is likely not suitable for large-scale adoption of electric cars. While not a constraint in the near term where numbers will be limited, the grid will require large investments over time to respond to the increased overall demand and the specific use patterns of the electric fleet. This investment will be passed along to the consumer, and if it is specifically passed to electric car owners, plug-in vehicles will lose a degree of their fuel cost advantage.

2.2.2.2 Estimates

Having presented some of the forces affecting plug-in vehicle adoption, we present three studies – one sponsored out of the Department of Energy (referenced as ‘Sentech’ below), one from the National Academy of Sciences, and one from an electricity industry group – that estimated the future US plug-in fleet. Each ignores the possibility of revolutionary technology, geopolitical upheaval, or large domestic political shifts. Even without such large market distorting events, we see that each presents a collection of highly variant alternatives.

Noticeably absent are any assessments by the automakers themselves. Such analyses would be proprietary and closely held, but the vastly different approaches the automakers themselves are taking with fleet electrification shows that not even they have a handle on what the market is going to look like in the coming decades. GM entered the EV market in the 1990s with the EV1, but discontinued the model. Non-plug-in hybrids first emerged in the late 1990s. Toyota made the explicit early decision not to include a plug on the Prius, but has reconsidered the decision for future models due to this year’s introduction of GM’s PHEV Volt. Nissan is skipping hybrid technology altogether with its EV Leaf this year.

The point here is that automotive market experts and even the automakers themselves are uncertain as to what the future holds for plug-in vehicles. The County, therefore, cannot expect to develop a good estimate of plug-in vehicle market penetration, and, as such, it should adopt a posture that does not hinge on a particular estimate.

To provide context for these studies, sales of new passenger vehicles in the US totaled roughly 17 million units annually from 2000 through 2007. With the general economic downturn, that total fell to 13.5 million in 2008 and 10.6 million in 2009 (Census, 2011). Roughly 250 million such vehicles are currently registered in the US (Census, 2011).

Figure 2 summarizes our source studies.

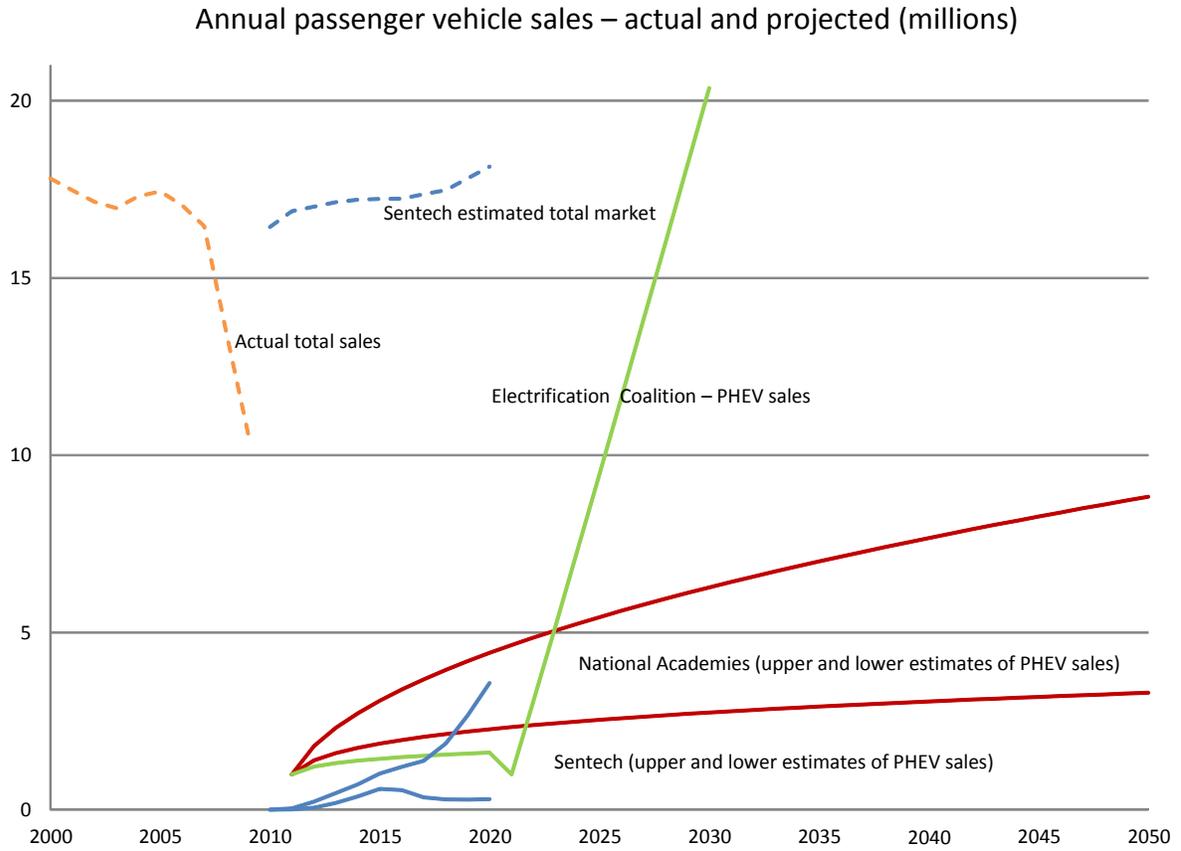


Figure 2: Annual passenger vehicle sales – actual and projected (millions)
 Sources: US Census, 2011; Sentech, 2010; derived and estimated from National Research Council, 2010; derived and estimated from Electrification Coalition, 2009.

The various studies estimate PHEVs to represent anywhere between 2 and 20% of 2020 sales, with estimates diverging dramatically afterwards. The point of showing the disparity between (and even within each of) the studies is to demonstrate the difficulty – if not impossibility – of Fairfax generating an estimate of plug-in vehicle adoption good enough to proceed with large scale installation of charging infrastructure. Instead, as we recommend below, the County should strongly encourage the development of infrastructure that allows for the minimum of retrofit costs and, therefore, the lowest long-term cost of fleet electrification and necessary charging station availability.

2.3 Charging stations

Charging stations constitute the plug-in vehicle’s connection point to the grid. Table 2 shows a summary of the three general classes of charging stations (Virginia Clean Cities, 2010).

Level of Charging	Level 1	Level 2	DC Fast Charge (Level 3)
Voltage	120 VAC	240 VAC	480 VAC (off board charger provides AC to DC conversion)
Amperage	15 - 20 Amp	40 - 80 Amp	85 Amp
Instantaneous Demand	1.2 - 1.6 kW	3.3 - 7.7 kW	60 kW
Charge Time			
PHEV 40 Vehicle	5 - 13 hours	2.5 - 5 hours	N/A
EV100 Vehicle	8 - 15 hours	3 - 5 hours	15 to 30 minutes

Table 2: Charging station summary

Level 1 can be as simple as a standard three-prong plug into a standard wall socket (Level 1 EVSE does exist to improve safety and improve grid integration, but it does not improve charging speed). The time required to fully charge a vehicle at Level 1 makes it an impractical general solution.

Level 2 is the answer to this impracticality. There is a defined standard (Society of Automotive Engineers J1772), and mass produced plug-in vehicles have sockets to fit. Despite their high current rating, the power demand shown is indicative of practical use where less current is used to improve longevity of the battery itself (not the individual charge). Level 2 is the assumed primary mechanism for most charging as it strikes a balance between practical speed and battery protection. It is intended for installation in the home and at other locations where the car is expected to sit unused for a number of hours at a time.

Level 3 is not yet standard, though multiple competing standards have emerged. It is the closest analogy to the current gasoline pump. Multiple rapid charges, however, negatively affect the longevity of current batteries, and so such chargers are assumed to be of use primarily in emergencies (Burke, et al, 2007; Hybrid Cars, 2010).

2.4 Construction costs

Construction costs serve as the final bit of input data for the analysis. Cost estimates for the parking structures help frame the analysis. The estimates are drawn from industry standard resources (RS Means CostWorks) and from private historical databases belonging to builders MITRE uses for our own construction efforts. They include design, construction, and labor. They do not include the cost of the land itself.

Table 3: Per parking space new construction estimated costs

	Estimated per space new construction cost
Below grade garage	\$33-38k
Above grade garage	\$12-17k
Surface lot	2.5-3.5k

With regards to the installation of plug-in vehicle charging infrastructure, the intent is to minimize the overall cost of establishing adequate charging supply. EVSE can be fully installed during initial construction, but if the demand never makes full use of that charging supply, money is wasted. EVSE can also be retrofitted into a building later when demand emerges, but retrofit is more expensive than is inclusion during initial construction. The per space construction costs (Table 3) must be borne regardless of whether EVSE is considered during initial construction or whether it is to be delayed for retrofit. The analysis thus turns on the difference between installation during initial construction and installation as part of a retrofit.

It turns out that conduit installation drives the higher costs of retrofit. It is far cheaper to embed conduit during initial construction than it is to drill through concrete (in a garage) or dig a tunnel and resurface asphalt (in a surface lot). The cost of installing transformers, switches, cable, and the charging stations themselves are equivalent whether they are being done during initial construction or as part of a retrofit. So, since we are considering the difference between initial construction and retrofit, we focus on the additional per space cost imposed by conduit installation.

Table 4 shows the estimates of the costs incurred during initial construction and during retrofit. Again, we rely on a mix of industry standard sources (RS Means) and the private historical databases of contractors with whom we have relationships.

Table 4: Additional per space estimated cost of EVSE conduit installation during...

	Initial construction	Retrofit
Surface lots	\$1800	\$2900
Garage	\$400	\$1200

The differences between garage and surface lot installation are a consequence of the fact that the conduits must be buried in a surface lot installation. In the garage, the conduit can be attached to the ceilings or wall.

3 Assumptions

This analysis rests on the fundamental assumption that plug-in vehicles will become widespread only if they become as convenient and economical as other non-plug-in vehicles (internal combustion and traditional hybrids). Likewise, plug-in vehicle charging infrastructure will only emerge where and when profit can be derived (after all, we couldn't put gasoline in our cars if we didn't put dollars into someone's pocket in the process). This simple notion leads to a number of consequences that affect the recommendations.

We further assume that plug-in vehicle owners will have the ability to fully charge their vehicles at home. Without that ability, the owner would be utterly reliant on an infrastructure that currently does not exist and will emerge in some currently unknown form. We accept our infrastructure dependence with internal combustion engines because most areas are saturated with gas stations and because the time to fill a car for a range of multiple hundreds of miles is minimal. These conditions are not satisfied for the plug-in fleet, and so home charging is a must.

3.1.1 Charging is done at home

With the assumption that the plug-in vehicle owner will spend the money to establish a charging capability at home, the question is how much he will rely on commercial charging stations.

If we consider only convenience, even a Level 3 charging station will likely require 30 minutes to fill an EV100. It is unreasonable to assume plug-in vehicle drivers will line up to fill the batteries before the commute home every day. Additionally, Level 3 rapid charging reduces the battery's useful lifespan (Burke, et al, 2007; Hybrid Cars, 2010). So between the impracticality of the charger and the wear it induces on the battery, we conclude that Level 3 charging (at least in the context of Fairfax County) will be an emergency activity for only a small fraction of plug-in vehicles in the near future.

So we turn to Level 2 charging, where we accept longer charging times and charge where we spend most of our time: at home and at work. Cost considerations push the driver to charge at home in this case. If charging stations become widespread, Dominion will impose time-of-day pricing on the charging station owners (Dominion, 2011). This helps to control peak demand, and it prevents a political fight over raising other rates to provide flat-rate pricing on charging stations. Since most drivers are away from home during the day when wholesale electricity prices are higher, the electricity they use away from home is more expensive.

While the electricity consumed away from home is itself generally more expensive, the fact that the charging station is owned by a for-profit entity – remember, money has to be made – also increases the cost of away-from-home charging. The charging model may simply be the price of electricity plus some fee (now that electricity resale is legal in Virginia for this application) (Virginia, 2011). It may also be in the form of a per session fee, a per minute fee (to absorb the opportunity cost of a car blocking the station but not charging), or an access rights model. In any of these cases, the charging station owner passes along the cost of electricity and then turns a profit for himself. Indeed, home charging is the cheapest charging.

3.1.2 Geography and drivers for focus

We now return to the map in Figure 1 **Error! Reference source not found.** to consider the effects of the home charging predominance.

All PHEV and BEV drivers who live in Tysons Corner will primarily charge their vehicles in Tysons Corner at night. The majority of people living in Tysons Corner will reside in large multi-family buildings and, therefore, do not have the individual option to install their own charging station if the building has not already either provided a charging station or the infrastructure into which a charging station can easily be installed. Thus, the County should put particular focus on residential buildings. If charging stations are not available to allow owners to charge their vehicles overnight, they cannot purchase plug-in vehicle, nor can people who already own plug-in vehicles tenant the building. This both slows new adoption of plug-in vehicles and potentially makes the area less attractive to people moving here from locations with better charging resource availability.

Moving outside of Tysons Corner itself, non-residential charging stations encourage PHEV adoption, but they are not sufficient. They make the commute less expensive – electric-only retains a price advantage over gasoline-augmented operations here in Tysons Corner even with a profit-making charging station on a hot summer afternoon (PJM, 2011; EcoWorld, 2006; Toyota,

2011) – and, therefore, build the case for plug-in vehicles, but they are not a necessary condition since the vehicle can continue with its internal combustion engine.

The savings are a function of the electric-only range of the PHEV (the pluggable Prius will be a PHEV12; the Chevy Volt at PHEV40) and the commute distance. The outer extreme of this case is represented by the 20-mile (40-mile return commute) ring which includes all of Fairfax, Arlington, Alexandria, and the District and contains about 65% of the Tysons Corner workforce (we do not have data granularity to estimate the fraction of the Tysons Corner workforce within the 6-mile ring). For commutes less than half of the electric-only range, the non-residential chargers in Tysons are of no use; the charging is done at home. For commutes longer than half of the all-electric range, the non-residential charging stations simply reduce the operating costs of PHEV.

Turning now to all-electric vehicles, the 40-mile and 80-mile rings are of interest. The 40-mile ring is the effective half range of an EV100. EV100 owners inside this ring will require little in the way of charging infrastructure in Tysons. They will charge at home. Roughly 90% of Fairfax’s workforce resides within this ring.

At the 80-mile ring (and this may be generous), we reach the effective outer range of the EV100 vehicles. A commuter originating between the 40-mile and the 80-mile rings (roughly 8% of the current workforce) will require charging resources to return home. Outside the 80-mile ring, the trip will not be attempted, and the County can safely ignore such drivers.

In summary, the Tysons Corner charging stations service distinct groups for distinct purposes;

- PHEV and EV ownership within Tysons Corner is made feasible with residential charging. There can be no plug-in ownership without home charging.
- Charging stations available to non-residents make the commute cheaper for PHEV drivers who come from further than half of their all-electric ranges. PHEV owners from inside this distance are unaffected by Tysons Corner charging infrastructure since they can fully charge at home.
- Commutes to Tysons Corner are made feasible for EV owners who live between 40 and 80 miles away. Otherwise outside EV owners are relatively unaffected by Tysons Corner charging infrastructure.

3.1.3 Technology evolution

These rings represent the state of 2011 technology, but a building shell is likely to be used for 40 to 50 years, so what happens as technology improves?

In general, improved battery and charging station technology will increase overall demand for plug-in vehicles and, therefore, charging infrastructure. An inspection of the rings, however, reveals consequences for Tysons Corner in particular.

Within Tysons Corner itself, improved technology will increase the fraction of resident vehicles that require home charging, and, any new residential building should assume that a large fraction of the resident fleet will be electric in the coming decades.

In thinking about the population commuting into Tysons, we consider the cases of charging speed and battery capacity independently.

If battery capacity improves, the rings move further out, but the effect on aggregate demand is indeterminate. Drivers from more densely populated inner rings that would have previously used

commercial charging stations no longer require that capability to return home. At the same time, plug-in drivers from less densely populated outer regions are newly within range of Tysons. This would indicate a net reduction in demand, but it must be assumed that as technology improves, the total fraction of vehicles that are plug-in will increase.

If charging speed improves then quick charge stations become more feasible, and the infrastructure begins to resemble more that of the current gasoline infrastructure. This may reduce demand for Level 2-style stations at office and retail locations, but it will not affect demand for home charging as home charging will still be the cheapest, most convenient charge mechanism.

If replaceable batteries become more prevalent, then some hybrid of home charging and swap stations will likely emerge. Home charging infrastructure is still required, but the fewer charging stations are required at offices and at retail location. To date, however, no vehicle on the market or proposed for the near future market features such batteries.

4 Policy recommendations

The County's development requirements and expectations must balance with the County's other objectives. The county wants to attract business and residents, so the costs it imposes cannot be too high. The county may want to enable and encourage the electrification of region's automotive fleet, so the charging infrastructure it requires should not lag or inhibit demand.

Here, we attempt to strike a balance between these objectives and recommend a course of action for the County. Having described the environment in which these decisions are made and described the assumptions underpinning our analysis, we present our policy recommendations here. We propose a long term, sustainable course; a plan for the short term; and recommendations for data collection, which will aid future market analysis of charging station demand.

4.1 Long-term recommendation

4.1.1 General

As we saw in the background sections above, considerable uncertainty exists regarding the adoption of plug-in vehicles. This uncertainty induces large financial risks for anyone installing and operating a commercial charging station. If demand is lower than expected, the charging station is a wasted investment. If demand is higher than originally expected and if the infrastructure into which additional charging capacity would be installed is constrained, then there exists a retardant on plug-in vehicle adoption. This uncertainty also induces political risk for the County. If it undertakes any strategy that depends on some assumption of adoption, a critic can always find a competing study arguing for more or less charging structure.

The best long-term policy response then is one that does not require the County, a resident, or a developer to estimate vehicle adoption or charging station demand. Here, we propose recommendations for initial building construction that are intended to reduce the risk associated with uncertain charging station demand.

The proposed building recommendations are intended to reduce the overall cost of electrifying a parking area with Level 2 charging stations, while allowing the owner or third-party to match

demand with investment over time by installing charging stations at minimal cost in the future. In the long-term case, profits can be earned with commercial charging stations. The objective of minimizing future installation costs is to increase the quantity and reduce the price at which supply and demand are equivalent.

Initial parking area construction satisfying three conditions is relatively inexpensive and serves as a basis for future installation at least expense. The following conditions are thus recommended:

- A newly constructed facility should have the physical space to allow the installation of enough transformer capacity to enable intended operations as well as allow electrification of the parking area. The transformer capacity to fully electrify the lot, however, need not necessarily be installed during initial construction. Full installation can occur as demand emerges in the future.
- The building's electrical room should have enough physical space to allow the future installation of a switchboard (with the capacity for sub-metering) for the charging stations. Again, the full switchboard need not be installed immediately.
- Initial parking area construction should include the conduit bank and conduit between the facility's electrical room and the spaces allotted for possible future electrification. An access point (junction box or hand hole) at each possible future charging station location is recommended. Access points (manholes, hand holes, and junction boxes) to draw cable from the electrical room to the charging stations are recommended as well.

The recommendations are a hedge against the uncertainty of charging station demand. The installation of conduit and access points are the primary drivers of difference between the cost of installing a charging station during initial construction and installing one in which the whole of the system is retrofit into a facility. The intent of the recommendation is that of insurance. If the cost is low enough, even if the lot is never electrified, the lost investment is bearable, but if large demand for charging stations indeed emerges, the recommendations greatly reduce the cost of servicing that demand.

4.1.2 Building class specifics

The transformer space and empty conduits are relatively small investments during initial construction, but they are not zero. Here, we consider the various classes of buildings and offer bounds on the fraction of parking spaces that should be designated for future charging station installation. In a previous section, we noted the three classes of plug-in vehicle drivers who will use the Tysons Corner charging infrastructure: Tysons Corner residents, PHEV drivers who live further than half of their all-electric ranges from Tysons Corner, and EV owners who live between 40 and 80 miles from Tysons Corner. They define the need.

4.1.2.1 Residential

It is with the development of residential buildings that the County should be most aggressive in negotiating for commitments from developers. Plug-in vehicles require home charging. If home charging is not available, there will be no plug-in vehicles.

Given the uncertainty of future demand, for residential development, we propose that the transformer space, switch space, and conduit recommendations in the previous section apply to

all newly constructed parking spaces. The objective is to allow an inexpensive, full migration to a plug-in fleet within the lifespan of the parking area. In Tysons Corner specifically, since most parking will be in garages – and likely underground garages at that – the cost of this conduit infrastructure is a tiny fraction of total cost, and its initial inclusion is roughly 30% of the costs of retrofit (see Table 4).

Though this analysis is focused specifically on Tysons Corner, we strongly recommend that all residential development (single family homes, townhouses, condominiums, and apartments) in broader Fairfax be subject to this guidance on conduit and space. Because of the dependence on home charging, we have to assume that long-term homeowners will constitute the bulk plug-in vehicle buyers as they have the stability to assume access to home charging for the whole of the vehicle's lifespan. Apartment dwellers may be less inclined to purchase plug-ins because they are generally more transient. The availability of a charging station at the next home is unknown, and without home charging a plug-in becomes impractical. Thus, the payoff for the policy is likely to be highest in developments where the owners are the occupants.

In the house, townhouse, and condominium markets, the developer, by definition, is not the long-term owner of the residence, and so he has the incentive to respond only to current market pressure. The installation of conduit during initial construction is an insurance policy against possible future market forces. Though the developer's cost of initial installation is a larger fraction of the overall construction cost for most home applications – presumably such costs are more in line with surface lot installation – the existence of such conduit greatly affects future adoption rates of plug-in vehicles since any retrofit costs implied by the purchase of a plug-in vehicle will depress demand. Such conduit is not yet a selling point for homes in the region, however, and so it is not yet a commonly-offered feature. Thus, to minimize hurdles to widespread adoption, the County is wise to strongly encourage the inclusion of conduit for all residential development across the county.

4.1.2.2 Commercial office buildings

For commercial office buildings, we recommend the transformer, switch, and conduit recommendations apply to 35% of newly constructed spaces – the fraction of spaces equivalent to the fraction of vehicles that arrive into Tysons from outside 20 miles. This would allow the full adoption of plug-in in the fleet arriving from outside the 20 mile ring (inside of which the Tysons charging infrastructure largely unnecessary). As zoning ordinances are modified in coming years – presumably, with the arrival of Metro, reducing the number of spaces required for an office building – this fraction would rise on the newer, smaller lots since more of the incoming vehicular traffic would be from outlying areas not served by Metro.

4.1.2.3 Retail

Most retail activities are substitutable across the Mid-Atlantic region, and so we have to guess that most retail customers in Tysons Corner live within a short radius. However, since retail is fundamentally about attracting customers to a particular destination and since the higher prices of plug-in vehicles imply relatively affluent buyers, retail developers have the incentive to make an adequate number of charging stations available. We thus assume that retail development will require the least nudge from the County to provision for charging stations.

Should the County find itself in the position of having to provide that nudge, we recommend the same guidelines as those for office buildings with conduit infrastructure being encouraged for the

fraction of vehicles coming from outside a 20-mile radius. That fraction of traffic, however, is unknown and certainly not presented in the Census resources from which we can determine work commuting patterns. Thus, the county is wise to work with its retail base to determine the source of the populations inbound for retail.

4.1.2.4 Hotels

Hotels offer the logistical opportunity for a Level 2 charge. We do not have any data describing the mix of vehicles that park in Tysons Corner hotels, so instead, we recommend that the County work with hotels in the region to determine need, with the need for conduit installation being primarily defined by the rental car population in a hotel's garage.

4.1.3 Charging station standards

The definition of a standard connection point for the charging station to the vehicle (SAE J1772) has been a necessary step towards the widespread adoption of plug-in vehicles. Without the standard connection point, drivers of the various plug-in models would have to carry around various connectors and adaptors in hopes of accessing charging resources more potent than a standard wall outlet.

We propose that the County coordinate with peer jurisdictions, which are also looking to ease the widespread adoption of plug-in vehicles, in an attempt to force a standard connection point for the charging station itself to the facility into which it is to be installed. The connection point is both the electrical connection and the piece by which the station is physically mounted to the wall, ground, or ceiling. The first and most obvious purpose is simply to reduce the overall cost of installation.

The second purpose of a standard mount is to allow for easy movement of charging station to a new location. We see the standard mount allowing multiple business models that reduce the risk associated with uncertain charging station demand. A third party vendor may manage a fleet of charging stations that it deploys and adjusts to service demand for multiple facilities. An apartment management company may rather provide a connection point and allow plug-in drivers to attach their own (sub-metered) charging stations, so that it does not have to deal with the risk of too many or too few charging stations. In both cases, the facility owner eliminates his need to monitor and respond to developments in the plug-in vehicle marketplace, and the flexibility afforded by a quick, easy installation ensures that supply is more responsive to demand.

From a driver's perspective, the standard mount also reduces risk. As the standard mount becomes more widespread, a plug-in owner knows he can take his charging station with him should he decide to find to a new home, and he knows he can sell his charging station to another plug-in owner should he no longer need the station or upgrade the station. Because the risk of vehicle ownership is potentially decreased, demand for plug-ins is potentially increased.

The definition of such a standard is certainly not the responsibility of Fairfax or any local jurisdiction. The point in making the recommendation here is that Fairfax is in a position with its peer jurisdictions to encourage the charging station vendors to proceed along this path.

4.2 Short term

4.2.1 Charging stations - seeding supply

Plug-in vehicle adoption has always been considered a ‘chicken and egg’ problem with cars not being purchased because charging stations are not available and charging stations not being installed because of inadequate numbers of plug-in vehicles. Thus, the County may recommend implementation of a handful of charging stations at each new building site and proffers that deliver charging stations to public areas.

Above, we see that residential charging is the key to widespread plug-in vehicle adoption, and we reasoned that plug-ins are more likely (in the near term) to be purchased by people who own their own homes and intend to stay there for the lifespan of the car. If the County wishes to speed adoption by apartment dwellers inside Tysons Corner, it may recommend the installation of charging stations at new apartment developments. If so, we recommend that the number of full stations be equivalent to the lowest estimate of market penetration for plug-ins (see 2.2.2.2). The region may have a higher rate of hybrid adoption over the recent years, but that margin will be swamped by the broader trends which drive nationwide adoption. In the lowest estimate presented above, plug-ins are estimated to constitute less than 2% of cumulative sales, and so we recommend that the upper-bound of any County negotiation for fully installed charging stations be limited to 2% of the parking spaces at an apartment building in Fairfax. This is in addition to the strong recommendation for the conduit infrastructure.

For office and retail buildings, we have recommended the County pursue commitments to the provision of infrastructure that would allow for inexpensive charging station installation in the future. We do not, however, recommend any expectation for full station installation. Plug-in vehicle adoption will be a function of home charging capacity; charging availability at work or retail locations alone is not sufficient to allow adoption. Luckily, if we return to the map and the concentric rings, office and retail charging is only a necessity for BEV drivers who live between 40 and 80 miles from Tysons Corner (and only 8% of inbound Fairfax commuters live at that distance). For PHEV drivers who live more than half of their all-electric range from Tysons Corner, the charging stations would indeed reduce commuting costs, but we cannot believe that a prospective PHEV owner would purchase such a vehicle while being dependent on cheap workplace charging to make the economic case for purchase. Any proffer for provisioning charging stations thus supports a very small fraction of inbound commuters (BEV owners from 40 to 80 miles away) or a group of drivers who would have purchased their vehicles anyway (PHEV owners). The lesson is that for office and retail development, developers may be able to better benefit the community with proffers that include improvements other than the provisioning of a large number of charging stations.

4.2.2 County procedures

The County itself can continue to support plug-in adoption by continuing to maintain its current easy, efficient process for permitting electrical installations at existing facilities. Plug-in buyers need this process to make the installation of charging stations at home to remain as easy as it is. If the process is slowed, then adoption of plug-in vehicles will also be slowed.

4.3 Data generation and monitoring

A primary purpose of the recommendations would be to allow charging station deployment to coincide with charging station demand. This would allow the business justification for commercial charging capacity to emerge and, therefore, would make plug-in vehicle ownership more convenient (and feasible for a larger population). To speed the development of the business case, the County (to the extent possible within in the bounds of privacy concerns, proprietary competitive data, and simple data gathering feasibility) is wise to develop the mechanisms to gather and monitor data describing:

- A more precise understanding of the Fairfax work population and where it lives within Fairfax and within the nearby counties;
- The other inbound population of Tysons Corner and where it lives;
- Use patterns for charging stations as they are installed in Tysons Corner. Who uses them? When are they used? On what sorts of vehicles?
- PHEV and BEV registrations for Tysons Corner and the jurisdictions within 100 miles of the area.

With a good handle on this information, the County would be better positioned to respond to changes and trends in the emerging markets of commercial charging stations and plug-in vehicles. Potential charging business owners would be better able to gauge demand. And Dominion would be better able to understand its supply requirements.

5 Conclusion

We close with an emphasis on two points. First, no demonstrably accurate estimate of plug-in vehicle market penetration is possible. And second, when plug-in vehicles do arrive to market in large numbers, their owners will completely rely on, will prefer, and will predominantly charge them overnight at home.

These two points naturally lead to the recommendations

1. Developers should be strongly encouraged to include the space, conduit banks, conduit, and access points for easy and inexpensive installation of charging infrastructure in the future. They should not be asked to install the transformers, switches, wiring, or charging stations themselves, however.
2. The fraction of parking slots for which the infrastructure should be included should represent a fully plug-in fleet for the groups of users that would use charging infrastructure at the facility. This means all slots in a residential building. At commercial and retail facilities, this means the fraction of vehicles that arrive from locations geographically situated to require a charge before the return trip.
3. The County can most appropriately seed charging station supply by negotiating for the installation of full charging stations at the lowest expected adoption rate in the near future. Any supply seeding is most efficiently done at apartment buildings and should be limited to a maximum of 2% of all parking spaces.
4. The County should coordinate with its peer jurisdictions to encourage charging station manufactures to form a standard defining the connection of the charging station to the

facility in which it is installed. The standard should define both the electrical connection and physical mount with the purpose of making it possible to move charging stations to a new facility relatively easily and quickly.

The overall points are that transformer space and conduits are more expensive to retrofit into a facility than to include during initial construction. Their inclusion at the outset would allow the cheapest possible overall cost of installing a full charging infrastructure, and their inclusion in such quantity would be a low-cost insurance policy against the inability to estimate plug-in vehicle market penetration rates over the expected life spans of newly constructed buildings.

The County thus would ensure that development in Tysons Corner would remain an attractive investment and that the area would be fully prepared for whatever occurs with plug-in vehicle adoption.

6 Acronyms

BEV	Battery Electric Vehicle
BEV100	Battery Electric Vehicle with 100-mile range
EV	Electric Vehicle
EV100	Electric Vehicle with 100-mile range
EVSE	Electric Vehicle Supply Equipment
PHEV	Plug-in Hybrid Electric Vehicle
PHEV12	Plug-in Hybrid Electric Vehicle with a charge-depleting range of 12 miles
PHEV40	Plug-in Hybrid Electric Vehicle with a charge-depleting range of 40 miles

7 References

- American Association of State Highway and Transportation Officials (AASHTO) (2011). Census Transportation Planning Package (CTTP) data product based on 2006-2008 3-year American Community Survey (ACS) Data. Accessed from: <http://ctpp.transportation.org/Pages/3yrdas.aspx>.
- Burke, A., Jungers, B., Yang, C., & Ogden, J. (June, 2007). *Battery Electric Vehicles: An Assessment of the Technology and Factors Influencing Market Readiness*. University of California Davis, Institute of Transportation Studies.
- Cunningham, J. S. (June, 2009). *An Analysis of Battery Electric Vehicle Production Projections*. Massachusetts Institute of Technology. Accessed from: http://web.mit.edu/sloan-auto-lab/research/beforeh2/files/Cunningham_BS_thesis_2009.pdf
- Dominion Virginia Power. (February 1, 2011). "Dominion Virginia Power Proposes Rate Options for Charging of electric Vehicles. PRNewsWire. Accessed Feb 4, 2011 from <http://www.virginiaev.org/archives/93>.
- EcoWorld. (August 4, 2006). "Electric Car Cost Per Mile". Accessed from: <http://www.ecoworld.com/energy-fuels/electric-car-cost-per-mile.html>.
- Electric Power Research Institute. (July 2007) Environmental Assessment of Plug-In Hybrid Electric Vehicles. Volume 1: Nationwide Greenhouse Gas Emissions. Final Report. Document number 1015325. Accessed from: <http://et.epri.com/publicdocuments.html>.
- Electrification Coalition. (November, 2009). *Electrification Roadmap: Revolutionizing Transportation and Achieving Energy Security*. Accessed from: <http://www.electrificationcoalition.org/reports/EC-Roadmap-screen.pdf>
- Fairfax County, Virginia. (2011). "About Fairfax County Government". Website: <http://www.fairfaxcounty.gov/dpz/comprehensiveplan/>
- Fairfax County, Virginia. (2007 Edition, Amended 2010). Comprehensive Plan. Accessed from: <http://www.fairfaxcounty.gov/dpz/comprehensiveplan/>
- George Mason University. Center for Regional Analysis. (September 17, 2008). Forecasts for Tysons Corner to 2050. Accessed from: <http://www.fairfaxcounty.gov/dpz/tysonscorner/finalreports/georgemason-forecast-tysons.pdf>
- Hybrid Cars. (May 27, 2010). *13 Key Questions and Answers about Nissan Leaf Battery Pack and Ordering*. Accessed from: <http://www.hybridcars.com/news/13-key-questions-and-answers-about-nissan-leaf-battery-pack-and-ordering-28007.html>
- National Research Council. (2010). *Transitions to Alternative Transportation Technologies—*

- Plug-in Hybrid Electric Vehicles*. National Academies Press. Accessed from:
<http://www.nap.edu/catalog/12826.html>
- PJM Interconnection (2011), “PJM – Markets & Operations”. Website:
<http://www.pjm.com/markets-and-operations.aspx>.
- Reed Construction Data. RS Means CostWorks. Accessed from:
<http://www.meanscostworks.com/> .
- Sentech, Inc. (January, 2010). *PHEV Market Introduction Study: Final Report*. Accessed from:
http://www.sentech.org/phev/pdfs/PHEV_Market_Introduction_Study_Report.pdf
- Sentech, Inc. (July, 2010). *Plug-In Hybrid Electric Vehicle Value Proposition Study: Final Report*. Accessed from:
http://www.afdc.energy.gov/afdc/pdfs/phev_study_final_report.pdf
- Toyota Motor Sales, USA Inc. (2011). “The 3rd Generation Toyota Prius Hybrid”. Accessed from:
<http://www.toyota.com/prius-hybrid/>.
- United States Census Bureau (2010). American Fact Finder. Accessed from
<http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>.
- United States Census Bureau (2011). Statistical Abstract of the United States. Accessed from
http://www.census.gov/compendia/statab/cats/wholesale_retail_trade/motor_vehicle_sales.html.
- United States Energy Information Administration (US EIA). Electric Utility Retail Sales Data. Accessed from
http://www.eia.doe.gov/cneaf/electricity/page/at_a_glance/sales_tabs.html.
- United States Energy Information Administration (US EIA). U.S. Gasoline and Diesel Retail Prices. Accessed from http://tonto.eia.doe.gov/dnav/pet/pet_pri_gnd_dcus_nus_w.htm.
- Virginia Clean Cities. (October 13, 2010). *Virginia Get Ready: Initial Electric Vehicle Plan*. Access from:
<http://www.virginiaev.org/wp-content/uploads/2010/11/EV-VGR-FINAL-October-13-2010.pdf>
- Virginia. Code of Virginia, Chapter 408 (March 23, 2011). Accessed from
<http://leg1.state.va.us/cgi-bin/legp504.exe?111+ful+CHAP0408>.



Ready For Electric Vehicle (REV) Program

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NRG Overview



- A Fortune 300 company, NRG Energy (NYSE: NRG) is one of the nation's largest wholesale competitive power generators.
- eVgo is a wholly-owned subsidiary of NRG Energy.
- We have built the nation's largest privately-funded comprehensive car charging network.



The eVgo Ecosystem



Multi-Family / Workplace Communities



- ✓ Low-cost, no-risk
- ✓ Scalable
- ✓ Attractive
- ✓ Ready-to-deploy
- ✓ Appealing clientele

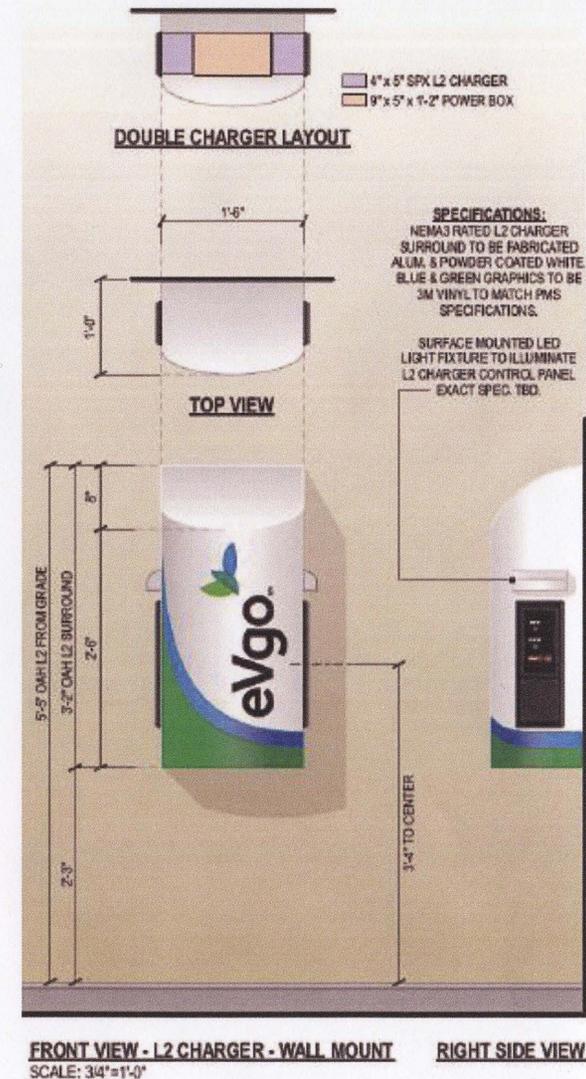


- Each EV gets its own dedicated charger (activated via key fob)
- Host need not own, install, maintain, or support the chargers
- Energy consumed by subscribing drivers is fully reimbursed
- Chargers are installed as-needed, so spaces do not go unused
- eVgo markets you as being "Ready for EVs"

Specifications



- Each parking space requires 220VAC @ 30 amps; each parking garage requires additional 15 amps for communications (i.e., 4 spaces * 30 amps = 120 amps + 15 amps = 135 amps total).
- Chargers can be wall-mounted (as shown at right) or floor-mounted; they are installed in-line with the stripe dividing two parking spaces.
- Host's sole responsibility is to run sufficient power to the parking area; using a single heavy-gauge wire reduces cost.
- eVgo will meter power, distribute power to each space, and provide all necessary hardware.
- Consider including one ADA space, keeping in mind it will be unavailable for general use once a charger is installed.



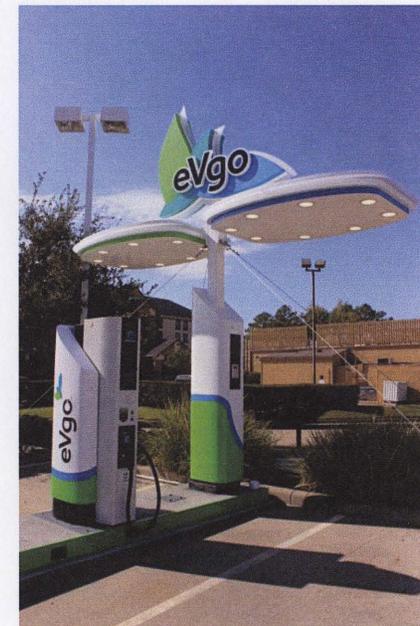
Our Regional Fast-Charging Network



Mid-Atlantic eVgo Network



In addition to home and workplace charging, eVgo offers access to an unparalleled network of direct current fast-chargers, providing EV drivers with affordable range confidence.



**Planning Commission Environment Committee review of the
MITRE report Electric Vehicle Charging Infrastructure
Recommendations to Fairfax County**

Possible approach to the Committee review

Noel Kaplan
November 29, 2012

Anticipated Outcome: Policy guidance regarding pursuit of commitments to the provision of electric vehicle supply equipment (or “EV-ready” design) through the zoning process. This could take the form of proposed Policy Plan language, prototype proffer language, or other form of guidance—the specific approach would be determined as discussions progress.

Meeting 1 (January-February 2013): Overview of electric vehicle charging concepts; Presentation from the MITRE Corporation on its report and recommendations to Fairfax County

Meeting 2 (February-March 2013): Regional efforts and recommendations—Overview of planning efforts at the Metropolitan Washington Council of Governments—Kambiz Agazi, Fairfax County Environmental Coordinator

Meeting 3 (March-April 2013): Perspectives from private sector providers of electric vehicle supply equipment, part 1.

Meeting 4 (April-May 2013): Perspectives from private sector providers of electric vehicle supply equipment, part 2.

Meeting 5 (May-June 2013): Perspectives from the development industry

Meeting 6 (June-July 2013): Committee discussion and direction

Green Building Policy Review – Comment Compilation, Staff Response, and Planning Commission Environment Committee (P.C. E.C.) Response, revised November 29, 2012					
Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
<p>RESOURCE CONSERVATION AND GREEN BUILDING PRACTICES</p> <p>The energy shortage in the United States in the 1970s highlighted the finite nature of our natural resources. Since the 1970s, efforts have been pursued at the federal level to enhance energy efficiency and the efficient use of water resources. While such efforts are best addressed at the federal level, local efforts to conserve these resources should be encouraged.</p> <p>The “green building” concept provides a holistic approach to the reduction of adverse environmental impacts associated with buildings and their associated facilities and landscapes.</p>	<p>RESOURCE CONSERVATION AND GREEN BUILDING PRACTICES</p> <p>The energy shortage in the United States in the 1970s highlighted the finite nature of our natural resources. Since the 1970s, efforts have been pursued at the federal level to enhance energy efficiency and the efficient use of water resources. While such efforts are best addressed at the federal level, local efforts to conserve these resources should be encouraged. <u>Recent events and trends have highlighted the increasing need for energy and resource conservation and efficiency, greenhouse gas reduction and green building practices. Many jurisdictions are now engaging in community energy planning and other strategies to best use available resources.</u></p> <p>The “green building” concept provides a holistic approach to the reduction of adverse environmental impacts associated with buildings and their associated facilities and landscapes.</p>	No Commenter	No Comment	Proposed Strawman text originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
Objective 13: Design and construct buildings and associated landscapes to use energy and water resources efficiently and to minimize short- and long-term negative impacts on the environment and building occupants.	Objective 13: Design and construct buildings and associated landscapes to use energy and water resources efficiently and to minimize short- and long-term negative impacts on the environment and building occupants.	Peter Rigby	In Objective 13 and throughout policy, clarify what "building" means. It appears to refer only to standalone commercial buildings, not single family residential.	Use of the word “building” is recommended as there is not an equally succinct and more inclusive term for the structures discussed in the policy. For clarity, the type of building – residential or non-residential - is specifically referenced throughout the policy. <u>No change is recommended.</u>	No change to Strawman text.

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Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
Policy a. Consistent with other Policy Plan objectives, encourage the application of energy conservation, water conservation and other green building practices in the design and construction of new development and redevelopment projects. These practices can include, but are not limited to:	Policy a. <u>In consideration of</u> Consistent with other Policy Plan objectives, encourage the application of energy conservation, water conservation and other green building practices in the design and construction of new development and redevelopment projects. These practices <u>may</u> can include, but are not limited to:	Linda Burchfiel	Add "natural lighting" to the list.	Staff feels that while the list in policy a. is not intended to be exhaustive, that this is a valid green building concept. <u>Recommend adding a bullet point stating, "• Natural lighting and views for occupants."</u>	<u>Added a bullet point: "• Natural lighting for occupants."</u>
<ul style="list-style-type: none"> Environmentally-sensitive siting and construction of development. 	<ul style="list-style-type: none"> Environmentally-sensitive siting and construction of development; 	No Commenter	No Comment	Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
<ul style="list-style-type: none"> Application of low impact development practices, including minimization of impervious cover (See Policy k under Objective 2 of this section of the Policy Plan). 	<ul style="list-style-type: none"> Application of low impact development practices, including minimization of impervious cover (See Policy k under Objective 2 of this section of the Policy Plan); 	No Commenter	No Comment	Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
<ul style="list-style-type: none"> Optimization of energy performance of structures/energy-efficient design. 	<ul style="list-style-type: none"> Optimization of energy performance of structures/energy-efficient design; 	Ross Shearer	In policy a. what does "optimization of energy performance of structures/energy-efficient design" mean? Recommend revision to specify a new or renovated building must meet or exceed ENERGY STAR for commercial buildings as a minimum to receive recognition as a green building. Commenter further recommends that this standard be ensured prior to zoning approval, with a posted bond.	<p>"Optimization of energy performance of structures/energy-efficient design" is intended to describe the design/construction and operation of a building with the most reduced energy usage possible.</p> <p>Staff notes comment recommending specific standards/guidelines for optimization but as the list in policy a. is intended to serve as general examples of green buildings technologies and not specific recommendations <u>no change is recommended to policy a.</u></p> <p><u>This recommendation for commercial buildings to receive ENERGY STAR certification at a minimum could be considered under policy b – discussion with the Environment Committee is recommended.</u></p> <p>Staff feels that the commenter's implementation recommendation for a green building standard to be ensured prior to zoning approval with a bond is beyond the scope of this policy. However, the proposed approach is similar to a green building escrow enforcement mechanism that has been incorporated within many of the proffered commitments that have been received to date (although not specifically for ENERGY STAR certification). <u>No change is recommended.</u></p>	Discussed; no change to Strawman text.

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Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
<ul style="list-style-type: none"> Use of renewable energy resources. 	<ul style="list-style-type: none"> Use of renewable energy resources; 	Gail Parker	Support for this text.	Staff notes support for the text. Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
<ul style="list-style-type: none"> Use of energy efficient appliances, heating/cooling systems, lighting and/or other products. 	<ul style="list-style-type: none"> Use of energy efficient appliances, heating/cooling systems, lighting and/or other products; 	No Commenter	No Comment	Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
<ul style="list-style-type: none"> Application of water conservation techniques such as water efficient landscaping and innovative wastewater technologies. 	<ul style="list-style-type: none"> Application of water conservation techniques such as water efficient landscaping and innovative wastewater technologies; 	Alan Ford	Consider referring to Best Practices. Need to consider both water requirements for maintaining landscapes and storm water runoff concerns.	While the list in policy a. is intended to provide general examples of green buildings technologies and not specific recommendations, <u>the statement could be changed to “• Application of best practices for water conservation techniques, such as water efficient landscaping and innovative wastewater technologies, that can serve to reduce the use of potable water and/or reduce stormwater runoff volumes.”</u>	<u>Bullet changed to: “• Application of best practices for water conservation’, such as water efficient landscaping and innovative wastewater technologies, that can serve to reduce the use of potable water and/or reduce stormwater runoff volumes.”</u>
<ul style="list-style-type: none"> Reuse of existing building materials for redevelopment projects. 	<ul style="list-style-type: none"> Reuse of existing building materials for redevelopment projects; 	No Commenter	No Comment	Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
<ul style="list-style-type: none"> Recycling/salvage of non-hazardous construction, demolition, and land clearing debris. 	<ul style="list-style-type: none"> Recycling/salvage of non-hazardous construction, demolition, and land clearing debris; 	No Commenter	No Comment	Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
<ul style="list-style-type: none"> Use of recycled and rapidly renewable building materials. 	<ul style="list-style-type: none"> Use of recycled and rapidly renewable building materials; 	No Commenter	No Comment	Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.
<ul style="list-style-type: none"> Use of building materials and products that originate from nearby sources. 	<ul style="list-style-type: none"> Use of building materials and products that originate from nearby sources; 	No Commenter	No Comment	Punctuation change originated during Environment Committee discussions. <u>No change is recommended.</u>	No change to Strawman text.

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Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
<ul style="list-style-type: none"> Reduction of potential indoor air quality problems through measures such as increased ventilation, indoor air testing and use of low-emitting adhesives, sealants, paints/coatings, carpeting and other building materials. 	<ul style="list-style-type: none"> Reduction of potential indoor air quality problems through measures such as increased ventilation, indoor air testing and use of low-emitting adhesives, sealants, paints/coatings, carpeting and other building materials; 	Ross Shearer	"Reduction of potential indoor air quality problems though measures such as increased ventilation" is unclear. Should be revised to specify technology which seals buildings and manages air flow. Commenter recommends amending the language to "increased ventilation means air managed under a system incorporating heat recovery systems and approved by LEED Silver, PassiveHaus, EarthCraft, or equivalent."	The list in policy a. is intended to provide general examples of green buildings technologies and not to itemize all technology that could be used for individual green buildings. The recommendation is very specific, so staff notes that <u>the statement could be changed to "Reduction of potential indoor air quality problems through measures such as technology which seals buildings and manages air flow, indoor air testing and use of low-emitting adhesives, sealants, paints/coatings, carpeting and other building materials."</u>	Discussed; no change to Strawman text. Can be reworded if desired.
NO CORRESPONDING EXISTING PLAN TEXT.	<ul style="list-style-type: none"> <u>Reuse, preservation and conservation of existing buildings, including historic structures;</u> 	Linda Burchfiel	Commenter strongly supports policy, wants to know how staff will encourage this. Will this be done through the zoning process or through an ordinance?	Having this statement in the policy will lend support to recommendations during the zoning process for the reuse, preservation, and conservation of existing buildings. There is no ordinance envisioned at this time. <u>No change is recommended.</u>	No change to Strawman text.
		Brian Winterhalter	Existing buildings that are included in zoning applications but that are not proposed for modification should clearly be exempt from complying with the green building policies.	The intent of this bullet is to recognize that the replacement of existing buildings with new buildings has resource use implications that would not occur with the retention of the existing buildings. The following bullet addresses retrofits to existing buildings. <u>No change is recommended.</u>	No change to Strawman text.
		Roger Diedrich	Existing buildings is not clearly defined. Commenter believes existing buildings should be addressed in a separate policy. Disagreement with Brian Winterhalter's comment. Could incentives be applied to encourage improvements to existing buildings?	Staff notes the use of the word "existing" to mean "currently constructed." Staff notes the request to have a separate policy. <u>Staff recommends a discussion with the Environment Committee to determine if such a policy is needed.</u> The following bullet addresses retrofits to existing buildings. <u>No change is recommended.</u>	Discussed; no change to Strawman text. Can be reworded if desired.

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Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
		Ross Shearer	Supports inclusion of existing buildings in policy where practices have standards. Wants to eliminate retention of inefficient structures, and encourage replacement of inefficient buildings with more efficient ones. Recommends revision of language to establish standards to be used for existing buildings.	Staff noted earlier that the intent of this bullet is to recognize that the replacement of existing buildings with new buildings has resource use implications that would not occur with the retention of the existing buildings. The commenter correctly notes, though, that there could also be benefits to replacing energy-inefficient structures with more efficient ones. There may also be opportunities to retrofit existing buildings such that they could be made to be more energy-efficient. It is not clear to staff that standards could be developed that could define, within the zoning process, the appropriate threshold between retention/retrofit and replacement of existing buildings, as the context of one zoning application is likely to be quite different from another (e.g., historic structures vs. non-historic structures; scope/magnitude of the development proposal) and as the intent of this proposed text is to note, in very general terms, that the retention, reuse and possible retrofitting of existing buildings can have environmental benefits warranting consideration in the decision-making process. Staff views this as a complex question of balance that does not lend itself to the specificity that is being suggested. Therefore, at this time, <u>no change is recommended</u> . However, as noted above, staff feels that this set of issues merits further discussion by the Planning Commission's Environment Committee, and additional thoughts on this matter would be welcomed.	Each case should be considered on a case-by-case basis with a flexible approach. No change to Strawman text.
NO CORRESPONDING EXISTING PLAN TEXT.		DPWES Building Design Branch	The meaning of Policy a. is not clear. Is the intent that when an existing building is being renovated, existing green building practices currently in the building should be preserved, conserved, and reused?	The intent is to provide additional green building practices to existing buildings during renovation. <u>Information item only, no change is recommended.</u>	Each case should be considered on a case-by-case basis with a flexible approach. No change to Strawman text.

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	<ul style="list-style-type: none"> • <u>Retrofitting of other green building practices within existing structures to be preserved, conserved and reused;</u> 	Fairfax County Federation of Citizens Associations	<p>Commenter recommends a separate policy for existing structures: “Policy i. Encourage the application of the listed practices to existing buildings. Whenever a structure is under major renovation, i.e. removal of 85 percent of the interior, or make renovations that cost more than 50% of the cost of replacing the structure, the full objective shall apply. For renovation/remodeling at reduced levels, Green Building ratings can be pursued by demonstrating an improved performance as described in Policy h regarding recording aggregated energy and water consumption data.</p>	<p>Staff notes the comment to have a separate policy. <u>Staff recommends that this issue be discussed with the Environment Committee. See also the response below to a comment from Brian Winterhalter.</u></p>	<p>Concur with staff that a separate policy is inappropriate as policies do not set requirements – however could be considered as an amendment to the Zoning Ordinance, were the Board of Supervisors to direct such a consideration.</p> <p>No change to Strawman text.</p>
		Brian Winterhalter	<p>Existing buildings should clearly be exempt from complying with the green building policies.</p>	<p>The list in policy a is intended to provide general examples of green buildings technologies and not specific recommendations. However, the inclusion of this bullet is intended to recognize the potential for retrofits to existing buildings and to encourage such efforts. In staff’s view, it would not be appropriate to consider broad “exemptions” from such general policy language, particularly since this language does not establish specific recommended performance levels. Rather, staff feels that the extent to which commitments to retrofits are pursued during the zoning process should be determined on a case-by-case basis and should be commensurate with the extent of the proposed changes/intensification to the uses in the building. There was considerable discussion of this issue at one of the committee meetings and staff feels that additional committee discussion and consideration is warranted. However, at this point, staff feels that the general identification of building retrofits as an example of green building practices would be appropriate. Therefore, at this time, <u>no change is recommended.</u></p>	<p>Concur with staff’s response.</p> <p>The Committee may also consider in the future whether a follow up motion the explore triggering green building requirements at the building permit stage is appropriate.</p> <p>No change to Strawman text.</p>

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		Roger Diedrich	Disagreement with Brian Winterhalter’s comment. Could incentives be applied to encourage improvements to existing buildings?	Staff notes the request to have a separate policy. <u>Staff recommends a discussion with the Environment Committee to determine if such a policy is needed.</u> The Comprehensive Plan’s guidance would be implemented through the zoning process. Therefore, existing buildings would only be affected by this guidance if they were to be included in a zoning proposal. Staff questions whether the Comprehensive Plan would be an effective or appropriate place for incentives to encourage improvements to existing buildings. <u>No change is recommended.</u>	Concur with staff that this comment goes beyond the scope of the policy plan. No change to Strawman text.
		Ross Shearer	Commenter supports retrofitting and renovating existing buildings, and the policy should include language to ensure energy efficiency and conservation objectives are achieved. Recommends inclusion of language regarding ENERGY STAR for existing buildings, LEED or equivalent.	Staff notes comment recommending ENERGY STAR or another green building rating system for existing buildings but as the list in policy a. is intended to provide general examples of green buildings technologies and not specific recommendations <u>no change is recommended to policy a.</u> <u>This recommendation for existing buildings to receive ENERGY STAR or another certification could be considered under policy b. Staff recommends that this issue be discussed with the Environment Committee.</u>	Discussed, no change recommended.
NO CORRESPONDING EXISTING PLAN TEXT.	<ul style="list-style-type: none"> <u>Energy and water usage data collection and performance monitoring;</u> 	Ross Shearer	Commenter supports inclusion of performance monitoring in policy a. but wants performance monitoring to be used for promotion of public advertising of energy use of buildings, or to encourage the reporting of results to the County for use in refining the Countywide GHG inventory.	Staff notes the comment. See related comments under proposed Policy h. <u>Staff recommends the goal of the performance monitoring be discussed with the Environment Committee.</u>	Discussed, no change recommended.
NO CORRESPONDING EXISTING PLAN TEXT.	<ul style="list-style-type: none"> <u>Solid waste and recycling management practices.</u> 	Larry Zaragoza	I would like to see something more aggressive in recycling. Buildings should recycle all of their primary waste streams that can be recycled.	Staff notes the comment. <u>Staff recommends this topic be discussed with the Environment Committee and DPWES.</u>	The item could be discussed at a later time as this goes beyond the scope of the policy plan. Review policy after two years to determine if any changes are needed. No change to Strawman text.
Encourage commitments to implementation of green building practices through certification under established green building rating systems	Encourage commitments to implementation of green building practices through certification under established green building rating systems <u>for individual</u>	Oomer Syed; Peter Rigby	Why is LEED-ND not included in the policy? / LEED-ND should be an option for satisfying the policy guidance.	LEED-ND focuses more on site design than individual buildings. The Comprehensive Plan has guidance on site design and where in the County LEED-ND-style development is most appropriate. The green building policy emphasizes individual green buildings. <u>No change is recommended.</u>	Concur with staff; no change to Strawman text.

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<p>(e.g., the U.S. Green Building Council’s Leadership in Energy and Environmental Design (LEED®) program or other comparable programs with third party certification). Encourage commitments to the attainment of the ENERGY STAR® rating where applicable and to ENERGY STAR qualification for homes. Encourage the inclusion of professionals with green building accreditation on development teams. Encourage commitments to the provision of information to owners of buildings with green building/energy efficiency measures that identifies both the benefits of these measures and their associated maintenance needs.</p>	<p><u>buildings</u> (e.g., the U.S. Green Building Council’s Leadership in Energy and Environmental Design for New Construction [LEED-NC®] or the U.S. Green Building Council’s Leadership in Energy and Environmental Design for Core and Shell [LEED-CS®] program or other comparable equivalent programs with third party certification). <u>An equivalent program is one that is independent, third-party verified, and has regional or national recognition. Where developments with exceptional intensity or density are proposed (e.g. at 90 percent or more of the maximum planned density or intensity), ensure that higher levels of green building performance are attained.</u> Encourage commitments to the attainment of the ENERGY STAR® rating where applicable. <u>Encourage certification of new homes through an established residential green building rating system that incorporates multiple green building concepts and has a level of energy performance that is comparable to or exceeds ENERGY STAR qualification for homes.</u> Encourage the inclusion of professionals with green building accreditation on development teams. Encourage commitments to the provision of information to owners of buildings with green building/energy efficiency measures that identifies both the benefits of these measures and their associated maintenance needs.</p>	<p>Brian Winterhalter</p>	<p>Available USGBC programs under which to receive certification should be expanded to include LEED-ND, LEED-EB, LEED-Retail, etc.</p>	<p>As noted above, LEED-ND focuses more on site design than individual buildings. The Comprehensive Plan has guidance on site design and where in the County LEED-ND-style development is most appropriate. The green building policy emphasizes individual green buildings. Staff does not recommend that LEED-ND be viewed as an alternative to single building rating systems.</p> <p>While greening of existing buildings does contribute to environmental goals, Comprehensive Plan policy is applied more to the design and construction of new development and redevelopment projects rather than the maintenance and operation of existing buildings (e.g., LEED-EB).</p> <p>LEED for Retail and other specialty LEED rating systems are applicable and eligible for use, depending on the proposed building type, despite not being specifically listed (“other equivalent programs”). <u>No change is recommended.</u></p>	<p>Concur with staff; no change to Strawman text.</p>
		<p>Inda Stagg</p>	<p>What is the difference between Policy a. and Policy c. in terms of 90% vs. mid-range? Are two separate expectations being established?</p>	<p>Policy a. speaks to exceptional intensity/density for all development and creates an expectation for correspondingly exceptional green building performance. Policy c. speaks to residential development only, and creates an expectation for measurable green building performance above and beyond basic levels in developments above the mid-range of the Plan density range. <u>Information item only, no change is recommended.</u></p>	<p><u>Policies a, b, and c changed for clarification (see handout from February 23, 2012 meeting).</u></p>
		<p>Inda Stagg</p>	<p>The County should provide a list of green building rating systems considered to be equivalent to LEED.</p>	<p>Staff concurs with this suggestion. This can be done outside of the Policy Plan (e.g. a memorandum clarifying this policy). <u>No change is recommended to Strawman, but staff will prepare this list.</u></p>	<p>Concur with staff; no change to Strawman text.</p>

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		Marlae Schnare - Supervisor Herrity's Office	What are examples of third-party certification systems equivalent to LEED and why aren't they listed?	The definition of "equivalent," which was not included in the policy adopted in December 2007, has been added as an item for discussion in the draft Strawman. Any rating system which meets this definition ("An equivalent program is one that is independent, third-party verified, and has regional or national recognition") is considered an equivalent of LEED. The reason that other systems are not listed is that the commercial market, with the exception of LEED which has been established as a market leader for over a decade, continues to be in flux and a rating system may not be eligible for inclusion at the time of this revision but may be in the future, and likewise a rating system that currently meets the definition now may fail to do so in the future. Rather than create potential confusion, a definition was thought to be the clearest way to provide guidance regarding eligible ratings systems. <u>Information item only, no change is recommended.</u>	Recommend posting a list of equivalent rating systems on the DPZ website, similar to comment above. Recommend flexibility in analyzing unusual applications. No change to Strawman text.
		Peter Rigby	Commenter does not feel that LEED is an independent and third-party verified system, so the definition of "equivalent" is flawed. Commenter does not feel rating systems should be evaluated based on equivalency to LEED.	In the definition, "independent" and "third-party" refers to having objective criteria and impartial reviewers, as well as having an appeals process. <u>No change is recommended.</u>	No change to Strawman text.
		Steve Nicholson (Fairfax County Public Schools, Office of Design and Construction)	FCPS uses 3 rd party commissioners for school projects (each conducting quality control within the specific trades for which they've received training). Would the policy guidance regarding equivalent programs be interpreted such that this would qualify as being "equivalent?"	Staff notes the comment. Staff recommends that this topic be discussed with Environment Committee and FCPS.	The Committee discussed this topic and felt that the FCPS situation could be determined to be equivalent. No change to Strawman text.

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		DPWES Building Design Branch	The definition of “higher levels of green building performance” is not clearly defined. Is this to provide flexibility in the higher level of performance? Or is the goal to get a higher level of certification, such as from LEED Silver to LEED Gold? Or is it to achieve additional points under a green building system (which may not get the project to a higher rating)?	“Higher levels” means certification levels above the basic level. The goal is a higher certification level, not additional points. <u>Information item only, no change is recommended.</u>	<u>Change the text in policy a. (now in policy b.) to: “higher than basic levels of green building certification.”</u>
		Fairfax County Federation of Citizens Associations	What makes a rating system equivalent? Different rating systems have different goals.	Staff notes the comment about different goals. A definition for equivalent (based on functional attributes, rather than content) has been suggested. <u>No change is recommended.</u>	No change to Strawman text.
		Ross Shearer	Regarding "encourage commitments to ENERGY STAR ratings where applicable," commenter wants “where applicable” clarified as developers may use this as a loophole. Also, explain the connection between this policy and the Tysons green building policy.	The intent behind the “where applicable” language is the recognition that there may be types of development for which the ENERGY STAR certification is not available. <u>No change is recommended.</u>	<u>Change “applicable” to “available.”</u>
		DPZ Staff	Consider adding language to the definition of “equivalent” to include incorporation of multiple green building concepts and similar overall levels of green building performance.	Staff recommends modifying the language to state, <u>“An equivalent program is one that is independent, third-party verified, and has regional or national recognition or one that otherwise includes multiple green building concepts and overall levels of green building performance that are at least similar in scope to the applicable LEED rating system.”</u>	<u>Change made to Strawman text.</u>
Policy b. Ensure that zoning proposals for nonresidential development and zoning proposals for multifamily residential development of four or more stories within the Tysons Corner Urban Center,	Policy b. <u>Within the Tysons Corner Urban Center, Suburban Centers, Community Business Centers, Industrial Areas and Transit Station Areas as identified on the Concept Map for Future</u>	Peter Rigby	In the Policy b. discussion of multi-family buildings with energy and comprehensive green building measures, there are no measurements through which equivalency would be assessed.	Per proposed changes to Policy a, <u>an equivalent program would be one that is independent, third-party verified, and has regional or national recognition.</u> Per the previous comment, this guidance could be expanded to recognize programs that otherwise include multiple green building concepts and overall levels of green building performance that are at least similar in scope to the applicable LEED rating systems. Otherwise, <u>no change is recommended.</u>	<u>Change referenced in comment above made to Strawman text.</u>

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<p>Suburban Centers, Community Business Centers and Transit Station Areas as identified on the Concept Map for Future Development incorporate green building practices sufficient to attain certification through the LEED program or its equivalent, where applicable, where these zoning proposals seek at least one of the following:</p>	<p><u>Development</u>, ensure that zoning proposals for nonresidential development <u>or</u> zoning proposals for multifamily residential development of four or more stories within the Tysons Corner Urban Center, Suburban Centers, Community Business Centers and Transit Station Areas as identified on the Concept Map for Future Development incorporate green building practices sufficient to attain certification through the LEED-NC or LEED-CS program or <u>its an equivalent program specifically incorporating both energy efficiency and comprehensive green building practices</u>, where applicable, where these zoning proposals seek at least one of the following:</p>	<p>Ellen Eggerton –DPWES; Roger Diedrich</p>	<p>In Policy b., why is Tysons specifically referenced if it has site specific language which is different from the Countywide recommendations?</p>	<p>The comment is correct that this could be confusing. <u>Recommend adding "unless otherwise recommended in the applicable area plan ..." to first sentence of Policy b.</u></p>	<p><u>Change made to Strawman text.</u></p>
		<p>DPWES Building Design Branch</p>	<p>Is this basically saying any development with those specified areas are required to comply? If not, what type of development is not required to comply?</p>	<p>Any non-by-right development proposals in these areas that would meet any of these criteria (the bullet points in that follow this text) would be expected to meet the certification targets in the policy. <u>Information item only, no change recommended.</u></p>	<p>No change made to Strawman text.</p>
		<p>Linda Burchfiel</p>	<p>Recommends raising the standard from LEED to LEED Silver (or equivalent). Since builders are building to LEED standards voluntarily, because it pays off, this policy should encourage them to advance to at least the next level. Supports broadening policy to apply in more areas of the County.</p>	<p>Staff notes the comment. At this time, Tysons Corner is the only area of the County to have a LEED Silver expectation (for commercial buildings). Proposed Strawman changes to Policy a would, however, establish an expectation, countywide, for higher levels of green building performance for development proposals seeking exceptional intensity or density (e.g., 90 percent or more of the maximum planned density or intensity). The areas of the County that are currently subject to Policy b are the areas where higher intensity development and redevelopment proposals are expected to be concentrated in the future. Broadening the areas of the County that would be subject to Policy b would result in a more comprehensive application of the policy but would likely affect primarily lower-intensity development proposals. The potential implications of such an expansion should be discussed further by the Planning Commission’s Environment Committee. <u>No change is recommended at this time.</u></p>	<p>Currently no change is recommended; this may be revisited in the future.</p>
		<p>Brian Winterhalter</p>	<p>Establish desired certification levels, rather than introduce a tiered certification system based on density. Also provide bonus density incentives for exceptional commitments.</p>	<p>Staff sees merit to establishing higher green building expectations based on density/intensity; to some extent, the existing text incorporates this concept. With respect to bonus density incentives, it is staff’s view that such incentives should only be considered in conjunction with area-specific studies (for example, the incentive that has been established in the Annandale Community Business Center), where the implications of additional densities/intensities that could result from this incentive could be considered in detail and comprehensively. A broader, countywide density bonus may have unintended adverse consequences relating to the additional densities/intensities that could be allowed (e.g., transportation facilities, schools, parks, . . .) <u>No change is recommended.</u></p>	<p>No change made to Strawman text.</p>
<p>Omer Syed; Peter Rigby</p>	<p>Why is LEED-ND not included in the policy? / LEED-ND should be an option for satisfying the policy guidance.</p>	<p>LEED-ND focuses more on site design than individual buildings. The Comprehensive Plan has guidance on site design and where in the County LEED-ND-style development is most appropriate. The green building policy emphasizes individual green buildings. <u>No change is recommended.</u></p>	<p>No change made to Strawman text.</p>		

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Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
		Brian Winterhalter	Available USGBC programs under which to receive certification should be expanded to include LEED-ND, LEED-EB, LEED-Retail, etc.	<p>As discussed above, LEED-ND focuses more on site design than individual buildings. The Comprehensive Plan has guidance on site design and where in the County LEED-ND-style development is most appropriate. The green building policy emphasizes individual green buildings. Staff does not recommend that LEED-ND be viewed as an alternative to single building rating systems.</p> <p>While greening of existing buildings does contribute to environmental goals, as this policy is focused on new construction and renovation, Comprehensive Plan policy is applied more to the design and construction of new development and redevelopment projects rather than the maintenance and operation of existing buildings (e.g., LEED-EB).</p> <p>LEED for Retail and other specialty LEED rating systems are applicable and eligible for use, depending on the proposed building type, despite not being specifically listed (“other equivalent programs”). <u>No change is recommended.</u></p>	Concur with staff; no change recommended.
		DPZ Staff	Consider clarifying “comprehensive green building practices” such that this concept is presented more consistently with similar concepts in Policy a. and Policy c.	<p>Staff recommends modifying the language to state, “. . . to attain certification through the LEED-NC or LEED-CS program or its an equivalent <u>program specifically incorporating multiple green building concepts both energy efficiency and comprehensive green building practices</u>, where applicable, . . .”</p>	<u>Concur with staff; recommend change in response document.</u>
		No Commenter	No Comment	<u>No change is recommended.</u>	No change made to Strawman text.
<ul style="list-style-type: none"> Development in accordance with Comprehensive Plan Options; 	<ul style="list-style-type: none"> Development in accordance with Comprehensive Plan Options; 	No Commenter	No Comment	<u>No change is recommended.</u>	No change made to Strawman text.
<ul style="list-style-type: none"> Development involving a change in use from what would be allowed as a permitted use under existing zoning; 	<ul style="list-style-type: none"> Development involving a change in use from what would be allowed as a permitted use under existing zoning; 	No Commenter	No Comment	<u>No change is recommended.</u>	No change made to Strawman text.
<ul style="list-style-type: none"> Development at the Overlay Level; or 	<ul style="list-style-type: none"> Development at the Overlay Level; or 	No Commenter	No Comment	<u>No change is recommended.</u>	No change made to Strawman text.

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<ul style="list-style-type: none"> Development at the high end of planned density/intensity ranges. For nonresidential development, consider the upper 40% of the range between by-right development potential and the maximum Plan intensity to constitute the high end of the range. 	<ul style="list-style-type: none"> Development at the high end of planned density/intensity ranges. For nonresidential development, consider the upper 40% of the range between by-right development potential and the maximum Plan intensity to constitute the high end of the range. 	Inda Stagg	What is the difference between Policy a. and Policy c. in terms of 90% vs. mid-range?	Policy a. speaks to exceptional intensity/density for all development and creates an expectation for correspondingly exceptional green building performance. Policy c. speaks to residential development only, and creates an expectation for measurable green building performance above and beyond basic levels in developments above the mid-range of the Plan density range. <u>Information item only, no change is recommended.</u>	<u>Addressed previously. Change made to Strawman.</u>
		Peter Rigby	For proposals at or above the mid-range of plan density, what are the measures that would qualify as exceeding expectations?	The intent of the proposed revision is to establish certification under an established green building rating system that incorporates ENERGY STAR Qualification for homes (or comparable energy efforts) as a minimum expectation for zoning proposals for residential development and to establish that, as proposed density increases beyond the midpoint of the Plan density range, the commitments to at least two green building categories should increase commensurately. The commenter is asking for the establishment of definitive thresholds for these determinations. In staff's view, the baseline threshold that would be established for proposals at the midpoint of the Plan density range would be any level of significant improvement over the baseline established in the rating system of choice. The increasing gradation as proposed densities increase beyond the midpoint would need to be assessed on a case-by-case basis. Staff recommends further discussion with the Planning Commission Environment Committee regarding the concern raised by the commenter (e.g., the subjectivity of this determination). Staff also recommends that the phrase "at or above the mid range of the Plan density range" be changed as follows: "at or above the <u>mid range point</u> of the Plan density range."	<u>Change recommended by staff ("at or above the midpoint of the Plan density range.") made.</u>

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<p>Policy c. Ensure that zoning proposals for residential development will qualify for the ENERGY STAR Qualified Homes designation, where such zoning proposals seek development at the high end of the Plan density range and where broader commitments to green building practices are not being applied.</p>	<p>Policy c. Ensure that zoning proposals for residential development will incorporate green building practices sufficient to attain certification under an established residential green building <u>rating system that incorporates multiple green building concepts and that includes an</u> qualify for the ENERGY STAR Qualified Homes <u>designation or an equivalent a comparable level of energy performance.</u> where <u>Where</u> such zoning proposals seek development <u>at or above the mid-the high end range</u> of the Plan density range, <u>and where broader commitments to green building practices are not being applied ensure that County expectations regarding the</u></p>	<p>DPWES Building Design Branch</p>	<p>The section includes two references to “County expectations.” Is it clear what the “County expectations” are or are they further defined with the development approvals? The section further states that the expectations increase commensurately as intensity or density increase. Will the approvals of the development better define the increased expectations? The section indicates exceeding in two or more categories, but what exactly does that mean? Can you just get more points within a credit or do you need two more credits within two different categories?</p>	<p>“County expectations” refers to the expectations discussed in policy c.</p> <p>The zoning process and proffers will more clearly define the expectations for each case; however the basic expectations are set by this policy.</p> <p>The categories listed are broad areas of green building strategies. It is envisioned that exceeding in two or more of these categories means demonstrating exceptional performance in these categories, as shown through performance or incorporated techniques. This is not tied to a specific rating system, so there are no defined point thresholds.</p> <p><u>Information item only, no change recommended.</u></p>	<p>No change made to Strawman text.</p>

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	<p><u>incorporation of green building practices are exceeded in two or more of the following measurable categories: energy efficiency; water conservation; reusable and recycled building materials; pedestrian orientation and alternative transportation strategies; healthier indoor air quality; open space and habitat conservation and restoration; and greenhouse gas emission reduction. As intensity or density increases, the expectations for achievement in the area of green building practices would commensurately increase.</u></p>	Linda Burchfiel	<p>Supports ensuring an ENERGY STAR rating or equivalent to reduce Greenhouse Gas (GHG) emissions. Notes certain credits should be emphasized more than others, no matter which rating system is used. Supports where development is at the higher range, additional green building features should certainly be expected. Wanting to focus on GHG reduction, recommends limiting the categories to energy efficiency, reusable and recycled building materials, emphasizing new projects for pedestrian orientation and alternative transportation strategies, and GHG emission reduction.</p>	<p>Staff notes the recommendation for ENERGY STAR, and for certain types of green building strategies to be emphasized. Staff also notes the recommendation for specific areas of emphasis. Areas of emphasis were discussed and identified at Environment Committee meetings. <u>Staff recommends discussion of the commenter’s suggestions by the Environment Committee.</u></p>	Discussed; no change made to Strawman text.
		Ross Shearer	<p>In policy c. energy efficiency is only one of many options, but commenter is concerned that it may not be chosen as it is more expensive than other options available. Last sentence is vague as how it would be applied.</p>	<p>Staff notes the comment. Without specifically emphasizing any credits/green building areas of emphasis or strategies, it is not possible to influence what credits or options are chosen by the builder. Staff feels that Mr. Shearer’s concern may be similar to that raised by Mr. Rigby (i.e., subjectivity/lack of specific thresholds). As noted in the response to Mr. Rigby’s comment, staff recommends further discussion with the Planning Commission Environment Committee regarding this concern.</p>	Discussed; no change made to Strawman text.
		Peter Rigby	<p>NAHB’s National Green Building Standard should be recognized explicitly as an acceptable residential green building rating system.</p>	<p>Staff notes that NAHB’s National Green Building Standard is currently accepted for use but is not explicitly stated in the policy - (this is also true for a few other residential systems). The Strawman language moves to a definition of acceptable systems instead of mentioning a specific system. This is done to keep the policy as current as possible – <u>listing a specific rating system which may change and no longer be eligible for use is not recommended.</u></p>	Discussed; no change made to Strawman text.

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		Linda Burchfiel	Instead of “encouraging commitments to monetary contributions,” commenter recommends all buildings or residential development (Policy c) that are approved contingent on a green rating system, a bond be required before construction is started. The bond will be held in trust and returned once the promised level of certification has been approved by a third party. If the building is not approved, the builder can choose to make the necessary changes or can forfeit the bond, which would then be applied to renewable energy or energy efficiency projects that the County chooses.	The commenter recommends a system of implementation which is currently in use for some development proposals. <u>No change is recommended.</u>	No change made to Strawman text.
		Brian Winterhalter	Establish later time frames for the LEED escrow than the timeframes currently being sought.	This is not a Plan policy issue but is instead an issue regarding details of an escrow-based mechanism that has been applied to implement the existing policy. DPZ staff has worked with DPWES staff to determine the latest time in the zoning/development process that an escrow should be posted (prior to the issuance of the building permit). While staff is interested in considering any enforceable mechanism for implementation of green building commitments, staff does not, at this time, support commitments that would result in the posting of escrow funds later than building permit issuance. <u>No change is recommended.</u>	No change made to Strawman text.
Policy d. Promote implementation of green building practices by encouraging commitments to monetary contributions in support of the county’s environmental initiatives, with such contributions to be refunded upon demonstration of attainment of certification under the applicable LEED rating system or equivalent rating system.	Policy d. Promote implementation of green building practices by encouraging commitments to monetary contributions in support of the county’s environmental initiatives, with such contributions to be refunded upon demonstration of attainment of certification under the applicable LEED rating system or equivalent rating system.	Ross Shearer	Require developers to post bonds to enforce commitments to green building. Forfeiture of the bond will result in the money being placed in a fund to further green building projects in Fairfax County.	The approach that is being suggested is a typical approach that has been applied within green building commitments (although funds that would be forfeited are typically tied to a county fund supporting environmental initiatives and not a narrower green building focus). It is not, however, the only approach to ensuring that green building commitments will be enforceable, and therefore staff does not support this proposal. It is staff’s view that applicants should have flexibility to suggest enforceable approaches. <u>No change is recommended.</u>	No change made to Strawman text.

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Policy e. Encourage energy conservation through the provision of measures which support nonmotorized transportation, such as the provision of showers and lockers for employees and the provision of bicycle parking facilities for employment, retail and multifamily residential uses.	Policy e. Encourage energy conservation through the provision of measures which support nonmotorized transportation, such as the provision of showers and lockers for employees and the provision of bicycle parking facilities for employment, retail and multifamily residential uses.	Bruce Wright	Commenter encourages strengthening policy, and notes that many people choose to commute by bicycle, but more would if there were better infrastructure both during and after the bicycle trips. Commenter feels that the LEED requirements are minimal and can lead to inadequate bike parking. Commenter also notes need for adequate and correctly located bike parking, and encourages staff to work with developers to provide adequate bike parking by providing proper guidance.	Staff notes the comment and feels that the commenter is raising a broader issue regarding bicycle-friendly design. <u>Staff has requested additional input from DOT staff and will update when it is received. No change is recommended.</u>	<u>DOT has recommended the following language, and the Committee agrees: "Encourage energy conservation through the provision of measures which support non-motorized transportation, such as the provision of showers and lockers for employees and the provision of secure short-term and long-term bicycle parking facilities for employment, retail, institutional, and multifamily residential uses."</u>
		Linda Burchfiel	Supports policy, notes infrastructure is vital to support bicyclists.	Staff notes the comment. <u>No change is recommended.</u>	No change made to Strawman text.
NO CORRESPONDING EXISTING PLAN TEXT.	<u>Policy f. Encourage private companies involved in public-private partnerships, where land is leased or provided by the County to meet or exceed County guidelines for green building certification.</u>	Oomer Syed	What is the role of this policy in government buildings (built/owned by government)?	The policy clarifies public-private partnership proposals, but local government buildings are built by Fairfax County under the Sustainable Development Policy for Capital Facilities. <u>Information item only, no change recommended.</u>	No change made to Strawman text.
		Peter Rigby	Revise to read "currently applicable" in reference to the applicable County guidelines.	All zoning applications are evaluated against current policies in place at the time. <u>Information item only, no change recommended.</u>	No change made to Strawman text.
		Gail Parker	Policy f. should set an example for business and residential to install solar panels on all County buildings or insist on renewable energy sources.	Staff recommends the discussion of solar panels on County buildings with the Environment Committee. <u>No change is recommended without discussion.</u>	No change made to Strawman text.

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		DPWES Building Design Branch	<p>The intent of Policy f is not clear to DPWES, and as written, DPWES believes that this paragraph should be deleted from the Strawman.</p> <p>DPWES notes that any development that is developed and/or operated by the County will fall under the Fairfax County Sustainable Development Policy already in place, while private development located on land owned by or leased from the County, or that is developed in partnership with the County, should be governed by the other sections of the Strawman to be consistent with expectations for any other private development.</p>	<p>There are different staff perspectives and potential options in addressing this policy. A concern has been raised for green building certification of adaptive re-use on County owned property. <u>Staff recommends that this matter be further explored through discussion with the Planning Commission Environment Committee.</u></p>	<p>Discussed; no change made to Strawman text.</p>
		DPWES Building Design Branch	<p>DPWES states that introducing a separate and higher threshold for sustainable development performance for private developers that work in partnership with the County adds a unique and undue burden to the private sector portion of a public-private partnership and that adding an additional, regulatory burden on the private development partner as a cost of doing business with the public (County), will add another layer of difficulty, cost and challenge to successfully implementing these partnerships.</p>	<p>There are different staff perspectives and potential options in addressing this policy. <u>Staff recommends that this matter be further explored through discussion with the Planning Commission Environment Committee and DPWES staff.</u></p>	<p>Discussed; no change made to Strawman text.</p>
		Linda Burchfiel	<p>Commenter strongly supports and notes that the County’s highest green building policy should apply to any projects on County land.</p>	<p>Staff notes support for policy. <u>No change is recommended.</u></p>	<p>No change made to Strawman text.</p>

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		Ross Shearer	Commenter is concerned that policy f. is too weak and forfeits opportunities for ensuring efficiency. Commenter notes that the County has the legal authority to require energy efficiency but that the policy only encourages it. Commenter wants LEED Gold with large posted bond as a minimum for private development on County land, and encourages LEED Platinum.	Staff notes the comment but questions whether the authority to require energy efficiency has been granted. Regardless, as this is a policy and not an ordinance, energy efficiency cannot be required by policy, only encouraged. <u>No change is recommended.</u> Staff notes the request to consider Gold and Platinum certification levels as a minimum expectation for development on county-owned property. There has not, in the past, been consideration of setting such expectations, and staff notes that such levels of green building performance would exceed the minimum expected level of performance for county facilities under the Sustainable Development Policy for Capital Facilities. <u>No change is recommended without discussion.</u>	Discussed; no change made to Strawman text.
		Fairfax County Federation of Citizens Associations	Commenter wants buildings to be designed to incorporate future potential for inclusion of alternative energy sources. Specifically, the commenter wants roofs to be designed to accommodate solar panels, and smart energy controls, specifically noting this is relevant to Policy f.	Staff recommends discussion with the Environment Committee of the potential for inclusion of Plan text encouraging building designs supporting future retrofits of alternative energy technologies. <u>No change is recommended without discussion.</u>	Discussed; no change made to Strawman text.
		Fairfax County Federation of Citizens Associations	Commenter wants a link to the County guidelines included in the Policy Plan, noting that the guidelines may change and should therefore not be incorporated in the Plan as they exist currently.	Staff notes the comment. Staff recommends clarification of the County guidelines in the wording of the policy but not linking to the guidelines <u>or referencing any specific set of guidelines (as the link and/or guidelines may also change)</u> . Specifically, the following change is suggested: <u>Policy f. Encourage private companies involved in public-private partnerships where land is leased or provided by the County to meet or exceed County guidelines for green building certification for capital projects.</u>	<u>Change made to Strawman text.</u>
NO CORRESPONDING EXISTING PLAN TEXT.	<u>Policy g. Encourage provision of charging stations and related infrastructure for electric vehicles within new development and redevelopment proposals- particularly for residential where other opportunities are not</u>	Peter Rigby	Policy g. appears to only refer to residential; it shouldn't be limited in this manner.	Staff notes that this policy does not only apply to residential development proposals. The language is intended to encourage consideration of these stations and infrastructure everywhere, but particularly in residential projects so as to not artificially constrain the market for such vehicles. Staff feels this is clear with the use of the word "particularly." <u>No change is recommended.</u>	No change made to Strawman text.

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	<u>available.</u>	Peter Rigby	Revise to clarify the intent is to encourage readiness for the charging stations and related infrastructure rather than the provision of the actual physical facilities.	<p>This recommendation is consistent with discussions by the Planning Commission’s Environment Committee, and therefore a revision consistent with this recommendation is suggested. Minor clarification revisions are also suggested. However, staff feels that the Environment Committee should discuss whether or not the Plan text should encourage both readiness for and provision of charging stations and related infrastructure, as there may be interest among some developers in establishing charging stations as part of their development proposals, and as the provision of small numbers of charging stations, particularly for residential development proposals where residents would have no other overnight charging options available, may be appropriate, perhaps as pilot projects, For now, staff suggests the following revision:</p> <p><u>Policy g. Encourage provision of readiness for charging stations and related infrastructure for electric vehicles within new development and redevelopment proposals, particularly for residential proposals where other vehicle charging opportunities are would not be available.</u></p>	<u>Change text to begin with “Encourage provision of or readiness for charging stations...”</u>
		DPWES Building Design Branch	DPWES notes that there are three different types of charging station (depending how fast to charge the vehicle), so is any particular type being encouraged? Another issue is who pays for the electricity used for charging.	Staff notes the information provided. No particular type is encouraged, and the issue raised regarding payment for the electricity has not been settled. <u>No change recommended without discussion.</u>	Discussed; no change made to Strawman text.

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		Marlae Schnare - Supervisor Herrity's Office	What is the cost of an electric vehicle charging station and related infrastructure?	<p>Installation costs vary from site to site. Such factors as distance from suitable electrical service, need for excavation, and desired station features can result in substantial differences in cost from one installation to another. For example, site preparation and installation may generally be more expensive for new surface lots than new garages, given that conduits would need to be buried under surface lots but could, at least in part, be attached to walls or ceilings of garages. For future charging stations for fleet use (not public access) at County facilities, the County's Department of Vehicle Services - (DVS) estimates (based on its review of articles, presentations, consultations with suppliers and other jurisdictions, and published equipment price lists) a typical equipment cost per charging station at about \$2,500-\$3,000 per unit plus typical site preparation and installation costs of about \$3,000-\$3,500 per station. Note that the per-unit site preparation/installation costs would likely be less for multiple stations at one site. The DVS estimate is for Level 2 charging stations. While most electric vehicles can recharge from a standard 120-volt electrical outlet, Level 2 equipment provides a 240-volt connection with higher current flows, thereby reducing charging time by more than half. For a battery with a 100-mile range (e.g., the Nissan Leaf), a full charge would be reached in about 3-5 hours with a Level 2 charging station, as opposed to 8-15 hours from a straight 120-volt outlet or a Level 1 charging station. Charging stations (Level 1 or Level 2) can also provide safety and control features that may not be available when using a straight outlet.</p> <p>Site preparation and installation costs can be reduced substantially if original construction includes preparations for electric-vehicle readiness without the immediate provision of the charging stations. Such preparations would be relatively low-cost during initial construction but more expensive as retrofits. They would involve such measures as the provision of raceways and conduits for later installation of wiring for charging stations (or oversized channels if charging station wiring added later would use the same routes as original wiring) and space and geometry for additional transformers and for the stations themselves, allowing for an easier future installation of charging stations. The MITRE Corporation is estimating that it would cost an additional \$1,800 per space for conduit installation for a new surface lot and an additional \$400 per space for such construction for a new garage lot (as opposed to per space additional costs of \$2,900 and \$1,200 for retrofits to existing surface and garage lots). <u>Information item only, no change recommended.</u></p>	No change made to Strawman text.

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		Marlae Schnare - Supervisor Herrity's Office	How many electric vehicle charging stations and related infrastructure are in the County and where are they located?	The U.S. Department of Energy's Alternative Fuels and Advanced Vehicles Data Center Fueling Station Locator website identifies five public charging stations in Fairfax County (one in the Herndon area (CIT), one in Chantilly, and three in Tysons Corner (including two at the same address) and one station each in Alexandria/Landmark, Falls Church, and Fairfax City. It is our understanding that the data on this website is voluntary/self-initiated, so there may be additional stations that are not identified. We're aware, for example, of a charging station at the Navy League Building in the Courthouse area of Arlington and have read that two stations have been established at the Potomac Overlook Regional Park in Arlington—these are not identified on the DOE website, so there could be others out there as well. We do not know how many charging stations have been established at residential locations (either single family or multifamily) or other private charging stations. County staff is in the process of seeking Energy Efficiency and Conservation Block Grant money to install 10 charging stations at County facilities to support County plug-in vehicles. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.

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		DPZ Staff	As discussed during previous Planning Commission’s Environment Committee meetings, consider inclusion of language to support readiness for charging stations and related infrastructure for electric vehicles; this could be done either instead of or in addition to language supporting provision of the stations and infrastructure.	See the earlier suggestion in response to a similar comment from Peter Rigby.	No change made to Strawman text.
		Fairfax County Federation of Citizens Associations	Commenter feels policy should not just be applied to multi-family residential structures, but also office and commercial parking lots, noting time spent at an office would allow for charging, and charging stations may encourage shoppers to stay longer in retail locations.	Staff notes that this policy does not only apply to residential development proposals. The language is intended to encourage consideration of these stations and infrastructure everywhere, but particularly in residential projects so as to not artificially constrain the market for such vehicles. <u>No change is recommended.</u>	No change made to Strawman text.

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Green Building Policy Review – Comment Compilation, Staff Response, and Planning Commission Environment Committee (P.C. E.C.) Response, revised November 29, 2012

Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
<p>NO CORRESPONDING EXISTING PLAN TEXT.</p>	<p><u>Policy h. Encourage recording of aggregated energy and water consumption data for a defined period of time following construction for use in monitoring and evaluating performance of green building strategies and technology.</u></p>	<p>DPWES Building Design Branch</p>	<p>The goal of collecting this data and the DPZ strategy for evaluating the data is unclear. If this section is retained in the Strawman, DPWES recommends that the developer be required to provide the data, “upon request from the County (DPZ)”. DPWES notes that there are many variables that effect energy consumption and the ability to analyze actual consumption data in a rational way. Post occupancy energy consumption and conservation analyses need to account for these varying factors, as well as considering the pertinent energy benchmark for comparison.</p>	<p>Staff notes the information in this comment. At the time of the Strawman, the goal of collecting the data was still unclear and further discussions are considered necessary. <u>No change is recommended until further discussion.</u></p>	<p><u>Discussed; Strawman language changed: “Encourage and participate in periodic regional and local evaluations of the outcomes achieved through the application of sustainable land use principles and technology, in coordination with the energy and resources providers and industry. Such evaluations should be based on pooled, anonymous-source data, and should provide information helpful in decisions regarding the costs and benefits of green practices, including evaluations focused on innovative approaches and technology.”</u></p>
		<p>Linda Burchfiel</p>	<p>Commenter feels that while there could be advantages to monitoring, there could also be limited benefit to comparing data from a wide variety of individual buildings, because of the many variables involved. The commenter also notes that there may be national standards available in the next few years and recommends waiting until such standards are available. The commenter also recommends encouraging recertification of building standard every 3 years rather than monitoring.</p>	<p>Staff notes the information in this comment. At the time of the Strawman, the goal and benefits of collecting the data were still unclear and further discussions are considered necessary. <u>No change is recommended until further discussion.</u></p> <p>Staff notes the comment regarding national standards and <u>recommends discussion of this topic.</u></p> <p>Staff also notes the comment regarding recertification of buildings every three years rather than monitoring. Staff feels that there are benefits to existing building green certification (e.g., LEED-EB, which addresses the operation and maintenance of existing buildings) but feels that such certifications need to occur outside of the context of the zoning process and that the Plan text that is considered through this review should focus on commitments that should be considered during that process. Therefore, <u>no change is recommended.</u></p>	<p>Discussed, see change above.</p>

Green Building Policy Review – Comment Compilation, Staff Response, and Planning Commission Environment Committee (P.C. E.C.) Response, revised November 29, 2012

Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
		Fairfax County Federation of Citizens Associations	What happens if a building's measured water and energy usage data fall short of expectations? What are the ramifications?	Staff notes the comment and concern about building performance failure. At this time, it is envisioned that information would be obtained solely for informational purposes to determine what the actual green building performance would be and not for any punitive actions. As such, there would be no ramifications. <u>No change is recommended.</u>	No change made to Strawman text.
		Roger Diedrich	Commenter believes a better definition of what is to be gained with monitoring is needed, as well as a comprehensive, structural approach to monitoring. Would there be a database with monitoring information?	Staff notes the comment and <u>recommends further discussion.</u>	Discussed, see change above.
		Marlae Schnare - Supervisor Herrity's Office	Who provides the data on energy and water consumption – how is it obtained?	The account holder would be providing the information on the energy and water usage. Dominion and Washington Gas are private companies and will not release that data to anyone other than the account holder. Usage information can be requested through the Freedom of Information Act from Fairfax Water, but they prefer that the account holder provide the information. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	What is the cost to the applicant (in resources and time) to obtain this data?	The applicant would not be responsible for obtaining or providing the data unless they are the account holder. In that case, it is a matter of consolidating the usage data provided on the bills. The applicant may proffer to provide the data from multiple account holders if they are able to obtain that data from the other account holders. Again, this is a matter of consolidating the data already provided on the bills. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	What is the cost of a meter that is referenced throughout the PC Environment Minutes?	Staff believes the meters referenced are the ones that are already installed for the utility company to measure usage. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	Once this data is collected, who is responsible for analyzing the data?	This question is still up for discussion. It has been discussed in the past, and no consensus of was reached. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	If the County intends to analyze the data, what is the County's cost to do this?	This question is still up for discussion. It has been discussed in the past, and no consensus reached. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.

Green Building Policy Review – Comment Compilation, Staff Response, and Planning Commission Environment Committee (P.C. E.C.) Response, revised November 29, 2012					
Existing Plan Text	Strawman Proposal	Commenter	Comment	Staff Analysis/Response	P.C. E.C. Response
		Marlae Schnare - Supervisor Herrity's Office	If the applicant is required to analyze the data, what is the cost to the applicant for this analysis?	Staff does not have an estimate. It is anticipated this would vary by case and project. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	What is the County planning on doing with this data? (for example, like USGBC is creating a database)	This question is still up for discussion. It has been discussed in the past, and no consensus was reached. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	What is the "defined period of time?"	This is under discussion. Staff does not believe a specific time was set as it would be determined on a case-by-case basis with the applicant. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	If the "defined period of time" is different for each applicant, what are the criteria you are using to determine the "defined period of time?"	It would be determined by the specifics of the case, as are all proffered commitments. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	Will this only be for LEED buildings or all buildings that are using a system (e.g., Earthcraft or Green Globes)?	That is under discussion with the Environment Committee. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	If the building is not performing to its initial modeling, what action, if any, can or will the County take?	At this time, it is envisioned that information would be obtained solely for informational purposes to determine what the actual green building performance would be and not for any punitive actions. As such, there would be no ramifications. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	How can or will the County keep this information private? Wouldn't this information be available to the public if provided to the County?	That is under discussion with the Environment Committee. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
		Marlae Schnare - Supervisor Herrity's Office	By asking for this information from the applicant, will we be asking for proprietary information?	In the revisions of the draft Strawman, one revision suggested the language "aggregated non-proprietary." That was removed at a subsequent committee discussion. There is no intent for any proprietary information to be shared. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.

Additional comments applicable to multiple portions of the text or comments not tied to specific text

Commenter	Comment	Staff Analysis/Response	Environment Committee Response
Oomer Syed	Does this policy apply to by-right development?	No, the Comprehensive Plan is a guidance document and not a regulatory document. Therefore, by-right development would not be affected. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Oomer Syed	Currently projects are reviewed for stormwater with LEED (credits 6.1 and 6.2) during the zoning process (in DPZ) and with the PFM at site plan (with DPWES). More consistent stormwater reviews are needed. LEED should be sufficient.	The criteria during the zoning process (LEED certification) and site/building plan (code/PFM) are separate and have separate goals. The zoning process seeks commitment to a green building standard, and the site/building plan review seeks compliance with code. Both reviews are necessary. <u>No change is recommended.</u>	No change made to Strawman text.
Stella Koch	Consider bird friendly design.	Staff recommends the discussion of bird friendly design with the Environment Committee. <u>No change is recommended without discussion.</u>	Discussed, no change made to Strawman text.
Fairfax County Federation of Citizens Associations	What is the purpose of this policy? Specifically, how are objectives balanced? Commenter feels policy needs a clear statement of purpose.	Staff feels that the existing text in Objective 13 of the Policy Plan provides the context for the existing policies that follow and for this Strawman Plan amendment: "Design and construct buildings and associated landscapes to use energy and water resources efficiently and to minimize short- and long-term negative impacts on the environment and building occupants." However, in response to this comment, staff also recommends the discussion of policy objectives with the Environment Committee. <u>No change is recommended without discussion.</u>	No change made to Strawman text.
Fairfax County Federation of Citizens Associations	It can take years to get LEED certification in some cases. What happens if a building does not achieve the expected rating? What are the ramifications?	If the building does not achieve the proffered level of green building certification, then the outcome is determined by the proffer (e.g. forfeiture of green building escrow). The ramifications of the failure to achieve the green building rating are determined by the individual proffer associated with the project. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Ross Shearer	Comments on purpose of policy, specifically if Fairfax desires to be a promoter of the status quo or a leader in green building. Commenter notes that this policy should be focused on Fairfax County promoting efficiency and waste avoidance, by using available technologies to reduce energy dependence.	Staff recommends discussing the purpose and focus of the policy with the Environment Committee. <u>No change is recommended without discussion.</u>	No change made to Strawman text.
Ross Shearer	Commenter recommends the policy place greater emphasis on energy efficiency and conservation.	Staff recommends the discussion of policy objectives and energy efficiency and conservation goals with the Environment Committee. <u>No change is recommended without discussion.</u>	No change made to Strawman text.
Ross Shearer	Emphasize Cool Counties Declaration, and how this green building policy can assist in reducing GHG emissions.	Staff recommends the discussion of Cool Counties/GHG emissions goals with the Environment Committee. <u>No change is recommended without discussion.</u>	No change made to Strawman text.
Ross Shearer	Promote information on energy use, specifically energy monitoring systems. Commenter wishes to extend language to create a public inventory of energy use by commercial leased space (annual BTUs per leased sq. ft.).	An inventory of countywide greenhouse gas emissions is being prepared. If guidance is desired on the details of this inventory, the Fairfax County Environmental Coordinator should be consulted. Staff does not feel that Comprehensive Plan policy language should focus on county programmatic efforts such as this inventory. Staff recommends the discussion of energy/performance monitoring goals with the Environment Committee. <u>No change is recommended without discussion.</u>	No change made to Strawman text.
Ross Shearer	Did discussion of costs associated with green buildings also address the benefits and savings?	Yes, costs as well as benefits have been discussed. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Ross Shearer	The purpose of the review is to "assess the efficacy of the policy" after two years. The commenter notes this information is not in the Strawman, and neither is any stated actions.	The commenter is correct that specific numbers or actions are not in the Strawman. Specific numbers were discussed during initial conversations with the Planning Commission's Environment Committee. The efficacy of the policy is being assessed in general terms, meaning what is working in the policy and what needs to be modified for the policy to continue to generate green building commitments. <u>No change is recommended.</u>	No change made to Strawman text.

Commenter	Comment	Staff Analysis/Response	Environment Committee Response
Ross Shearer	The words "encourage," "ensure," and "promote" are relied on exclusively and interchangeably, even where there are opportunities to set policy requirements.	As this is not an ordinance, but is instead a policy, it is unable to set requirements. Policies can only encourage goals and objectives to be met. <u>No change is recommended.</u>	No change made to Strawman text.
Ross Shearer	Commenter feels that the planning process should describe the impacts and experiences of the existing policy and also describe specific actions such as how developers will be "encouraged," and how green buildings will be "promoted," and how the public will be educated and the nature of the assurances.	Staff notes the comment. The policy serves as a framework that provides guidance. Typically the policy does not contain specifics such as the suggestions that are referenced in the comment, as these specifics can change over the time the policy is implemented. Staff can share information on current implementation practices; however it is not recommended that implementation information be incorporated into the policy. <u>No change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wishes to see minutes of the PC environment committee meetings and a list of the attendees for each meeting where the green building policy was discussed.	The meetings of the Planning Commission Environment Committee where this was discussed were on: 11/19/09, 1/28/10, 3/25/10, 6/24/10, 7/22/10, 9/30/10, 12/2/10, 1/19/11, 2/24/11, 4/14/11, 4/28/11, and 5/26/11. The minutes taken by the Clerk to the Planning Commission and are available online: http://www.fairfaxcounty.gov/planning/committee_minutes.htm . Information item only, no change is recommended.	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants information on the outreach that was done to builders, developers, community groups, and citizens, as well as their affiliations, during the proposal development process.	The PC Environment Committee recognized a need for broad stakeholder review and input but first wanted to develop a Strawman draft to serve as a basis for discussion. At the committee's direction, EQAC was notified of each meeting. In addition, all committee meetings have been posted on the County's public meeting calendar and on the Planning Commission's website. Broader outreach efforts have not been pursued until now. However, it is staff's perspective that the Strawman represents a starting point for the discussion and not an endpoint; the Strawman draft is intended to serve as a vehicle through which a broader stakeholder discussion can be facilitated. As noted in the Strawman (the bold and underlined section on page 1), this is a preliminary working document, and no positions are considered to be final. Indeed, staff anticipates that revisions will need to be made based on the stakeholder discussions. Staff anticipates that the PC Environment Committee will take whatever time it feels necessary to collect and review stakeholder comments and to revise the draft amendment in advance of forwarding a recommendation to the full Planning Commission (and ultimately a recommendation to the Board of Supervisors for the advertisement of an amendment). Stakeholder meetings were held in July and September; the next meeting is scheduled for November 17, 2011, and additional meetings will be planned as needed. A list of the stakeholders notified to attend these meetings is available. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants a list of applications, plans, and associated contacts for zoning proposals that have made LEED commitments since the adoption of the original green building policy.	This list can be provided. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants information on the amount of money in escrow as a result of LEED commitments obtained during the zoning process.	Staff has requested an update to this item, and will include it when received. As of 7/6/11, there were two commitments to LEED (SEA 89-L-080 and SE 2007-MA-034), with a total escrow of \$93,000. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants information on alternative language that was considered during the Strawman development, and a rationale for that language.	All revisions and reasons for these changes are detailed in the pages 7-9 of the draft Strawman (the "Comprehensive List of Changes (as of July 7, 2011)"). Additionally, the minutes for the Environment Committee meetings detail the changes requested and the discussions surrounding these recommendations. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.

Commenter	Comment	Staff Analysis/Response	Environment Committee Response
Marlae Schnare - Supervisor Herrity's Office	Commenter wants a list of strategies, plans, laws, and statues that were considered as a model for the language in the Strawman. Commenter specifically references the addition of the text: "Many jurisdictions are now engaging in community energy planning and other strategies to best use available resources."	As this process is a review of an existing policy, the original research which informed the discussions and adopted policy in 2007 was not repeated. However, the Planning Commission Environment Committee did request extensive research during the review discussions held from November 2009 onward which informed the Environment Committee as it considered possible revisions for inclusion in the Strawman draft. A list of the questions and staff responses can be provided if there is interest. The specific sentence referenced was crafted by Commissioner Sargeant, who, in his capacity as an employee of Dominion Electric, is aware of many community energy plans. As this sentence was added to the policy upon his request and at the concurrence of the Environment Committee, staff was not asked to do the research to support this statement. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants estimates of the benefits and costs incurred. Commenter requests information on Fairfax County LEED certifications (NC, CS, Homes).	Staff can provide national data, as that is the only data with enough measurements to be statistically valid. Developers who have worked in Fairfax County may be willing to share their proprietary data regarding their costs and benefits; however this data has not been shared with staff. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants average estimates of costs incurred by staff in addressing green building commitments when processing zoning applications.	It would be difficult to produce an average estimate of costs incurred by staff in addressing green building commitments. Every case is different, and as this policy is no different than other policies or guidance in our Comprehensive Plan (e.g. stormwater management, Environmental Quality Corridors, transportation), it would be difficult to answer how much time is spent to work with the applicant on green building issues as compared to EQC or stormwater issues or any of the other concerns that arise during the zoning evaluation process. However, over the last few years staff has developed many prototype proffers for consideration by applicants. It is fair to say that the "average" time spent on green building considerations is greatly reduced now than was the case when the policy was first adopted in 2007, recognizing that case-by-case variability remains. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter feels that this policy is beginning to look more like an ordinance than a policy and wants to know why the County is not drafting a green building ordinance/code. Commenter wants to know if it is possible to adopt such an ordinance, including one that referenced LEED as is done in the policy plan.	Staff has used language consistent with the guidance in other policies (i.e. using words like "encourage" rather than "require") and this language is intended to guide reviews of zoning applications. Staff has not, to date, been asked by the Board of Supervisors to consider the development of ordinance requirements. Staff is not aware of legislative authority for a green building ordinance. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants an update on the International Green Code Construction (IgCC) and how it would relate to this Policy Plan if the IgCC were to be adopted in Virginia.	Version two of the IgCC is currently in the final stages of review. This code is an overlay to existing building codes which are adopted by the state of Virginia in the Uniform Statewide Building Code (USBC). The IgCC is not currently part of the USBC in Virginia and is not anticipated to be part of the next three year review process, which would be adopted in March 2014. The Commonwealth of Virginia has the ability to, and generally does, modify the code from the national version to one that is adopted by the state, removing and adding portions as deemed appropriate. If the IgCC was to be adopted by Virginia in the next round (to be adopted in 2017) it is difficult to say how it might relate to our policy as it is extremely likely that both green building ratings systems and the IgCC as adopted by Virginia would have changed in the interim. If the IgCC is adopted by Virginia, staff would certainly review the code and determine its impact on our policy. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.
Marlae Schnare - Supervisor Herrity's Office	Commenter wants information on what legal issues were raised in regard to referencing LEED in codes, statutes, or policy plans. Wants information on whether there were discussions regarding a lawsuit against the USGBC for false advertising or other litigation regarding LEED/green building.	The only issue that was discussed by the Planning Commission's Environment Committee was the desire to be open to as many rating systems as possible, recognizing that many have merit and to leave the choice to the developer of the property. The Environment Committee also wished to clarify "equivalent" so that developers would have more assurance if the system they wished to use would be eligible. It was noted that Fairfax County's Sustainable Development Policy for Capital Facilities (for County-owned and built buildings) requires LEED and does not offer the option to use an equivalent. <u>Information item only, no change is recommended.</u>	No change made to Strawman text.

Commenter	Comment	Staff Analysis/Response	Environment Committee Response
Fairfax County Federation of Citizens Associations	<p>Commenter feels the guidance regarding levels of green building performance tied to the receipt of higher development intensity/density are too vague. Commenter suggests the applicant proffer to a level of performance which will be guaranteed by a bond requiring the applicant to validate performance based on two years of data. The commenter suggests the policy plan should outline specific standards for performance which correlate to expected levels of LEED certification attainment.</p>	<p>Staff feels that the existing and Strawman draft text provide an appropriate level of specificity but recognizes that further discussion by the Planning Commission's Environment Committee would be desirable.</p> <p>With respect to the concept of a green building bond, the proposed approach is similar to a green building escrow enforcement mechanism that has been incorporated within many of the proffered commitments that have been received to date; however, the release of the escrow has been tied to attainment of green building certification and not building performance based on data recorded over a certain period of time. Staff also notes the recommendation to correlate performance with LEED certification, however it is difficult to quantify LEED certification as many different paths may be chosen to achieve the same certification level and performance in any particular area will vary based on the options chosen. <u>No change is recommended.</u></p>	No change made to Strawman text.
Becky Cate	<p>Commenter feels that if the policy is used to grant increased FARs, stormwater standards should exceed being "no worse than it was for the property prior to construction" as that is too vague and may not result in improved stormwater control. Commenter recommends enhancing stormwater runoff control according to a formula and recommends a 20-year storm event as a standard. Commenter also recommends a requirement to have the release of captured water done over time that is less than the 1 year event.</p>	<p>Staff recommends the discussion of stormwater goals with the Environment Committee. <u>No change is recommended without discussion.</u></p>	No change made to Strawman text.
Larry Zaragoza	<p>The Strawman seems to be wide open accepting all kinds of things. The problem is that the standard seems to be unclear. LEED Silver is a low threshold. Seems like we might accept less than that with this Strawman?</p>	<p>Staff notes the comment. At this time, Tysons Corner is the only area of the County to have a LEED Silver expectation (for commercial buildings. Proposed Strawman changes to Policy a would, however, establish an expectation, countywide, for higher levels of green building performance for development proposals seeking exceptional intensity or density (e.g., 90 percent or more of the maximum planned density or intensity). <u>Staff recommends further discussion of this concern with the Planning Commission's Environment Committee.</u></p>	No change made to Strawman text.

Green Building Comprehensive Plan Policy Review Strawman November 29, 2012

INTRODUCTION

At the time of the initial Green Building Policy adoption in December 2007, the Planning Commission was directed to review the policy after two years to assess the efficacy of the policy as well as to determine if any revisions were necessary, given that the green building field is rapidly evolving.

To begin this review, in November 2009 staff and the Planning Commission's Environment Committee began a series of discussions to identify issues associated with the use and implementation of the policy. These issues reflected staff's experience with using the policy for two years, as well as changes to the rating systems and technological evolutions in the green building field.

The Environment Committee and staff discussed these issues from November 2009 through June 2011. Department of Planning and Zoning (DPZ) staff researched items of interest and other County staff from the Department of Public Works and Environmental Services (DPWES) provided expertise on various issues. During this process, the Planning Commission's Environment Committee expressed the expectation that these discussions would lead to an amendment of the current Green Building Policy Plan language.

A first draft of a Strawman of the potential policy language was prepared in July 2011, with two public meetings held to allow for stakeholder input. After the stakeholder input was received, staff prepared a comment response document, which was then reviewed with the Environment Committee in a series of meetings from November 2011 through October 2012. At the conclusion of those meetings, a second draft Strawman (this document) was prepared, detailing potential changes to the policy language that reflect stakeholder input and Environment Committee discussion and recommendations.

As a disclaimer, staff wishes to stress that this document has been prepared by staff of the Planning Division of the Department of Planning and Zoning as a working document intended to reflect Environment Committee guidance on the development of a draft Plan Amendment that would be advertised for further consideration through the public hearing process. Revisions incorporated herein do not necessarily reflect positions of the committee; some revisions are being suggested in order to provide flexibility for consideration of a range of options during the public hearing process. Additional public comment will be sought through that process.

Summary of Current and Draft Policy Language, as of November 29, 2012:

Current Policy

- Applies to development and redevelopment.
- Encourages commitments to the U.S. Green Building Council (USGBC)'s Leadership in Energy and Environmental Design (LEED) rating system OR the equivalent.
- Encourages commitments to ENERGY STAR qualification for homes and creates an expectation for such commitments when zoning proposals seek development at the high end of the plan density range.
- Creates an expectation for green building commitments (LEED certification or equivalent) for zoning proposals for nonresidential development and for multifamily residential development of four or more stories in Tysons, Suburban Centers, Community Business Centers and Transit Station Areas when the zoning proposals seek one of the following:
 - Development in accordance with Plan options
 - Development involving a change in use from what would be allowed under existing zoning
 - Development at the Overlay Level
 - Development at the high end of the planned density/intensity range.

Draft Policy

The preliminary draft policy language proposes the following changes:

- Clarifying the emphasis of the policy to be on individual buildings, not site/neighborhood design.
- Adding support for reuse of and for greening/retrofitting existing buildings.
- Adding language to encourage energy and water usage data collection and performance monitoring, as well as participation in regional and local evaluations of outcomes.
- Adding language to encourage the use of natural lighting.
- Defining “equivalent” in reference to green building rating systems.
- Adding support for higher levels of green building performance when proposed developments have relatively high levels of intensity or density (both residential and non-residential).
- Updating the range of residential green building rating systems available for use, recognizing the more comprehensive systems now available, and revising the related policy to focus more holistically on green building design and not just ENERGY STAR Qualification.
- Adding Industrial Areas to the areas of the County with an expectation for a green building commitment.
- Clarifying expectations for public-private partnerships.
- Adding support for infrastructure for alternative fuel vehicles.

DRAFT POLICY PLAN LANGUAGE

Staff presents for discussion language detailing revisions to the Fairfax County Comprehensive Plan, 2011 Edition, Policy Plan, Environment Section as amended through July 27, 2010, pages 19 through 21, as follows. To identify changes from the adopted Plan, changes made are shown with either an underline (new draft text) or ~~strikethrough~~ (deleted text).

The changes shown in this document reflect the differences between the current plan guidance (adopted in December 2007), and the revisions suggested during the Environment Committee's review of the comment response document (dated November 8, 2011, as revised November 29, 2012). The changes suggested by the original draft Strawman (dated July 7, 2011) are incorporated into this document only to the extent that they have been carried forward per the Environment Committee's review of the comment response document. The changes that have been made to the July 7, 2011 strawman draft are identified on the revised comment response document (dated November 29, 2012).

“RESOURCE CONSERVATION AND GREEN BUILDING PRACTICES

The energy shortage in the United States in the 1970s highlighted the finite nature of our natural resources. Since the 1970s, efforts have been pursued at the federal level to enhance energy efficiency and the efficient use of water resources. While such efforts are best addressed at the federal level, local efforts to conserve these resources should be encouraged. Recent and foreseeable events and trends have highlighted the increasing need for energy and resource conservation and efficiency, greenhouse gas reduction and green building practices. Many jurisdictions are now engaging in community energy planning and other strategies to best use available resources.

The “green building” concept provides a holistic approach to the reduction of adverse environmental impacts associated with buildings and their associated facilities and landscapes.

Objective 13: Design and construct buildings and associated landscapes to use energy and water resources efficiently and to minimize short- and long-term negative impacts on the environment and building occupants.

Policy a. In consideration of ~~Consistent with~~ other Policy Plan objectives, encourage the application of energy conservation, water conservation and other green building practices in the design and construction of new development and redevelopment projects. These practices may ~~can~~ include, but are not limited to:

- Environmentally-sensitive siting and construction of development;
- Application of low impact development practices, including

minimization of impervious cover (See Policy k under Objective 2 of this section of the Policy Plan);-

- Optimization of energy performance of structures/energy-efficient design;:-
- Use of renewable energy resources;:-
- Use of energy efficient appliances, heating/cooling systems, lighting and/or other products;:-
- Application of best practices for water conservation, techniques such as water efficient landscaping and innovative wastewater technologies, that can serve to reduce the use of potable water and/or reduce stormwater runoff volumes;:-
- Reuse of existing building materials for redevelopment projects;:-
- Recycling/salvage of non-hazardous construction, demolition, and land clearing debris;:-
- Use of recycled and rapidly renewable building materials;:-
- Use of building materials and products that originate from nearby sources;:-
- Reduction of potential indoor air quality problems through measures such as increased ventilation, indoor air testing and use of low-emitting adhesives, sealants, paints/coatings, carpeting and other building materials;:-
- Reuse, preservation and conservation of existing buildings, including historic structures;:-
- Retrofitting of other green building practices within existing structures to be preserved, conserved and reused;:-
- Energy and water usage data collection and performance monitoring;:-
- Consideration of Solid waste and recycling management practices;
- Natural lighting for occupants.

Encourage commitments to implementation of green building practices through certification under established green building rating systems for individual buildings (e.g., the U.S. Green Building Council's Leadership in Energy and Environmental Design for New Construction [LEED-NC®] or the U.S. Green Building Council's Leadership in Energy and Environmental Design for Core and Shell [LEED-CS®]) program or other comparable equivalent programs with third party certification. An equivalent program is one that is independent, third-party verified, and has regional or national recognition or one that otherwise includes multiple green building concepts and overall levels of green building performance that are at least similar in scope to the applicable LEED rating system. Encourage commitments to the attainment of the ENERGY STAR® rating where applicable and to ENERGY STAR qualification for homes. available. Encourage certification of new homes through an established residential green building rating system that incorporates multiple green building concepts and has a level of energy performance that is comparable to or exceeds ENERGY STAR qualification for homes. Encourage the inclusion of professionals with green building accreditation on development teams. Encourage commitments to the provision of information to owners

of buildings with green building/energy efficiency measures that identifies both the benefits of these measures and their associated maintenance needs.

Policy b. *[Within the Tysons Corner Urban Center, Suburban Centers, Community Business Centers, Industrial Areas and Transit Station Areas as identified on the Concept Map for Future Development, unless otherwise recommended in the applicable area plan,]*** Ensure that zoning proposals for nonresidential development and or zoning proposals for multifamily residential development of four or more stories within the Tysons Corner Urban Center, Suburban Centers, Community Business Centers and Transit Station Areas as identified on the Concept Map for Future Development incorporate green building practices sufficient to attain certification through the LEED-NC or LEED-CS program or its an equivalent program specifically incorporating multiple green building concepts, where applicable, where these zoning proposals seek at least one of the following:

- Development in accordance with Comprehensive Plan Options;
- Development involving a change in use from what would be allowed as a permitted use under existing zoning;
- Development at the Overlay Level; or
- Development at the high end of planned density/intensity ranges. For nonresidential development, consider the upper 40% of the range between by-right development potential and the maximum Plan intensity to constitute the high end of the range.

Where developments with exceptional intensity or density are proposed (e.g. at 90 percent or more of the maximum planned density or intensity), ensure that higher than basic levels of levels of green building certification are attained.

*** The issue of equity across geography in regards to uses was a topic of discussion subsequent to the completion of the response document in November 2011. One potential solution to this concern would be to remove the geographic differentiation from the policy, thereby establishing consistent recommendations that would apply to all uses meeting the bulleted criteria, regardless of the locations of these uses. The Environment Committee preferred to have this issue receive public feedback prior to making a decision on whether to remove the geographic areas of expectation or to leave policy b as it currently is. The bracketed and italicized language in policy b could be removed to offer maximum flexibility for the advertisement of the draft guidance. It should be stressed that, if this is done for the purpose of advertisement, it would not signal an endorsement of a broadening of the application of this policy guidance—it would be done for the purpose of maximizing flexibility to consider a range of options during the public hearing process.*

- Policy c. Ensure that zoning proposals for residential development that are not otherwise addressed in Policy b above will incorporate green building practices sufficient to attain certification under an established residential green building rating system that incorporates multiple green building concepts and that includes an qualify for the ENERGY STAR Qualified Homes designation or a comparable level of energy performance, where Where such zoning proposals seek development at or above the mid-the high-end point of the Plan density range, and where broader commitments to green building practices are not being applied ensure that County expectations regarding the incorporation of green building practices are exceeded in two or more of the following measurable categories: energy efficiency; water conservation; reusable and recycled building materials; pedestrian orientation and alternative transportation strategies; healthier indoor air quality; open space and habitat conservation and restoration; and greenhouse gas emission reduction. As intensity or density increases, the expectations for achievement in the area of green building practices would commensurately increase.
- Policy d. Promote implementation of green building practices by encouraging commitments to monetary contributions in support of the county’s environmental initiatives, with such contributions to be refunded upon demonstration of attainment of certification under the applicable LEED rating system or equivalent rating system.
- Policy e. Encourage energy conservation through the provision of measures which support nonmotorized transportation, such as the provision of showers and lockers for employees and the provision of secure short-term and long-term bicycle parking facilities for employment, retail, institutional, and multifamily residential uses.
- Policy f. Encourage private companies involved in public-private partnerships, where land is leased or provided by the County to meet or exceed County guidelines for green building certification for capital projects.**
- **For the purposes of advertising, policy f is also left unchanged. However, the Committee did not reach a consensus on how this policy should be worded, and if “exceed” should be included. The Committee wishes to receive public input on this question; therefore, “exceed” is being suggested for retention for the purpose of advertisement.*
- Policy g. Encourage provision of or readiness for charging stations and related infrastructure for electric vehicles within new development and redevelopment proposals, particularly for residential where other opportunities are not available.

Policy h. Encourage and participate in periodic regional and local evaluations of the outcomes achieved through the application of sustainable land use principles and technology, in coordination with the energy and resources providers and industry. Such evaluations should be based on pooled, anonymous-source data, and should provide information helpful in decisions regarding the costs and benefits of green practices, including evaluations focused on innovative approaches and technology.

CLEAN COPY OF DRAFT STRAWMAN GUIDANCE

RESOURCE CONSERVATION AND GREEN BUILDING PRACTICES

The energy shortage in the United States in the 1970s highlighted the finite nature of our natural resources. Since the 1970s, efforts have been pursued at the federal level to enhance energy efficiency and the efficient use of water resources. While such efforts are best addressed at the federal level, local efforts to conserve these resources should be encouraged. Recent events and trends have highlighted the increasing need for energy and resource conservation and efficiency, greenhouse gas reduction and green building practices. Many jurisdictions are now engaging in community energy planning and other strategies to best use available resources.

The “green building” concept provides a holistic approach to the reduction of adverse environmental impacts associated with buildings and their associated facilities and landscapes.

Objective 13: Design and construct buildings and associated landscapes to use energy and water resources efficiently and to minimize short- and long-term negative impacts on the environment and building occupants.

Policy a. In consideration of other Policy Plan objectives, encourage the application of energy conservation, water conservation and other green building practices in the design and construction of new development and redevelopment projects. These practices may include, but are not limited to:

- Environmentally-sensitive siting and construction of development;
- Application of low impact development practices, including minimization of impervious cover (See Policy k under Objective 2 of this section of the Policy Plan);
- Optimization of energy performance of structures/energy-efficient design;
- Use of renewable energy resources;
- Use of energy efficient appliances, heating/cooling systems, lighting and/or other products;
- Application of best practices for water conservation, such as water efficient landscaping and innovative wastewater technologies, that can serve to reduce the use of potable water and/or reduce stormwater runoff volumes;
- Reuse of existing building materials for redevelopment projects;
- Recycling/salvage of non-hazardous construction, demolition, and land clearing debris;
- Use of recycled and rapidly renewable building materials;

- Use of building materials and products that originate from nearby sources;
- Reduction of potential indoor air quality problems through measures such as increased ventilation, indoor air testing and use of low-emitting adhesives, sealants, paints/coatings, carpeting and other building materials;
- Reuse, preservation and conservation of existing buildings, including historic structures;
- Retrofitting of other green building practices within existing structures to be preserved, conserved and reused;
- Energy and water usage data collection and performance monitoring;
- Solid waste and recycling management practices;
- Natural lighting for occupants.

Encourage commitments to implementation of green building practices through certification under established green building rating systems for individual buildings (e.g., the U.S. Green Building Council's Leadership in Energy and Environmental Design for New Construction [LEED-NC®] or the U.S. Green Building Council's Leadership in Energy and Environmental Design for Core and Shell [LEED-CS®]) program or other equivalent programs with third party certification. An equivalent program is one that is independent, third-party verified, and has regional or national recognition or one that otherwise includes multiple green building concepts and overall levels of green building performance that are at least similar in scope to the applicable LEED rating system. Encourage commitments to the attainment of the ENERGY STAR® rating where available. Encourage certification of new homes through an established residential green building rating system that incorporates multiple green building concepts and has a level of energy performance that is comparable to or exceeds ENERGY STAR qualification for homes. Encourage the inclusion of professionals with green building accreditation on development teams. Encourage commitments to the provision of information to owners of buildings with green building/energy efficiency measures that identifies both the benefits of these measures and their associated maintenance needs.

Policy b. *[Within the Tysons Corner Urban Center, Suburban Centers, Community Business Centers, Industrial Areas and Transit Station Areas as identified on the Concept Map for Future Development, unless otherwise recommended in the applicable area plan]**, ensure that zoning proposals for nonresidential development or zoning proposals for multifamily residential development incorporate green building practices sufficient to attain certification through the LEED-NC or LEED-CS program or an equivalent program specifically incorporating multiple green building concepts, where applicable, where these zoning proposals seek at least one of the following :*

- Development in accordance with Comprehensive Plan Options;
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- Development at the high end of planned density/intensity ranges. For nonresidential development, consider the upper 40% of the range between by-right development potential and the maximum Plan intensity to constitute the high end of the range.

Where developments with exceptional intensity or density are proposed (e.g. at 90 percent or more of the maximum planned density or intensity), ensure that higher than basic levels of levels of green building certification are attained.

*** The issue of equity across geography in regards to uses was a topic of discussion subsequent to the completion of the response document in November 2011. One potential solution to this concern would be to remove the geographic differentiation from the policy, thereby establishing consistent recommendations that would apply to all uses meeting the bulleted criteria, regardless of the locations of these uses. The Environment Committee preferred to have this issue receive public feedback prior to making a decision on whether to remove the geographic areas of expectation or to leave policy b as it currently is. The bracketed and italicized language in policy b could be removed to offer maximum flexibility for the advertisement of the draft guidance. It should be stressed that, if this is done for the purpose of advertisement, it would not signal an endorsement of a broadening of the application of this policy guidance—it would be done for the purpose of maximizing flexibility to consider a range of options during the public hearing process.*

Policy c. Ensure that zoning proposals for residential development that are not otherwise addressed in Policy b above will incorporate green building practices sufficient to attain certification under an established residential green building rating system that incorporates multiple green building concepts and that includes an ENERGY STAR Qualified Homes designation or a comparable level of energy performance. Where such zoning proposals seek development at or above the mid-point of the Plan density range, ensure that County expectations regarding the incorporation of green building practices are exceeded in two or more of the following measurable categories: energy efficiency; water conservation; reusable and recycled building materials; pedestrian orientation and alternative transportation strategies; healthier indoor air quality; open space and habitat conservation and restoration; and greenhouse gas emission reduction. As intensity or density increases, the expectations for achievement in the area of green building practices would commensurately increase.

Policy d. Promote implementation of green building practices by encouraging commitments to monetary contributions in support of the county's environmental initiatives, with such contributions to be refunded upon

demonstration of attainment of certification under the applicable LEED rating system or equivalent rating system.

Policy e. Encourage energy conservation through the provision of measures which support non-motorized transportation, such as the provision of showers and lockers for employees and the provision of secure short-term and long-term bicycle parking facilities for employment, retail, institutional, and multifamily residential uses.

Policy f. Encourage private companies involved in public-private partnerships where land is leased or provided by the County to meet or exceed County guidelines for green building certification for capital projects.**

***For the purposes of advertising, policy f is also left unchanged. However, the Committee did not reach a consensus on how this policy should be worded, and if “exceed” should be included. The Committee wishes to receive public input on this question; therefore, “exceed” is being suggested for retention for the purpose of advertisement.*

Policy g. Encourage provision of or readiness for charging stations and related infrastructure for electric vehicles within new development and redevelopment proposals, particularly for residential where other opportunities are not available.

Policy h. Encourage and participate in periodic regional and local evaluations of the outcomes achieved through the application of sustainable land use principles and technology, in coordination with the energy and resources providers and industry. Such evaluations should be based on pooled, anonymous-source data, and should provide information helpful in decisions regarding the costs and benefits of green practices, including evaluations focused on innovative approaches and technology.

Comprehensive Plan policy—Green Building guidance (general)ⁱ

Draft as of October 4, 2012

<u>Location</u>	<u>Type of Development</u>	<u>LEED or equivalent expectation</u>	<u>ENERGYSTAR or equivalent expectation</u>	<u>Additional guidance</u>
Tysons Corner Urban Center	Nonresidential	LEED Silver or equivalent expectation	X	
	Residential	Same as policy in Suburban Centers, etc.	Same as policy in Suburban Centers, etc.	
Suburban Centers, Community Business Centers and Transit Station Areas (general)	Nonresidential and 4+ story multifamily residential, where at least one of four criteria are met	LEED Certified or equivalent expectation	X	
	Other residential	Encouraged	ENERGY STAR Qualified Homes expectation for proposals seeking the high end of the Plan density range where broader green building commitments are not being applied	
	Other nonresidential	Green building commitments encouraged	Green building commitments encouraged	
Annandale Community Business Center	See above	See above	See above	Incentive building height tied to LEED Gold and LEED Platinum certification
Vicinity of the Center for Innovative Technology, General TOD Guidance	Nonresidential	LEED Silver or equivalent expectation	X	
	Residential	Same as policy in Suburban Centers, etc.	Same as policy in Suburban Centers, etc.	
Land Unit D, Lorton-South Route 1 Community Planning Sector	Nonresidential mixed use, in accordance with a Plan option	LEED Silver or equivalent expectation	X	

<u>Location</u>	<u>Type of Development</u>	<u>LEED or equivalent expectation</u>	<u>ENERGYSTAR or equivalent expectation</u>	<u>Additional guidance</u>
Woodlawn Community Business Center, Sub-unit A-2	Office with hotel and/or retail, mixed use (option)	LEED Silver certification	X	
Woodlawn Community Business Center, Sub-unit A-3	Community-serving retail (option)	LEED Silver certification	X	
Woodlawn Community Business Center, Sub-unit B-1	Mixed use (option)	LEED Silver certification	X	
Woodlawn Community Business Center, Sub-unit B-2	Office, retail and/or hotel (option)	LEED Silver certification	X	
Huntington Transit Development Area—WMATA property	Development above base level (mixed use)	LEED Silver (or comparable) certification	X	
Huntington Transit Development Area—specific area within the Huntington Conservation Area	Transit-oriented mixed use option	LEED Silver certification	X	
Huntington Transit Development Area—83-1 ((1)) 34C	Mixed use	LEED Silver certification	X	
Huntington Transit Development Area—83-3 ((1)) 76	Residential and hotel	LEED Silver certification	X	
Franconia-Springfield Transit Station Area, Land Unit P (north of Loisdale Estates), parcels 90-2 ((1)) 58D and 90-4 ((1)) 11B	Office option	LEED Silver certification	X	
Lake Anne Village Center	All	LEED Certified or equivalent	X	LEED Silver or equivalent or better is strongly encouraged

<u>Location</u>	<u>Type of Development</u>	<u>LEED or equivalent expectation</u>	<u>ENERGYSTAR or equivalent expectation</u>	<u>Additional guidance</u>
106-2 ((1)) 8 (north of the Shoppes at Lorton Valley, Ox Road)	Assisted living facility option	LEED certified or comparable	X	
Northeast of the Telegraph Road/Beulah Street intersection	Retail and office	Encouragement of LEED Silver or comparable for office; LEED certified or comparable for retail	X	
I-95 Industrial Area, Land Unit K	Office	Encouragement of LEED Silver or comparable for freestanding office building(s)	X	
Lewin Park (northeast of Franconia-Springfield Parkway at Beulah Street)	Office and/or hotel with support retail	LEED Silver certification	X	
A specific area between the South County Center CBC and Woodlawn CBC	Mixed use urban/town center concept	LEED Silver or comparable encouraged for freestanding office or residential buildings	X	
Other areas	All	Green building commitments encouraged	Green building commitments encouraged	
Note: Plan policy encourages commitments to monetary contributions in support of the county's environmental initiatives, with such contributions to be refunded upon demonstration of attainment of green building certification. Plan guidance does not, however, establish any expectations for any particular enforcement mechanism.				

ⁱ Does not include LEED credit-specific guidance (e.g., lighting and stormwater management guidance in some areas). Also does not include area-specific guidance that effectively reiterates broader policy guidance.