
ANNUAL REPORT ON THE ENVIRONMENT

CHAPTER VII

**NOISE, LIGHT
POLLUTION, AND
VISUAL POLLUTION**

VII-1. NOISE

A. AIRPORT NOISE

1. Operations and Associated Noise Impacts at Ronald Reagan Washington National Airport and Washington Dulles International Airport

Fairfax County is served by Ronald Reagan Washington National Airport and Washington Dulles International Airport. An average of eight million passengers traveled through National and Dulles each quarter in 2002 on approximately 130,000 commercial flights. This number is still well below the pre-September 2001 level, but has been slowly climbing. While the return of commercial air traffic is a welcome event to the local economy, it still has adverse impacts on the quality of life for those living around the airfields.

Dulles sees approximately 34,000 flights each month, still below the 9-11-01 levels. This breaks down to more than 1,200 flights each day, with an increase of several hundred flights on Saturdays and Sundays. The scheduled operations between 7 A.M. and 10 P.M. show a typical pattern, with many flights in some hours and a relatively small number in other hours. Peaks are at 7 A.M., 12 P.M., 5 P.M., and 8 P.M., with low times at 5 A.M., 10 A.M., 2 P.M., 6 P.M., and 10 P.M.

National has about half as many flights as Dulles; approximately 18,000 flights go in and out each month, still below the 9-11-01 levels. This breaks down to more than 600 flights each day, with an increase of several hundred flights on Saturdays and Sundays. Most flights occur between 7 A.M. and 10 P.M.. National is under the Federal Aviation Administration's (FAA's) High Density Rule, which limits, with some exceptions, the air carriers to 37 scheduled operations per hour and the commuter carriers to 13 scheduled operations per hour.

The Metropolitan Washington Airports Authority (MWAA) monitors aircraft and community noise around the clock at 32 locations in the Washington, D.C. Metropolitan Area. The monitoring equipment evaluates different sound events and separates those events likely to have been caused from aircraft from the remaining events, which are attributed to the community. In 2002, the Airports Authority's noise complaint centers at National and Dulles reported receiving 369 noise complaints from 155 different callers. National reported 298 complaints from 110 callers. Dulles reported 71 complaints from 45 callers.

National has one of the strictest noise regulations in place at any major airport in the United States. All aircraft operating between 11:00 P.M. and 7:00 A.M. must satisfy the Airport's nighttime noise limits or face monetary fines of \$5,000.00 maximum per violation. There were fourteen violations during the year 2002. Civil penalties were sought for seven violations and seven letters of warning were issued. A total of \$11,500 was received from four penalties, with the remaining cases pending.

Resources

Metropolitan Washington Airports Authority	
Community Relations and Noise Abatement	703-417-8745
National Airport Noise Complaints	703-417-8020
Dulles International Airport Noise Complaints	703-572-8215

Federal Aviation Administration	
Washington National Airport	703-413-1530
Dulles International Airport	703-471-1270
FAA Noise Ombudsman	202-493-5047

2. Additions to Washington Dulles International Airport

The Metropolitan Washington Airports Authority (MWAA) has begun the process of preparing an Environmental Impact Statement (EIS) to evaluate the possible addition of two new air carrier runways (one oriented north-south and the other east-west) to Dulles Airport. The scoping process for this EIS took place during the summer of 2002; a draft EIS is anticipated in the fall of 2004. Other recent Dulles Airport projects that have gone through the National Environmental Policy Act (NEPA) process include: the addition of a new midfield concourse and related facilities; the construction of an “Automated People Mover” system to replace the existing Mobile Lounges with an underground rail system; and the construction of a new air traffic control tower.

3. Part 150 Noise Compatibility Planning for Ronald Reagan Washington National Airport

The following discussion has been excerpted and modified slightly from the Web site of the Metropolitan Washington Council of Governments:

MWAA is initiating a major update of the Noise Compatibility Study for Ronald Reagan Washington National Airport. This study, conducted in accordance with the provisions of the Federal Aviation Administration's “Part 150” process, is designed to forecast future noise contours at Reagan National and to propose abatement and mitigation actions to reduce community noise impacts.

Because of the importance of this issue to the community, the Metropolitan Washington Council of Governments' (MWCOG) Committee on Noise Abatement and Aviation at National and Dulles Airports (CONAANDA) is partnering with MWAA throughout the process. A Part 150 Study Advisory Committee (Advisory Committee) has been established to assist and advise the Airport Authority in this study. The Part 150 update process is expected to take about 18 months. At the conclusion of this study, an updated noise compatibility program for Reagan National Airport will be submitted to FAA for approval.

4. Potomac Consolidated TRACON: Airspace Redesign

The 2002 *Annual Report on the Environment* described the Draft EIS for the proposed redesign of airspace in the Baltimore-Washington metropolitan area in conjunction with the newly consolidated TRACON (Terminal Radar Approach Control) facility that has been established at Vint Hill Farms in Fauquier County, Virginia. In May, 2003, FAA issued a Record of Decision supporting “Alternative 2,” which will generally preserve air traffic transfer points along the boundary of the Potomac Consolidated TRACON airspace while changing the airspace structure within the boundary (in order to take advantage of opportunities for improved efficiency and overall noise reduction offered by the consolidation of four separate TRACON facilities). Of the three “action” alternatives that were presented in the Draft EIS, Alternative 2 presented the least change from existing practices and was therefore viewed by FAA as a “low-risk” concept from the standpoint of implementation.

B. HIGHWAY NOISE

1. Background

Traffic in the Washington metropolitan area, including Fairfax County, continues to grow with intense residential development in Loudoun and Prince William Counties. The area’s traffic ranks consistently as one of the most congested in the country. As more lanes are added and some new roads are constructed, increased traffic generates more noise that creates demands for noise attenuation or abatement measures, including constructing barriers/walls or berms, providing landscaping/vegetation, or providing acoustical design techniques. Barriers have become the most popular choice. Since 1991 in Fairfax County, barriers constructed by the Virginia Department of Transportation (VDOT) have consisted of a solid wall of absorptive concrete that breaks the line of sight between vehicles and homes. Although noise barriers have a maximum decibel reduction of 20 dBA, most only provide 10-12 decibel reductions.

2. State Policy

Virginia adopted its original noise abatement policy in 1989. The policy established criteria for providing noise protection in conjunction with proposed highway projects in the State. Implementation of the policy has aided in the construction, or construction approval, of more than 100 federally-funded sound barriers. Experience with this policy created considerable feedback from citizens and elected officials. As a result, the Commonwealth Transportation Board decided to evaluate the policy for possible changes. The major source of information used was a survey of 15 state departments of transportation in the eastern U.S. The culmination of this process was the adoption of changes to the State policy in November, 1996, which became effective in January, 1997.

The key changes to the policy were to: 1) raise the cost-effectiveness ceiling from \$20,000 per protected receptor to \$30,000 per protected residential property based on other state practices; 2) clarify that Virginia will not participate in any retrofit project along an existing highway when not in conjunction with an improvement for that highway; and 3) add the possibility for third party funding of the amount above VDOT's \$30,000 ceiling if the abatement measure otherwise satisfies the criteria.

3. Noise Study Submission Guidelines

On July 24, 2000, the Board of Supervisors adopted Zoning Ordinance Amendment ZO 00-330, which permits noise barriers in excess of the Zoning Ordinance fence/wall height limitations where needed to reduce adverse impacts of highway noise on properties adjacent to major thoroughfares, or to reduce adverse noise impacts of commercial and industrial uses on adjacent properties. Such barriers may be approved by the Board of Supervisors in conjunction with the approval of a proffered rezoning for any zoning district, including P districts, or in conjunction with the approval of a special exception application, or by the Board of Zoning Appeals as a special permit use. Pursuant to Par. 1 of Sect. 8-919 or Par. 3F of Sect. 10-104 of the Zoning Ordinance, a noise impact study is required to demonstrate the need for the noise barrier and the proposed height and level of mitigation to be achieved by the noise barrier. In conjunction with the adoption of this Zoning Ordinance Amendment, the Planning Commission and Board of Supervisors requested staff to develop standardized noise study submission guidelines, which would be submitted to the Planning Commission for review and comment prior to implementation.

In response to this request, a noise study submission form and guidelines were developed. This form requires the applicant to provide information regarding the assumptions and data used in the noise study, the results of the analysis, and a detailed description of the visual impacts of the noise barrier and its effectiveness in providing noise mitigation. Given that the cost of providing this information may be prohibitive for a noise barrier request on an individual residential lot, a second form has been developed which requires less information for noise barrier requests on individual residential properties.

Staff from the Department of Planning and Zoning, Department of Transportation, and the Virginia Department of Transportation participated in the review and development of these guidelines. In addition, acoustical engineers from several firms that have submitted noise studies to the County in the past were invited to provide written comments on two occasions; participating consultants met with staff to discuss their issues and concerns regarding the proposed noise study submission guidelines. In addition, the Northern Virginia Building Industry Association (NVBIA) and the National Association of Industrial and Office Properties (NAIOP) were provided with the opportunity to comment on these guidelines.

On March 14, 2002, the Planning Commission's Environment Committee reviewed and endorsed the Noise Study Submission Guidelines. On March 20, 2002, the Planning Commission endorsed the guidelines.

On April 29, 2002, the Board of Supervisors accepted the proposed guidelines without change.

4. State Projects in Fairfax County

VDOT's Northern Virginia Office constructed the following sound barriers in FY 01-02:

- Four barriers were approved and completed on Fairfax County Parkway between Sunset Hills Road and Barron Cameron Avenue.
- Four barriers were approved and constructed this year with widening of Ox Road between Burke Lake Road and Lee Chapel Road.

The following barriers have been approved for the following highway construction projects underway in FY 03-04:

- Four barriers for Ox Road between Davis Drive and Lee Chapel Road; widening project underway.
- Two barriers for Ox Road between North Davis Drive and the Prince William County line.
- Two barriers (Fairfax County portion) for Route 1 interchange improvements associated with the Woodrow Wilson Bridge Project; advertisement was scheduled for July, 2003.
- Two barriers approved for Richmond Highway (Route 1) widening between Lorton Road and Telegraph Road; advertisement is scheduled for October, 2003.
- One barrier approved for VDOT Project 0495-029-137,C501; advertisement is scheduled for January, 2004.

C. RECOMMENDATION

1. **NOISE SUPPRESSION/ABATEMENT GUIDANCE:** The Federal Aviation Administration (FAA) does not specify aircraft noise exposure limits for communities near airports. Instead, the FAA sets limits on noise emissions from individual types of aircraft and sets deadlines for permitted operation of aircraft at U.S. airports that do not conform to these limits. Aircraft noise emission limits are important to communities around airports, but they are also important to airport planners who need to evaluate the noise impact of changes in airport operations produced by changes in facilities and normal growth in air traffic. Most airports, even smaller general aviation airports, maintain an airport master plan. An airport master plan is a written document that outlines all aircraft operations, assesses environmental effects including noise, and forecasts future airport growth.

EQAC recommends the following:

- A. Support the use of runways with least impact, especially during sleep hours (11 P.M. – 7 A.M.);
- B. Work with local, state, and federal groups to encourage airlines to restrict use of noisy aircraft during the above time frames; and
- C. Encourage the design and construction of new runways and taxiways to make best use of compatible land and water.

VII-2. LIGHT POLLUTION

A. OVERVIEW

Light pollution is a general term used to describe light output primarily from exterior (outdoor) sources in commercial, residential, and roadway settings that is excessive in amount and/or that causes harmful glare to be directed into the path of travel or into residential neighborhoods. Light pollution is thus both a safety issue and a quality of life issue. With the increasing urbanization of Fairfax County, exterior (outdoor) lighting and light pollution in its many forms have become pressing issues to our communities. Fairfax County had some regulations regarding exterior lighting, but they were minimal and out of date. A major effort was undertaken last fall to write a totally new and modern Outdoor Lighting Ordinance that took into account the numerous advances that have been made in lighting technology in recent years. This highly successful effort utilized several workshops, in which EQAC and a number of local experts participated, and came to fruition in the early summer of 2003 with the adoption of the new Ordinance. It is regarded by experts in the community as being one of the best such ordinances in the mid-Atlantic region.

B. ISSUES AND PROBLEMS

The main issues and problems of exterior lighting and light pollution may be summarized as follows:

1. Glare

Glare, as defined by the Illuminating Engineering Society of North America (IESNA), falls into three main categories:

- a. Disability glare – Disability glare, also known as veiling luminance, is caused by light sources that shine directly into ones eyes and is dangerous because it is blinding.
- b. Discomfort glare – Discomfort glare does not necessarily reduce the ability to see an object, but it produces a sensation of discomfort due to high contrast or non-uniform distribution of light in the field of view.
- c. Nuisance or annoyance glare – Nuisance glare is that which causes complaints such as, “The light is shining in my window.”

Glare is a significant and pervasive problem that seriously impairs both safety and quality of life. Glare demands attention in that one’s eyes are naturally attracted to bright light, and at night this destroys the eye’s dark adaptation, which is a serious

driving hazard. Obtrusive lighting by commercial establishments to attract attention is a serious problem as is selection of inappropriate fixtures for exterior residential lighting. Glare and excessive illumination cast into surrounding residential neighborhoods not only detracts from the quality of life but can make it difficult for pedestrians and homeowners to see their surroundings.

2. Light Trespass

Light-trespass is the poor control of outdoor lighting such that it crosses property lines and detracts from the property value and quality of life of those whose property is so invaded. It is particularly common when obtrusive commercial lighting is immediately adjacent to residential neighborhoods or when a homeowner uses inappropriate fixtures, light levels, and lighting duration, often in the interest of “security.” It is generally categorized in two forms:

- a. Adjacent property is illuminated by unwanted light.
- b. Excessive brightness occurs in the normal field of view.

Both of these forms may be present in a given situation.

3. Security

Much outdoor lighting is used in the interest of providing security. These safety concerns often result in bad lighting rather than real security. One reason often cited for today's bright lights is that high wattage is needed to deter crime. If light is overly bright with excessive glare it makes it easier for a person to hide in the deep shadows created by objects in the harsh glaring light. This might actually encourage crime rather than discouraging it. The debate as to whether or not additional light provides more safety has been more emotional than factual. The few rigorous studies that have been done reveal no connection between higher lighting levels and lower crime rates. This may be due to people with nefarious intent taking more risks in better lit areas. For example, the National Institute of Law Enforcement and Criminal Justice found no statistically significant evidence that lighting impacts the level of crime (Ungren, 1996). Thus, the supposed correlation between a high level of security lighting and reduced crime appears to be nothing more than a popular myth.

4. Urban Sky Glow

Urban sky glow is brightening of the night sky due to manmade lighting that passes upward with the light rays reflected off of submicroscopic dust and water particles in the atmosphere. Although urban sky glow was first noted as a problem by the astronomical community, it is by no means any longer solely an astronomical issue. With the increasing urbanization of many areas of the U.S., all citizens in those areas are now being affected. In Fairfax County, which is now an urban county, improper

lighting has seriously degraded the darkness of our local night skies into a pallid luminescence that many of our citizens find objectionable.

5. Energy Usage

Smart lighting techniques, which direct all of the light generated onto the target area, reduce energy consumption and hence the use of fossil fuels. Several engineering estimates suggest that at least 30 percent of outdoor lighting is being wasted through spilling upward and outward rather than being directed downward onto the target area. Also, many installations are greatly over-illuminated as well as being lighted for unnecessary durations, further compounding the energy wastage. Inefficient lighting incurs both direct financial costs and hidden environmental costs. It has been estimated by national organizations studying light pollution that in excess of \$8 billion of electricity is being wasted annually on obtrusive and inefficient outdoor lighting (see data from Virginia Outdoor Lighting Task Force and the International Dark-Sky Association). Since electricity generation in the eastern part of this country is mostly from fossil fuels, every unnecessary kilowatt of electrical energy generated also produces unnecessary greenhouse gases and acid rain.

C. CURRENT COUNTY STANDARDS AND REGULATIONS

In EQAC's view, Fairfax County now has an excellent ordinance that prescribes limits for the maximum wattage of light sources and for the amount of glare in commercial and residential districts. However, these standards do not cover all roadways (particularly main roadways, which are under the jurisdiction of the Virginia Department of Transportation (VDOT)) and represent a continuing source of glare and light pollution. Installations that were noncompliant at the time of adoption of the new Ordinance under State law are allowed to continue until such time as the fixture requires replacement. Additionally, the combined effects of glare into residential neighborhoods from sources such as nearby park lights and lights on nearby commercial buildings are not as fully addressed as would be desirable.

Fairfax County's *Policy Plan: The Countywide Policy Element of the Comprehensive Plan* (2000 Edition) recognizes the nuisance of light emissions arising from increasing urbanization and recommends that efforts be made to avoid creating sources of glare that interfere with residents' and/or travelers' visual acuity. To put this into practice, the County Zoning Ordinance lists glare standards. Specifically, it requires that illumination shall not produce glare in residential districts in excess of 0.5 foot candles and that flickering or bright sources of light shall avoid being a nuisance in residential districts.

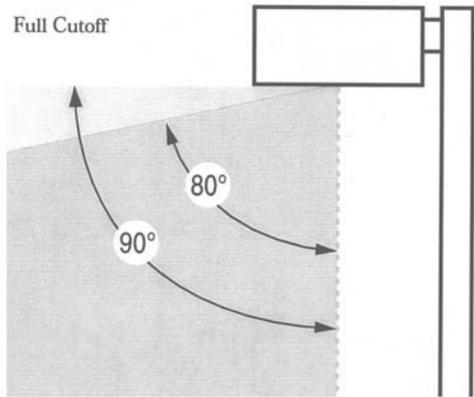
D. ADDRESSING THE PROBLEM

While the new Ordinance very adequately addresses new and replacement installations of outdoor lighting and fixtures in commercial and residential districts, much roadway lighting remains a problem because it is prescribed by VDOT. The new Virginia law and policy henceforth to use only fully shielded fixtures will eventually mitigate these problems as older fixtures are replaced.

One of the most common street lights in use, the drop-lens, cobra-head fixture, draws 150 watts. A fixture with reflective backing and shielding can direct all light below the horizontal plane with the same illumination of streets and homes and use only 100 watts. The same possibility exists with the popular 175 watt unshielded mercury vapor lamp. Both the 150-watt cobra-head fixture and the 175-watt mercury vapor lamp cast light laterally as well as down. As a result, substantial glare is often cast directly into the eyes of drivers. This glare destroys drivers' dark adaptation, creating potential safety hazards. In many cases the driver is not able to see the roadway any better than he or she would with lower-wattage properly shielded lights, and in many cases his or her vision is much worse. Because they cut down on glare, shielded fixtures not only are safer for drivers, but, according to experts (see references), actually make it easier for pedestrians and home owners to see their surroundings.

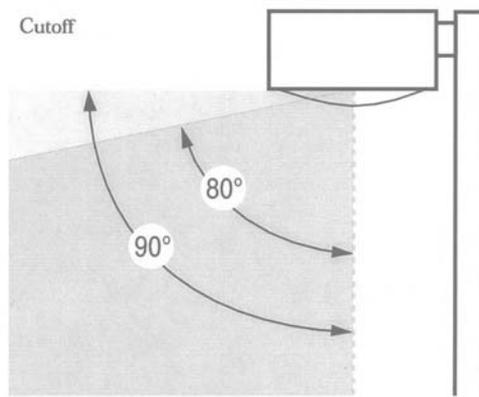
By redirecting this wasted energy, lower wattage lights provide the same amount of illumination in the areas where it is needed. These fixtures have reflective backing and full cut-off shielding to direct all light below the horizontal plane, with 90 percent of the light directed below an angle of 20 degrees from the horizontal. For example, a 50-watt metal halide lamp with a reflective shield will provide as much illumination below the horizontal plane as the 150-watt cobra-head fixture or the 175-watt unshielded mercury vapor lamp. These newer types of fixtures, which are recommended by the Illuminating Engineering Society of North America, are widely available and direct all light below the horizontal plane, thereby eliminating lateral glare (see Figure VII-2-1). It is estimated that it takes only three years of energy savings to recoup the initial investment in these fixtures. The lower wattage fixtures provide energy savings, improved driver safety, better visibility for pedestrians, and an improved ambiance and security for neighborhoods. Several municipalities, such as Tucson, Arizona, San Diego, California and Sanibel Island, Florida, have adopted street lighting ordinances requiring these newer fixtures.

Figure VII-2-1
Effects of Cut-off and Non Cut-off Luminaires



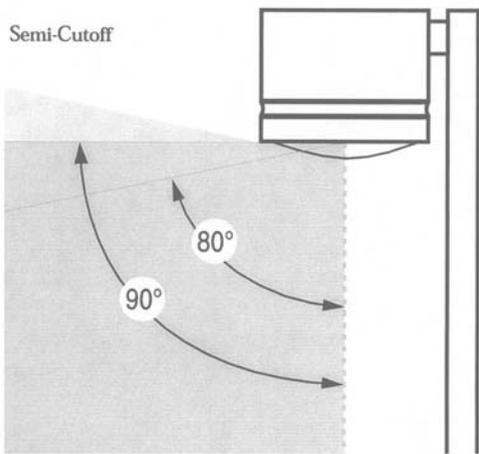
ALLOWS:

- No light at 90 degrees
- 100 cd per 1000 Lamp Lumens at 80 degrees



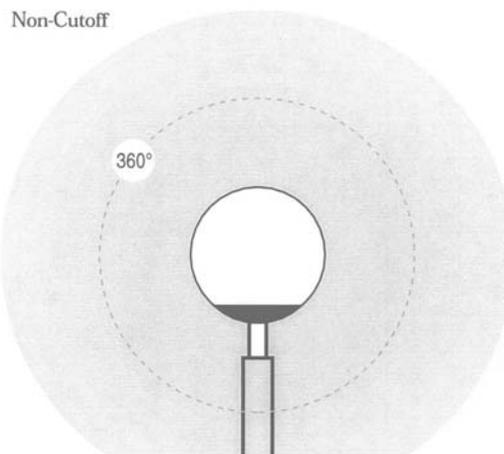
ALLOWS:

- 25 cd per 1000 Lamp Lumens at 90 degrees
- 100 cd per 1000 Lamp Lumens at 80 degrees



ALLOWS:

- 50 cd per 1000 Lamp Lumens at 90 degrees
- 200 cd per 1000 Lamp Lumens at 80 degrees



ALLOWS:

- Unrestricted distribution of light at any angle

(Sources: Paulin, Douglas, *Full Cutoff Lighting: The Benefits*, IESNA Web site, and Shaflik, Carl, *Environmental Effects of Roadway Lighting*, Information Sheet Number 125, International Dark-Sky Association, Tucson, Arizona, August 1997.)

Most security lighting is overdone, with high wattage lights burning from dusk to dawn. As noted earlier, constant levels of illumination tend to be largely ignored because they are commonplace, and they waste a huge amount of energy. The large amount of glare produced by high intensity sources creates shadows that provide hiding places for intruders. Moreover, the constant glare and light trespass onto adjacent properties is a major source of annoyance to their occupants. On the other hand, lights that are activated by motion within a controlled area attract immediate attention and, at the same time, use very little energy and create intrusion on adjacent properties only when such attention is desired. For example, if one is using 300 watts of security lighting for an average of 10 hours each night and converts to an infrared motion sensor control that turns on the lights only when there is motion in the controlled area, energy cost is reduced to almost nil. In addition, the cost of the added sensor-control hardware itself can be recovered in as little as two months due to the energy saving. At the same time, security is increased rather than decreased, and glare and light trespass onto adjacent properties is virtually eliminated.

Glare is a significant and pervasive problem, but one that is easily solved by installing fully shielded light fixtures, or in some cases using supplementary shielding panels, to prevent light trespass onto adjacent residential properties. Where it is not possible to completely eliminate glare through the use of shielded fixtures, motion detector controls can limit the harsh light to only a minute or two when it is really needed.

Light-trespass is a term of relatively recent origin and denotes (1) glare that is generated by sources on one property that lie within the normal field of view of the occupants of another property, and (2) light that spills over the boundaries of one property onto another, thereby producing unwanted illumination of it. Increasingly, such light intrusions are being regarded as trespass violations every bit as serious as physical trespass of a person onto the property of another. Such problems can now be readily avoided by the selection of proper fixtures, intensity levels, and the use of timers and sensors/controllers. These are areas where our new and comprehensive County ordinance does an excellent job of spelling out acceptable technology.

Sky-glow is also readily addressed by the selection of properly designed modern fixtures for new installations and phased retrofit of current inadequate installations. The cost of such retrofits is normally recoverable within a reasonable time period (usually estimated at about three years) through efficiently placing all of the light onto the desired area and the resulting lower energy usage.

Adherence to the following four principles will do much to mitigate or eliminate light pollution.

- a. Always illuminate with properly shielded fixtures that prevent the light source itself, and the resultant glare, from being directly visible. This is done by using cutoff fixtures or supplementary shielding that keeps all of the illumination below the horizontal plane and directed onto the target area.

- b. Do not over-illuminate. Never use more illumination than needed for the task at hand. Using a 400 watt floodlight to illuminate a small parking area or a flag at night is overkill and wastes a great deal of energy. A properly shielded and adjusted 250 watt luminaire (light source + fixture) can illuminate an area just as effectively as an older style 1,000 watt light source.
- c. Always aim lighting downward, keeping all of its distribution within the property lines and below the horizontal plane so that it is not a source of glare. Light trespass onto adjacent properties is unnecessary, inconsiderate, and potentially illegal.
- d. Do not burn lighting all night long with the intention of improving security. Using infrared motion sensor-controlled lighting that comes on instantly when there is motion in the designated area is far more effective as a security measure. That rapid change from dark to light draws the immediate attention of everyone in the surrounding area, including security and law enforcement personnel on patrol, and may well be unsettling enough to cause illicit intruders to immediately flee. Lighting that stays on all night draws no special attention and is an enormous waste of energy.

E. PUBLIC AGENCY RESPONSIBILITIES

Compliance with glare standards for residences and other private property is the responsibility of the County's Zoning Enforcement Branch. The County has 18 Zoning Inspectors (two per magisterial district) to oversee all Zoning Ordinance enforcement. Any enforcement activity dealing with light is complaint-driven. Typically, light-related complaints represent about 0.5% of total complaints. The County does not respond to anonymous complaints. Complaints are either filed directly with the Zoning Enforcement Branch or are forwarded by the staff of a member of the Board of Supervisors. The causes of the complaints were usually fast food establishments, security lighting for residences, athletic facilities (e.g., ball fields, driving ranges), or churches. The Zoning Inspectors typically resolve violations with informal enforcement such as a verbal warning that there is a violation and how it may be remedied. A written notice of violation or civil action can be used if needed. Beyond the general glare standards, the County frequently is able to impose additional restrictions through the provisions of the rezoning, special permit, and special exception processes.

One of the most onerous sources of light pollution is the obtrusive lighting of commercial and industrial facilities, particularly commercial retail and service establishments. While their desire to attract attention to themselves is understandable, abusive excesses degrade the overall ambience of our commercial areas and materially degrade the quality of life in adjacent residential neighborhoods. This is of particular concern in the case of "by-right" development, where there are no public hearings (e.g., Planning Commission, Board of Zoning Appeals, Board of Supervisors) at which adjacent property owners and neighborhoods can register their concerns and see approval conditioned on appropriate

restrictions. In such “by-right” cases, the initial responsibility would necessarily fall almost entirely upon the Office of Site Development Services of the Department of Public Works and Environmental Services, which reviews all proposed plans before a building permit is issued and subsequently conducts inspections to ensure that the work is in compliance with regulations. Evaluation of plans for compliance would add a small amount of effort to the review process but would add only a negligible amount to the inspection process.

At this time, the County has no formal policies regarding street lighting. Some neighborhoods within the County prefer to have local streets lighted, while others do not. Whether or not the County provides street lighting is often driven by budget priorities, and, unless there is a demonstrable public safety need, the priority for retrofitting an established community is usually low. More often, street lighting is addressed in the overall planning of new subdivisions. In these cases, the Office of Site Development Services would have responsibilities for both reviewing the plan and inspecting the implementation of it.

Responsibility for the lighting of main roadways is under the jurisdiction of VDOT. Historically, local communities and neighborhoods have had to deal directly with VDOT over roadway lighting issues. It has proven very difficult to influence VDOT’s choice of fixtures and technical standards, even when it can be demonstrated that their proposed implementations will result in unacceptable levels of glare and light trespass in adjacent residential neighborhoods. However, quite recently, encouraging headway has been made in getting VDOT to recognize the severity of the problem and to take some limited first steps to address it.

F. PUBLIC EDUCATION AND AWARENESS NEEDS

The general public needs to be made aware of the sources and problems of light pollution and of the methods by which these can be best addressed. This can be done in two ways. First, an excellent and informative 16 page booklet has been prepared by County staff to explain the new Outdoor Lighting Ordinance. It can be made available to individuals, homeowners groups, and community associations directly through appropriate County offices and also through the district offices of the members of the Board of Supervisors. Second, this information will soon be available through the County’s Web site, which has become an exemplary vehicle for distributing the latest information relating to all aspects of County governance and services. In addition, the International Dark Sky Association and the Illuminating Engineering Society of North America (IESNA) maintain Web sites with a variety of technical information on lighting issues and technology.

A few jurisdictions in other areas have prepared technical brochures and bulletins to familiarize architects, contractors, and electricians with their lighting codes and to specifically describe what their jurisdictions do not permit (e.g., unshielded security lights, angle-directed post or building mounted fixtures, wall packs without shielding or baffling, excessive wattage or unshielded floodlights, light-trespass onto other properties, etc.) and what practices they recommend. Our County’s 16 page booklet provides much of the

information that these persons need. Thus, the development, contractor, and building management communities will be fully aware from the outset of the revised standards in the new Ordinance and how best to address them.

There is an excellent Web site (<http://www.qualityoutdoorlighting.com>) that illustrates many examples of good, bad, and ill-conceived lighting practices right here in our local area. It can play a central role in education of the public.

G. CONCLUSIONS

The principal means to prevent poor exterior lighting practices is a comprehensive code or ordinance, because this provides well thought out standards for, and enforceable and legal restrictions on, specific lighting practices that affect the community and its quality of life. Numerous jurisdictions have adopted codes and ordinances that have proven very effective in reducing light pollution and preventing light trespass. A properly conceived and well written code permits all forms of necessary illumination at reasonable intensities, but requires shielding and other measures to prevent light pollution and light trespass. A good code applies to all forms of outdoor lighting, including streets, highways, and exterior signs, as well as lighting on dwellings, commercial and industrial buildings, parking areas, and construction sites. A good code also provides for reasonable exceptions for special uses within acceptable time periods and subject to effective standards. In EQAC's opinion, Fairfax County's newly adopted Outdoor Lighting Ordinance is an outstanding example of such a code. As the County gains experience with application of the new Ordinance there will no doubt be discovered some areas where small adjustments and fine-tuning will be beneficial, but the solid foundation has been laid and should serve us well into the future.

The County needs to work closely with VDOT to achieve better lighting practices on roadways within Fairfax County that are under VDOT jurisdiction. Current VDOT lighting and proposed new installations are regarded as being very intrusive by adjacent neighborhoods. However, it should be noted that a newly enacted law requiring the Commonwealth to acquire only shielded fixtures should materially improve VDOT practices in this regard on new installations and as old fixtures are replaced.

Much of the security lighting, both residential and commercial, in Fairfax County is poorly conceived, excessive in intensity, and improperly directed and controlled. These deficiencies could be corrected at relatively low initial costs that would be rapidly recovered through the energy savings realized. This will require considerable public education to familiarize the using public with the issues and the available technology.

Much lighting in residential neighborhoods uses old style fixtures (or new but poorly designed ones) that cause excessive glare and light trespass onto adjacent properties. The new comprehensive Ordinance and an intensive public awareness campaign should be used to address correction of these problems. Single family dwellings especially need to be brought into compliance with the spirit and provisions of the revised Ordinance, for that is

where the majority of us live and where our quality of life is most affected by intrusive lighting.

Poor lighting design, particularly in commercial areas, is contributing to excessive and highly objectionable sky-glow. The new Ordinance and retrofitting or adjustment of fixtures can eliminate the worst of this effect.

H. RECOMMENDATIONS

1. EQAC recommends that the Board of Supervisors monitor and evaluate the effectiveness of the recently enacted Outdoor Lighting Ordinance to determine any areas in which enhancements and modifications may be needed and to ensure that lighting standards and practices and the reduction of light pollution in Fairfax County are comprehensively addressed.
2. EQAC recommends that the Board of Supervisors direct that all exterior lighting fixtures installed on Fairfax County facilities and properties be consistent with the new Ordinance and follow the recommendations of the Illuminating Engineering Society of North America.
3. EQAC recommends that the Board of Supervisors direct that all older lighting fixtures under County control that do not meet the above standards be replaced on a phased basis with the newer recommended fixtures. EQAC notes that these steps will lead to significantly lower energy costs that will recoup the costs of the changeover within a reasonable period of time.
4. EQAC recommends that the Board of Supervisors ensure that the Fairfax County Public Schools and the Fairfax County Park Authority fully comply with the new Ordinance and consistently follow the recommendations of the Illuminating Engineering Society of North America.
5. EQAC recommends that the Board of Supervisors work with VDOT and Virginia elected officials to eliminate unnecessary roadway lighting and to achieve replacement of existing poorly designed fixtures (under the control of VDOT) on our roadways with the same type of fixtures specified in Recommendation 3 above.
6. EQAC recommends that the Board of Supervisors fully support County staff efforts to disseminate its new booklet and provide information on the County Web site to promote public awareness of issues, problems, and solutions connected with illumination and light pollution. EQAC further recommends that the Board of Supervisors support County staff efforts to develop any additional technical information that may be needed for the education of architects, contractors, electricians, and builders as to what the County permits and does not permit in the field of illumination and the technology available for compliant installations.

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Some Lighting Myths, Information Sheet Number 42, International Dark-Sky Association, Tucson, Arizona, January 1991.

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Illuminating Engineering Society of North America Web site, <http://www.iesna.org/>.
(There are numerous subsidiary and related Web sites)

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National Electrical Manufacturers Association Web site, <http://www.nema.org/>.
(Particularly see their White Paper on Outdoor Lighting Code Issues.)

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Quality Outdoor Lighting Web site, <http://www.qualityoutdoorlighting.com/> .

VII-3. VISUAL POLLUTION AND URBAN BLIGHT

A. OVERVIEW

Historically, the term “pollution” has referred primarily to the fouling of air, water, and land by wastes or from the byproducts of human activities. In recent years it has come to signify a wider range of disruptions to environmental quality. Both noise pollution and light pollution issues have been addressed earlier in this chapter. This section of the chapter focuses on visual blight/pollution issues, including such things as proliferation of signs, billboards, litter, auto junkyards, and the like, which are important components of visual pollution.

Simply stated, “blight” is something that impairs or destroys appearance and results in a deteriorated condition. In recent times, urban blight has come to include a wide range of visual pollutants that degrade the ambience of our communities, including such things as trash and litter on roadsides, unkempt properties, above-ground power and video transmission lines, communication towers, intrusive and objectionable advertising signage, and other forms of extraneous visual impairments.

B. SIGNS AND BILLBOARDS

Unnecessary signs and billboards, almost always placed as some kind of advertising, have been called "visual pollution," "sky trash," "litter on a stick," and "the junk mail of American roadways." Nothing can destroy the distinctive character of our communities and countryside more quickly or thoroughly than uncontrolled signs and billboards.

Imagine your ideal destination. Chances are the first thing that springs to your mind are charming little communities with tree-lined streets, tasteful architecture, and friendly people who are proud of where they live, not a clutter of signs and billboards. Increasingly though, intrusive signage is marring our ideal destinations and making every place look the same. A proliferation of on-premise signs creates visual clutter that detracts from the unique character and beauty of a place. However, appealing signs that are compatible with local character contribute to a neighborhood or downtown, cultivating local pride and inviting travelers to stop.

Signs in the public rights-of-way have been around for as long as there have been public rights-of-way, but the numbers have spiraled out of control in recent years. Between fields of “popsicle-stick” signs for homebuilders and politicians, and signs for weight loss, work-at-home businesses, painting, hauling, and other signs plastered on every available traffic sign and utility pole, everyone in Fairfax County has something to hate about the proliferation of signs.

Communities can regain control of their visual environment, preserve their distinctive character, and protect natural beauty and the environment by enacting and enforcing ordinances that control signage and billboards. Reducing sign and billboard blight helps communities reclaim local beauty and character. Excellent alternatives to large intrusive signs and billboards, such as wayfinding signs, logo signs, and tourist-oriented directional signs, can help people locate local businesses and are minimal in their visual impact.

C. TELECOMMUNICATION TOWERS AND UTILITY TRANSMISSION LINES

In 1996, Congress passed the landmark Federal Telecommunications Act to encourage the rapid development and growth of new telecommunications technology such as wireless telephones and digital television. Yet new towers, sometimes as high as 300 feet, are rapidly popping up near people's homes, next to historic buildings, or in rural, scenic areas. Towering above trees, neighborhoods, and protruding into the skyline, these towers often have an unappealing visual impact (see the Web site <http://www.scenic.org> for examples). The real loser in such deals is the community that has had the tower foisted upon it because it had no legal way to prevent its construction.

The visual blight associated with above ground utility lines besets both our residential and commercial areas. These lines and poles are particularly objectionable in our local shopping areas where they obstruct the vision of drivers and greatly impair the visual attractiveness of the locale.

D. ADDRESSING THE PROBLEM

Creating sign regulations developed with community input encourages business owners to erect less intrusive signs that reflect an area's spirit, contributing to civic pride and helping to revitalize commercial districts. Regulations should encourage signs that quickly communicate their message, complement their surroundings, and enhance the visual character of the community. Attractive on-premise signs can help encourage citizens and business owners to work together to improve and revitalize local appearance.

The Fairfax County Zoning Ordinance, Article 12, deals with signs and signage regulations. Basically, it deals with permitted and non-permitted signage (e.g., what kind of sign needs a permit versus that signage not requiring a permit). For example, the Ordinance states when political or other signage that is temporary in nature must be removed, etc. The Ordinance appears to cover the subject thoroughly, but the fact that impermissible signage is overabundant indicate that enforcement is lacking, or that County staff functions are not organized in a way that could provide cost effective enforcement.

The Board of Supervisors initiated the Fairfax County Sign Task Force in August, 2000. In September, 2001, the Task Force issued its report, "*Illegal Signs in the Right of Way*" which:

- Examined current Fairfax County practices and enforcement procedures regarding signs within and along the roadways;
- Evaluated other jurisdictions' best practices in dealing with illegal signs; and
- Recommended amendments to the County's sign ordinance and suggested new legislative approaches to address this problem.

Communities can do much to regulate the height, number, and location of wireless telecommunication towers by enacting strong ordinances. Without good ordinances, communities are at the whim of telecommunication companies who avidly seek sites for towers and property owners who may willingly lease land for a tower. Fairfax County recently prevailed at the Virginia Supreme Court in a decision that required VDOT to reasonably comply with the Fairfax County Zoning Ordinance in siting monopole towers within the VDOT right-of-way.

E. PUBLIC AGENCY RESPONSIBILITIES

The Sign Task Force concluded that there is no one agency within the County government that is devoted to removing impermissible signs or prosecuting persons who erect the signs in violation of the law. The Task Force concluded that cleanup efforts are inadequate unless a County official receives complaints or VDOT receives complaints. Therefore, it appears that what little effort there is to remove signs is responsive rather than proactive. Some neighboring communities assign specific persons to this job, but Fairfax County does not have such a system. In fact, Zoning Inspectors do have authority delegated to them from VDOT to remove illegal signs. However, on many occasions when County inspectors have removed signs; e.g., on a Friday afternoon, they are back up by Monday morning or sooner. Good citizens attempting to help the County by removing signs themselves are not authorized to do so; therefore, they are inviting a liability action when they do remove signs. The ordinance needs to be changed to empower the citizenry to take action, but this will require State enabling legislation.

At present, about the only way the ordinary citizen can be involved with removing signs without the risk of liability is through the Adopt-a-Road Program. In this program a group agrees to become responsible for keeping a stretch of roadside cleaned of debris and litter and is, in effect, deputized with authority to remove impermissibly placed signs along with other litter. However, this program applies to VDOT right-of-ways. A comparable program is needed with respect to utility poles which are placed within easements.

F. RECOMMENDATIONS

1. The Fairfax County Sign Task Force made several recommendations. EQAC strongly urges the Board of Supervisors to again consider the Task Force's report and either implement its findings or reconstitute the Task Force to find alternatives that are more palatable to the Board and citizens of the County.
 - After holding a public hearing, the Board, pursuant to Virginia Code §33.1-375, should enter into an Agreement with the Commissioner of VDOT to enforce Virginia Code § 33.1-373. The Agreement would provide for sharing civil penalties collected after the County's costs have been recovered. [The Task Force provided a draft Agreement for the Board to consider.]
 - The County should fully support the County Sheriff's program of using inmates for removal of roadside litter, including removal of signs illegally posted in a right-of-way.
 - The County should implement a pilot project of approximately six months to determine whether additional resources are needed, and if so, develop a list of alternatives for further evaluation and ranking in terms of cost benefit analysis for the Board to use as it decides whether to expand the Agreement or move in a different direction.
 - The County should conduct an information and public outreach program regarding restrictions of signs in the public rights-of-way and any new County program to prosecute sign violations.
 - The County Executive should send letters to public entities within the County advising them of illegal signs and outcomes of posting same.
 - The Board should invite VDOT to consider implementing in Fairfax County additional possible deterrents to minimize illegal signs in the rights-of-way.
 - As part of its Legislative Program, the Board should seek an amendment to the Code of Virginia that would declare all signs illegally posted in a right-of-way to be abandoned and, therefore, illicit trash that may be removed by anyone.
 - If the above is not successful or possible, then the alternative is to seek an Amendment to the Code of Virginia that would permit individuals, as opposed to organized groups, to participate in the Adopt-A-Highway program to remove or cleanup illegal signs as duly authorized representatives of the Commissioner.
 - The County should seek an Amendment to the Code of Virginia placing reasonable limitations on political campaign signs in the right-of-way. The County should offer recommendations for limits on the number, minimum distance between individual signs, and the time frame for posting and then removing the signs.

2. The Environmental Quality Advisory Council supports the general premise underpinning each of the Task Force's recommendations above, but believes that before the County seeks any amendments to the Code or introduces new programs of its own, a study should be performed to determine the impact on existing programs, staffing, and budget, and that a cost benefit analysis be performed to determine the extent to which the proposed amendments or additions would contribute to reducing visual pollution in a cost effective manner, having due regard for the possibilities of cost recovery through the rigorous imposition of civil penalties.