December 19, 1989

Loudoun County, Virginia
CUB RUN
Area Management Plan

December 19, 1989
Loudoun County, Virginia
Acknowledgments

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Introduction
Introduction

A. Background and Purpose

The Cub Run Area Management Plan is a plan for the Cub Run planning area, a portion of the Dulles South planning area. The Dulles South planning area covers a total of 25,100 acres (approximately 39 square miles) in the southeastern part of Loudoun County, lying both west and south of Dulles Airport. Portions of four small watersheds form the physical boundaries of Dulles South. Three of these watersheds, Cub Run, Elklick Run and Foley Branch, are part of the large Occoquan Watershed; the fourth, Upper Broad Run, is part of the Broad Run Watershed (see Figure 1, page 2). This large planning area includes the communities of Pleasant Valley, Arcola and Lenah as well as the Route 50 corridor east of Route 15. Dulles South, despite the presence of these villages, remains sparsely settled largely because it is not serviced by central sewer and water, the farmland is not rich and the soils are not well suited for the use of septic drainfields.

During the past few years, however, the Dulles South study area has been the subject of increasing interest to private citizens and developers alike. In light of these concerns and interests, the Dulles South Technical Study on Sewer and Water Needs was completed in 1986 at the direction of the County Board of Supervisors. Based on the information contained in that report, the Board of Supervisors directed that an area management plan be prepared for the Cub Run planning area. A plan or plans for the Elklick Run, Foley Branch and Upper Broad Run Watersheds will follow in a timeframe yet to be established by the Board of Supervisors.

The Cub Run planning area encompasses approximately two square miles or 1,320 acres of the portion of the Occoquan Watershed located in Loudoun County. It is bounded by Dulles International Airport to the north, Fairfax County to the east, and by Route 742 and the Chantilly Crushed Stone Quarry to the south and west. It must be noted that the Cub Run planning area boundaries differ somewhat from the natural, topographical boundaries of the Cub Run Watershed. Generally, Route 742 lies slightly west of the ridgeline which actually divides the drainage areas of the Cub Run Watershed and the Elklick Run Watershed. This ridgeline remains the primary boundary for determining sewer and water service areas. However, in order to coordinate land use planning with road improvements, Route 742 was chosen as the geographical boundary of the Cub Run planning area. Figure 2, page 3 illustrates both the planning area and Watershed boundaries.

For a number of reasons, the Cub Run planning area is experiencing more immediate and intense development pressures than the rest of the Dulles South area. First, Cub Run is near the rapidly developing Fair Oaks area, Dulles International Airport and existing sewer and water lines which serve the portion of the Cub Run Watershed which lies in Fairfax County. Secondly, it is bisected by Route 50, providing easy access to Route 28 and Route 66. Finally, the potential development character of the Cub Run planning area differs substantially from the other three watersheds in Dulles South. Due to high levels of projected aircraft noise blanketing this small planning area, it will be developed for employment uses rather than residential uses, thus producing positive economic and fiscal benefits to the County. Because pressure for growth and development is particularly evident in Cub Run, an area plan is necessary in order for the County to address future land use issues in a manner which will benefit present and future citizens of this area and the County as a whole.

The purpose of the Cub Run Area Management Plan is to:

1. Recommend specific land use policies and programs regarding such elements as environmental management, kinds of future
land uses, density and character of development, transportation improvements and public facilities and utilities;

2. Provide guidance to coordinate actions between the County and public agencies such as the Loudoun County Sanitation Authority (LCSA), the Virginia Department of Transportation and the Metropolitan Washington Airports Authority;

3. Provide guidance to coordinate actions among citizens, residential developers, industrial and office developers, and retail and service investors;

4. Establish specific County goals and policies for guiding the development of land and public improvements in the area during the next 10 to 20 years.

B. Planning Process

The County’s comprehensive planning program provides the basis for land use and zoning decisions and consists of several related elements (See Figure 3, page 5). The initial plan that provides a basis for all subsequent plans is the Resource Management Plan (RMP), adopted in 1979. The RMP consists of general goals and policies that apply to the entire County. Area plans are specific land use plans for particular areas or communities. The area plans use the RMP goals and policies as a basis for developing more detailed land use guidelines for particular planning areas. To date, the County has adopted the Eastern Loudoun Area Management Plan (1980), the Leesburg Area Management Plan (1982), the Rural Land Management Plan (1984), the Dulles North Area Management Plan (1985), the Waterford Area Management Plan (1988) and the Round Hill Area Management Plan (1990). Figure 4, page 6 illustrates the geographical boundaries of the County’s various planning areas.

The other essential elements of the County’s land management program are the Zoning Ordinance, which regulates the types and intensities of uses that can be located on a property, and the Land Subdivision and Development Ordinance (including the Facilities Standards Manual) which regulates subdivision, site development and construction.

The County has a strong tradition of citizen and community participation in the formulation of area plans. Because these plans affect the overall character of a specific area including land use, development types and intensities, location of roads, utilities and public facilities, the citizens of the specific area should be the fundamental advisors to the Planning Commission and the Board of Supervisors on how the area should develop. The Cub Run Citizen Committee drafting process took nine months and was followed by Planning Commission and Board of Supervisors review. The Planning Commission certified its final version of the draft plan to the Board of Supervisors on October 25, 1989 and the Board adopted the Cub Run Area Management Plan on December 19, 1989.

C. Relationship to the Resource Management Plan

The Resource Management Plan (RMP), as a policy document, does not seek to establish specific land use directives for the Dulles South planning area. Rather, it establishes Countywide goals and desirable development patterns which act as a framework for orderly growth, change and decision-making. The RMP goals are grouped into eight major categories which address the conservation and preservation of natural, agricultural and historic resources, the character of housing and mix of housing types, the timing and location of public facilities and utilities, the development of a sensitive and coordinated transportation system, the development of compatible employment and industrial resources and the maintenance of community values and quality of life through careful public spending. While this plan takes its primary goals from the RMP, these general directives are translated into specific policies and guidelines tailored to the unique needs of the Cub Run planning area of Loudoun County.
The Resource Management Plan forms the core document of the County planning program. Special Studies and Area Plans provide detailed guidance in specific areas of the County, while the Zoning and Subdivision Ordinances and the Capital Improvements Program are tools used to implement the County planning program.
A. Existing Land Uses

Cub Run, a planning area of approximately two square miles or 1,320 acres, lies on the Fairfax County line only seven miles west of the rapidly developing Fair Oaks area. The entire planning area is bisected by Route 50, forming a corridor scattered with commercial establishments, single-family residences and various open space and agricultural uses. To the north of Route 50 is a major quarry of close to 75 acres which, to some extent, has influenced the industrial character of the northern portion of the planning area and the nature of recent development applications. A second major influence on land use in Cub Run is increasing development in nearby areas and consequent demand for land on which to locate construction related businesses. This is particularly evident along Routes 639 and 609 where a number of construction companies and contractors have recently located. Heavy equipment storage is also prevalent in these areas.

Land uses to the south of Route 50 differ significantly from those to the north. While residences are scattered throughout the southern portion of the planning area, most of this land remains wooded or in open fields. Approximately 175 acres of land here is currently in active agricultural use for grass turf and hay production. It is estimated that approximately one-third of the farmland located in the Cub Run planning area is held in absentee ownership. Land use patterns are illustrated in Figure 5, page 9. Table 1, page 7 shows the approximate percentage of land in various uses.

To date, growth has been very slow in this community, largely because the soil is generally not suitable for septic systems and because central sewer or water service is not available. Thus, there has not been a residential or a commercial/industrial development surge as has been experienced to the east in Fairfax County.

B. Existing Population

The existing population of the Cub Run planning area totaled approximately 140 people in 1987.* This population, which falls within Census Tract 6007, is characterized by the U. S.

<table>
<thead>
<tr>
<th>Table 1 — Existing Land Uses in the Cub Run Planning Area**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use</td>
</tr>
<tr>
<td>Open Space/Forestal</td>
</tr>
<tr>
<td>Agricultural</td>
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<tr>
<td>Extractive Industry</td>
</tr>
<tr>
<td>Residential</td>
</tr>
<tr>
<td>Industrial</td>
</tr>
<tr>
<td>Commercial</td>
</tr>
<tr>
<td>Church</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

* Compiled by Loudoun County Department of Planning, Zoning and Community Development from 1986 aerial photographs and 1979 Planimetric Maps.

** Loudoun County Department of Planning, Zoning estimate based on 1986 aerial photographs and field surveys.
Existing Land Uses • Figure 5
Census Bureau as geographically scattered, relatively stable and slightly older than the County norm. In 1980, the median age of residents in the census tract which included the planning area was 31.6, nearly two years above the median age Countywide. Sixty-one percent of this population was reported to be between the ages of 18 and 62.* The average number of persons per household that same year in Census Tract 6007 was 2.92, which is less than the 3.05 persons per household average reported Countywide.** The median household income also differed between the County and the census tract which includes the Cub Run planning area. According to the 1980 census, the median household income for the County was $24,434; higher than the $20,583 reported for the census tract that same year.

C. Existing Zoning

The County’s Zoning Ordinance is the basic tool for implementing the community land development policies of the Comprehensive Plan. Much of the existing zoning in Cub Run, however, is based on historical factors which may not appropriately reflect current influences and land use concerns in the area. The 593.2 acres of land zoned R-1 (single-family, one acre minimum lot size) lying to the south of Route 50, may reflect an erroneous assumption that this area would be suited to development with private wells and individual septic systems. In fact, however, extensive soil limitations in the area preclude residential development without central sewer provision. Dulles International Airport, directly to the north of the planning area, also poses concerns for any future residential development in the existing R-1 zones. All of the Cub Run planning area is located in, or adjacent to, areas projected for noise levels of Ldn 65 or greater, which are not considered suitable for residential development.*** By contrast, the remainder of land in Cub Run is zoned for commercial and industrial activities which are, in general, compatible with these high noise levels (See Figure 6, page 10).

Approximately 40% of the total land area in the Cub Run planning area is accounted for by 581.4 acres of I-1 general industrial land located

| TABLE 2 — Approximate Acreage of Zoning Districts in the Cub Run Planning Area |
|---------------------------------|----------------|----------------|
| Zoning Districts               | Acreage  | Percentage |
| R-1 Single-family, one acre minimum | 593.2 ac. | 44.9%        |
| I-1 General Industrial         | 581.4 ac. | 44.0%        |
| LI Light Industrial            | 122.9 ac. | 9.5%         |
| PD-GI Planned Dev. General Indust. | 10.0 ac. | .8%          |
| 100 Year Floodplain            | 10.0 ac.  | .8%          |
| C-1 Commercial                 | 3.0 ac. (approx.) | —           |
|                                 | 1,320.5 ac. | 100.0%       |

The general location of these zoning districts and of floodplains and drainageways in the area are shown in Figure 6, page 11.

** U.S. Bureau of the Census, 1980 Summary Tape File 1, Tabulation 34.
*** Ldn: average day/night noise levels measured in decibels. Based on Peat, Marwick, Mitchell and Co. “Air Traffic Forecasts and Preliminary Noise Exposure” (June 1983), page 46.
immediately south of Dulles Airport, and a small 10 acre parcel of PD-GI (planned development - general industrial) land located near the Fairfax County line. Concurrent with the adoption of this plan, the County Board of Supervisors rezoned properties in the Cub Run Watershed which were zoned C-1 for commercial use, to a new light industrial district, LI. The LI district extends 500' to the north of route 50 and 300' to the south of Route 50. This zoning district allows for a wide range of light industrial uses and encourages consolidated entrances and appropriate landscaping along Rt. 50. A small area of C-1 zoning remains in the Cub Run planning area, outside the Cub Run Watershed. The approximate acreage of land in each zoning district is presented in Table 2, page 9.

**D. Recent Development Activities**

The Cub Run planning area has recently been the subject of increasing interest by the development community. The majority of development proposals have taken place on I-1 industrially zoned land to the north of Route 50. During the 1980’s, several subdivisions and site plans for construction related activities were approved in the Wade Drive area, just off of Route 609.

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### TABLE 3 — Major Landholdings in the Cub Run Planning Area over 40 Acres

**May 20, 1987**

<table>
<thead>
<tr>
<th>Holding Number</th>
<th>Tax Map</th>
<th>Acreage</th>
<th>Zoning</th>
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<tbody>
<tr>
<td>1</td>
<td>102-13</td>
<td>56.46</td>
<td>I-1</td>
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<td></td>
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<td>3.00</td>
<td>I-1</td>
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<td>102-36A</td>
<td>28.43</td>
<td>I-1, L-1 (500' w)*</td>
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<tr>
<td></td>
<td>102-37</td>
<td>50.05</td>
<td>I-1</td>
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<td></td>
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<td>I-1</td>
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<td>102-40</td>
<td>21.79</td>
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<td>6</td>
<td>107-47</td>
<td>44.78</td>
<td>R-1, L-1 (300' w)*</td>
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</table>

* C-1 land rezoned by Board of Supervisors to new LI Zoning District. See Zoning Ordinance Amendment 89-04 and ZMAP 89-25.
Only one tract of land in the Cub Run planning area was undergoing review for rezoning as the draft plan was being prepared. In January 1986, the Lee Sammis Corporation submitted a proposal to rezone 27.12 acres of R-1 Land to PD-IJP with a special exception for office uses. This parcel, which fronts on Route 609 south of Route 50, is adjacent to 160 acres of land owned by the applicant in Fairfax County. It is the intent of the applicant to develop an office park business center which will include the tract of land located in the Cub Run area as well as the Fairfax tract.

These activities indicate a growing interest in the Cub Run area among developers. However, if a significant amount of land development is to occur here in the future, central utilities and rezonings will be necessary.

E. Land Ownership

Cub Run is not typified by the very large agricultural landholdings which are characteristic of other rural portions of the County. The largest single parcel of land located in the Cub Run planning area is a 200 acre tract which lies to the south of Route 50. A portion of this property is currently used for agricultural purposes. The largest total landholding in the planning area is composed of several parcels which belong to an industrial, rather than an agricultural owner. Chantilly Crushed Stone, Inc. owns approximately 345 acres (26%) of land in Cub Run. Currently, approximately 75 acres of this property is actively used for quarrying operations. Bordering by Chantilly Crushed Stone properties on either side is a third large tract of land in single ownership. This 100 acre tract, zoned for industrial use, is vacant except for the Loudoun County Sheriff's Department firing range. A list of significant landholdings appears in Table 3, page 11. Figure 7, page 12 indicates the location of large landholdings in Cub Run.

F. Historic Resources

Two structures in the Cub Run planning area have been surveyed for historical significance by the Virginia Department of Historic Resources (VDHR). Pleasant Valley Methodist Church, located on Route 50, is a typical late 19th century wood frame church. A brick addition to the structure was constructed in the mid-20th century. The church is in good repair and maintains an active congregation. A barn, fronting on Route 50 at the Chantilly Crushed Stone quarry entrance, is the second structure recorded by VDHR. This barn, although currently abandoned and in dilapidated condition, is an example of a late 19th century barn architectural type uncommon in Loudoun County. Few barns in the County have a front central pediment with an angled window suggesting a diamond shape. The location of these structures is indicated in Figure 8, page 13.

G. Public Utilities and Facilities

Public facilities and utilities such as schools, roads, sewers and libraries are elements which contribute to the structure and quality of a community. Accordingly, the mix of these services varies with the mix of land uses in a community. In some cases, the provision of utilities shapes the growth of an area, in others, growth or change creates needs and demands for facilities which did not previously exist. In any case, public facilities represent considerable investments which may become the responsibility of developers, the federal, state or local government, or residents themselves through the implementation of user fees or special taxing districts. Maintenance of public facilities, even after initial capital investments have been made, is an additional financial responsibility which should be anticipated.

In planning for the Cub Run area, the impact of certain public utilities on the type and timing
of development must be understood and taken into consideration. Therefore, many of the decisions which influence the development of this area will center upon the type of public improvements which are needed and on whom the responsibility for financing and maintaining these improvements should fall. Existing facilities and utilities which serve the Cub Run planning area are described below.

1. **Sewer**

The Cub Run planning area is not served by central sewer service; therefore, residences, businesses and industries use individual, on-site sewage disposal systems. The potential for new on-site disposal systems and the reliability of existing systems in Cub Run are, however, severely limited by soil characteristics common to the Dulles South area. Loudoun County soil maps indicate an extremely small occurrence of soils in this area having good or fair potential for conventional septic drainfields. The majority of the soils are shallow to bedrock and have a seasonally high water table at or near the ground’s surface (see Figure 9, page 15). Where shallow depth to bedrock is not a problem, very plastic “gooey” subsoils or clay layers further cause a high water table. These conditions result in inadequate percolation rates which will either not allow for proper absorption and filtering of effluent or which will not allow sewage effluent to remain in the soil long enough to undergo sufficient biological breakdown.

According to the County’s Division of Environmental Health, unsuitable soils have posed ongoing problems for Dulles South where it is estimated that 80 to 90 percent of on-site sewage disposal systems in the area do not meet minimum standards of acceptability at some time during the year. Alternatives to conventional on-site sewage disposal systems are limited by cost and performance capabilities under these severe soil constraints. Further, it must be noted that the State Water Control Board (SWCB) does not consider package treatment plants as a viable sewer option for new development in Cub Run Watershed. Therefore, little or no new residential development and only limited commercial and industrial uses are foreseen until central sewer service becomes available in the Cub Run Watershed.

Clearly, the primary factor which will influence the intensity, timing and type of development in the Cub Run planning area is central sewer service. In June, 1986, the Loudoun County Sanitation Authority (LCSA), in cooperation with Camp, Dresser and McKee (CDM), consultants, completed an extensive feasibility study evaluating four alternatives for wastewater treatment in the Dulles South planning area which includes the Loudoun County portion of the Occoquan Watershed and the Upper Broad Run Watershed. Three options were determined to be feasible:

a. Conveying the wastewater with pumping facilities and interceptor sewers to the existing wastewater treatment plant owned and operated by the Upper Occoquan Sewage Authority (UOSA) in Centerville, Virginia, which discharges into a feeder stream of the Occoquan Reservoir;

b. Conveying the wastewater with pumping facilities to a new wastewater treatment plant, constructed, owned and operated by the Loudoun County Sanitation Authority (LCSA) within the Loudoun County portion of the Occoquan Watershed which would discharge to a feeder stream of the Occoquan Reservoir upstream of the UOSA treatment plant, and;

c. Conveying the wastewater with pumping facilities to a new wastewater treatment plant discharging to Broad Run, constructed, owned and operated by the LCSA to treat flows generated within both the Loudoun County portion of the Occoquan Watershed and the Broad Run Watershed.

Although each of these systems would be technically adequate to service the Occoquan portion of the Dulles South planning area, the feasibility and desirability of implementing
these options varies. The wastewater management alternatives studied in the LCSA report are evaluated not only on technical aspects but also on expected starting date of operations, projected environmental impacts, LCSA reliance on other jurisdictions and agencies for approval and permits, County control over facility operation and expansion, the ability of the system to accommodate wastewater flow beyond the year 2010, required effluent quality standards and projected cost associated with each alternative.

Based on these selection criteria, the recommendation of the LCSA study for long term treatment of wastewater generated in the Occoquan and Upper Broad Run Watersheds is for the construction of a new 5.0 mgd (million gallons per day) advanced wastewater treatment plant in the Broad Run Watershed with a pump-over from the Occoquan into the Broad Run Watershed. This proposed facility, including major trunk lines and pump stations, would be constructed in two phases at an estimated cost of approximately $86 million.

Although the recommended alternative of constructing a new sewage treatment facility in Broad Run would require State approval for an interbasin transfer, this approval is expected to be more easily obtained than permission to increase wastewater discharges into the Occoquan Reservoir. Additionally, this proposal does not rely heavily upon commitments by other jurisdictions and it allows the County total control over the operation of the new treatment facility. This proposal is also in keeping with the Dulles North Area Management Plan which recommends the location of a site for a new wastewater treatment plant in the Broad Run Watershed to serve development in the Dulles North area.

Prior to construction of the plant, wastewater would be treated at the Blue Plains Treatment plant via the Potomac Interceptor. Loudoun County has agreements with the District of Columbia to treat up to 17.83 million gallons of effluent until 2000, when the agreement will be renegotiated. After the year 2000, sewage effluent would be diverted by way of a new interceptor to the new treatment plant on the Broad Run Watershed.

The findings of the CDM study relate directly to the possibilities of bringing central sewer facilities to portions of the Cub Run planning area. Figure 10, page 18 indicates the proximity of central sewer lines located very near the Cub Run study area in Fairfax County. In February, 1985, the Loudoun County Board of Supervisors requested the LCSA to initiate negotiations with Fairfax County for the extension of nearby sewer lines and the purchase of interim capacity in the Upper Occoquan Sewage Treatment Plant for the treatment of sewage generated in the Cub Run Watershed. In concert with these negotiations, and in order to plan for utilities consonant with anticipated growth in the Cub Run planning area, the Loudoun County Board of Supervisors adopted a resolution in February 1987 which approved, in concept, a long range plan for the treatment of sewage generated in the Cub Run Watershed. This resolution, which appears as an appendix to this plan, endorsed the concept of pumping over waste from the Cub Run Watershed to the Blue Plains Interceptor or to a new advanced wastewater treatment plant in the Broad Run Watershed.

2. Water

Currently, there is no central water service in the Cub Run planning area. Instead, businesses and residences rely on individual, private wells. A recent survey of Health Department records indicates that the depth of wells drilled in the Planning area since 1979 varies from a shallow depth of 61' to a relatively deep depth of 450'. Well yields in the area also vary. The average rate of water flow per well, measured in gallons per minute (gpm), ranged from 2 gpm to 20 gpm. As development in this area continues, increasing demands on underground water resources may pose uncertainties for the future in terms of water quality and availability.

The City of Fairfax owns and operates a water reservoir and treatment plant on Goose Creek, northwest of the planning area. The Treatment Plant currently has an average delivery capacity of 15 million gallons per day while Goose Creek, if developed with additional

Cub Run Area Management Plan 17
impoundments, could yield some 30 million gallons per day. According to agreements between Fairfax City and Loudoun County, the County has "first call" on any water from the Goose Creek impoundment. Presently, the County's Sanitation Authority purchases approximately 4 to 4.5 million gallons of water a day from the City of Fairfax. In addition to the possibility of obtaining water from the Goose Creek impoundment, the Cub Run Watershed could possibly be served by an extension of Fairfax County water lines since Fairfax County water lines currently serve properties adjacent to the planning area. Figure 10, page 18 shows the location of these nearby water lines.

3. Transportation

Roads: The Cub Run planning area is bisected by Route 50, a four lane median divided facility, which provides access to the planning area from the east and west. Route 50 is the only primary road serving the area. The average daily traffic (ADT) count on Route 50 at the Fairfax County line in the Cub Run planning area is estimated to be approximately 15,000 based on June 1985 data. The estimated a.m. peak hour volume is 1,400 and the estimated p.m. peak hour volume is 1,600. Based on these data, Route 50 is operating at a level of service B or better within the boundaries of the planning area. The County estimates that traffic volumes in this area could double and still remain at an acceptable level of service.

Although Route 50 is operating effectively in the Cub Run area of Loudoun County, traffic builds up rapidly on the Fairfax side of the County line. Traffic counts taken in June 1985 in Fairfax County at the intersection of Route 50 and Route 28, approximately two miles from the Cub Run planning area, indicate that Route 50 operates at level of service D during a.m. and p.m. peak hours. These traffic levels on Routes 50 and 28 in Fairfax County may pose transportation constraints in the Cub Run area even though sufficient capacity is currently available on the Loudoun portion of Route 50. Proposed improvements to Route 28 which include up-grading this facility to a six lane freeway may alleviate these problems in the future.

The Cub Run planning area is also served by three hard surfaced secondary roads: Route 609, Route 639 and Route 742. These roads function primarily as local roads at this time, although Route 609 north of route 50 is rapidly developing as a light industrial employment corridor. None of these routes has been funded for improvements in the County's Six-Year Secondary Road Improvement Program. To date, the existing road network has adequately served the sparsely settled planning area. However, as growth and development continue to occur, the existing transportation system can be expected to suffer potentially significant decreases in levels of service.

Washington Dulles International Airport: The Cub Run planning area lies directly to the south of the one of the region's most important transportation facilities, Washington Dulles International Airport. Flight operations at Dulles Airport increased 25% between 1985 and 1986 and have continued to increase. Forecasts anticipate that by the year 2000, aircraft operations at Dulles will reach 394,000 per year and the airport will serve an estimated 7.5 million passengers. Proposed construction of an additional north-south runway in the next century would permit airport expansion to 740,000 aircraft operations per year.

The location of Dulles Airport has generated substantial employment investments in Loudoun as well as western Fairfax and Prince William Counties. The planning area's proximity to the airport places it in an excellent position to attract employers who depend on air transport of materials, personnel, and distribution of goods.

4. Recreation

Although there are no public recreational facilities located in the Cub Run planning area, there is a community center in Arcola, approximately four miles away, which is operated by the Loudoun County Department of Parks and Recreation. Outdoor facilities at the Arcola
Community Center include a tennis court, ballfields, a basketball court, a pavilion and a playground for young children. The center also offers a variety of community service programs for various age groups.

5. Public Safety

There is a volunteer fire department in the village of Arcola which answers calls from the Cub Run planning area. The fire company has an active membership of 11 volunteers in addition to two professional fire fighters who are “on-call” during weekdays. The fire station possesses a rolling stock inventory of two fire attack pumps, one water tanker, two brush fire units and an ambulance.

The Loudoun County Sheriff’s Department provides police protection for the planning area from its facilities in the Town of Leesburg.

6. Schools and Libraries

The Cub Run planning area is served by Arcola Elementary School which, in 1986, had an enrollment of 147 students and a use capacity of 465 students. The middle school which serves the area, Seneca Ridge Middle School, is located in Eastern Loudoun near Sugarland Run. Seneca Ridge also operated below its use capacity of 1,080 in 1986 as total student enrollment equaled 657. Broad Run High School is located north of Cub Run on Route 641 between Ashburn and Ryan. The high school has a use capacity of 1,193 and in 1986, had 1,052 students enrolled.

Sterling Library, located in Sterling Park, is the primary library facility serving the Cub Run planning area. Projected development in the Dulles North area is expected to require additional schools and branch libraries which may eventually assist in serving the Cub Run area.

H. Natural Resources and Environment

One fundamental influence on land use is the natural environment. Generally, areas that are unsuitable for development are obvious, such as steep slopes, soils which will not percolate, low-lying swampy soils and unstable stream banks. Conflicts begin to occur, however, when environmental constraints are less obvious or when technological improvements can be employed to overcome environmental constraints to development. Historically, development in Cub Run has been severely limited by poor soils which have restricted the potential for on-site sewage disposal. Recently, however, rising development pressures have brought increased interest in overcoming these existing environmental constraints by providing central sewer and water service to the area. If new opportunities for development in the Cub Run planning area become available, they will doubtless result in changes which will affect the visual character and the natural environment of the area. This area plan will be valuable in striking a balance between the pressures and impacts of development and the preservation of important natural resources.

1. Water/Hydrology Resources

The Cub Run Watershed, which lies within the boundaries of the Cub Run planning area, is one of the three subwatersheds forming the Loudoun portion of the Occoquan Watershed. These subwatersheds drain into the Occoquan Reservoir, the primary source of drinking water for over 600,000 people in Fairfax and Prince William Counties. Sand Branch and an unnamed tributary of Cub Run, both located in the Cub Run planning area, flow southward to the Occoquan Reservoir via Bull Run (See Figure 11, page 21). The presence of these tributaries in the planning area creates conditions which require specific land use considerations.

Ten acres of land in the Cub Run study area are located in the 100 year floodplain of Sand Branch as designated by the Federal Emergency Management Agency (FEMA). Existing County policy designates floodplain areas as environmentally critical. Therefore, land uses within 100 year flood zones are currently limited by the County Zoning Ordinance to primarily passive uses (i.e. parking, open space and recreation).

Preservation of water quality in the Occoquan Reservoir is a regional concern which
should also influence land use in the Cub Run area. Non-point source pollution from run-off associated with various agricultural and urban land uses has been identified as a factor contributing to accelerated eutrophication (i.e., the premature aging of a water body) of the Occoquan Reservoir. Thus, if growth is to occur in the Cub Run planning area, review of future land use proposals must consider the influence of development on the area’s water resources.

2. Geology/Mineral Resources

Geological formations present in the Cub Run planning area have been mapped by the United States Geological Survey and further refined by the Loudoun County Department of Natural Resources. The most significant geologic resource in the area is diabase rock which is quarried for crushed stone used to manufacture concrete and to build roads. The locations of diabase rock formations and of the active diabase quarry in the Cub Run planning area are indicated in Figure 12, page 24.

3. Topography/Steep Slopes

The Cub Run planning area is made up of level to gently undulating land ranging in elevation from approximately 250 to 350 feet above sea level. There are no substantial natural steep slopes greater than 15%. Manmade steep slopes do exist however, in the area of the quarry, due to diabase rock extraction.

4. Soil Resources

Soils located throughout the Dulles South area possess a number of characteristics which limit the area’s suitability for various land uses. These soil conditions, which include perched water tables, clayey, plastic subsoils, and shallow depth to bedrock, lessen the agricultural productivity of land in the Cub Run planning area. Approximately one-half of the land in the planning area is considered to be secondary cropland because the combination of these soil characteristics affects root penetration, seedbed preparation and the water holding capacity of soils. The remaining land in the planning area, in terms of agricultural use, is suited for hay, pasture and woodland rather than cropping. Figure 13, page 24 illustrates the location of soils suitable for secondary cropland in the Cub Run planning area.

As discussed previously in the Land Use section of this plan, large sections of soils in the planning area are classified as having poor to very poor potential for residential septic systems and, in large part, have contributed to the sparse settlement patterns in the area. Even with the provision of central sewer service to the Cub Run Watershed however, these soils would present extensive engineering problems which must be overcome in order for safe development to occur. The construction of roads, basements and building foundations on soils with high water tables or on clayey soils, which swell and shrink, may result in problems ranging from major structural damage to cracked walls and wet basements. Figure 14, page 25 indicates the general development potential of soils in the planning area.

5. Forest and Wildlife Resources

Small tracts of woodlands exist throughout the Cub Run planning area along watercourses and on abandoned agricultural land. Because the majority of soils in the area are naturally wet, trees and other types of vegetation generally have shallow root networks at or near the soil surface. Unless proper precautions are taken, high mortality rates for vegetation in this planning area can be anticipated if the water table is lowered due to grading or utility installation required for future development.

Changes in patterns of wildlife habitation can also be expected to occur as growth and development take place in Cub Run and neighboring planning areas such as Dulles North. Many forms of wildlife, deer in particular, may be driven into less developed areas of the County. Although there is no existing detailed inventory of wildlife species and habitats in the Cub Run planning area, or
Agricultural Soil Suitability • Figure 13
the County as a whole, general wildlife management concepts should be considered when planning for new development. For example, linear corridors such as stream valleys, floodplains and utility right-of-ways function as key feeding, resting and breeding grounds for wildlife. These corridors can be preserved and incorporated into the design of new developments as utility and storm drainage easements, floodplain areas and open space.

6. Airport Noise

In 1986 a total of 278,307 aircraft operations took place at Washington Dulles International Airport, a 25% increase over the previous year. As the number of aircraft operations has increased at Dulles so has its importance as a regional “hub”. Between 1985 and 1987, four airlines designated the airport as a regional “hub” and more airlines are expected to follow suit. Therefore, it appears quite possible that the airport will reach its year 2000 projected level of 394,000 aircraft operations well ahead of schedule. Such increases in operations are likely to generate a significant rise in ambient noise levels in the aircraft flight paths.

In 1982 the Federal Aviation Administration (FAA) commissioned Peat, Marwick, Mitchell and Co. as consultants to prepare a noise impact study as part of the airport Master Plan update. In order to determine the level of noise generated by airport traffic, the consultants used past aircraft arrival and departure routes and data from sound monitors stationed around Dulles. The sound impact of an overhead aircraft varies depending on (a) the route the aircraft follows which varies from flight to flight, (b) what a person or household is doing: watching T.V., sleeping, entertaining in the backyard, and (c) the time of year: winter with closed windows, summer with open windows.

There is an ongoing study to codify aircraft noise impact. In 1982 the FAA released the third version of an integrated Noise Model (Mod. 38) based on (a) the acoustical energy content at 500 Hertz (a note close to Middle C on a piano), (b) the noise event rise time and duration, and (c) the noise peak level. Two measures are available to display the results of the noise exposure calculations, grid cells and contours. Noise exposure can be calculated for the center of a grid of 40 acre cells surrounding the airport given certain aircraft types, arrival and departure routes, etc.

Noise contour lines can then be traced through these grid cells for predetermined noise exposure levels. Figure 15, page 28 shows the future full potential Ldn (average day/night noise levels measured in decibels) noise contour profiles for the Cub Run area. Weather conditions, angle of ascent or descent other than the eight degrees specified in the model, and pilot judgement will alter the detailed configuration of these routes and thus the precise boundaries of the noise zones.

A 1980 Federal Interagency report on noise and community reaction to noise levels is summarized in Table 4, page 27. The data indicate that below Ldn 55, community reaction to noise is slight while a certain amount of community stress may be expected in areas subject to Ldn 55-65. Significant negative community response may be expected in areas subject to Ldn 65-70 and HUD considers such areas undesirable for residential use. Very severe community reaction may be expected in areas subject to Ldn 70-75 and HUD would only consider approval of development in such areas if there were no alternative sites available to ease a pressing housing problem.

Peat, Marwick, Mitchell and Co., consultants for the Federal Aviation Administration, have developed a noise compatibility chart based on the U.S. Department of Transportation, “Federal Aviation Regulations, Part 150, Airport Noise Compatibility Planning.” The standards use slightly different Ldn noise classifications from those used by the Federal Interagency group and thus Table 4, page 27, has been adjusted to reconcile the two systems. It should be noted that the consultants’ table assumes that the building itself will reduce sound by 20 decibels by means of sealed windows and the installation of...

Base Map • Figure 2

Cub Run Area Management Plan
mechanical air handling systems. The consultants' recommendation for noise level reduction components would require construction devices in addition to sealed windows and mechanical air handling. The table further assumes that the County could obtain special enabling legislation from the Commonwealth of Virginia to implement unique deviations from the Virginia building code. Legislative experience, however, suggests that the prospect of obtaining such legislation in the near future is uncertain. Of course, little can be done to reduce sound either inside a building if windows are opened in warm weather or outside in yards and on patios. A particular land use thus ultimately becomes inappropriate for a given high ambient noise level and areas exposed to such noise should be planned for activities and uses which are not affected by high noise levels. Offices, for example, frequently have fixed windows and mechanical air systems and are not normally used as places to sleep. A quarry generates much noise by itself and would not be disturbed by overhead aircraft noise.

Table 4 — Suggested Land Use Compatibility Standards in Aircraft Noise Exposure Areas

<table>
<thead>
<tr>
<th>LAND USE</th>
<th>BELOW LDN 60</th>
<th>LDN 60 TO 65</th>
<th>LDN 65 TO 70</th>
<th>LDN 70 TO 75</th>
<th>LDN 75 TO 80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential:</td>
<td>Compatible</td>
<td>Compatible</td>
<td>Discretionary NLR* Required</td>
<td>Normally unacceptable NLR** Required</td>
<td>Incompatible</td>
</tr>
<tr>
<td>(Slight community reaction to noise in the 45-55 range and moderate community reaction in the 56-60 range).</td>
<td>(Noise likely to be community issue).</td>
<td>(Noise a significant community issue).</td>
<td>(Noise a serious community issue).</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Public Use:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Schools, hospitals, etc.</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>Incompatible</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Churches, auditoriums</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>Incompatible</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Governmental services</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Transportation</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Parking</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>Incompatible</td>
</tr>
<tr>
<td>Commercial Use:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offices: business and professional</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Wholesale and retail: building materials, hardware, farm equipment</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Retail trade—general utilities</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Communication</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Manufacturing &amp; production:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manufacturing: general</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Photographers and optical</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Agriculture (except livestock)</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Livestock farming</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Mining</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Recreational:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Outdoor sports arenas</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Outdoor amuseums</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Amusement: parks, recp. etc.</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
<tr>
<td>Golf, riding and water-recreation</td>
<td>Compatible</td>
<td>Compatible</td>
<td>NLR Required</td>
<td>NLR Required</td>
<td>NLR Required</td>
</tr>
</tbody>
</table>

**NLR level reduction.
Ldn Noise Contours - Full Potential • Figure 15

- Ldn 65
- Ldn 70
- Ldn 75
- Watershed Boundary
- Planning Area

Adopted
December 30, 1989

Cub Run Area Management Plan
Chapter 2
Goals
Chapter Two — Goals

A goal is a desired future state. This plan takes its primary goals from the Resource Management Plan* while it specifically seeks to achieve the following goals within the Cub Run planning area.

1. Manage the level and pattern of development in order to promote fiscally balanced growth which will not unduly strain County or planning area resources including the natural environment, the County budget, transportation system, service support facilities and utilities.

2. Provide for appropriate industrial development which will assist the County in achieving a strong fiscal position.

3. Establish a development setback along Route 50 of a type and design which will enhance the visual image of the corridor and strengthen the importance of the Route 50 corridor as a major entrance into the County.

4. Conserve the natural, archaeological, and historic endowments of the planning area while promoting the provision of all necessary utilities and facilities in a manner which causes the least environmental, social or community dissonance.

5. Provide a safe, efficient, accessible road network which will meet the needs of businesses and residents in Cub Run as well as the County and region as a whole.

6. Provide a level of public utility and facility service consonant with the efficient and economical use of public funds which ensures the health, safety and welfare of the residential and business communities in the Cub Run area.

7. Provide employment opportunities for County residents and others in the Northern Virginia region.

8. Establish appropriate transitional land uses between existing residential communities and non-residential development.

Chapter 3
Policies
Chapter Three — Policies

The following policies are designed to achieve the goals identified in Chapter II. Policies are guides to action which direct builders and governmental agencies to achieve community desires in the development of the Cub Run planning area. The generalized Plan Map (Figure 16, Page 32) represents Loudoun County's interpretation of the policies contained in this plan. The map serves as a general development guide. Therefore, final implementation may deviate somewhat from the plan map. Despite minor deviations, the goals will be achieved if the policies are upheld. Thus, an emphasis on goals and policies rather than on a detailed map will permit creativity on the part of the development community and governmental agencies while ensuring that the County's overall goals are achieved.

I. Agricultural Policies

A. Issue Statement and Policy Resolution

Should agricultural land uses be encouraged to continue in the Cub Run planning area?

The County encourages the preservation of precious agricultural soils in part by encouraging concentrated development in areas where soils are not well suited for agricultural use. Although the Cub Run planning area does not offer the County's best agricultural soils, it does offer a number of locational advantages which make it particularly attractive for employment and general business uses. Therefore, the County anticipates and will encourage the orderly conversion of agricultural landholdings in the planning area to employment and general business uses as appropriate utilities become available.

B. Policies

1. The County will encourage the continuation of agricultural uses in the area until such time as the conversion of farmland to business and employment uses becomes appropriate and is desired by the landowners.

2. The County will continue to make farmland preservation programs available to farmlands in the Cub Run planning area until such time as landowners initiate the development approval process.

II. Residential Community Policies

A. Issue Statement and Policy Resolution

What should be the form, size and densities of new residential communities and where should these be located in the Cub Run planning area?

A blanket of Ldn 65+ (Loudness Day/Night Index) Noise Zones, an active diabase quarry and problem producing soils in the Cub Run planning area limit the desirability and feasibility of the area for future residential development. Therefore, although the County will encourage the protection and preservation of the existing residential communities, further residential development in the Cub Run area will be strongly discouraged.

B. Policies

1. In the Cub Run planning area, the County will not approve rezonings to PDH zoning districts, and will strongly discourage the use of existing R-1 zoning for residential land uses within or adjacent to the projected Ldn 65+ Noise Zones, as measured on the Integrated Noise Model, Mod 3.8, and as shown on Exhibit 15 of the “Final Report, FAR Part 150, Noise Compatibility Program, Washington Dulles International Airport”, prepared by Peat, Marwick, Mitchell for the Metropolitan Washington Airports and dated January 1985. (See Figure 15, page 28.)
2. New non-residential development or expansions of existing non-residential land uses should be appropriately screened from existing residences by means of a buffer zone as described in Section III, Policy 9, page 35.

3. The County will encourage rezonings of existing R-1 districts to appropriate zoning districts which are consistent with the goals and policies of this area plan.

III. Employment Policies

A. Issue Statement and Policy Resolution

What types of employment uses are appropriate for the Cub Run planning area and where should such uses be located?

The proximity of the planning area to Dulles International Airport, the Route 28 corridor, and the rapidly developing Fair Oaks area, makes Cub Run an ideal location for a variety of employment uses. Further, the Route 50 corridor provides good access to the area and has the potential to become an attractive, highly visible entrance to the County. These locational amenities, along with the land use limitations imposed by projected noise zones in the area, suggest that a mix of industrially oriented employment uses are particularly appropriate. The County will encourage the development of attractive, light industrial/business park type employment to the south of Route 50. North of Route 50, close to the airport and to the diabase quarry, the County will encourage the location of well screened heavy employment activities (See Figure 17, page 34.)

B. Policies

1. Land located to the south of Route 50 will be designated for a mix of attractive, light industrial office/research and high technology assembly uses.

2. Land located to the north of Route 50 will be designated for a variety of employment uses ranging from light industrial activities such as manufacturing and warehousing to heavy industrial employment activities such as quarrying or concrete mixing.

3. Land directly bordering Route 50 will be designated for attractive, low intensity employment uses. C-1 parcels located in the Cub Run planning area, but outside the Cub Run Watershed, should be encouraged to rezone to an appropriate light industrial or employment district once sewer and water service is planned by the County for such parcels.

4. Heavy industrial activities should be screened from direct view of residences, public roads and less intensive employment uses by buffers which may include berms, vegetative screening, or other material deemed suitable by the County at the time of rezoning, special exception or site plan review.

5. All portions of structures to be used as offices and lying within the limits of the 65-75 Ldn contour will be developed with building materials and/or with building techniques to achieve interior noise reduction of interior work spaces to Ldn 45. The limits of the projected 65-75 Ldn zones shall be shown on applications for rezoning, special exception, and subdivision plans as well as on site plans.

6. Special exceptions for non-accessory offices in areas designated for light industrial uses will be considered provided that the maximum permitted floor area ratio for these hybrid office/industrial buildings shall be limited to the extent necessary in order to limit traffic impacts to those which would be generated by PD-IP permitted uses. Additionally, non-accessory office uses allowed by special exception in these hybrid office/industrial buildings shall not exceed 49 percent of the total gross floor space of any single building. Notwithstanding the above, permitted PD-IP uses shall still be allowed at .4 FAR.

7. In order to maintain the character of light industrial districts, special exceptions for non-
accessory offices in PD-IP zones will also be subject to specific architectural controls. In particular, hybrid office/industrial buildings will be limited to two stories in height, and must have a minimum of two loading bays, screened or situated so as not to be seen from a public street. Additionally, at least 50 percent of the total gross floor area will have a floor load capacity of at least 125 pounds per square foot live load.

8. Employment industries that may be adversely affected will be discouraged from locating near the area's active quarrying operations or on diabase rock beds which conduct vibrations. The limits of these areas will be determined through subsequent studies by Loudoun County.

9. New nonresidential activities shall be properly screened from existing residences by means of a development buffer zone. In addition to meeting any zoning district minimum yard requirements as detailed in the Loudoun County Zoning Ordinance, a buffer zone of 300 feet shall be provided between any nonresidential structure and an existing dwelling unit. Depending on the nature of noise, storage and loading facilities, outdoor lighting etc. associated with a nonresidential use, total visual screening may be required. A landscape plan indicating buffer zone widths, berms, planting and screening materials should be submitted with all such rezoning, special exception and site plan applications.

10. New nonresidential activities shall be properly screened and buffered from Route 50 by means of a minimum 50' development setback, measured from the right-of-way of Route 50. (See Section VII, page 51) Depending on the location of parking, loading and storage facilities, total visual screening may be required. A landscape plan indicating buffer zone widths, berms, planting and screening materials should be submitted with all such rezoning, special exception and site plan applications.

11. Certain ancillary commercial activities serving industrial and/or employment areas such as stationery supply stores, printing shops, or sandwich shops will be encouraged to locate within these developments and will be reached by means of the entrances and roads established to serve employment areas.

IV. Commercial Facilities Policies

A. Issue Statement and Policy Resolution

What kind of commercial facilities will be needed to serve the residential and working populations of the Cub Run planning area? How should these areas be integrated into the overall plan for the area?

Development in the Cub Run planning area is expected and encouraged to be of an industrial/employment nature. Accordingly, the nature of commercial facilities will differ from those typically serving a residential community. Ancillary commercial uses which would serve a working population such as office supply stores, printers, and sandwich shops are encouraged as an integrated part of employment complexes. The existing C-1 zoning* presently located along Route 50 allows for unattractive and unsafe commercial strip development which often precludes optimum land development as it allows development to proceed in an uncoordinated, piecemeal fashion. Therefore, the County encourages the assemblage of small parcels along Route 50 with larger parcels in the area and the subsequent rezoning of these properties to a more appropriate zoning district.

B. Policies

1. The County will not approve rezonings to C-1 or the expansion of existing C-1 districts in the Cub Run planning area.

2. The County will strongly discourage

*Concurrent with the adoption of this plan, the Board of Supervisors created a new LI Zoning District (Zoning Ordinance Amendment 89-04) and rezoned the C-1 properties in the Cub Run subwatershed to that district (ZMAP 89-25).
approval of special exception uses in the C-1 districts in the Cub Run planning area.

3. The County will encourage those properties in the Cub Run planning area currently zoned C-1 to combine with larger tracts and for such tracts to seek rezoning to an appropriate light industrial or employment zoning district as sewer and water is planned by the County for such parcels.

4. A landscape plan indicating buffer zone widths, berms, planting and screening materials should be submitted with any site plan application located in a C-1 district. The County will encourage a minimum 50' building setback along Route 50 for C-1 properties in the planning area.

5. Use of commercial entrances along Route 50 should be discontinued as reverse frontage for commercial properties becomes available. Therefore, applicants submitting site plans in existing C-1 districts in the Cub Run planning area will be encouraged to plan sites and structures which in the future can be served via roads which parallel Route 50. Such plans should include commitments to only temporary access to Route 50.

V. Community Facilities Policies

A. Issue Statement and Policy Resolution

What sort of community facilities should be located in the Cub Run planning area? Where, when, and by whom should these facilities be acquired?

The Cub Run planning area currently has a very small residential population which is served by community facilities located in Arcola and Eastern Loudoun. Because the planning area is planned for a mix of industrial and employment-oriented land uses, there will be little need for the new schools, libraries, parks and similar facilities typically needed to serve increased populations generated by residential development. Furthermore, the Cub Run planning area, lying at the County’s edge and adjacent to Dulles Airport, is not geographically central to areas of the County where residential development is likely to occur therefore making it an unlikely location for the construction of community facilities which may be needed to serve future nearby residential populations. For these reasons, rather than seeking to establish new community facilities in the planning area, the policies in this plan are directed toward supporting and improving those community facilities and services presently serving the Cub Run planning area which will be in even greater demand as the planning area develops.

Of primary importance in the Cub Run planning area is the provision of adequate, appropriate fire and rescue services. The light and heavy industrial land uses proposed for the Cub Run planning area will create new demands for the county’s volunteer fire organizations which serve the area. The nature of industrial fires can vary widely, depending upon the types of equipment or chemicals which a particular industry or manufacturer uses in daily operations. Consequently, local fire-fighters may need a considerable variety of firefighting equipment and training to meet the needs of new development in the Cub Run planning area. The policies below reflect the shared responsibility between the public and private sectors in meeting these challenges and supporting the County’s volunteer fire and rescue organizations.

B. Policies

1. The County will consider the provision of fire and rescue proffers for rezonings, and as conditions of special exceptions in making its decision to approve or deny the proposals.

2. The County may require as a condition of site plans, special exceptions or rezonings, the installation of appropriate fire detection/suppression systems in new non-residential structures as determined on a case by case basis.

3. Until such time as public water service is established in the Cub Run area, new developments should provide for, or have access to, an on site emergency water supply system ad-
equately sized for the needs of structures which would be served in the event of a fire emergency. Final approval of this aspect would rest with the Director of Fire and Rescue Services.

4. During the review of rezonings, special exceptions, subdivisions and site plans in the Cub Run area, the County will encourage the provision of a minimum of two points of ingress and egress serving an employment park complex in order to facilitate fire and rescue access. The County may also require the provision of a minimum of two points of access to a particular site depending upon the intensity and nature of the proposed uses. Final approval of site ingress/egress would rest with the director of Fire and Rescue Services.

VI. Transportation Policies

A. Issue Statement and Policy Resolution

*How should the transportation system in the Cub Run planning area be designed and implemented to ensure a condition of stable flow and efficient travel?*

A new road network will be needed in the Cub Run planning area to support the level of development expected to occur. Therefore, the County will oversee the design and implementation of a transportation network which promotes safe and convenient vehicular traffic, reduction of long-term road maintenance costs, efficient investment of public funds, appropriate use of land and protection of water quality by reducing impervious surfaces to a minimum. Additionally, the County will seek the protection of existing residential communities in Cub Run by limiting neighborhood traffic volume, speeds, noise and fumes. The central design concept underlying County policy is one of separation of different types of travel from one another and from incompatible land uses as illustrated in Figures, 18 and 19, pages 38 and 39. A glossary of transportation terms and a summary of the road network proposed for the Cub Run planning area appear as an Appendix C to this document.

B. Policies

1. Road Policies:

   a. The road network in the Cub Run area will consist of a coordinated and balanced hierarchy of roads designed to achieve the safe, efficient and functional movement of people and products.

   b. All roads in the Cub Run planning area will be built to Virginia Department of Transportation (VDOT) standards to be eligible for acceptance into the State Highway system.

   c. Arterial Roads:

      i. *Designation:* Route 50 will continue to function as the major arterial transportation corridor for the Cub Run area.

      ii. *Functional Description:* In the short-term, Route 50 will be classified as a major arterial to accommodate 40,000 vehicle trips per day in a condition of stable traffic flow at traffic speeds averaging 50 miles per hour. In the long-term, Route 50 will be classified as a limited access freeway to accommodate 60,000 vehicle trips per day in a condition of stable traffic flow at traffic speeds averaging 50 miles per hour.

      iii. *Design:* In the short-term Route 50 will be designed as a six-lane, median divided U-shaped facility with controlled access. Left and right turn lanes will be provided at all intersections. A deceleration lane shall be provided at any entrance found to be consistent with Route 50's controlled access format. Although controlled access design will be sufficient for Route 50 in the short term, in the long term limited access design will be necessary. Therefore, direct lot access to Route 50 will be prohibited where possible. Where direct access is the only option, the County will require that such access be temporary and that the development/site plan be designed so as to provide
Transportation Plan - Short Term • Figure 18

[Map of area with various roads and symbols indicating transportation elements, such as major and minor arterials, collectors, and possible internal access.]

Key:
- Major Arterial
- Major Collector
- Minor Collector
- Cul-de-sac
- Possible Internal Access
- Realigned Section
- Local Road
- Watershed Boundary
- Planning Area

Adopted December 19, 1989
for alternative access at a future time when development occurs on adjacent tracts. In
the long-term, Route 50 will be designed as a six lane limited access freeway. An inter-
change will be provided at Route 609 west of the Cub Run area. The Route 609 Interchange
is intended to serve development within the Cub Run Management Area.

iv. Route 50 Landscaping and Setback Plan: A landscaping plan with a 50’ foot building
restriction setback from the ultimate right-
of-way will be developed along Route 50 in
the Cub Run area and will be implemented concurrently with development on both
sides of the road.

d. Major Collector/Community “Spine” Roads:

i. Designation: The South Parallel Road to Route 50 will connect with a realigned
Route 609 to provide a direct through route to Route 50 and serve as a Major Collector
road in the Cub Run area.

ii. Functional Description: The South Parallel Road/Route 609, will be designed
primarily to assist vehicular movement throughout the Cub Run area and not for
access to individual lots. Major collector roads will be designed to accommodate
30,000 vehicle trips per day at speeds averaging 45 miles per hour in a condition of
stable flow.

iii. Design: Major collector roads will be designed as four-lane, median divided U4R
or R4R facilities with appropriate turning and acceleration/deceleration lanes. Access
to property will not be allowed on major collector roads. Parking will not be allowed
on major collector roads.

e. Major Local Access Collector Roads:

i. Functional Description: Minor collector roads conduct and distribute traffic from the
major collector roads to the local access roads and to major industrial developments
and public facilities. The minor collector roads will be designed to accommodate
8,000 vehicle trips per day at design speeds averaging 40 miles per hour. The North and
South Route 50 Access Roads are two of the minor collectors in the Cub Run Area.

ii. Design: Minor collector roads in industrial/employment areas will be designed
to control lot access points. Minor collector roads can provide direct access to larger em-
ployment facilities if safe and stable traffic flow is ensured. Minor collector roads shall
be four-lane undivided roads with U4 geometric sections. Minor collector roads
will be designed to discourage through traffic from other developments and will not
provide on-street parking.

f. Major Local Access Roads:

i. Functional Description: Major local access roads will provide access to abutting
properties and may also conduct traffic from local access roads that intersect them. The
major local access roads will be designed to accommodate a traffic volume no greater
than 5,000 vehicle trips per day at speeds of 35 miles per hour.

ii. Design: Major local access roads will be designed to twice intersect a minor col-
llector road. Geometric sections will vary according to the characteristics of the local
areas being served. Curb face to curb face widths will be 40 to 48 feet depending on the
nature of the specific road. On-street parking will be discouraged in the Cub Run plan-
ning area but will be evaluated on a case by case basis and could be allowed on major
local access roads if two safe moving lanes are maintained consistent with VDOT standards.

g. Local Access Roads:

i. Functional Description: Local access roads will provide access to abutting prop-
erties and will be designed to carry no
more traffic than that which is generated on the road itself.

ii. Design: A variety of geometric sections are feasible for local access roads consistent with the nature of the area and the amount of traffic anticipated. These roads will be designed consistent with VDOT standards. (See VDOT's Major Subdivision Street Standards and Bridge and Road Standards.)

h. The County expects that development proposals in the Cub Run area will incorporate a hierarchical road network from local access to minor collector roads commensurate with the traffic flows associated with the proposal.

i. The County anticipates that developers in the area will construct the planned road network which, by providing vehicular access to all parts of the Cub Run Area, will benefit all local landowners.

j. The timeframe for this transportation element of the Cub Run Area Management Plan is 10 years for the short-term and 25 years for the long-term. The road network in the plan will accommodate build-out in those areas of Cub Run specified for employment uses and also accommodate the limited amount of development anticipated for the Route 50 corridor in the Regional Cooperative Forecasts. These forecasts do not anticipate short-term extension of sewer and water infrastructure into areas of the Route 50 corridor west of Cub Run. Should this occur, the amount of through traffic on Route 50 through Cub Run could escalate significantly and accelerate the need to upgrade Route 50 to limited access freeway status.

k. The Cub Run transportation element has a limited number of connections with the external road network with Route 50 serving a large majority of the through trips. It may be necessary to provide amplified connections to the regional road network in the future. Future updates to the Cub Run Plan coordinated with the County's forthcoming 25 Year Transportation Plan and 10 Year Transportation Management Program or any adjacent area plans should continue to reexamine the need for and format of these amplified external road connections.

l. In considering development applications for the Cub Run area, the County will require that new buildings be so located as not to preclude the extension of any future roads or upgrading of a road which may ultimately be required, including eventual construction of grade-separated interchanges of major intersections along Route 50.

m. Median breaks on any median-divided roads in the Cub Run area shall be consistent with the desirable distances for such breaks as detailed in VDOT standards.

n. In considering development applications in the Cub Run planning area, the County will strongly encourage the consolidation of existing entrances along Route 50 and will encourage shared entrances for new development. Additionally, as development occurs in the Cub Run planning area, the County will encourage a system of interparcel access to provide an alternative means of access to parcels fronting along Route 50.

2. Shared Ride Policies:

a. The County will encourage the use of arterial and collector network by carpools, vanpools and community buses by cooperating with metropolitan information exchange efforts.

b. The County will encourage the daytime use of portions of shopping center or other parking lots located near arterial roads by those seeking to share commuter rides.

c. The County will cooperate with the Virginia Department of Transportation in the creation of a park-and-ride lot or lots within the Cub Run Area, as part of a system of facilities in the Route 50 Corridor. These lots shall be
conveniently situated for access to Route 50.

d. The County will consider proposals to locate a community bus terminal in an employment zone if the proposed use is compatible with surrounding development and if appropriate public facilities and utilities are available to support the facility.

e. The County will consider proposals to locate trucking and bus repair facilities in the employment zones of the Cub Run area if the proposed use is compatible with surrounding development and if appropriate public facilities and utilities are available to support the facility.

3. Airport Policies:

a. The County will encourage the use and expansion of the Washington Dulles International Airport to achieve its full potential as a five runway facility.

b. The County will cooperate with the Washington Dulles International Airport authorities to research and refine effective operational procedures which will permit compatible growth of the airport and the Cub Run planning area.

c. The County will negotiate with the Washington Dulles International Airport authorities such agreements on airport operations as will ensure harmonious community development in the Dulles area.

d. The County will map present and future corridors of aircraft arrival and departure in the Cub Run planning area and will only permit land uses in these corridors which are compatible with the height, noise and vibration characteristics associated with low flying aircraft.

VII. Route 50 Corridor Policies

A. Issue Statement and Policy Resolution

The Route 50 corridor in the Cub Run planning area is one of only two major eastern entrances into Loudoun County. Here, where the roadside is relatively undeveloped and the topography is flat and open, development setbacks and landscaped buffers should be encouraged to increase road safety and to create an aesthetically pleasing visual experience. Planting and berming can be used advantageously in the planning area to lead drivers' eyes toward desirable views or, just as importantly, to screen from view areas which are distracting or unattractive. Additionally, uniform setbacks and roadside landscaping will be especially important in Cub Run for establishing a visual edge which will assist motorists in speed awareness by creating a sense of motion within a driver's cone vision. For these reasons, and to create a sense of arrival in Loudoun County, development setbacks for buildings and guidelines for landscaped buffer zones have been established along the Route 50 corridor in the Cub Run planning area.

B. Policies

1. Concurrent with the review of rezoning, special exception and site plan applications for properties bordering Route 50 in the Cub Run planning area, a minimum 50' building setback, measured from the ultimate right-of-way, will be required. Setbacks greater than 50' may be recommended depending upon the nature of the proposed land use.

2. Concurrent with the review of rezoning, special exception and site plan applications for properties located along Route 50 in the Cub Run planning area, a minimum 50' parking setback will be recommended, provided that parking areas are screened completely from view of Route 50 by means of berming and/or plant materials. Fences or walls are unacceptable screening materials for these parking area.
3. A landscape plan indicating buffer zone widths, location of berms, and plant materials must be submitted with any site plan, special exception or rezoning application for a property located along Route 50 in the Cub Run planning area.

4. Heavy industrial activities, particularly along the north side of Route 50, must be screened from view of Route 50 by plant materials such as evergreen trees and shrubs that will attenuate noise and provide complete visual opacity.

5. Stormwater management ponds may not be located within the required 50' development setback.

6. Where complete visual screening is not required, informal, attractive plantings which enhance the natural surroundings of the planning area are encouraged in order to create a park like atmosphere along the Route 50 corridor. Any areas left in a natural state must be properly maintained in an attractive, well kept condition.

7. All plant materials located within the Route 50 development setback buffer should be tended and maintained in a healthy growing condition, replaced when necessary and kept free of refuse and debris.

VIII. Sewer Service Policies

A. Issue Statement and Policy Resolution

Should the County pursue the provision of central sewer facilities in the Cub Run Watershed? If so, how should the County implement and manage wastewater treatment to minimize public expense and plan for the future?

Because poor soils in the Cub Run planning area pose significant natural constraints to development with on-site sewage treatment facilities, the primary factor which will influence the intensity, timing and type of development in the Cub Run planning area is central sewer service. In order for development to proceed, a central sewer system must be provided. Development in the Cub Run area is expected to have a positive fiscal impact on the County’s revenue base. Therefore, expansion of utility lines into the Cub Run Watershed, contained within the planning area, is an effort to meet the needs of the development community while managing growth in a fiscally responsible manner.

B. Policies

1. The County Board of Supervisors will pursue negotiations with Fairfax County and the Upper Occoquan Sanitation Authority to serve the Cub Run Watershed through the extension of the existing Fairfax County sewer lines into the Cub Run Watershed and to acquire treatment capacity in the UOSA plant on an interim basis.

2. The County Board of Supervisors supports the concept of a pumpover from the Cub Run Watershed to the Blue Plains Interceptor or to an advanced wastewater treatment plant in the Broad Run Watershed as a means of long term sewage disposal.

3. In supporting the concept of a pumpover as specified in Section VIII, policy 2, the County will continue to rely on the Potomac Interceptor Sewer as the provider of 17.93 million gallons per day of sewage flow until such time as the new advanced wastewater treatment plant contemplated by the Dulles North Area Management Plan is constructed in the Broad Run Watershed with the additional capacity sufficient to accommodate the sewage generated in the Cub Run Watershed.

4. The Board of Supervisors has the responsibility to plan community facilities consonant with the efficient and economical use of public funds and to protect against undue density of population in relation to community facilities and, therefore, should future exploration and examination of sewage disposal options indicate that a pumpover is not the most practical...
method for providing sewer service, the County Board of Supervisors will pursue other alternatives to provide sewer service to the area.

5. The County will encourage the Loudoun County Sanitation Authority (LCSA) to vigorously pursue the provision of central sewer and water service to the Cub Run Watershed so that such service will be in place within three years of the adoption of this plan. In the interim, the County will encourage the LCSA to provide pump and haul service to this Watershed in concert with LCSA policy.

6. In the event that the County cannot acquire or provide any means of central sewer service with sufficient capacity to service the Cub Run Watershed, the County will reexamine this plan, and, if necessary, develop a revised land use plan.

7. The County will not fund the extension of sewer lines to serve private development in the Cub Run Watershed. Line extensions will be the responsibility of the private sector.

8. The County will require the pretreatment of toxic waste from industrial land uses before these wastes are allowed to enter the main sanitary sewer system.

9. The planning and/or provision of central sewer service to the Cub Run Watershed does not make or imply any current or future commitment to provide utility services to the Elklick, Foley Branch or Upper Broad Run Watersheds.

IX. Water Supply Policies

A. Issue Statement and Policy Resolution

How should the County plan for the future water supply needs in the Cub Run area?

The type and scale of development which will occur in the Cub Run planning area will, to some extent, depend on the provision of central water service. In particular, some industrial and employment activities may require large amounts of water which cannot be adequately provided by individual wells. Therefore, in order to anticipate and meet the development needs of the Cub Run planning area, the County will authorize the Loudoun County Sanitation Authority to pursue alternatives for providing water service to the Cub Run Watershed.

B. Policies

1. The County will authorize the Loudoun County Sanitation Authority to immediately pursue the most viable option for water service to the Cub Run Watershed, which lies in the Cub Run planning area. Preliminary findings indicate that the extension of Fairfax County water lines into the Cub Run Watershed may be the most attractive alternative for the immediate future. However, other water supply options including the use of Fairfax City’s Goose Creek Impoundment, the Leesburg Potomac Intake, and construction of a new LCSA facility on the Potomac should be examined.

2. The County will not fund the extension of water lines to serve private development in the Cub Run Watershed and will require that line extensions be the responsibility of the private sector.

X. Environmental Policies

A. Issue Statement and Policy Resolution

What measures should be taken to minimize the effect of new development on the natural environment in the Cub Run planning area?

It is a challenge to integrate the changes brought on by development with the natural systems operating in the environment. Accordingly, the County will seek to ensure that development is sensitive to the critical environmental conditions which exist in the Cub Run planning area. In particular, the County will encourage the protection of vegetation, floodplains, stream valleys and the water quality of the Occoquan Reservoir. However, just as these natural elements need to be protected from
change brought on by new development, there are constraints posed by other environmental conditions (natural and man-made) from which new development should be protected. The development community in the Cub Run area will need to be regulated in order to avoid problems created by soils, airport noise, and noise and vibrations from an active diabase quarry.

B. Policies

1. Water Resources and Watershed Management Policies:

The County will continue and will supplement existing policies which seek to protect property owners by maintaining the existing watershed and watercourse system in a stable, long-term pattern. Existing floodplain ordinances designed to reduce disturbance to the stream bed profile to a minimum will be maintained. Any changes to the floodplain will not be allowed to increase either the erosive velocity or height of floodwaters above or below the altered property in order to protect the property rights of adjacent landowners. Also, because the Cub Run planning area is a subwatershed of the Occoquan Watershed, the County will encourage the development of holding basins, runoff restriction sluices and the planting of vegetation belts. To control the quantity and quality of surface water runoff from new developments with their extensive impervious surfaces, the County will expect and strongly encourage the retention of all watercourses in as natural a state as possible because this is in harmony with its policy of maintaining the hydrologic patterns in a historically stable equilibrium.

a. The County will seek to preserve the 100 year floodplains (as defined in the Loudoun County Floodplain Ordinance) in their natural state and will ensure that land development and changes do not increase flooding on site or downstream beyond what would now occur in a 100 year flood.

b. The County will encourage multiple use of the 100 year floodway and floodway fringe for timber and firewood production, wildlife habitat, passive recreation and trails to the extent that these activities maintain hydrologic and ecological balance.

c. The County will encourage maintenance of perennial streams in a natural condition and will require that modifications of any dry drainageways will be accomplished in an environmentally sensitive manner.

d. Modifications to perennial streams will be allowed only in situations for which a highly significant public need is served; in such cases, the County will require restoration of the streambed and adjacent slopes to a comparable hydrological and ecological function.

e. The County will discourage all but the minimum number of stream and floodplain crossings and will encourage the use of streams and floodplains as natural divisions between differing land uses.

f. The County will manage its portion of the Occoquan Watershed to help ensure that the Occoquan Reservoir will not suffer reduction of water quality.

g. In order to control non-point source pollution, Best Management Practices (BMP’s)* must be used in any agricultural operations and in any new development, including during the construction phase of such development. Additionally, the County will require the use of BMP’s, such as vegetation belts and natural stream buffers, to assist in maintaining the quality and quantity of stormwater runoff.

h. The County will require the provision of appropriate stormwater catchment facilities as an integral part of any development proposal for the Cub Run planning area.

*Practices that is determined by the State of Virginia to be the most effective, practicable means of preventing or reducing the amount to pollution generated by nonpoint sources to a level compatible with water quality goals. (Source: Best Management Practices Handbook, SWCB, 1979.)
i. The County will seek to protect the quality of groundwater resources in the Cub Run planning area through the use of BMP's and the periodic monitoring of groundwater.

j. The County will not waive requirements for stormwater management facilities in the Cub Run planning area.

2. Problem Producing Soils Management Policies:

Development on problem soils, particularly the clayey, plastic soils prevalent in Cub Run could lead to cracked roads and foundations, wet basements and other situations that are very difficult and expensive to correct retroactively. Therefore, the County will continue to positively address the question of problem soils in initial development.

a. Soil conditions should be a determining factor when developers assemble a rezoning, subdivision, special exception or site plan proposal for County review. Furthermore, the County will weigh the conformance of a proposal with the underlying soil conditions in decisions to approve or deny the proposal.

b. The County prefers the use of building types, materials and practices which will reduce potential soil related problems for future users to a minimum.

c. The County will not permit the location of sanitary or debris landfills in the Cub Run planning area due to the potential problems with subsurface and surface drainage, grading and excavation of these soils and due to the location of the planning area in the environmentally sensitive Occoquan Watershed.

3. Noise Management Policies:

As Dulles International Airport continues to expand its operations and as development occurs in those areas of Cub Run planned for industrial employment, noise levels in the planning area will rise significantly. In order to minimize the effect of this increasing nuisance on the residential and working populations of the Cub Run area, the County will not permit the development of noise sensitive land uses in the air corridors used by low flying aircraft enroute to or from Washington Dulles International Airport. Buffer zones, berms and vegetation belts between conflicting uses will be the preferred technique of ensuring community harmony between uses which are not completely noise compatible.

a. The County will continue to negotiate with the Washington Dulles International Airport authorities to refine airport operations and aircraft arrival and departure routes in order to minimize the effects of noise on noise sensitive land uses.

b. The County will institute review procedures for proposed new noise sensitive land uses such as offices located within the projected Ldn 65+ noise zone. Approval for noise sensitive uses will be subject in part to the installation of noise attenuation measures in the fabric of the structure.

c. The County will seek to buffer noise sensitive land uses, such as residences, from noise generating uses, such as industrial employment, in order to reduce noise based community frictions.

d. The County will establish appropriate buffering, berm and vegetation planting standards to minimize the effects of traffic or noise generating land uses on noise sensitive land uses.

4. Vegetation and Wildlife Management Policies:

"Trees and other vegetation: help stabilize the soil and prevent erosion; decrease stormwater run-off and maintain water quality through canopy interception and root zone absorption; aid in energy conservation and human comfort through the moderation of temperature extremes and provision of shade..."
and windbreaks; provide buffers and screens that help to reduce noise and air pollution; filter pollutants from the air; assist in groundwater recharge; contribute to the reduction of flood magnitudes; provide important psychological, social and aesthetic benefits in urban and suburban areas; function as integral components of the natural eco-system and serve as a habitat for various animal and bird species which in turn assist in the control of insect populations; and tend to conserve and increase property values.”

a. “... It is the policy of the Loudoun County Board of Supervisors to preserve and protect the existing natural vegetation of the County to the maximum practical extent.”

b. “The Loudoun County Board of Supervisors shall implement this policy by amendment to existing ordinances and adoption of new ordinances and regulations and by incorporation of adequate vegetation analysis into all aspects of the County Planning, zoning and land development process.”

c. Existing vegetation should be a significant factor when developers assemble a rezoning, subdivision, special exception or site plan proposal for County review. Furthermore, the County will weigh the conformance of a proposal with the existing vegetation in decisions to approve or deny the proposal.

d. Where development is proposed on a tract which has open space as well as wooded areas, the County will recommend development be located in the open space contingent upon soil suitability.

e. Where existing vegetation is disturbed in development, indigenous or ecologically compatible species should be used in landscape restoration.

5. Natural Resource Extraction Policies:

The Cub Run area is the source of some of the highest quality diabase rock available on the East Coast. Quarrying is a prominent local industry which supplies diabase, an important road building and construction material, to the rapidly growing Metropolitan Washington area. Despite the important resources which quarries provide, they make difficult neighbors for most other land uses. The County will seek to protect quarries operating in the Cub Run planning area by taking measures to ensure that nearby future land uses in the area are compatible and that environmental and safety standards are observed.

a. The County will not allow mineral extraction activities to be visible from the Route 50 corridor.

b. The County will allow mineral extraction in areas designated for general industrial uses if the proposed activity demonstrates benefits to the local economy while ensuring protection of existing and planned neighboring uses from such dangers as economic, safety and health hazards and the environment from short and long-term degradation.

c. The County will require the submission and approval of a development-exploitation plan and a reclamation plan prior to issuance of a zoning permit allowing the expansion of an existing mineral extraction operation.

d. The County will encourage creative solutions for the reclamation of mineral extraction sites such as recreational facilities, emergency water supplies or deposit sites for clayey plastic soils stripped for construction purposes.
XI. Historic Resource Policies

A. Issue Statement and Policy Resolution

What efforts should be undertaken to conserve the area’s archaeological and historical heritage as new development occurs?

Only a small number of structures in the Cub Run planning area have been surveyed for historical significance. Therefore, as the area begins to develop, it is important that the survey process for existing structures and sites suspected of having archaeological or historical significance to the County or the Cub Run area be continued. New development in the Cub Run area should be located in a way which will enhance and respect existing historical structures. A clear spatial boundary between the new and the old such as a landscaped screen of vegetation is preferred. New developments in close association with the old should not generate negative off-site traffic, parking or other effects which would be detrimental to archaeological remains, historic structures and general character of the area.

B. Policies

1. Protection of archaeological sites and historic structures and groups of structures will be sought and encouraged by the County at the time of land rezoning, subdivision, special exception and site plan review and development.

2. A transition zone between new development and archaeological sites and historic structures and groups of structures will be sought by the County during review of new development proposals. The retention of adjacent existing woodlands and/or vegetative screens will be strongly encouraged.

3. Individuals, organizations, groups and members of the development community will be encouraged by the County to identify, research and preserve archaeological sites and historic structures or groupings of historic structures which contribute to the local culture and archaeological past of the County and the Cub Run area. The County will assist in such efforts by providing the use of its historic files and liaison assistance commensurate with the County’s resources and ability to provide such aid.
Chapter 4
Implementation
Recommendations
The following recommendations are intended to facilitate a smooth transition of this Plan’s goals and policies into action by coordinating County Comprehensive Planning efforts with regulations which guide land use and with fiscal programs which influence public facility and service expenditures. Although they are intended primarily to implement the policies which are proposed for adoption for the Cub Run planning area, these recommendations are equally important for improving and managing development Countywide. The County encourages development of any additional or alternative implementation strategies by the public or private sector as long as they fulfill the basic purpose and intent of the plan’s goals and policies.

A. Amendments to the Zoning Ordinance

[The following recommendations were written before the Board of Supervisors adopted the LI District and rezoned most of the C-1 land in Cub Run to the new zoning district. They remain in the plan because they are pertinent for areas other than Cub Run.]

1. C-1 District:
A substantial amount of C-1 zoning exists along Route 50 in the Cub Run planning area creating a conflict between what is planned and what the existing zoning would permit. Both the policies section of this plan and the County’s Zoning Ordinance recognize that C-1 zoning is undesirable because it allows for uncoordinated, unattractive strip development, encourages multiple entrances along highways and in some cases, precludes optimum land development. Landowners and developers in the Cub Run planning area are strongly encouraged to assemble and subsequently submit rezoning applications to rezone C-1 properties to a zoning category consistent with this area plan. The following recommendations are proposed in order to limit the intensity of development in C-1 zones to a level consistent with existing commercial development.

a. The County should amend the existing C-1 zoning district regulations so as to allow a maximum FAR of .20 in order to ensure that any new commercial development is consistent with existing commercial development in Loudoun County.

b. The County should amend the existing C-1 zoning district regulations to remove uses 17-26 as permitted uses and allow them only as special exceptions permissible by the Board of Zoning Appeals.

c. The County should amend the existing C-1 zoning district to require a minimum front yard of 50 feet.

2. I-1, R-1, A-3 Districts:
Diabase quarrying and activities associated with diabase resources are important economic assets in the Cub Run planning area. This plan encourages the continuation of quarrying activities to the North of Route 50 in areas where diabase is present and where industrial zoning exists. Diabase quarrying is not encouraged south of Route 50 although there are deposits of diabase and the present R-1 zoning would allow mineral extraction by special exception. As the Cub Run planning area develops it will become increasingly difficult to reconcile heavy industrial land uses with less intensive land uses that are planned south of Route 50. Therefore, in order to oversee extractive industries more carefully, and to promote greater compatibility among land uses in the County’s I-1, R-1 and A-3 zoning districts, the following changes are recommended:

a. Concurrent with the adoption of a new Resource Extraction zoning district (see Recommendation B) mineral extraction (quarries, mines, sand and gravel recovery etc.) and associated activities (such as asphalt or concrete mixing plants, screening plants and rock crushers) should be removed from the I-1 zoning district as a by-right permitted use.
b. Resource extraction should be removed from R-1 and A-3 zoning districts as a special exception use permissible by the BZA.

B. Development of a New Resource Extraction District

In conjunction with amendments to the Zoning Ordinance regarding resource extraction, the County should develop a new zoning district which is designated for the extraction of resources and associated activities. In the Cub Run planning area, the new zoning district will replace existing I-1 zoning in order to promote continued diabase quarrying in those areas north of Route 50 which are particularly well suited for this activity.

1. The County should adopt a comprehensive mineral extraction zoning district which will be the single zoning district in which new mineral extraction activities and related uses are permitted.

2. Upon the adoption of a new resource extraction zoning district and amendments to the I-1 district, the Board should rezone existing quarries to the new resource extraction zoning district and should identify and designate other areas of the County which appear well suited for resource extraction zoning district designation.

3. The County will adopt the policy of requiring a rezoning and special exception application for all mineral extraction proposals in areas designated for mineral extraction. The proposal will, furthermore, be accompanied by a geotechnical report detailing the following:

   a. Description of the geologic formation and evidence of proven reserves.

   b. The effects of extraction operations on groundwater supply sources using current industry-wide technologies and procedures.

   c. The effects of blasting on nearby structures, uses or areas designated for community development or prestige employment areas.

   d. The proposed program to monitor short and long-term damage to affected structures and groundwater supplies.

   e. The proposed program and financing mechanisms of soil erosion abatement and eventual site reclamation design which will provide a stable and safe environmental situation in the quarry areas, although a complete restoration of the area to its former contours is not necessarily expected.

   f. The phases of site development, the nature of noise and vibration abatement procedures, setback and buffer screen designs and the location of ancillary extraction or processing operations such as concrete block manufacture and/or storage, or other activities such as hot bitumen preparation.

C. Revisions to the PD-IP Zoning District

The County has received numerous applications for blanket special exceptions for office uses in light industrial, PD-IP zoning districts in Dulles North and Eastern Loudoun. Because the Cub Run planning area is expected to develop in a similar fashion, a number of blanket special exception applications can be anticipated here as well. The following revisions to the Zoning Ordinance are recommended to facilitate the review of such applications.

1. The County should amend the existing PD-IP zoning district or create a new zoning district which will allow a mix of light industrial uses and non-accessory office uses as permitted uses rather than by special exception.

2. In order to encourage greater than required development setbacks in PD-IP zoning districts, the County should amend the PD-IP zoning district to allow the transfer of unused floor area from one lot to another within a PD-IP district as long as the floor area of the entire project does not exceed .40 FAR.
D. Acquisition of Land for Park and Ride Lot

At the appropriate time the County will cooperate with VDOT and a developer or developers, to select and acquire a "park and ride" commuter lot in the Cub Run area. If a parcel of land for this use cannot be acquired through the proffer process, the County should include the purchase of a suitable parcel in its Capital Improvement Program.

E. Fire and Rescue Proffer System

New development in the Cub Run area will place increased demands on the County's volunteer fire and rescue system. In particular, contributions for additional training and special equipment for industrial firefighting could assist in meeting Cub Run's fire protection needs. In order to ensure support for the County's volunteer fire and rescue squads in this and other areas, the County should adopt a uniform fire/rescue contribution system, based on land uses and building sizes, in order to establish suitable guidelines for contributions toward fire and rescue services associated with applications for new development.

F. Route 50 Corridor Study

Route 50 is a major transportation corridor important not only to the Cub Run planning area, but all of southern Loudoun County. The visual quality and character of the Route 50 corridor, as well as its importance as one of the County primary highways, has been a major focus of the Cub Run area plan. Ideally, it will continue to be the focus of planning efforts beyond the boundaries of Cub Run in order to establish the cohesive, attractive, and functional corridor envisioned by the County. Therefore, the County should initiate a Route 50 corridor study which will develop guidelines for setbacks, landscaping, and buffers for the entire Route 50 corridor. Additionally, the County should identify possible interchange locations and the width of right-of-way necessary for future road improvements. Until such time as more specific area plans are adopted, these policies should be incorporated into the County's Rural Land Management Plan. The following recommendations should function as a starting point for a Route 50 corridor study.

1. A development setback should be established along Route 50. This setback should gradually widen from a width of 50' in the east, to an ultimate width of 300' in the western, rural portion of the corridor.

2. Guidelines for landscaping within the development setback should be established.

3. Reduced landscape buffering requirements should be considered in exchange for a greater development setback width.

4. Proposed long term road improvements and interchange locations in the Cub Run planning area should be included and analyzed in the context of a Route 50 corridor study.

G. Water Supply Plan

In order to determine the water supply needs of the Cub Run planning area in conjunction with the water supply needs of Eastern Loudoun as a whole, Loudoun County shall request the Loudoun County Sanitation Authority to pursue a water needs study for Eastern Loudoun which will include long term alternatives for providing water to the Cub Run Watershed and other areas of the County.
Appendices
Appendix A


Conclusions

1. 20-year average daily wastewater flow for the year 2010 are estimated to be 2.7 mgd for the Loudoun County portion of the Occoquan Watershed and about 2.0 mgd for the Loudoun County upper Broad Run Watershed. By the year 2040, average daily wastewater flows in the two watersheds are estimated to increase significantly, ranging from approximately 10 mgd for the Occoquan Watershed within Loudoun County to about 7.6 mgd for Upper Broad Run.

2. Alternative No. 1 - Construction of pumping stations, force mains, and gravity sewers to convey wastewater from the Loudoun County portion of the Occoquan Watershed to the existing UOSA wastewater treatment plant is technically feasible. This is the least costly alternative with an estimated present worth cost of about 56 million dollars. However, a high degree of uncertainty exists regarding implementability, which is contingent upon the following items:

   a. Fairfax County approval of rights-of-way for Loudoun County sewers in Fairfax County to connect to the UOSA wastewater collection system along Cub Run.

   b. Approval by all four UOSA member jurisdictions of a request by Loudoun County to become a member of UOSA and to be allocated required capacity in the treatment plant.

   c. In the event that Loudoun County chose not to seek membership in UOSA, the approval by a participating UOSA jurisdiction of the purchase of long-term capacity in the UOSA treatment plant.

   d. State Water Control Board approval of capacity in excess of 40 mgd at the UOSA wastewater treatment plant.

Benefits of Alternative No. 1 include the possibility of serving the Cub Run and Elklick Run subwatersheds in the Loudoun County portion of the Occoquan Watershed by about 1989. Disadvantages of Alternative No. 1 include the uncertainty about implementability, heavy reliance upon commitments by other jurisdictions to convey and accept Loudoun County flow at UOSA, and the lack of total County control over the operation and expansion of the treatment facility.

3. Alternative No. 2 - The use of the Potomac Interceptor and Blue Plains for wastewater generated after year 2000 in Loudoun County is not a viable alternative unless the Authority's service agreement with the District of Columbia can be amended. Beginning in the year 2000, Loudoun County discharges to the Potomac Interceptor and Blue Plains will be limited to the year 2000 flow. Thus, a major disadvantage of Alternative No. 2 is that it does not provide for treatment capacity to serve the Loudoun County Occoquan and Upper Broad Run Watersheds for a 20-year period.

4. Alternative No. 3 - Construction of a new 3.0 mgd advanced wastewater treatment plant in the Loudoun County portion of the Occoquan Watershed is technically feasible. The required design would be similar to the existing UOSA treatment facility to meet the stringent effluent water quality standards of the Occoquan Watershed Policy. Of the four wastewater management alternatives considered, Alternative No. 3 was estimated to have the greatest present worth cost (about 66 million dollars). Another disadvantage of Alternative
No. 3 is that permanent wastewater service would not be available in the Loudoun County portion of the Occoquan Watershed until 1992. Benefits of the alternative include total County control over the operation and expansion of the treatment facility and no reliance on other jurisdictions to convey and accept flow from the Occoquan Watershed of Loudoun County.

5. Alternative No. 4 - Construction of a new 5.0 mgd advanced wastewater treatment plant in the Upper Broad Run Watershed of Loudoun County to serve both the Loudoun County portion of the Occoquan Watershed and the Upper Broad Run Watershed is technically feasible. The plant would not be required until the year 2000 because the Authority could rely upon its available capacity in the Potomac Interceptor to serve future development through the year 2000, with additional treatment capacity required to handle flow increases after 2000. The alternative was estimated to be the second least costly wastewater management alternative with a total present worth cost of about $5 million dollars, assuming a treatment plant with a design very similar to the UOSA treatment plant to satisfy the stringent requirements of the existing Dulles Area Watershed Policy (DAWP). If the DAWP treatment standards are relaxed by the State Water Control Board at a later date to match the recommendations in a recent study the Northern Virginia Planning District Commission, it is likely that the present worth cost for this alternative could be reduced by as much as 6 million dollars. Thus, future changes in DAWP treatment standards could conceivably reduce the present worth cost for Alternative No. 4 to a level which is only about 5 percent greater than the least cost alternative (No. 1).

Alternative No. 4 would provide the County with complete control over the operation and future expansion of the treatment facility. The alternative would be in compliance with the Dulles Area Watershed Policy, which recommends a regional treatment plant location within the Broad Run Watershed of Loudoun County. The treatment facility could also serve other portions of the Authority's service area in addition to Dulles International Airport and possibly Fairfax County. Another advantage of this alternative is the reduced risk of adverse water quality impacts since the treatment plant will discharge to a stream/river system rather than a reservoir system, like the Occoquan Reservoir. As a result, there should be less uncertainty about regulatory agency approval of a Loudoun County discharge and future treatment plant expansions in comparison with the options which involve increasing wastewater discharges into the Occoquan Reservoir. A disadvantage of the alternative is that all flows generated within the Occoquan Watershed of Loudoun County would have to be pumped into Broad Run Watershed. The alternative would require the greatest number of wastewater pumping stations and force mains of the three feasible alternatives studied.

6. Watershed Policies - Alternative Nos. 1 and 3 involve wastewater treatment facilities discharging to the Occoquan Watershed. Alternative No. 4 would discharge to the Dulles Area Watershed. Effluent quality standards will be more stringent for treatment facilities located in the Occoquan Watershed than in the Dulles Area Watershed. In addition, the State Water Control Board is currently reevaluating the effluent quality standards established by the Dulles Area Watershed Policy which could result in the relaxation of some existing treatment standards.

7. Alternative No. 1 is the least-cost alternative. If minimizing costs is the primary concern of Loudoun County, Alternative No. 1 is the best approach despite the relatively high level of uncertainty and risk associated with this option.

8. The amount of uncertainty and risk associated with each wastewater management alternative should also be a very important factor in the evaluation and selection of a plan for Loudoun County. The Authority needs to embark upon a reasonably reliable course of action as soon as possible to satisfy short-term wastewater service needs which include projected Occoquan Watershed flows on the
projected Occoquan Watershed flows on the order of 1.0 mgd by 1990. At the same time, the plan selected by the Authority should offer a high degree of certainty that there will be treatment capacity available to handle the very significant increase in wastewater flows after 2010. By far, Alternative No. 4 promises the least amount of uncertainty and risk over the long-term as well as the short term. This is primarily because Alternative No. 4 involves a discharge to a stream/river system rather than a reservoir system which is considered to be the most critical water resource in northern Virginia. As a result, there is less uncertainty about regulatory agency approval of a Loudoun County discharge to Broad Run in comparison with regulatory decisions about the ultimate capacity limit for existing or future wastewater treatment plants in the Occoquan Watershed. Further, under Alternative No. 4, Loudoun County does not have to rely upon commitments from other jurisdictions for conveyance system routes or treatment plant operations and expansions. Therefore, if reducing the amount of uncertainty and risk associated with future wastewater services is of paramount concern to Loudoun County, Alternative No. 4 is the best approach despite the higher costs.
<table>
<thead>
<tr>
<th>Selection Criteria</th>
<th>Alternative No. 1</th>
<th>Alternative No. 3</th>
<th>Alternative No. 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>* 2.67 mgd from Loudoun County Occoquan Watershed to UOSA (year 2010)</td>
<td>* 2.67 mgd from Loudoun County Occoquan Watershed to new 3.0 mgd WWTP (year 2010)</td>
<td>* 4.62 from Occoquan and Upper Broad Run Watersheds in Loudoun County to new 5.0 mgd WWTP In Upper Broad Run (start operation in year 2000). Use Potomac Interceptor from 1990 to 2000.</td>
</tr>
<tr>
<td>1. Total Present Worth Cost (1986 dollars)</td>
<td>$35,980,000</td>
<td>$65,680,000</td>
<td>$67,700,000</td>
</tr>
<tr>
<td>2. Initial Capital Cost (1986 dollars)</td>
<td>$37,240,000</td>
<td>$39,300,000</td>
<td>$43,050,000</td>
</tr>
<tr>
<td>4. County Control Over Facility Operation and Expansion</td>
<td>Very little County control since UOSA to treat Occoquan Watershed of Loudoun County and Blue Plains to treat Upper Broad Run watershed.</td>
<td>Complete Authority control for new WWTP in Occoquan Watershed of Loudoun County. Little control over treatment operation for flow from Upper Broad Run watershed to Blue Plains via Potomac Interceptor.</td>
<td>Starting in year 2000, complete County control for new WWTP in Upper Broad Run Watershed. For 1990 to 2000, little County control since flow from Occoquan and Upper Broad Run Watersheds discharged to Blue Plains via Potomac Interceptor.</td>
</tr>
<tr>
<td>5. Environmental Impacts</td>
<td>Increased discharge to Occoquan Watershed via UOSA has potential for greater long term water quality impact. Also, uncertainty regarding the ultimate capacity to be approved by regulatory agencies for UOSA WWTP. No significant water quality impacts expected for discharge to Blue Plains.</td>
<td>Increased discharge to Occoquan watershed has greater potential for long term water quality impact in comparison with new discharge to Broad Run. As a result, there is greater uncertainty about future regulatory rulings on future capacity. No significant water quality impacts expected for discharge to Blue Plains.</td>
<td>No significant water quality impacts expected if new WWTP discharge meets effluent quality standards established by Dulles Area Watershed Policy. For period 1990-2000, no adverse water quality impacts expected for discharge to Blue Plains.</td>
</tr>
<tr>
<td>6. Ability to Accommodate Future Wastewater Flow Beyond Year 2010</td>
<td>Expansion potential limited by stringent water quality standards in Occoquan Reservoir and wastewater needs of UOSA members.</td>
<td>Expansion potential limited by stringent water quality standards in Occoquan Reservoir and wastewater needs of UOSA members.</td>
<td>Expansion not limited by Broad Run or Potomac River quality. Larger WWTP size has been established by Dulles Area Watershed Policy.</td>
</tr>
</tbody>
</table>
At a meeting of the Board of Supervisors of Loudoun County, Virginia, held in the Board of Supervisors' Meeting Room, 18 North King Street, Leesburg, Virginia, on Tuesday, February 17, 1987, at 1:30 p.m.

PRESENT: Betty W. Tatum, Chairman
Andrew R. Bird, III, Vice-Chairman
Charles A. Bos
James F. Brownell
Thomas S. Dodson
Ann B. Kavanagh
Frank I. Lambert
Steve W. Stockman

IN RE: POLICY LEGISLATIVE COMMITTEE REPORT/WASTEWATER MANAGEMENT ALTERNATIVES IN THE OCCOQUAN

Mr. Dodson moved approval of the recommendation of the Policy Legislative Committee that the Board of Supervisors adopt the following resolution supporting the concept of a sewage pumpover from the Cub Run Watershed to the Blue Plains Interceptor at such time as the Cub Run Watershed is designated as a growth area in the comprehensive plan:

WHEREAS, the Loudoun County Board of Supervisors had requested the Loudoun County Sanitation Authority to negotiate with Fairfax County and the Upper Occoquan Sanitation Authority for interim capacity in the Occoquan Sewage Treatment Plant for treatment of sewage generated in the Cub Run Watershed of Loudoun County; and

WHEREAS, the Loudoun County Sanitation Authority has reported to the Loudoun County Board of Supervisors that Fairfax County and the Upper Occoquan Sanitation Authority will not negotiate with them concerning capacity in the Occoquan Sewage Treatment Plant until the Loudoun County Board of Supervisors provides assurances of its intent to assume responsibility for treatment of sewage generated in the Cub Run Watershed of Loudoun County; and

WHEREAS, the Cub Run Area Management Plan now under consideration by the Cub Run Area Citizens' Committee recommends a level of development which would require central sewer service; and
February 17, 1987
Policy Legislative Committee Report/Wastewater
Management Alternatives in the Occoquan

WHEREAS, the Board of Supervisors of Loudoun County recognizes its responsibility to plan community facilities consonant with the efficient and economical use of public funds and to protect against undue density of population in relation to community facilities; and

WHEREAS, the best data currently available indicates that the most practical method for Loudoun County to provide sewage treatment for the Cub Run Watershed area of Loudoun County is by means of a pumpover from the Cub Run Watershed to the Blue Plains Interceptor, or to an Advanced Wastewater Treatment Plant in the Broad Run Watershed; and

WHEREAS, a pumpover from the Cub Run Watershed to the Blue Plains Interceptor, or to an Advanced Wastewater Treatment Plant in the Broad Run Watershed at such time as the Cub Run Watershed is designated as a growth area in the Comprehensive Plan for Loudoun County would facilitate the efficient and economic use of public funds and would protect against undue density of population in relation to community facilities; and

WHEREAS, the Loudoun County Sanitation Authority, for its engineering and financial planning purposes, has requested direction from the Board of Supervisors of Loudoun County.

NOW, THEREFORE, BE IT RESOLVED by the Board of Supervisors of Loudoun County, Virginia that:

The Board of Supervisors of Loudoun County supports the concept of a pumpover from the Cub Run Watershed to the Blue Plains Interceptor or to an Advanced Wastewater Treatment Plant in the Broad Run Watershed as a means of sewage disposal at such time as the Cub Run Watershed area of Loudoun County is designated as a growth area in the Comprehensive Plan for Loudoun County; and

BE IT FURTHER RESOLVED that:

This in no manner is to be construed as a support for, or commitment to, the redesignation of the Cub Run Watershed at this time. Additionally, this in no manner is to be construed as support for, or commitment to the redesignation or development of the Elk Lick Watershed, Foley Branch Watershed, or Upper Broad Run Watershed, all of
February 17, 1987
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which lie within Planning Policy Areas designated as Rural Fringe and which shall remain so designated until such time as the Comprehensive Plan for Loudoun County may be amended.

Seconded by Mr. Brownell.

Voting on the motion: Supervisors Tatum, Bird, Bos, Brownell, Dodson, Kavanagh, Lambert and Stockman - Yes; None - No.

A COPY TESTE:

[Signature]
COUNTY ADMINISTRATOR FOR THE
LOUDOUN COUNTY BOARD OF SUPERVISORS

mlt:2/17/87
## Appendix C

### Table B

**Road Network: Cub Run Planning Area • November 18, 1987**

<table>
<thead>
<tr>
<th>Road</th>
<th>Termini</th>
<th>Lanes</th>
<th>Right of way</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Route 50</td>
<td>Fairfax County Line to West of Route 742</td>
<td>6 lanes - divided 200' ROW plus land required for Route 606 interchange</td>
<td></td>
</tr>
<tr>
<td>2. South Parallel Road</td>
<td>Route 609</td>
<td>4 lanes - divided 120' ROW</td>
<td></td>
</tr>
<tr>
<td>(new road)</td>
<td>Route 609 - Route 742</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. South Access Road</td>
<td>Route 609 - Route 742</td>
<td>4 lane - undivided 70' ROW</td>
<td></td>
</tr>
<tr>
<td>(new road)</td>
<td>North Access Road - South Parallel Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. North Access Road</td>
<td>Fairfax County Line to West of Cub Run Area</td>
<td>4 lanes - undivided 70' ROW</td>
<td></td>
</tr>
<tr>
<td>(new road)</td>
<td>North Access Road - South Parallel Road</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Route 639</td>
<td>North Access Road - South Parallel Road</td>
<td>4 lanes - undivided 70' ROW</td>
<td></td>
</tr>
<tr>
<td>6. Route 639</td>
<td>North Access Road - South Parallel Road</td>
<td>4 lanes - undivided 60' ROW</td>
<td></td>
</tr>
<tr>
<td>7. Route 609</td>
<td>North Access Road - South Parallel Road</td>
<td>4 lanes - divided 120' ROW</td>
<td></td>
</tr>
<tr>
<td>8. Route 609</td>
<td>North Access Road - South Parallel Road</td>
<td>4 lanes - undivided 70' ROW</td>
<td></td>
</tr>
<tr>
<td>9. Route 609</td>
<td>South Parallel Road - Fairfax County Line</td>
<td>4 lanes - undivided 70' ROW</td>
<td></td>
</tr>
<tr>
<td>10. Route 742</td>
<td>Route 50 - Fairfax County Line</td>
<td>2 lanes - undivided 60' ROW</td>
<td></td>
</tr>
<tr>
<td>11. Local Access Roads</td>
<td>Connections with roads described above to be determined</td>
<td>Consistent with County and VDOT standards</td>
<td></td>
</tr>
</tbody>
</table>

- Freeway, E6R, limited access. All at-grade access will be terminated when road becomes a freeway. Clover interchange at Route 606. 60 mph design speed. Western terminus of freeway outside Cub Run Area.
- Pre-freeway description. U6D, a 6 lane median divided major arterial. Controlled access, 55 mph design speed. Left and right turn lanes required at all intersections.
- U4R, controlled access median divided Major Collector. Left and right turn lanes required at all intersections. 800' desirable distance between median crossovers. 45 mph design speed. Western terminus of road outside the Cub Run area.
- U4, Minor Collector. 40 mph design speed. 52' curb face to curb face width. Intersection with route 609 to be located to accommodate safe distance to future Route 50 interchange ramp gore points.
- U4, Minor Collector. 40 mph design speed. 52' curb face to curb face width. Intersection with route 609 to be located to accommodate safe distance to future Route 50 interchange ramp gore points.
- U4, Minor Collector. 40 mph design speed. 52' curb face to curb face width. At-grade intersection to be maintained at Route 50 until such time Route 50 becomes limited access freeway. Left and right turn lanes, with appropriate ROW, required at Route 50 intersection. Overpass to be provided over Route 50 when it becomes a limited access freeway.
- Local Industrial Access Road, 35 mph design speed. Cross section consistent with VDOT standards.

Pre-Freeway Description. U4R Controlled Access Major Collector. Left and right turn lanes required at all intersections. 800' desirable distance between median crossovers. 45 mph design speed. Present alignment relocated to provide through connection with South Parallel Road.

U4, Minor Collector. 52' curb face to curb face width. 40 mph design speed.

R2, Local Road. 24' pavement width, shoulders. 40 mph design speed. At-grade intersection to be maintained at Route 50 with appropriate turn lanes until such time Route 50 becomes a limited access freeway, at which time Route 742 will be cul-de-sac'd south of Route 50.

The location and geometric sections of these local roads will be determined in conjunction with County/VDOT review of development applications. Geometric sections must meet County and VDOT standards.
Appendix C

Transportation Glossary: Cub Run Area Management Plan

E6R: A 6-lane road with limited access also with a raised median.

U6D: A 6-lane divided road with roadside curb and gutter and a depressed median.

U4R: A 4-lane divided road with curb and gutter and a raised median. The pavement width of each 2-lane directional section will generally be 27 feet. Sidewalks should be provided in areas where substantial pedestrian movements are anticipated.

R4R: A 4-lane divided road with shoulders and drainage ditches and a raised median.

U4: A 4-lane undivided road with curb and gutter. Forty-eight feet of pavement is generally required with two 2-foot gutters for a total curb face - curb face width of 52 feet.

L4: Similar to a U4 section but with narrower pavement widths. Curb face - curb face widths of 40 feet - 48 feet depending on projected traffic volumes and adjoining land uses.

R2: A 2-lane road, 20-24 feet of pavement with shoulders and drainage ditches.
Appendix D

Setback Study Based on Cone-of-Vision

The development setback along Route 50 in the Cub Run Planning area has been established to increase road safety as well as to create a pleasing visual image along this important highway corridor and entrance to Loudoun County. Accordingly, the relationship between the driver and his view of the road has been an important factor in determining an appropriate setback for buildings from the road. This relationship is described in Visual Values for the Highway User.

"The driver is, in a sense, a captive. His view is controlled by the direction of the highway and limited by the windshield size. As his speed increases, other restrictive effects occur.

1. As speed increases, concentration increases.
2. As speed increases, the point of concentration recedes.
3. As speed increases, peripheral vision diminishes.
4. As speed increases, foreground detail begins to fade.
5. As speed increases, space perception becomes impaired.

These effects have been documented and can be transferred to a cone-of-vision template which simulates the width and length of the driver's view in relation to his direction and speed of travel as he moves along the highway (see Figure A). The elements in the environment can be assessed for their relative visual impact based on their location in relation to the driver during his travel.

A cone-of-vision template similar to the one illustrated in Figure A was used in conjunction with maps of the Cub Run Planning area to determine those areas which would appear in the driver's field of vision as a car travels along Route 50 at 50 mph. A second template was then used to evaluate which areas within this vision cone are most visually significant.

Figure B illustrates the hierarchy of visual significance within a driver's cone-of-vision. "As the driver directs his view to the focal point, the effects of the visual field decrease in direct relation to the distance of the components from he driver." Therefore, the higher the value assigned to an area in the cone-of-vision diagram on page 65, the greater will be the visual impact of features appearing in that zone of a driver's view. Using a template based on a 50 mph travelling speed to study the Cub Run planning area, it was found that the most significant views along Route 50 would fall within approximately 300' to either side of Route 50. Hence, a 300' development setback is encouraged in the planning area in an effort to improve the most visually significant portion of the Route 50 corridor.

Within this setback it is important to create a sense of visual edge along Route 50 which will help contain and direct the driver's view of the road. The importance of visual edge is discussed below:

"Manipulation of visual edge...offers a major opportunity to organize roadside components for specific driver view needs. Visual edge may be manipulated to guide the driver's tasks of steering, movement and information control, as well as to enhance his pleasurable visual experiences."

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** Ibid., p. 173.
**** Ibid., p.115.
Visual edge is produced by the location of roadside elements (i.e., vegetation, structures, topography, etc.) as perceived by the driver. Rather than reacting to each individual element, the driver generally responds to overall views of many edge factors which appear as large masses or lines.**

A visual edge can assist in increasing the aesthetic quality of the Route 50 corridor and improving motorist's understanding of the highway itself. The visual edge created by the roadside landscape helps focus a driver's attention and aids visual comprehension of the route being traveled. Visual conditions at the road's edge ideally will minimize undesirable distractions and assist the driver by providing information which will help the driver react safely to highway conditions. "Awareness of speed and motion helps motorists drive safely within desired limits."** A sense of visual edge and enclosure will create an index of speed as passing objects "whiz by". This concept will be very important in the Cub Run planning area where there are open fields along Route 50 which give motorists little sense of an "edge". In other areas, structures appear too close to the road, creating a sense of encroachment rather than edge. These elements of visual edge, along with the development setback proposed for the Cub Run planning area, will assist in modifying the Route 50 corridor to achieve a cohesive, attractive, distraction free entrance to Loudoun County.

** Ibid., p. 98.
Figure A: Angle of Vision

Figure B: Cone-of-Vision
CPAM 1992-0010
Greenways and Trails Policies

Adopted September 21, 1994
SECTION I: BACKGROUND

A. INTRODUCTION

Greenways are areas of open space, usually linear, which connect and protect various natural, recreational, and cultural resources. They often follow linear landscape features such as streams, ridges, or abandoned railroads. Greenways can be publicly or privately owned, and may be open or closed to visitors. They are not necessarily parks or public land. Parts of a greenway may be a scenic resource or an important wildlife habitat, owned and maintained by a private landowner, with no public access. Other parts may include public trails for hiking, bicycling, or horseback riding. Greenways that include trails provide linkages for people to natural and community resources. They enable citizens to travel without motor vehicles to schools, community centers and parks.

Greenways serve a variety of functions, including recreation, alternative transportation, wildlife habitat, water quality protection, flood hazard reduction, aquifer recharge, erosion prevention, property value enhancement, economic development and scenic beauty.

The Loudoun Greenways plan encourages pathway connections which would provide our own residents with alternative transportation corridors, independent of car ownership. It is a comprehensive plan which takes a "big picture" look at Loudoun’s future development. It recognizes the need for Loudoun’s existing communities to develop resource corridors which unify the County, creating an amenity for the benefit of business and residential communities as well as the tourist industry.

B. CONTEXT AND PURPOSE

Loudoun County and its county seat, the Town of Leesburg, border the Potomac River in northern Virginia approximately 35 miles northwest of Washington, D. C. The County as a whole offers a wealth of historic and natural features and a blend of urban amenities, rural landscapes, and small communities.

Proximity to Washington and the presence of a major international airport, Dulles, in the southeast part of the County stimulate strong growth trends. While development provides welcome economic opportunities, many citizens are concerned about the effects of growth and the potential for loss of local recreational opportunities and valuable natural, scenic and historic resources. Greenways and trails are one method of preserving some of these features unique to the County.

The purpose of this plan is to acknowledge a commitment to the establishment of a county-wide system of greenways and trails. This system should link people and resources, put open space within a short walk of people’s homes and connect major regional and national trails. Greenways can protect natural resources and do not necessarily contain trails or have public access. Where
trails provide a link between home and work, an alternative to auto dependent transportation can be provided.

C. RELATIONSHIP TO OTHER COUNTY DOCUMENTS

Loudoun County's Comprehensive Plan consists of several related documents with the General Plan performing the function of an "umbrella" document which establishes county-wide goals and policies. Chapter 8 of the General Plan addresses implementation as a continuing process with future actions which should be undertaken to implement the Plan.

County-wide Recommendation #21 is the action of adopting CPAM 1992-0010, Greenways Plan, as an element of the General Plan. The Greenways Plan would also add one more building block toward implementing policy recommendations for Water Quality Buffers (#5), Scenic River Corridors and Potomac Shoreline Protection (#10), Protection of Endangered and Threatened Habitats (#23), and Rural Transportation Strategies for Bicycle Routes (#18).

In recognition of existing County policy and public testimony which encourage a viable agricultural community, the following goals and policies will apply only to the rapidly developing areas of the County described in the following area plans: Eastern Loudoun Area Management Plan, Dulles North Area Management Plan, Dulles South Area Management Plan, Cub Run Area Management Plan, Leesburg Area Management Plan, and the adopted plans for the Urban Growth Areas of the western towns.

D. COMMUNITY PLANNING PROCESS

The documentation for the greenways and trails system is contained in the 1993 Greenways and Trails Master Plan for Loudoun County and Leesburg, Virginia. This plan was developed by a citizen-government partnership, through an open public process. As a result of a Memorandum of Understanding signed by the County of Loudoun, the Town of Leesburg, the directors of the Leesburg and Loudoun County Parks and Recreation Departments, representatives of the National Park Service's Rivers, Trails and Conservation Assistance Program, and the Northern Virginia Regional Parks Authority, a citizens' advisory committee was formed in the fall of 1989. The group represented the interests of businesses, development, landowners, conservationists and recreationists. The Plan was developed over a two year period and was based on regular public input from public workshops, presentations and public meetings. Documentation of specific public outreach is contained on page 69 of the 1993 Greenways and Trails Master Plan for Leesburg and Loudoun County, Virginia.
SECTION II: COMMUNITY GOALS

A. MISSION STATEMENT

The purpose of a greenways and trails system is to preserve the County's essential natural and historic resources as the County passes from rural to suburban, to provide recreation for a growing population, and to provide alternative transportation corridors.

B. GOALS OF THE GREENWAYS AND TRAILS SYSTEM

- Link neighborhoods and communities including schools, shopping areas, community centers, parks and other public facilities
- Link towns in Loudoun County.
- Provide recreational opportunities and alternate transportation corridors for foot traffic, cyclists and horseback riders.
- Protect historic resources.
- Protect rivers, streams, and drainage basins.
- Protect ecologically critical and sensitive areas.
- Maintain and link wildlife habitats.
- Provide natural flood and erosion control to discourage channelization.
- Include scenic roads.

SECTION III: POLICIES

A. RESOURCES

A sound greenways and trails system depends on the identification of the County's significant natural, cultural, recreational and community resources. The Citizens' Committee dedicated the first year of its effort to identifying and mapping those resources, using a variety of existing data and the knowledge of local citizens. These resources contribute greatly to the distinctive character of the County. They can serve as the hubs and spokes of a greenways and trails network and can provide a basis for making decisions on where greenways should be located. Listed below are the county resources agreed to by the Committee as significant features of the County. These resources are contained in the Geographic Information System Map created by the citizens. (resources described on pages 14, 15, and 16 of the Greenways and Trails Master Plan for Leesburg and Loudoun County, Virginia.)

- State Scenic Rivers
- Perennial Streams
- Floodplains
- Ridges
- Natural Heritage Sites
- Existing and Planned Parks
Greenways Policies

- Existing and Planned Trails
- Historic Sites and Districts
- Historic Settlements
- Schools
- Community Centers
- Discontinued Roads
- Scenic Roads
- Incorporated Towns

POLICIES

1. The inventory of cultural, historic and natural resources should be maintained with the County GIS and should be used for reference in greenway and trail planning.

2. Greenways should be a mechanism to protect important or sensitive resources.

B. PUBLIC PARTICIPATION

The process of turning a plan for greenways into a reality will require a cooperative effort involving many people and organizations. While the total land area of any proposed greenways network is relatively small, its benefits will be widely felt and its many parts varied in terrain, ownership, and proposed use. The County will play an integral role in establishing the system although it is unlikely that a single entity would have the means to acquire or manage an extensive system. Therefore, it is recommended that a network of greenways and trails be owned and managed through a partnership effort, rather than by a single agency organization. The system could be established piece by piece by a number of different entities using a variety of public and private conservation methods. Public agencies, private organizations, businesses, civic groups, clubs and individuals should participate in the creation and management of the system. It is assumed that exact locations of greenways and trails will be determined by the communities of interest.

POLICIES

1. Inform and educate the public about the opportunities generated by the greenways and trails system.

2. Encourage public involvement in the planning and development of the greenways and trails system.

C. DEVELOPMENT STRATEGIES

Members of the community have expressed concern about the loss of open space and the changing character of the County resulting from increased development. Greenways are a way to retain some rural landscapes and incorporate open space within developments. Citizens also
expressed a desire for trails between adjacent developments to allow walking and/or biking to neighbors' houses or other parts of the community. The greenways concept is a mechanism to guide the development process to create useful areas of open space.

**POLICIES**

1. Incorporate greenways and trails plans into the land development process and land use decisions. Creation of greenways and trails should occur primarily in the developing areas of the County with initial effort focused on the rapidly developing areas of the eastern portion of the County and around the western towns.

2. Create options and incentives which will encourage landowner participation in the establishment of greenways and trails.

3. Coordinate the establishment of greenways and trails with landowners using a variety of conservation methods. Three categories of landowners should be encouraged to participate in the greenways and trails system:
   - The development community: proffers of greenways and trails should be encouraged and referrals administered by the Planning Department with input from impacted agencies and citizens as needed.
   - Private landowners: voluntary donations, conservation easements, bequests, leasebacks, remainder interest and other non-coercive methods should be facilitated to encourage participation by private landowners.
   - Public land: negotiations of right-of-ways through land already dedicated to public benefit including, but not limited to, County, State and Federally owned land, utility easements, and roads discontinued for public maintenance.

4. Parcels under consideration as greenways or trails must meet one or more of the following criteria
   a. **Linkage:** The identified parcel will provide linkage between or to a significant natural, cultural or historic resource as defined on pages 14, 15, 16 of the Greenways and Trails Master Plan for Leesburg and Loudoun County and listed in Section III.A above.
   b. **Resource Protection:** The parcel contains an identified natural resource or species of value.
   c. **Recreation Enhancement:** The parcel will enhance recreational opportunities either by providing a connection to an existing park or recreational facility or providing in and of itself opportunities for hiking, biking or horseback riding.
d. **Economic Enhancement:** The parcel provides increased access to local business and shopping areas including but not limited to bed and breakfasts and tourist sites.

**D. TRANSPORTATION**

Greenways and trails that are designed to link communities and commercial areas can encourage some people to travel without motor vehicles, thus reducing traffic congestion on roadways. Planning for alternative transportation and recreational opportunities for foot traffic, cyclists and horseback riders is an important public responsibility to provide for increased user safety on transportation corridors. A greenways master plan can be an important element of compliance with the Clean Air Act of 1991.

**POLICIES**

1. Multi-use trails should be encouraged within major road corridors as shown in Appendix G of the *Greenways and Trails Master Plan for Leesburg and Loudoun County, Virginia.* Portions of this trail system should be incorporated as an element of the regional COG Bicycle Plan.

2. Loudoun County review of applications for discontinued roads should encourage appropriate conversions to the greenways and trails system.

3. Loudoun County should pursue grant funding of greenway and trail projects which can be combined with other transportation goals and policies.

**E. FUNDING, ADMINISTRATION AND MAINTENANCE**

Financial and management issues are critical to both the initial establishment of greenways and their long-term vitality. Local government funds for greenways may be scarce and greenways frequently must compete for funds with other uses such as developed parks. The mechanisms used for protecting land or securing public access can be a major factor determining the cost of implementing greenways. Public land purchase, the most expensive technique, is only one of a variety of possible techniques. Others include land donations, purchases or donations of easements, landowner agreements and acquisition by nonprofit groups.

Maintenance is one need that is often overlooked; greenway interests may focus on the establishment of the greenway and neglect to consider long-term maintenance. Long-term greenway success will require careful planning for funding and maintenance. Administrative overhead might be reduced if the system were managed by a private organization focused only on the greenway system.
POLICIES

1. Require that established greenways and trails adequately provide for long-term funding, maintenance, and administration for the implementation of the greenways and trails system through public-private partnerships.

2. When possible the County would jointly hold easements to guarantee long-term protection of land.

3. Assure that right of eminent domain is not utilized to establish greenways and trails.

F. ECONOMIC DEVELOPMENT

The Greenways Master Plan recommends the creation of a comprehensive greenways and trails system primarily based on such natural landforms as valleys and ridges. Other elements are based on an assemblage of linear open spaces of various kinds to create a green infrastructure for the County. Like other forms of infrastructure necessary for development, greenways are part of a good business plan. These key elements of a community's memorable image are increasingly becoming today's marketing tools for economic development.

Few communities today can ignore the economic benefit of tourism. Loudoun's primary tourist attractions are its natural and historic resources. The greenways could include a foot path, a horse path, a bike path or none of the above, simply providing visual respite to the urban resident. The W&OD Regional Trail is an example of a greenway which attracts visitors, businesses and residents to Loudoun. One such business, the Cornerstone Bed and Breakfast near Paeonian Springs derives as much as 50 per cent of its clientele from cyclists who ride out from Washington and Maryland to tour the Loudoun area.

In order to attract a balanced variety of businesses, provide housing options with desirable amenities for all income levels, and assist government in managing the resources of Loudoun County, it is time to plan for a greenway system.

POLICIES

1. Loudoun County should incorporate greenways and trails in economic development planning and promotion.

2. Coordinate with an overall tourism plan for Loudoun County.
Strategic Land Use Plan for Telecommunication Facilities

Adopted as part of Loudoun County’s Comprehensive Plan
November 6, 1996
Adopted by:
The Loudoun County Board of Supervisors

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SECTION I: BACKGROUND

A. INTRODUCTION

There are currently more than forty commercial public telecommunication antenna sites in Loudoun County (see “Existing and Proposed Telecommunication Antennas” map available through the County). Changes in commercial public telecommunication demand and technology have caused a great demand for additional antenna mounting facilities, mostly in the form of lattice towers or monopoles. The increased demand for these facilities poses a number of important land use issues for Loudoun County including facilitating collocation of antennas, ensuring appropriate siting and design, and mitigating impacts of telecommunication facilities.

The policies outlined in this document were developed by the Transportation, Subdivision, and Site Plan Committee of the Loudoun County Planning Commission to balance the public demand for commercial public telecommunication service with the County’s desire to avoid proliferation of towers and monopoles. Guidance is provided for the location and design of commercial public telecommunication facilities only, not amateur operations. The intent of these policies is to provide the overall land use strategy for allowing commercial public telecommunication service in Loudoun County, while mitigating any negative impacts.

B. GOAL AND OBJECTIVES

Goal:

Loudoun County recognizes that modern, effective, and efficient telecommunications is an essential part of creating an attractive economic development environment and meeting the desires of its citizens for high quality service. The County seeks to encourage improvements in telecommunications services while mitigating the impacts on its residents, nearby land uses, scenic beauty, and rural heritage.

Objectives:

1. To identify a hierarchy of areas where future commercial public telecommunication facilities can be located, while minimizing the proliferation of towers and monopoles;

2. To require collocation of commercial public telecommunication facilities on existing structures and towers;

3. To attempt to ensure compatibility of telecommunication facilities with nearby land uses;

4. To establish siting and design criteria to mitigate negative impacts;
5. To establish commercial public telecommunication tower and monopole removal policies; and

6. To establish a process by which an applicant can demonstrate their compliance with these policies.

7. To stay abreast of changing technologies that may reduce the need for new towers and monopoles.

C. COMMUNITY PLANNING PROCESS

The proposed policies were developed initially by the Transportation, Subdivision, and Site Plan Committee of the Planning Commission over a three month period in the spring of 1996 that included two public input sessions. As part of their review, the Committee heard presentations from citizens, telecommunication providers, the FCC, Leesburg Airport, and the County’s Fire and Rescue staff. The Committee then reviewed existing County policy and regulations and looked at the policy and regulations of several other jurisdictions.

On May 22, 1996, the Committee presented the recommended draft policies to the Planning Commission Committee of the Whole. The draft policies were then sent to referral agencies for review. The Planning Commission held a public hearing on the draft telecommunication policies on June 12, 1996 and made further amendments to the draft policies at their June 19 work session. The Board of Supervisors held a public hearing on these policies on September 4, 1996 and subsequently added two new policies and revised others. On November 6, 1996, the Board approved this comprehensive plan amendment establishing this document as part of the County’s comprehensive plan.

D. RELATIONSHIP TO OTHER COUNTY DOCUMENTS

Loudoun County’s Comprehensive Plan consists of the General Plan, several area management plans, strategic plans, and related documents. The General Plan provides the overall countywide goals and policies for managing growth and development while the area management plans and strategic plans outline more specific strategies for local planning areas or particular issues. These telecommunications policies are a strategic plan consisting of goals and policies for the siting and design of telecommunication facilities. As such, these telecommunication policies supersede Energy and Communication Policies 4, 5, and 6 on page 83 and Energy and Communication policy 2 on page 156 in the General Plan and apply in all areas of the County.
SECTION II.  TELECOMMUNICATION POLICIES

A.  LOCATION POLICIES

The location policies establish a hierarchy of preferred locations for new commercial public telecommunication facilities. The County’s first preference is to have new antennas collocate on existing tall structures, monopoles and towers in order to minimize the need for new towers and monopoles. When a telecommunication antenna cannot locate on an existing structure for technical or location reasons, the County then prefers that new towers or monopoles be located where they are most compatible with surrounding land uses.

The second level of preferred locations for new monopoles or towers is in industrial and employment areas, within overhead transmission line rights-of-way, and on public sites or volunteer fire and rescue company properties (see the “Public Facility Sites” and “Telecommunications By-Right Zoning” maps available through the County). The policies provide incentives, such as allowing monopoles as a by-right use, for applicants to locate in these preferred areas. In urban eastern Loudoun County, the policies encourage telecommunications antennas additionally on light poles within the VDOT or Dulles Greenway right-of-way, and potentially on towers on existing low-rise heavy industrial buildings.

In order to protect the scenic rural beauty of Loudoun County, commercial public telecommunications towers and monopoles in rural areas will be allowed only by special exception. Furthermore, the County will not allow new towers or monopoles to locate in County designated historic districts.

Countywide Location Policies

1. To minimize the need for new towers and monopoles, the County prefers that new commercial public telecommunication antennas be located on existing buildings, towers, monopoles, water tanks, overhead utility transmission line structures and other tall structures wherever possible. Commercial public telecommunication antennas should be permitted by-right on all existing towers, monopoles, and other tall structures subject to performance standards to mitigate visual impacts.

2. Where it is not feasible to locate on an existing structure, the County prefers that new towers or monopoles be located

   a. In planned and zoned industrial and employment areas,
b. Within overhead utility transmission line rights of way where structures greater than eighty (80) feet in height already exist, and

c. On public sites or volunteer fire or rescue company properties where such facilities mitigate adverse impacts on the character and use of the public or public safety site.

3. In order to encourage location in industrial and employment areas, commercial public telecommunication monopoles up to 199 feet in height should be a by-right use, subject to performance standards to mitigate visual impacts, in areas that are both planned and zoned for industrial and employment uses (such as the GB, PDGI, PDSA, PDOP, PDIP, PDRDP and MRHI zoning districts but not the employment areas within PDH districts) provided that the monopole is not located within 750 feet of a residentially zoned property.

4. In order to facilitate use of volunteer fire and/or rescue company sites, telecommunication monopoles should be permitted as a by right use up to 199 feet in height, subject to performance standards to mitigate visual impacts, on fire and/or rescue sites in rural and agricultural areas (specifically A3, A10, A25, all CR, and RC zoning districts). In addition, The County encourages use of other public sites where telecommunication uses should be permissible as an accessory use by special exception. Any Zoning Ordinance amendments should also consider adoption of visual impact performance standards to mitigate impacts on adjacent residential or other sensitive uses.

5. Except for areas where towers or monopoles are permitted by right, an applicant for a new commercial public telecommunication tower or monopole will demonstrate to the County that location on an existing tall structure is not feasible. An applicant will evaluate the feasibility of using existing or approved towers, monopoles, or other structures greater than 50 feet in height within a one mile radius of any proposed site in the Eastern Loudoun Urban Growth Area and within a two-mile radius elsewhere in the County. Technological, physical, and economic constraints may be considered in determining unfeasibility. Collocation may be determined to be unfeasible in the following situations:

a. Planned equipment would exceed the structural capacity of existing and approved towers or monopoles, considering existing and planned use of those towers, and such towers or monopoles cannot be reinforced to accommodate planned or equivalent equipment at a reasonable cost;

b. Planned equipment will cause interference with other existing or planned equipment for that tower or monopole, and that the interference cannot be prevented at a reasonable cost;
c. Existing or approved towers or monopoles do not have space on which planned equipment can be placed so as to provide adequate service; or

d. Existing or approved towers or monopoles will not provide adequate signal coverage.

6. The County encourages new towers and monopoles to locate in overhead utility transmission line rights of way where there are existing tall structures. The Zoning Ordinance should be amended to allow monopoles up to 199 feet in height by-right, subject to performance standards, within overhead utility transmission line rights of way where there are existing transmission support structures greater than eighty (80) feet in height.

Urban Location Policies

1. The County should revise the Zoning Ordinance to allow towers up to 40 feet in height on existing buildings in areas which are both planned and zoned for heavy industrial uses (such as MRHI and PDGI) subject to performance standards to mitigate visual impacts.

2. The County encourages the location of commercial public telecommunication antennas on light poles and other existing tall structures in the right of way of the Dulles Greenway and VDOT’s arterial roads.

Rural Location Policies

The County recognizes the importance of maintaining the natural scenic beauty and historic character of the rural and historic areas. As such, monopoles and towers are prohibited within the County’s Historic and Cultural Conservation Districts. As in urban areas, the County prefers locating new antennas on existing towers, monopoles or other tall structures. When existing structures cannot be used, new monopoles or towers should be sited within the right-of-way for overhead utility transmission lines where the visual impact of an additional tall structure would be minimal. Elsewhere, towers and monopoles should be located in rural areas only by Special Exception and subject to design criteria for mitigating visual impacts.

1. The County prefers that commercial public telecommunication antennas locate on existing tall structures where possible.

2. Except within overhead utility transmission line rights of way as specified in Countywide Location Policy six (6), commercial public telecommunication towers and monopoles will be permissible in agricultural-residential areas (such as the A-3, A-10, A-25, and CR zoning
districts) only by special exception and subject to performance standards to mitigate visual impacts.

3. Commercial public telecommunication towers and monopoles are prohibited within County designated historic districts.

**B. DESIGN STANDARDS**

This plan calls for design standards to address visual and land use impacts of commercial public telecommunication facilities. There are two main components of the design strategy. The first is to limit the need for new towers and monopoles by providing for collocation. The second is to mitigate visual impacts through appropriate setbacks, screening, and design. The policies will help minimize and mitigate impacts through appropriate siting and design and provide guidance for development of new Zoning Ordinance performance standards.

**Tower and Monopole Design**

1. Due to their reduced visual impacts, when technologically and physically feasible, monopoles are the preferred design.

2. Tower and monopole sites should be designed and constructed to the minimum height necessary to accommodate at least three providers on the tower or monopole and provide sufficient land area for additional equipment buildings unless doing so would:

   a. Create an unnecessary visual impact on the surrounding area; or

   b. No additional need is anticipated for any other potential user in this area; or

   c. There is some valid economic, technological or physical justification as to why collocation is not possible.

**Countywide Visual Impacts**

1. The visual impact of commercial public telecommunication facilities should be mitigated so as to blend with the natural and built environment of the surrounding area.

2. The specific communication facility design issues that should be examined in looking at visual impact are: the setting, color, lighting, topography, materials and architecture. Towers and antennas should be neutral in color to blend with the background, unless specifically required by the FAA to be painted or lighted otherwise.
3. To mitigate the visual and noise impacts of new equipment buildings and accessory uses, these structures should blend in with the surrounding environment through the use of appropriate color, texture of materials, topography, scale of buildings, landscaping and visual screening.

Rural and Historic Areas

1. New commercial public telecommunication facilities sited in rural and historic areas should conform with the following design considerations:
   
a. Monopole or tower sites should be sited within areas of existing mature vegetation so that the maximum amount of the structure and associated buildings are screened;

b. Monopoles or tower sites shall not be located along ridge lines but down slope from the top of the ridge lines to protect views of the Catoctin, Bull Run, and Hogback Mountains, the Short Hill, and the Blue Ridge;

c. Monopoles or towers proposed where mature vegetative buffering or topographical conditions will not contribute to screening shall demonstrate that there is no existing mature vegetated area nearby that could be used instead. In all cases, the County encourages camouflaging the facility to mitigate visual impacts;

d. Monopoles or towers should generally be sited toward the interior of a property rather than close to a property line unless a lesser visual impact would occur from locating it elsewhere. Visual impacts should be mitigated by measures onsite rather than relying on offsite conditions for mitigation.

2. When there is not a feasible location with existing mature vegetation then the preferred location for a new tower or monopole is close to existing tall structures.

3. Commercial public telecommunication towers or monopoles on the property of a structure or site that is listed on the National Register of Historic Places should show how the visual impact on views from or toward the structure will be mitigated. The applicant should provide visual imagery from several different perspectives to help determine the extent to which the facility could be designed to mitigate the visual impact on the historic structure or site.
4. Applicants proposing a telecommunication tower or monopole within one mile of a County designated Historic District or State Scenic Byway should provide both a visual impact analysis and justification why the tower or monopole could not be sited elsewhere.

Publicly Owned or Controlled Facilities and Volunteer Fire or Rescue Companies

1. Applicants for commercial public telecommunication towers or monopoles must demonstrate that there will not be any physical or technological interference with the existing or planned function of the public facility or volunteer fire or rescue company facility.

2. Required landscaping may be less stringent for public sites or volunteer fire or rescue company sites where the visual impact of the support building is otherwise mitigated or is consistent with the surrounding area.

By-Right Uses

1. Commercial public telecommunication monopoles in employment or industrial areas should locate toward the interior of a lot rather than along the common boundary with existing or planned residential areas and should mitigate visual impacts onsite rather than relying on offsite conditions for visual mitigation.

2. Within employment or industrial areas, commercial public telecommunication monopoles should be separated from residentially zoned property by a minimum of 750 feet. Along existing overhead utility transmission line rights of way, the 750 foot separation does not apply.

3. In some locations, such as in industrial areas, required landscaping may be less stringent where the visual impact of the support buildings is otherwise mitigated or consistent with the surrounding area.

Arterial Road Corridors

1. The County may consider allowing towers or monopoles in major and minor arterial road corridor setback areas if the tower can be sited within existing mature vegetation or the topographical conditions are such that the visual impact of locating within the setback is less than a nearby location that adheres to the setback.
C. SAFETY AND HEALTH POLICIES

This plan addresses two main issues related to safety and health. The first is the potential for conflict between new towers or monopoles and existing airports. The Metropolitan Washington Airports Authority (MWAA) and the Town of Leesburg have expressed concern with coordination between the commercial public telecommunication providers, the County, and the airport authorities. The Plan calls for a commercial public telecommunications provider to demonstrate to the County that they have contacted the appropriate airport authorities prior to submission of a land development application so that any potential airport issues can be addressed.

The second issue relates to the appropriate abandonment of a site no longer maintained for commercial public telecommunication use. The County has included a policy to require that a site no longer used for commercial public telecommunications be returned as nearly as possible to pre-existing site conditions.

Policies

1. Applicants for any commercial public telecommunications facility shall demonstrate that they have complied with applicable regulations of the FCC and the FAA. If a proposed telecommunications tower or monopole is higher than 200 feet or within (5) five miles of either Dulles or Leesburg Airports, the applicant will provide verification that he/she has notified the appropriate airport authority (Metropolitan Washington Airports Authority or the Town of Leesburg) and that the FAA has determined that the proposed facility is neither a hazard nor an obstruction to aviation.

2. An applicant or its successors shall remove all unused structures and facilities from a commercial public telecommunication site, including towers and monopoles, within 90 days of cessation of commercial public telecommunication use or the expiration of the lease, whichever occurs first, and the site should be restored as closely as possible to its original condition.

D. IMPLEMENTATION POLICIES

The implementation policies specify strategies for the County to execute this telecommunications plan. The policies give guidance to applicants proposing new commercial public telecommunication facilities as well as outline further actions the County intends to take to implement these policies.
1. The County should initiate a *Zoning Ordinance* amendment to develop regulations that comply with this plan. The *Zoning Ordinance* performance standards for commercial public telecommunication facilities should be revised to be in conformance with these policies.

2. The County should maintain maps of existing and proposed telecommunication facilities, public facility sites, and areas of by-right zoning for telecommunication monopoles for information purposes.

3. The Joint Annexation Committees for Purcellville and Round Hill should be encouraged to adopt the County’s commercial public telecommunication policies for their Urban Growth Areas.

4. Require all applications for future monopoles and towers to:
   
   a. Demonstrate that the location proposed has resulted from the systematic review of all options from the hierarchy of County location preferences and justify the option selected.

   b. Demonstrate compliance with all design criteria. The applicant should provide a photo-image or other similar visual simulation to show the proposed tower or monopole in relation to its surroundings. The applicant should provide such visual imagery from several different perspectives to help determine the extent to which the facility could be designed to mitigate the visual impact on area residences and roads.

   c. Address the terms and conditions under which collocation by other users would be acceptable.

5. Applicants for proposed new towers should notify in writing and meet with citizens in the vicinity of the proposed site at least three weeks prior to the Planning Commission public hearing.

6. Applicants for proposed new towers are encouraged to provide space on the tower for Loudoun County Fire and Rescue communication purposes.