FISCAL IMPACT ANALYSIS OF RESIDENTIAL DENSITY
CHERRY HILL PENINSULA
PRINCE WILLIAM COUNTY, VIRGINIA

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INTRODUCTION

Comprehensive plans are a translation of a community's vision for the future physical evolution of the jurisdiction. The comprehensive plan was a process to visualize and verbalize political policies and community goals relating to the allocation and distribution of resources and commodities. The adoption of a physical strategy to reflect a comprehensive plan was a static representation of the community's vision at that given point in time. As a community fluctuates over time, comprehensive plans would be flexible to work towards a mercurial destination.

Comprehensive plans have been mandatory in Virginia for all jurisdictions since 1980. Communities in Virginia were required to draft comprehensive plans that took into consideration existing and future land uses, existing and planned public utilities and facilities, and the purposes for which land use ordinances were adopted. Substantial adherence to a comprehensive plan provided a larger context for the individual development decision, and supported a claim of reasonableness in achieving legitimate public goals. In Virginia, comprehensive plans were general advisory guides for physical development, intended to provide advance planning and to meet the purposes for which

land use ordinances might be adopted. A mandatory five year review allowed the comprehensive plan to be a non-binding advisory guide in a politically flexible and changing environment.

The Board of Supervisors of Prince William County, Virginia adopted the original comprehensive plan for the entire county in 1974. The 1982 Comprehensive Plan constituted the first overall revision of the original 1974 plan. On March 5, 1985, the first amendment to the 1982 plan was adopted. This amendment was followed by the adoption of an update to the plan on March 18, 1987. The 1982 Prince William County Comprehensive Plan and subsequent amendments represented a balancing of environmental and fiscal responsibility within the fluctuating community and political arena. The comprehensive plan for Prince William County was scheduled for a major update and revision in 1990 as a means to reflect the current political policies and to emphasize the present agenda of long-range community goals. Some sectors of the jurisdiction had been reevaluated individually in response to major impacts from policy decisions. Since 1985, five areas within the county, each larger than twenty acres, had been the subject of comprehensive plan amendments. The flexibility of the plan emulated the metamorphosis of the community.

PROBLEM

The Cherry Hill peninsula was an intrinsic portion of the coastal plain located in the southeastern section of Prince William County, Virginia on the Potomac River. The Cherry Hill peninsula had been selected as the preferred location of a bridge connection between Maryland and Virginia, over the Potomac River, to facilitate the eastern bypass around the Washington D.C. area. Cherry Hill was an undeveloped peninsula comprising more than 4,000 acres. It was bounded on the west side by U.S. Route 1, with Powell's Creek to the north and Quantico Creek on the south. The Prince William County Comprehensive Plan identified the majority of the Cherry Hill peninsula for Resource Management. The term Resource Management was utilized to define areas of extreme environmental sensitivity including the presence of vital natural resources. Resource Management was specified as a low density single-family residential area with a minimum lot size of five to ten acres for each dwelling unit.

The selection of the Cherry Hill peninsula as the preferred alignment for an interstate bridge created a major impact on the community and political goals for the

future of this large natural area of Prince William County. It also raised questions relating to the possible incongruity between the development capacity allowed by the designation of the peninsula for Resource Management and the development potential represented by interstate highway access through the peninsula.

An anticipatory reaction to the impact of the interstate bridge was an unsolicited request by a development entity for an amendment to the comprehensive plan for the majority of the Cherry Hill peninsula. This proposed amendment included over 1,500 acres of a new comprehensive plan designation described as Suburban Metropolitan. Suburban Metropolitan was defined as a mix of land uses; commercial, office, light industrial, and high density residential (areas of greater than 16 dwelling units per acre). This designation was further clarified to include; 18,000,000 square feet of commercial, office or light industrial, a 2,000,000 square foot regional mall, and 2,800 residential dwelling units.

PROPOSAL

A discrepancy had developed between the low density Resource Management designation of one residential dwelling

unit per five to ten acres, and the high density mixed land use proposed under the Suburban Metropolitan designation. The appropriate method of resolving the discrepancy between densities of development presented by the two highly variant comprehensive plans was to utilize the planning process to evaluate the Cherry Hill peninsula. The planning process was a method whereby the area and development proposals were evaluated in terms of economic, physical, social, and political considerations through a public forum. This method would have allowed a cross-section of the jurisdiction to evaluate and weight the potential negative and positive impacts of the development on the locality.

The purpose of this report was to provide a fiscal impact analysis of the residential densities presented by the present comprehensive plan and the proposed Suburban Metropolitan amendment for the Cherry Hill peninsula. A fiscal impact analysis was a portion of the data that was necessary for the positive and negative benefits of a development to be evaluated through the planning process. A fiscal impact analysis provided estimates of potential public costs associated with private developments. For the purposes of this paper, the fiscal impact analysis had been limited to direct impacts on the public expenditures and revenues of the local jurisdiction as calculated in the

most current dollars available, and the expenses and incomes were derived from changes in population. The fiscal impact analysis was an analytical tool which projected revenues and expenditures, but did not evaluate the costs and benefits of a development. The planning process required that the physical and social aspects of a development must be analyzed, and then integrated and appropriately weighted with the fiscal elements for the costs and benefits of a project to be effectively evaluated. Conclusively, this report was designed to estimate and analyze jurisdictional revenues and expenditures associated with potential residential development on the Cherry Hill peninsula of Prince William County, Virginia. In addition, appendix A of this report compared the expenditure and revenue estimates obtained by the Per Capita Multiplier method with the fiscal impact analysis method which was currently utilized by the Prince William County Planning Office. The effectiveness of this method was then evaluated. Furthermore, this report was intended to point to areas for future study to furnish a viable and flexible comprehensive plan for the long range use and development of the Cherry Hill peninsula.

METHODOLOGY/SCOPE

This report was designed to provide a fiscal impact analysis of the suitability of the two different residential densities within the Cherry Hill peninsula based on an expenditure verses revenue analysis. The analysis utilized the Per Capita Multiplier Method for evaluating the difference between the expenditures required to provide services for the different residential densities and the revenue that the residential densities would generate. This method utilized the relationship between the population and total jurisdictional expenditures. Appendix B outlines the general procedures necessary to utilize the Per Capita Multiplier method of fiscal impact projection. (Burchell 1985).

The Per Capita Multiplier Method for estimating the fiscal impact of a residential development was based on several assumptions. The basic assumption was that the present average municipal expenditures per resident and the current school district costs per student were an appropriate method of estimating future operating costs created by development. Secondly, local service levels, rather than regional or national service levels, were accurate indicators of future service levels. Furthermore, the present composition of the population would be

maintained in the future. In addition, the type of dwelling units in a new development and the number of bedrooms in the dwelling units had an effect the number of residents and students associated with the development. Lastly, the existing distribution for service expenditures was an indication of the allocation of future expenditures. (Burchell 1983).

This paper has been organized into a section that documented the current fiscal impact of residential density in Prince William County utilizing the Per Capita Multiplier method of fiscal impact analysis. The second section was an evaluation of varied demographic multipliers for determining residential and school populations. The third portion of this paper was the calculation of the potential fiscal impact of the residential densities for the Resource Management and Suburban Metropolitan comprehensive plan designations based on the Per Capita Multiplier method of estimating jurisdictional expenditures and revenues. Appendix C shows an example of a spreadsheet which can be developed using the Per Capita Multiplier method of fiscal impact projection. (Burchell 1985). The concluding section of this paper analyzed the fiscal impact of the residential densities proposed for the Cherry Hill peninsula of Prince William County, the appropriateness of the determinations made in this paper to the situation in

Prince William County, and recommended points for further study to provide a balanced comprehensive plan. The Appendix of this paper was the documentation of the fiscal impact of residential density which utilized the actual method employed by the Prince William County Planning Office.

BASE DATA CALCULATIONS

Prince William County, located southeast of the Washington, D.C. metropolitan area, had a 1988 estimated population of 210,000. More than 150,000 acres of the total 227,425 acres within the County were utilized as agricultural, vacant, or parkland in 1986. Prince William County was a mixture of suburban and rural areas, which had seen a rapid growth rate in the 1950's and 1960's level off to about a three percent annual growth rate since 1970. More than sixty-five percent of the County's population was concentrated in two urban center areas, one in the western section of the county and the other in the eastern portion of the jurisdiction. Urban centers were development areas planned to be serviced by central water and sewer systems. Services throughout the county would be considered to be at capacity with a somewhat deficient capacity due to the continued population increase and the vestiges of the rapid growth experienced twenty years ago. (Prince William County 1988).

The Per Capita Multiplier Method of fiscal impact analysis, as present by Burchell (1983), was selected as an appropriate analytical tool due to the level of Prince William County's existing service capacity, the current

population growth rate, and the type of community that the jurisdiction typifies. Appendix D describes appropriate fiscal impact methods applicable to jurisdictions with varying characteristics. (Burchell 1985). In addition, knowledge of the community indicated that the five basic premises of current average costs, local service levels, population composition, the relationship of persons to dwelling units, and distribution of expenditures, as outlined in the methodology section, were valid. Furthermore, the Per Capita Multiplier method had historically been utilized by Prince William County as a means of analyzing fiscal impact.

PARAMETERS

Prior to the onset of estimating expenditures and revenues, general data regarding the jurisdiction had been obtained from local sources to facilitate the calculations necessary for the analysis. This data included the current population estimate, current school-age population estimate, and current school district attendance estimate. Additional general information needed was the total local assessed real property value, total local nonresidential real property value (which was the sum of commercial and industrial properties) total number of taxable land

parcels, and the sum of the number of commercial and industrial parcels for total nonresidential land parcels. Furthermore, most jurisdictions would need to obtain the local equalization ratio, which is the ratio of the assessed value of the real property to the true market value of the real property. However, Section 58.1-3201 of the Code of the State of Virginia required that the assessed value of all real property would be one hundred percent of the fair market value of the property (Spengler 1987). While this value simplified several calculations, it was included in this paper for clarification of the process. Table 1 presents an aggregate of this general data for Prince William County.

The primary figures were utilized to obtain secondary parameters that were prerequisites for the methodology to estimate the fiscal impact of residential densities. This general data was utilized to calculate the expenditures attributable to nonresidential, commercial and industrial, uses.

The total local equalized real property value was calculated by dividing the total local assessed real property value by the local equalization ratio, Table 1.

TABLE 1.

GENERAL PARAMETERS OF PRINCE WILLIAM COUNTY, 1988

Total county population	210,000
Total school age population	47,460
Total public school district population	40,091
Total local assessed real property value	$7,805,291,800
Total local nonresidential real property value (Commercial and industrial)	$1,168,918,400
Local equalization ratio	1.00
Total number of taxable land parcels	73,523
Total number of nonresidential land parcels (Commercial and industrial)	2,256

Source: Prince William County 1988. Prince William County Real Estate Assessment Office 1988.

In the case of Prince William County, the equalized value was the same as the assessed value.

$$\frac{\$7,805,291,800}{1.00} = \$7,805,291,800$$

The total local equalized nonresidential real property value was obtained by dividing the total local real property value for nonresidential properties with the local equalization ratio, Table 1.

$$\frac{\$1,168,918,400}{1.00} = \$1,168,918,400$$

The average equalized real property value per land parcel was calculated by the division of the total local equalized real property value by the total number of taxable land parcels, Table 1.

$$\frac{\$7,805,291,800}{73,523} = \$106,161$$

Finally, the average equalized nonresidential, commercial and industrial, real property value per land parcel was obtained by the division of the total local equalized nonresidential real property value by the total number of nonresidential land parcels, Table 1. These parameters have been compiled into Table 2.

$$\frac{\$1,168,918,400}{2,256} = \$518,138$$

TABLE 2.

SECONDARY PARAMETERS OF PRINCE WILLIAM COUNTY, 1988

Total equalized real property value (Assessed value divided by equalization ratio)	$7,805,291,800
Total equalized nonresidential real property value (Nonresidential value divided by equalization ratio)	$1,168,918,400
Average equalized real property value (Equalized total value divided by total number of parcels)	$ 106,161
Average equalized nonresidential real property value (Equalized nonresidential value divided by total nonresidential parcels)	$ 518,138

BUDGET EXPENDITURES

Utilizing the current budget summary for Prince William County, the expenditures were grouped into five service categories and a debt service category. This arrangement required that the Prince William County subgroups of general governmental administration, judicial administration, and community development be combined into a single category designated as general government. These categories have been summed to indicate the total county

expenditures.

The Prince William County Public School's budget had also been summed and manipulated to obtain two categories, operating and debt service. The county and school district expenditures, by categories and totals, are shown on Table 3.

The dollar figures for the service categories were further expressed as a percentage of the total expenditures. These percentages are also shown on Table 3. Subsequently in the Per Capita Multiplier methodology, these percentages have been utilized to distribute the total estimated expenditures resulting from the increased density into the appropriate service categories for the county and the school district.

In order to determine the amount of annual expenditures attributable to residential uses, the

TABLE 3.

COUNTY AND SCHOOL DISTRICT EXPENDITURES BY SERVICE CATEGORY, PRINCE WILLIAM COUNTY, VIRGINIA, 1988

	Salaries & Wages/ Other Expenses	Percent of Total
COUNTY		
Operating (including statutory)		
General Government	$ 29,051,276	25.90
Public Safety	37,876,409	33.80
Public Works	12,164,568	10.90
Health and Welfare	19,985,377	17.90
Recreation and Culture	10,052,864	9.00
Debt Service	2,801,792	2.50
TOTAL	$111,932,286	100.00
SCHOOL DISTRICT		
Operating (including statutory)	$226,502,352	95.10
Debt Service	11,733,000	4.90
TOTAL	$238,235,352	100.00

Source: Prince William County Adopted Fiscal Plan 1988.
Prince William County Public Schools 1988.

Proportional Valuation technique (Burchell 1983) was utilized to segregate the proportion of nonresidential from residential expenses. First of all, the percentage of nonresidential property value was determined with the division of the equalized nonresidential real property value by the total equalized real property value from Table 1.

$$\frac{\$1,168,918,400}{\$7,805,291,800} = 0.15$$

For Prince William County, fifteen percent of the real property value was attributable to commercial and industrial uses. An average value per nonresidential parcel was determined by dividing the total number of commercial and industrial land parcels into the total nonresidential real property value, Table 1.

$$\frac{\$1,168,918,400}{2,256} = \$518,138$$

This calculation was also utilized to determine the average of all property in Prince William County. Using Table 1, the total real property value was divided by the total number of taxable land parcels.

$$\frac{\$7,805,291,800}{73,523} = \$106,161$$

Then, the average value of a nonresidential property was divided by the average value of a local parcel.

$$\frac{\$518,138}{\$106,161} = 4.88$$

This indicates that for Prince William County the value of an average commercial and industrial parcel exceeds, by a factor of 4.88, the average value of a nonresidential parcel. However, an insufficient share of expenditures would be attributable to commercial and industrial uses when the average nonresidential use was valued at 4.88 times the average land parcel. This factor was utilized to obtain a refinement coefficient, as provided in Burchell (1983). An interpretation of the appropriate table yields a refinement coefficient of 1.13. This coefficient was multiplied by the percentage of the nonresidential share of the total real property value obtained previously.

$$0.15 \times 1.13 = .1695$$

This figure indicated that 16.95 percent of the total county expenditures, rather than fifteen percent, were

estimated to be attributable to nonresidential uses. The dollar amount of expenditures assigned to commercial and industrial uses were then determined by multiplying the total county expenditures, Table 3., by 16.95 percent.

$$\$111,932,286 \times .1695 = \$18,994,908$$

The total nonresidential costs were subtracted from the total county expenditures to obtain the costs assigned to the residential sector.

$$\begin{array}{r} \$111,932,286 \\ - \quad 18,994,908 \\ \hline \$\ 92,937,378 \end{array}$$

The total annual expenditures attributable to residential use were divided by the current county population estimate, Table 1., to determine the average costs of county services for a single resident of Prince William County.

$$\frac{\$92,937,378}{210,000} = \$443$$

The existing level for Prince William County services cost each resident approximately $443 on an annual basis.

The annual school district expenditures per student were obtained in the same manner as the residential costs.

The total school district expenditures, Table 3., were divided by the total public school district population, Table 1.

$$\frac{\$239,362,481}{40,091} = \$5,971$$

This determined that the existing level of public school education in Prince William County was estimated to cost $5,971 for each pupil per year.

The net annual jurisdictional per capita costs and the net annual school district expenditures per student, Table 4., have been utilized subsequently in this paper to estimate the future local governmental expenses that were assignable to potential residential densities.

TABLE 4.

NET ANNUAL PER CAPITA AND PER PUPIL EXPENDITURES, PRINCE WILLIAM COUNTY, VIRGINIA, 1988

Annual per Capita Costs for County Services to Residential Properties	Annual per Pupil Costs for School District Services
$433	$5,971

BUDGET REVENUES

The current revenue summary for Prince William County was utilized to group the revenues into three categories, taxes, charges, and transfers. Table 5. listed the total county revenue by source for 1988. More than eighty percent of the total county revenues were obtained from local taxes. Real property taxes, personal property taxes, and consumer utility taxes comprised eighty-four percent of the total tax revenues. The revenues from these three taxes were directly attributable to residential uses.

Using the estimated revenue summary for the Prince William County Public School system, the specific revenues were grouped into general sources of revenue. The public school system revenues and sources were shown on Table 5. Forty-three percent of the total school district revenues were attributable to residential taxes by the means of an intergovernmental transfer from Prince William County.

This section of the paper compiled the basic data necessary to utilize the Per Capita Multiplier method of fiscal impact analysis which related specifically to Prince William County. The base data included population figures, total land assessed real property values, total number of taxable land parcels, and the local equalization ratio. The 1988 Prince William County and school district budgeted

TABLE 5.

COUNTY AND SCHOOL DISTRICT REVENUE BY SOURCE,
PRINCE WILLIAM COUNTY, VIRGINIA, 1988

COUNTY, OWN SOURCE REVENUES	
REAL PROPERTY TAX	$117,235,000
PERSONAL PROPERTY TAX	24,005,846
SALES TAX	16,800,000
CONSUMER'S UTILITY TAX	7,000,000
MISCELLANEOUS TAXES	12,764,784
TOTAL TAXES	$177,805,630
FEES AND PERMITS	$ 7,755,926
FINES AND FORFEITURES	884,500
INTEREST AND INVESTMENTS	7,030,560
USER CHARGES	2,960,757
MISCELLANEOUS REVENUE	411,517
TOTAL CHARGES/ MISCELLANEOUS	$ 19,043,260
TOTAL OWN SOURCE REVENUES	$196,848,890
INTERGOVERNMENTAL TRANSFERS	
LOCAL	$ 1,915,355
COMMONWEALTH	13,088,630
FEDERAL	3,799,411
TOTAL INTERGOVERNMENTAL TRANSFERS	$ 18,803,396
TOTAL COUNTY REVENUE	$215,652,286
SCHOOL DISTRICT	
FEDERAL REVENUE	$ 4,305,691
STATE REVENUE	87,219,516
LOCAL REVENUE	572,370
COUNTY TRANSFER	103,720,000
MISCELLANEOUS FUNDS	42,417,775
TOTAL SCHOOL DISTRICT REVENUE	$238,235,352

Source: Prince William County Adopted Fiscal Plan 1988.
Prince William County Public Schools 1988.

expenditures were grouped into recognizable categories for constancy with the process. The jurisdictional revenues were analyzed for determination of the significant revenues which could be directly attributable to residential uses. The net annual county expenditures per person were calculated to be $433. The public school district net annual expenditures per student were calculated to be $5,971. This section accomplished the first five steps described in appendix B.

FORMULATION OF DEMOGRAPHIC MULTIPLIERS

Prince William County was a suburban area within commuting distance of the Washington, D.C. employment area. The relatively lower cost of housing in Prince William County was a major attraction for families who must live and work in the Washington, D.C. area. To estimate the potential future population for a proposed density of residential development, the anticipated number of housing units were multiplied by the appropriate demographic multiplier for the size and type of dwelling unit. The prediction of school population was calculated by multiplying the expected number of dwelling units by the appropriate school-age children multiplier, and then times the percentage of children who attend public verses non-public schools. The selection of the appropriate multipliers had a significant impact on the estimated resident and school populations.

RESIDENTIAL POPULATION

Demographic multipliers to estimate population were developed based on a historical relationship between the size and type of existing dwelling units and the number and age of the residents occupying the housing. Depending on

the quality and timeframe of the data available, local demographic multipliers might have been considered to be the most appropriate demographic multipliers to use in predicting local residential and school populations. However, as Prince William County had changed dramatically over the past thirty-five years, various demographic multipliers were considered. Several different sources of demographic multipliers were available for estimating the potential population of new residential development on the Cherry Hill peninsula of Prince William County, Virginia. Table 6. was a compilation of the anticipated total residential population for the Suburban Metropolitan comprehensive plan designation. The demographic multipliers used include: the blended regional multipliers derived from the 1980 U.S. Census Public Use Sample, the multipliers which were currently being utilized by the Prince William County Planning Office, and the multipliers that had been utilized to present the developer's case for amending the comprehensive plan designation on the Cherry Hill peninsula. The county's multipliers yielded the significantly highest population estimate at 8,432. The lowest population prediction of 6,160 was obtained utilizing the blended regional demographic multipliers. The demographic multipliers presented by the proposed developer of the Cherry Hill peninsula provided a slightly

TABLE 6.

ANTICIPATED TOTAL RESIDENT POPULATION BY HOUSING TYPE,
PRINCE WILLIAM COUNTY, VIRGINIA, 1988
USING VARIOUS DEMOGRAPHIC MULTIPLIERS

	NUMBER OF DWELLING UNITS (1)	DEMOGRAPHIC MULTIPLIERS (2)	TOTAL RESIDENTS (1 x 2)
BLENDED REGIONAL			
SINGLE FAMILY D.U. (a)	400	3.238	1,295
TOWNHOUSES (b)	720	2.442	1,758
APARTMENTS (1,680)			
GARDEN (c)	1,008	2.071	2,088
HIGHRISE (d)	672	1.516	1,019
TOTAL (SUM a thru d)			6,160
PRINCE WILLIAM COUNTY			
SINGLE FAMILY D.U. (e)	400	4.07	1,628
TOWNHOUSES (f)	720	3.22	2,318
MULTIFAMILY (g)	1,680	2.67	4,486
TOTAL (SUM e thru g)			8,432
CHERRY HILL AMENDMENT			
SINGLE FAMILY D.U. (h)	400	3.18	1,272
TOWNHOUSES (i)	720	2.49	1,793
MULTIFAMILY (j)	1,680	2.26	3,797
TOTAL (SUM h thru j)			6,862

Source: Burchell 1985. Prince William County, Office of Planning 1986. Residential Planning Group 1987.

higher residential population estimate. For comparison purposes the average of these three potential populations was calculated.

$$\begin{array}{r} 8,432 \\ 6,160 \\ +\ 6,862 \\ \hline 21,454 \end{array} \quad \frac{21,454}{3} = 7,151$$

The average of these three population estimates yielded a potential residential population of 7,151 for the 2,800 housing units proposed under the Suburban Metropolitan designation for the Cherry Hill Peninsula. The use of South Atlantic regional demographic multipliers, rather than any of the three utilized previously, allowed the calculation of residents according to the number of bedrooms in a residential housing unit. The total anticipated population by housing type and number of bedrooms for both the existing Comprehensive Plan designation, Resource Management, and the proposed Comprehensive Plan amendment, Suburban Metropolitan, is represented on Table 7. These demographic multipliers yielded population estimates of 704 residents under the Resource Management designation, and a total of 6,366 people for Suburban Metropolitan. These residential

TABLE 7.

ANTICIPATED TOTAL RESIDENT POPULATION BY HOUSING TYPE,
PRINCE WILLIAM COUNTY, VIRGINIA, 1988
USING REGIONAL DEMOGRAPHIC MULTIPLIERS DERIVED FROM THE
1980 U.S. CENSUS PUBLIC USE SAMPLE (BURCHELL 1985)

	NUMBER OF DWELLING UNITS	DEMOGRAPHIC MULTIPLIERS	TOTAL RESIDENTS
	(1)	(2)	(1 x 2)
RESOURCE MANAGEMENT			
SINGLE FAMILY D.U. (200)			
3 BEDROOM (a)	100	3.145	315
4 BEDROOM (b)	100	3.889	389
TOTAL (a + b)			704
SUBURBAN METROPOLITAN			
SINGLE FAMILY D.U. (400)			
3 BEDROOM (c)	200	3.145	629
4 BEDROOM (d)	200	3.889	778
TOWNHOUSES (720) (e)	720	2.491	1,794
APARTMENTS (1,680)			
GARDEN (f)	1,008	2.086	2,103
HIGHRISE (g)	672	1.580	1,062
TOTAL (SUM c thru g)			6,366

population estimates were utilized to calculate the expenditures and revenues of the fiscal impact analysis for the Cherry Hill Peninsula.

SCHOOL POPULATION

Demographic multipliers utilized to estimate school populations yield an anticipated total school-age population. This total population would include all school-age children regardless of attendance in public, private, or parochial schools. This fiscal impact analysis dealt with public government costs. Therefore, it was necessary to obtain the percentage of the total school-age population which attended public schools. Using Table 1., the total public school district population was divided by the total school-age population.

$$\frac{40,091}{47,460} = 0.845$$

This calculation indicated that 84.5 percent of the total local school-age population attended school in the public school system. The same sources of demographic multipliers as utilized for the residential projections were again employed to calculate the potential public school population. These projections were compiled on Table 8.

TABLE 8.

ANTICIPATED TOTAL SCHOOL POPULATION BY HOUSING TYPE,
PRINCE WILLIAM COUNTY, VIRGINIA, 1988
USING VARIOUS DEMOGRAPHIC MULTIPLIERS

	NUMBER OF DWELLING UNITS	DEMOGRAPHIC MULTIPLIERS	TOTAL STUDENTS
	(1)	(2)	(1 x 2)
BLENDED REGIONAL			
SINGLE FAMILY D.U. (a)	400	0.813	325
TOWNHOUSES (b)	720	0.402	289
APARTMENTS (1,680)			
GARDEN (c)	1,008	0.267	269
HIGHRISE (d)	672	0.041	28
SUB-TOTAL (SUM a thru d)			911
TOTAL (SUB-TOTAL x 86.8%)			791
PRINCE WILLIAM COUNTY			
SINGLE FAMILY D.U. (e)	400	.906	362
TOWNHOUSES (f)	720	.614	442
MULTIFAMILY (g)	1,680	.260	437
TOTAL (SUM e thru g)			1,241
CHERRY HILL AMENDMENT			
SINGLE FAMILY D.U. (h)	400	.782	313
TOWNHOUSES (i)	720	.411	296
MULTIFAMILY (j)	1,680	.239	402
SUB-TOTAL (SUM h thru j)			1,011
TOTAL (SUB-TOTAL x 90%)			910

Source: Burchell 1985. Prince William County Planning Office 1988. Residential Planning Group 1987.

The blended regional demographic multipliers, required the utilization of the average, 86.8 percent, of the total school-age population, to obtain the lowest estimate at 791. The Prince William County School District calculations projected 1,241, with the percentage of public to non-public school children already factored into the demographic multipliers. The demographic multipliers and public school percentage utilized in the developer's proposed amendment to the Cherry Hill peninsula comprehensive plan projected a significantly lower, 910, public school attendees. To retain the consistency within this fiscal impact analysis, and to allow the number of bedrooms in a dwelling unit to be figured into the projection of the public school attendance, the South Atlantic regional demographic multipliers were utilized to compute the total public school population. As shown on Table 9., the estimated number of public school students generated by the development of the Cherry Hill peninsula under the Resource Management designation was 172, while the projection was 846 pupils for the 2,800 dwelling units proposed with the comprehensive plan amendment to Suburban Metropolitan.

This section of the paper compared various selected demographic multipliers. The population figures obtained from the South Atlantic demographic multipliers were chosen

TABLE 9.

ANTICIPATED TOTAL SCHOOL POPULATION BY HOUSING TYPE,
PRINCE WILLIAM COUNTY, VIRGINIA, 1988
USING REGIONAL DEMOGRAPHIC MULTIPLIERS DERIVED FROM THE
1980 U.S. CENSUS PUBLIC USE SAMPLE (BURCHELL 1985)

	NUMBER OF DWELLING UNITS	DEMOGRAPHIC MULTIPLIERS	TOTAL STUDENTS
	(1)	(2)	(1 x 2)
RESOURCE MANAGEMENT			
SINGLE FAMILY D.U. (200)			
3 BEDROOM (a)	100	0.718	72
4 BEDROOM (b)	100	1.324	132
SUB-TOTAL (a + b)			204
TOTAL (SUB-TOTAL x 84.5%)			172
SUBURBAN METROPOLITAN			
SINGLE FAMILY D.U. (400)			
3 BEDROOM (c)	200	0.718	144
4 BEDROOM (d)	200	1.324	265
TOWNHOUSES (720) (e)	720	0.411	296
APARTMENTS (1,680)			
GARDEN (f)	1,008	0.263	265
HIGHRISE (g)	672	0.046	31
SUB-TOTAL (SUM c thru g)			1,001
TOTAL (SUB-TOTAL x 84.5%)			846

as appropriate for the calculations in this report due to the ability to consider the number of bedrooms in a dwelling unit, the professionally recognized acceptability, and the legal defensibility of the use of the multipliers. The South Atlantic regional demographic multipliers yielded an anticipated total population for the Resource Management designation of 704 residents and 6,366 residents for the Suburban Metropolitan amendment. The total anticipated school population projected from the South Atlantic regional demographic multipliers estimated 172 students for the Resource Management designation and 846 students for the Suburban Metropolitan amendment.

FISCAL IMPACT ANALYSIS

EXPENDITURES

In order to anticipate the fiscal impact of a residential development on the Cherry Hill Peninsula of Prince William County, Virginia, residentially induced local expenditures and revenues were projected. The estimation of the residentially induced expenditures was carried out by the use of data previously calculated in this paper. The estimated residential populations, Table 7., and the estimated public school enrollment, Table 9., were multiplied by the average annual county and school district expenditures, Table 4. This obtained the local residentially induced expenditures broken down by county versus school costs based on the estimated populations for both the Resource Management comprehensive plan designation and the proposed Suburban Metropolitan comprehensive plan amendment. Listed on Table 10. were the anticipated total annual expenditures.

Given the percentage of the total budget allotted by service category, Table 3., the estimated total annual residentially induced county and school expenditures were reapportioned by service categories. Table 11. distributed the anticipated total cost for the 200 dwelling unit

TABLE 10.

ESTIMATED TOTAL RESIDENTIAL EXPENDITURES
PRINCE WILLIAM COUNTY, VIRGINIA, 1988

	POPULATION (1)	ANNUAL EXPENDITURE PER PERSON (2)	TOTAL ANNUAL EXPENDITURE (1 x 2)
RESOURCE MANAGEMENT			
RESIDENTIAL (a)	704	$ 443	$ 311,872
SCHOOL (b)	172	$ 5,971	$ 1,027,012
TOTAL (a + b)			$ 1,338,884
SUBURBAN METROPOLITAN			
RESIDENTIAL (c)	6,366	$ 443	$ 2,820,138
SCHOOL (d)	846	$ 5,971	$ 5,051,466
TOTAL (c + d)			$ 7,871,604

TABLE 11.

COUNTY AND SCHOOL DISTRICT EXPENDITURES BY SERVICE CATEGORY,
ASSIGNABLE TO THE 200 UNIT RESOURCE MANAGEMENT
PRINCE WILLIAM COUNTY, VIRGINIA, 1988

	Generated Costs by Service Catagory	Percent of Total
COUNTY		
Operating (including statutory)		
General Government	$ 95,461	25.90
Public Safety	124,579	33.80
Public Works	40,175	10.90
Health and Welfare	65,975	17.90
Recreation and Culture	33,172	9.00
Debt Service	9,214	2.50
TOTAL	$ 368,576	100.00(20.3)
SCHOOL DISTRICT		
Operating (including statutory)	$1,379,856	95.10
Debt Service	71,097	4.90
TOTAL	$1,450,953	100.00(79.7)
TOTAL PUBLIC COSTS	$1,819,529	(100.0)

Resource Management comprehensive plan designation by service category. The percentages of the total estimated annual expenditures by service category associated with the proposed 2,800 dwelling unit Suburban Metropolitan comprehensive plan amendment are shown on Table 12.

REVENUES

As discussed previously under Budget Revenues, a plurality of the Prince William County revenues came from tax sources. In all, 84 percent of the local taxes, which were directly attributable to residential uses, accounted for more than 69 percent of the total jurisdictional revenues. Prince William County transferred 48 percent of the total county revenues to the Prince William County Public Schools, and thereby, provided more than 43 percent of the total budget for the public school system. Real property tax, which accounted for a majority of the Prince William County total revenues, was assessed at a rate of 13.8 mills, or $1.38 per $100 of assessed valuation. The projection of the total real property taxes generated by a residential density was calculated by multiplying the local tax rate, expressed as a decimal, by the total expected assessed valuation of the property, or by multiplying the equalized tax rate with the true market value of the

TABLE 12.

COUNTY AND SCHOOL DISTRICT EXPENDITURES BY SERVICE CATEGORY, ASSIGNABLE TO THE 2,800 UNIT SUBURBAN METROPOLITAN PRINCE WILLIAM COUNTY, VIRGINIA, 1988

	Generated Costs by Service Catagory	Percent of Total
COUNTY		
Operating (including statutory)		
General Government	$ 833,908	25.90
Public Safety	1,088,267	33.80
Public Works	350,950	10.90
Health and Welfare	576,331	17.90
Recreation and Culture	289,775	9.00
Debt Service	80,493	2.50
TOTAL	$ 3,219,724	100.00(28.6)
SCHOOL DISTRICT		
Operating (including statutory)	$7,660,190	95.10
Debt Service	394,689	4.90
TOTAL	$ 8,054,879	100.00(71.4)
TOTAL PUBLIC COSTS	$11,274,603	(100.0)

property. State law in Virginia required that the assessed valuation of property be 100 percent of the true market value. Therefore, the tax rate did not have to be equalized. Table 13. shows the projected property taxes, which utilized the average market values obtained from the Prince William Board of Realtors and the suggested market values presented with the proposed comprehensive plan amendment.

Personal property taxes were assessed at numerous different tax rates in Prince William County; $0.70 for farm machinery, $1.00 for machinery and tools, $1.30 for aircraft, and $1.42 for mobile homes. The preponderance of personal property in Prince William County, which included automobiles, was taxed at a rate of $3.95 per $100 of assessed value. The average amount of personal property tax paid by a resident of the county in fiscal year 1988 was $99.00. On Table 14., the personal property tax was projected according to the estimated number of residents for both the Resource Management and Suburban Metropolitan comprehensive plan designations.

The consumer's utility tax was imposed upon the purchasers of natural gas, electricity, and telephone service. The tax rate for residential users was fifteen percent of the first fifteen dollars of each monthly utility bill, and not to exceed $2.25 per month. The

TABLE 13.

PROPERTY TAX REVENUE PROJECTION
PRINCE WILLIAM COUNTY, VIRGINIA, 1988

REAL PROPERTY TAX (average value)					
RESOURCE MANAGEMENT					
Single-family units					
200	X $135,160	X .0138	=	$	373,042
SUBURBAN METROPOLITAN					
Single-family units					
400	X $135,160	X .0138	=	$	746,083
Townhouse units					
720	X $ 90,391	X .0138	=	$	898,125
Multi-family units					
1,680	X $ 45,000	X .0138	=	$	1,043,280
TOTAL					$2,687,488
REAL PROPERTY TAX (proposed value)					
RESOURCE MANAGEMENT					
Single-family units					
200	X $175,000	X .0138	=	$	483,000
SUBURBAN METROPOLITAN					
Single-family units					
400	X $175,000	X .0138	=	$	966,000
Townhouse units					
720	X $120,000	X .0138	=	$	1,192,320
Multi-family units					
1,680	X $ 85,000	X .0138	=	$	1,970,640
TOTAL					$4,128,960

TABLE 14.

PERSONAL PROPERTY AND UTILITY TAX REVENUE PROJECTION
PRINCE WILLIAM COUNTY, VIRGINIA, 1988

PERSONAL PROPERTY TAX

RESOURCE MANAGEMENT

Total number of residents
704 X $99 = $ 69,696

SUBURBAN METROPOLITAN

Total number of residents
6,366 X $99 = $630,234

UTILITY TAX

RESOURCE MANAGEMENT

Total number of residential units
200 X $81 = $ 16,200

SUBURBAN METROPOLITAN

Total number of residential units
2,800 X $81 = $226,800

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estimated, utility tax calculated by multiplying the total number of residential dwelling units by $81.00, was compiled on Table 14.

The residentially induced local revenues, real property tax Table 13., personal property tax Table 14., and consumer utility tax Table 14., were summed on Table 15. to determine the total estimated annual county revenues for the two potential residential densities under the Resource Management and Suburban Metropolitan comprehensive plan designations.

IMPACT

The fiscal impact of a residential development was estimated by the surplus or deficit of revenues versus expenditures. Table 16. calculated the total annual fiscal impact of the two potential residential housing densities on the Cherry Hill Peninsula of Prince William County. In both cases, the expenditures exceeded the revenues producing an annual local governmental deficit. This appeared to indicate that residential developments do not provide a beneficial fiscal base for the Prince William County government without a balance of commercial and industrial developments.

The Resource Management comprehensive plan designation

TABLE 15.

TOTAL ESTIMATED TAX REVENUES
PRINCE WILLIAM COUNTY, VIRGINIA, 1988

RESOURCE MANAGEMENT	
REAL PROPERTY TAX (a)	$ 373,042
PERSONAL PROPERTY TAX (b)	$ 69,696
UTILITY TAX (c)	$ 16,200
TOTAL (SUM a thru c)	$ 458,938
SUBURBAN METROPOLITAN	
REAL PROPERTY TAX (d)	$ 2,687,488
PERSONAL PROPERTY TAX (e)	$ 630,234
UTILITY TAX (f)	$ 226,800
TOTAL (SUM d thru f)	$ 3,544,522

TABLE 16.

TOTAL ANNUAL FISCAL IMPACT OF RESIDENTIAL DEVELOPMENT
PRINCE WILLIAM COUNTY, VIRGINIA, 1988

RESOURCE MANAGEMENT	
TOTAL PUBLIC EXPENDITURES (a)	$ 1,338,884
TOTAL PUBLIC REVENUES (b)	$ 458,938
NET FISCAL IMPACT (a - b)	$ 879,946
SUBURBAN METROPOLITAN	
TOTAL PUBLIC EXPENDITURES (c)	$ 7,871,604
TOTAL PUBLIC REVENUES (d)	$ 3,544,522
NET FISCAL IMPACT (c - d)	$ 4,327,082

does not provide for any commercial or industrial uses which would impact the Prince William County expenditures and revenues. However, the preservation of natural land areas under the Resource Management comprehensive plan designation would provide a public good which should be taken into consideration. The assignment of bonus money for open space preservation could counterbalance the negative fiscal impact of the 200 dwelling unit residential development.

The Suburban Metropolitan comprehensive plan amendment proposed 20,000,000 square feet of nonresidential development. This proposed development doubles the estimated 1988 square feet of existing commercial, office, and industrial development. While this paper only considered the fiscal impact of residential development, the revenues and expenditures associated with the proposed nonresidential development must be considered for an understanding of the total fiscal ramifications.

CONCLUSION

ANALYSIS

The original intent of this paper was to provide a component of the data and background research that would normally be carried out during the comprehensive land use planning process. Until a comprehensive land use planning process was accomplished, the aggregate physical, social, and economic costs and benefits could not be elucidated to establish the basis of a land use development decision.

This paper was designed to evaluate the fiscal impact of residential development on the Cherry Hill peninsula in Prince William County, Virginia. The concentration of this scope limited the conclusions that could be drawn from this paper. First of all, the restriction of the focus to residential uses without regard to the fiscal impact of the commercial or industrial uses which were proposed with or might be caused by the residential development does not provide an integral fiscal illustration.

Secondly, the selection of the Per Capita Multiplier method of fiscal impact analysis required that several assumptions hold true for Prince William County. If any one of the assumptions discussed previously in this paper failed to be correct, the reasoning in the methodology

would provide a deceptive conjecture. In addition, the comparison of an auxiliary method of fiscal impact assessment would provide a more cogent demonstration of pecuniary viability.

The selection of the appropriate demographic multipliers had a profound affect on the fiscal estimates. As aforementioned in this paper, the demographic multipliers currently utilized by Prince William County yielded a significantly larger residential population figure than the average obtained by all of the multipliers. The quality of the documentation supporting the calculation of the local multipliers should indicate the applicability of local as contrasted to regional demographic multipliers. While the regional demographic multipliers developed from the 1980 U.S. Census Public Use Sample (Burchell 1985) are professionally recognized and legally defensible, they diverge greatly from the Prince William County demographic multipliers. This could be an indication that the population composition of Prince William County does not correspond to the regional norm. The county's high residential population estimate appeared to correspond to the significantly above average anticipated school population estimated utilizing the county school's multipliers.

The estimation of the county's public school district

revenue indicated that only forty-three percent of the district's total income was obtained from a local intergovernmental fund transfer. Although the calculation of expenditures per student was a good indication of total fiscal impact, the federal and state funding sources provided a majority of the public school's revenues. These sources should have been evaluated for assurance of the continuation of the current average level of funding. The continuity of the nonlocal revenue should have been included either in the total revenue projections or as a percentage of local expenditures per student.

Prince William County's fiscal worksheet, as discussed in appendix A, appeared to be a fairly viable alternative for expeditious fiscal impact calculations. However, the worksheet should be kept contemporary with the most recent data available, and the school expenditures should include more than capital costs. The inclusion of one-twentieth of the value of the impact abatement proffers adjusted the fiscal impact to correspond approximately with the actual local fiscal impact.

As indicated by the utilization of the Per Capita Multiplier method of fiscal impact analysis, the potential development of 200 residential dwelling units under the Resource Management comprehensive plan designation were estimated to have a negative fiscal impact on Prince

William County. The proposed Suburban Metropolitan comprehensive plan designation with 2,800 residential dwelling units also indicated a local budget deficit. Provided that the average future level of local service expenditures approximates the 1988 level, residential growth in Prince William County would create more county and school district expenditures than the tax revenue that would be generated by the associated residents and dwelling units.

RECOMMENDATIONS

While the intent and design of this paper limited the level of analysis possible, this focus served to stimulate the thought process and broadened the realm of future possibilities. Several recommendations for subsequent scrutiny materialized as this paper evolved from problem to impact.

Initially, local demographic and school-age population multipliers should be verified and recalculated with current data. The utilization of local population facts rather than regional information would provide an advantageous means of projecting future population distributions and growth.

The inclusion of a percentage of the value of the

impact abatement proffers into the revenue calculations would provide a truer indication of the total fiscal impact on the jurisdiction. Although this was a decidedly Northern Virginia phenomenon, the value of impact abatement proffers had a significant impact on the provision of capital improvements in Prince William County. The utilization of the one-twentieth or one year's cost over a twenty year lifespan utilized in the fiscal impact worksheet, appendix A, developed by the county was a legitimate method of applying the value of the proffers to the fiscal impact analysis. The incorporation of this value in the assessment of the fiscal impact of private development on the public budget may be applicable in other jurisdictions where the process of negotiation produced similar capital improvements. Impact fees and users fees could also provide positive cash flow to offset the negative fiscal impact. The preservation of open space which provides a public good should be assigned bonus money in the fiscal impact analysis to provide a fuller understanding of the public costs and benefits.

The fiscal impact analysis should be expanded to incorporate the nonresidential fiscal implication. This should encompass proposed nonresidential uses, and nonresidential uses projected to be precipitated by the residential development. While this paper was not intended

to consider the fiscal impact of nonresidential uses, the fiscal implications of the residential development inspired questions regarding the total fiscal impact. The proportional level of residential development to commercial and industrial uses necessary for local fiscal viability and growth should be determined.

The estimation of fiscal impact by use of the Per Capita Multiplier method does not provide tangible facts relating to what might happen should the level of services change or other alterations occur within the basic assumptions. It would be appropriate to provide a cross comparison with other methods of fiscal impact assessment. The resemblance of Prince William County to Fairfax County, Virginia of several years ago may furnish a germane example for the Comparable City or Case Study method of fiscal impact analysis.

Perhaps the compelling recommendation that proved to be the underlying fundamental concern that prompted this paper was the utilization of the comprehensive planning process in the development of land use decisions. The proposed Suburban Metropolitan comprehensive plan amendment was an instance where transportation issues, the location of the interstate bridge, were influencing major development decisions without the benefit of extensive information regarding the physical, economic, and social

costs and benefits. The Cherry Hill peninsula of Prince William County, Virginia was indicated to be the habitat of several endangered wildlife and plant species, a significant source of tidal and non-tidal wetlands which acted to maintain water quality, trap non-point pollution sources, and control erosion, as well as a major natural area in an increasingly metropolitan area of the country. Although this paper indicated that exclusive residential development would have a negative fiscal impact on the county, residential development was considered necessary to develop or attract commercial and industrial development. A proposed commercial, office, and industrial development which doubles the existing nonresidential square footage should be supported by a carefully scrutinized market study. The comprehensive planning process would weigh and balance the environmental considerations with the desires to attract economic development to Prince William County. The appropriate mix and density of land use on the Cherry Hill peninsula should be established through the comprehensive planning process by the citizens of Prince William County, Virginia, not by a single entity interested in a quick profit through maximization of land development density.

APPENDIX A

FISCAL WORKSHEET

The Prince William County Fiscal Impact Assessment worksheet was developed in 1986 by the comprehensive planning section of the Planning Office. The worksheet utilized a method of estimating expenditures similar to the Per Capita Method utilized within this paper. However, the worksheet had two dissimilarities. First of all, public school costs were calculated based only on capital expenditures rather than total budgeted expenditures.

In addition, the Northern Virginia area had a system of potential impact abatement which allowed developers to proffer, or offer to provide, to the jurisdiction, at the time of rezoning, items of public benefit. These impact related proffers were limited only by the development establishment's imagination and the negotiation process, but normally included such things as school sites, the development of parks, and monetary contributions for commuter parking lots. The contribution of capital improvements provided by the proffer system offset some expenditures incurred by residential development. The Fiscal Impact Assessment worksheet added one-twentieth of the fair market value of the non-roadway contributions to

the estimated annual tax revenues.

For the purposes of this paper, the calculations on the worksheet were revised in accordance with the current data provided by this paper and the resource material, and consistent with the multipliers presently utilized by Prince William County. As follows on Table 17., the proposed comprehensive plan amendment to Suburban Metropolitan was applied to the Prince William County Fiscal Impact Assessment worksheet.

According to the calculations of the worksheet, the expenditures associated with the 2,800 units proposed under the Suburban Metropolitan comprehensive plan designation totaled $5,163,939. While the revenues anticipated to be generated by the potential development were $4,030,056. This resulted in a deficit of $1,133,880. Consequently, it would appear that the proposal for 400 single-family, 720 townhouse, and 1,680 multi-family dwelling units on the Cherry Hill Peninsula would have a negative fiscal impact on Prince William County.

TABLE A-1.

PRINCE WILLIAM COUNTY WORKSHEET
FISCAL IMPACT ASSESSMENT, RESIDENTIAL DEVELOPMENT

NUMBER OF RESIDENTS

a. Number of single-family detached units X 4.07 =
400 X 4.07 = 1,628
b. Number of townhouse units X 3.22 =
720 X 3.22 = 2,318
c. Number of multi-family units X 2.67 =
1,680 X 2.67 = 4,486
Total number of residents = 8,432

VALUE OF THE PROJECT

a. Number of single-family detached units X $135,160 =
400 X $135,160 = $ 54,064,000
b. Number of townhouse units X $90,391 =
720 X $ 90,391 = $ 65,081,520
c. Number of multi-family units X $45,000 =
1,680 X $45,000 = $ 75,600,000
Total value of the Project = $194,745,520

ANNUAL COUNTY GOVERNMENT COSTS

Number of residents X $443 =
8,432 X $443 = $3,735,376

ANNUAL SCHOOL CAPITAL COSTS

a. Number of single-family detached units X $1,043 =
400 X $1,043 = $417,200
b. Number of townhouse units X $707 =
720 X $ 707 = $509,040
c. Number of multi-family units X $299 =
1,680 X $ 299 = $502,320
Total school capital costs = $1,428,560

TOTAL ANNUAL COSTS

Total county costs = $3,735,376
Total school capital costs = $1,428,560

Total annual costs = $5,163,936

TABLE A-1. CONTINUED

PRINCE WILLIAM COUNTY WORKSHEET
FISCAL IMPACT ASSESSMENT, RESIDENTIAL DEVELOPMENT

ANNUAL REAL ESTATE TAX
Total value of the project X $0.0138 =
$194,745,520 X $0.0138 = $2,687,488
Real Estate Tax = $2,687,488

ANNUAL PERSONAL PROPERTY TAX
Total number of residents X $99.00 =
8,432 X $99.00 = $834,768
Personal Property Tax = $ 834,768

ANNUAL UTILITY TAX
Total number of residential units X $81.00 =
2,800 X $81.00 = $226,800
Total Utility Tax = $ 226,800

TOTAL ANNUAL TAX REVENUES
Real Estate Tax = $2,687,488
Personal Property Tax = $ 834,768
Utility Tax = $ 226,800
Total Tax Revenue = $3,749,056

CAPITAL CONTRIBUTIONS
Fair market value of non-roadway contributions = $5,620,000
Divided by 20 year life span 20
Annual Value of Contributions = $ 281,000

TOTAL ANNUAL REVENUES
Total Tax Revenues = $3,749,056
Annual Value of Contributions = $ 281,000
Total Annual Revenues = $4,030,056

EXCESS OF ANNUAL COSTS OVER REVENUES
Total Annual Costs = $5,163,936
Minus Total Annual Revenues = $4,030,056

Excess of Costs over Revenues = $1,133,880

Note: A negative value for the Excess of Costs over Revenue indicates a beneficial Fiscal Impact.

Source: Prince William County, Office of Planning 1986.

PER CAPITA MULTIPLIER FISCAL IMPACT METHOD: SUMMARY OF COST PROJECTION PROCEDURES

STEP NUMBER	*ANALYSIS/ACTIONS*	*EXAMPLE CALCULATION (A 3,000 UNIT PUD IS PROPOSED FOR A N.J. COMMUNITY OF 16,000 POPULATION. SEE EXHIBIT 1 FOR FULL COST PROJECTION.)*
1	Contact the office of the city manager and superintendent of schools to obtain local municipal and school district budgets and the latest estimates of municipal/school district populations.	This step reveals the following local information: Municipal population of 16,000 residents; Total municipal expenditures of $3,266,171; School district population of 2,400 pupils; and educational expenditures of $4,440,000
2	Categorize local expenditures into five municipal service categories plus the school district function.	Step 2 disaggregates total local municipal and school district expenditures into component services—general government, public safety, public works, health and welfare, recreation and culture and school district.
3	Obtain total annual municipal expenditures by summing the annual costs, including debt service for capital facilities, for each of the five service categories. Obtain total annual school district expenditures.	Step 3 aggregates component service costs into total municipal and total school district outlays.
4	Assign a share of total annual municipal costs to existing local nonresidential facilities based on the proportion of their value to total local real property valuation. Subtract this share from the total annual municipal costs.	The Proportional Valuation Method (see Exhibit 8) is used to determine local, nonresidential induced municipal expenditures in the example community. This amount ($1,199,338) is subtracted from total local municipal costs ($3,266,171) to yield residential induced expenditures of $2,066,833 ($3,266,171 - $1,199,338).
5	Calculate the net (residentially-induced) annual costs of the five municipal functions on a per capita basis and the annual costs of education on a per pupil basis.	*Municipal Costs Per Capita* = *Residential Induced Expenditures* ÷ *Total Municipal Population* $129 = $2,066,833 ÷ 16,000 *Per Pupil Education Costs* = *Total Educational Expenditures* ÷ *Total School District Pupils* $1,850 = $4,400,000 ÷ 2,400
6	Calculate anticipated total resident and school population by housing type.	As example community is in New Jersey,* use demographic multipliers for Northeast region, Middle Atlantic subregion (see Exhibit 2 and Exhibit 1, column 2). See Exhibit 1 columns 1-3 for calculation of total resident (8,154) and school (1,456) populations.
7	Calculate residentially-induced total annual municipal and school district expenditure increases by multiplying per capita/per pupil municipal and school district expenditures by the projected number of residents/pupils.	See Exhibit 1, columns 3-5 for calculation. This step indicates that the PUD's residential component will generate $3,342,166 in local expenditures.
8	Calculate municipal costs for any nonresidential uses if they are inclusive of the growth increment; assign a share of local costs to the nonresidential facility based on the facility's share of total local nonresidential property valuation.	The Proportional Valuation Method indicates that the PUD's nonresidential component will generate $12,353 in local municipal costs. The PUD therefore increases total local costs by $3,354,519 ($3,342,166 + $12,353).
9	Determine total annual public costs and refine the projection by allocating total costs by service category.	The PUD generated total costs of $3,354,519 is disaggregated into the different public service components following the percentage breakdowns determined in Step 2.

Source: Burchell, 1985.

Source: Burchell 1985.

EXAMPLE FISCAL IMPACT COST PROJECTION USING THE PER CAPITA MULTIPLIER METHOD

USING THE PER CAPITA MULTIPLIER METHOD TO EVALUATE THE FISCAL IMPACT OF A DEVELOPMENT PROPOSAL

3,000 Unit Planned Unit Development	Number of Dwelling Units (1)	Demographic Multipliers Household/ Students (2)		Total Residents[1] (3)	Total Students[1] (3)	Annual Expenditure Per Capita/ Municipal[2] (4)	Annual Expenditure Per Pupil/ School District[3] (4)	Total Annual Expenditures/ Municipal[4] (5)	Total Annual Expenditures/ School District[4] (5)	Total Annual Public (Municipal and School District) Expenditures (6)
RESIDENTIAL										
Townhouses (1,500)										
1 bedroom (elderly)	250	1.699	0.000	425	–	$129	$1,850	$ 54,825	$ –	$ 54,825
2 bedroom	1,000	2.630	0.304	2,630	304	129	1,850	339,270	562,400	901,670
3 bedroom	250	4.110	1.311	1,028	328	129	1,850	132,612	606,800	739,412
Garden Apartments (1,000)										
1 bedroom	700	1.722	.011	1,205	8	129	1,850	155,445	14,800	170,245
2 bedroom	300	2.545	.200	758	60	129	1,850	97,782	111,000	208,782
Single-Family Homes (500)										
3 bedroom	250	3.776	1.111	944	278	129	1,850	121,776	514,300	636,076
4 bedroom	250	4.655	1.911	1,164	478	129	1,850	150,156	884,300	1,034,456
Total Residential	3,000	–	–	8,154	1,238 (1,456)[5]	–	–	1,051,866	2,290,300[6] (2,693,600)[6]	3,342,166[7] (3,745,466)[8]
NONRESIDENTIAL										
Community Shopping Center (100,000 Ft²)		–	–	–	–	–	–	12,353	–	12,353
TOTALS	3,000 (100,000 Ft²)			8,154	1,456	–	–	$1,064,219	$2,290,300	$3,354,519

Notes:
1 Equals the demographic multipliers shown in column (2) multiplied by the number of units shown in column (1).
2 Includes operating and debt service for capital facilities.
3 The figure in parenthesis is the actual subtotal of column (3) for projected pupils. Since the multipliers in column (2) are total school-age children rather than public school-age children and in this particular locale 15 percent of school-age children attend public schools, projected local pupils has been multiplied by 85 percent to reflect the actual anticipated public school burden.
4 Equals total residents/students multiplied by cost per resident/student.
5 Equals total *public* school-age children (1,238) multiplied by the cost per pupil ($1,850). This is the figure the analyst is interested in because it indicates actual generated public costs.
6 Equals total school-age children (1,456) multiplied by the cost per pupil ($1,850). It is also equal to the sum of the shown subtotals.
7 Equals $1,051,866 + $2,290,300.
8 Equals $1,051,866 + $2,693,600.

FISCAL IMPACT METHOD APPLICATIONS

ROW	Status of Community's Existing Service Capacity	Community Most Typifying Service Capacity	Development Proposals (Residential)	Development Proposals (Nonresidential)	Land Use Alternatives	Rezoning/ Variances	Annexations/ Boundary Changes	EIS's	Urban Renewal/ Community Redevelopment
1.	Significant excess capacity [a]	Central city—declining moderately or slightly	CS	CS	CS/CC	CS/CC	CS	CS	CS
2.	At capacity,[b] slight excess capacity	Second order city—stable growth or declining slightly	CS/CC	CS/EA	CS/CC	CS/CC	CS	CS/CC	CS
3.	At capacity	Suburb—stable growth or slightly increasing	M/SS	PV/EA	M/SS	M/SS	M/SS	M/SS	CS
4.	At capacity, slight deficient capacity[c]	Suburb-moderately increasing growth	M/SS	PV/EA	M/SS	M/SS	M/SS	M/SS	
5.	Moderate deficient capacity	Exurban—moderately increasing growth	CS/CC	CS	CS/CC	CS/CC	M/SS	CS/CC	
6.	Significant deficient capacity	Exurban—rapidly increasing growth	CS/CC	CS	CS	CS/CC	CS	CS	

Applicable Methods: M = Per Capita Multiplier
CS = Case Study
SS = Service Standard
CC = Comparable City
PV = Proportional Valuation
EA = Employment Anticipation

Notes:

a. *Excess Capacity*—This service system is underutilized and exhibits room for service expansion without significant additional operational or capital expenditures.

b. *At Capacity*—The service system is operating at its most efficient level; most service categories exhibit neither over nor underutilization.

c. *Deficient Capacity*—The service system is overutilized; the slightest form of additional service demand will occasion significant operational or capital expenditures.

Source: Burchell, 1975.

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FISCAL IMPACT ANALYSIS OF RESIDENTIAL DENSITY
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AN ABSTRACT OF A MASTER'S REPORT

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ABSTRACT

An integral part of the comprehensive land use planning process is the fiscal impact analysis. A method of fiscal impact assessment is the Per Capita Multiplier method, which utilizes the relationship between existing populations and current jurisdictional budget levels to estimate the future public expenditures and revenues associated with private development. The proximity of the Washington, D.C. employment center motivates residential development in Prince William County, Virginia. The Cherry Hill peninsula of Prince William County was a virtually undeveloped natural area adjacent to the Potomac River. Development pressures suggested that the peninsula should be planned for a more intense density than the area was designated for by the existing comprehensive plan. A portion of the comprehensive planning process to evaluated the costs and benefits of the various level of development density was the fiscal impact of residential densities on Prince William County and the public school district. Use of the Per Capita Multiplier method of fiscal impact assessment indicated that residential development when considered exclusively would have a negative fiscal impact on local governmental expenditures. The higher density of the residential development would have an incrementally negative impact on the county and school district budgets.

Use of the fiscal impact worksheet developed and utilized by Prince William County takes into account private proffers for development impact abatement and only considers capital improvement costs for the school system. The worksheet also yielded an unfavorable fiscal impact. Exclusively residential development in Prince William County, Virginia had a deleterious fiscal impact on the jurisdictional and school district expenditures. However, the fiscal impact is only a part of the overall economic, physical, and social costs and benefits of land development which should be weighed and balanced through the comprehensive planning process. Through the comprehensive planning process it may be found that the inclusion of nonresidential development indicated a positive fiscal impact, while an aggregate fiscal impact may be outweighed by overriding environmental impacts. The local planning process should comprehensively evaluate all of the economic, physical, and social costs and benefits prior to jurisdictional development decisions.