Fiscal impact analysis for new single family residential development in Plains Montana

Nicholas P. Kaufman

The University of Montana

Let us know how access to this document benefits you.
Follow this and additional works at: https://scholarworks.umt.edu/etd

Recommended Citation
https://scholarworks.umt.edu/etd/9217

This Thesis is brought to you for free and open access by the Graduate School at ScholarWorks at University of Montana. It has been accepted for inclusion in Graduate Student Theses, Dissertations, & Professional Papers by an authorized administrator of ScholarWorks at University of Montana. For more information, please contact scholarworks@mso.umt.edu.
COPYRIGHT ACT OF 1976

THIS IS AN UNPUBLISHED MANUSCRIPT IN WHICH COPYRIGHT SUBLISTS. ANY FURTHER REPRINTING OF ITS CONTENTS MUST BE APPROVED BY THE AUTHOR.

MANSFIELD LIBRARY
UNIVERSITY OF MONTANA
DATE: 1984
FISCAL IMPACT ANALYSIS
FOR
NEW SINGLE FAMILY RESIDENTIAL DEVELOPMENT
IN
PLAINS, MONTANA

By
Nicholas P. Kaufman
B.A., University of Montana, 1974

Presented in partial fulfillment of the requirements for the degree of
Master of Science
UNIVERSITY OF MONTANA
1984

Approved by:

[Signatures]
Chairman, Board of Examiners
Dean, Graduate School

5/3/84
Date
ACKNOWLEDGMENTS

I wish to acknowledge my advisory committee, Evan Denney, Harold Bockemuehl and especially John Wicks for their encouragement, expertise and patience.

A special thanks to my wife and parents for their support during my years of education.
INTRODUCTION

The fiscal impact analysis for new single family housing in Plains, Montana, occurred in the spring of 1980. It was a preliminary study, performed within city budget and time constraints, and led to preparation of a comprehensive plan for the town of Plains.

The study is now expanded to fulfill the requirements of a professional paper. Sections are included to clarify, identify and present, in an organized fashion, the original analytical procedures and their justification.
### TABLE OF CONTENTS

ACKNOWLEDGMENTS ............................................. ii  
INTRODUCTION ................................................. iii  
LIST OF ILLUSTRATIONS ...................................... vi  

Chapter  

I. FISCAL IMPACT ANALYSIS AS A PLANNING TOOL FOR PLAINS, MONTANA ......................... 1  

II. FISCAL IMPACT ANALYSIS AND ITS LEGAL BASIS IN MONTANA .......................... 6  

  Comprehensive Planning ........................................ 7  
  Zoning ................................................................ 8  
  Subdivision Review ........................................... 10  
  Annexation ..................................................... 11  

III. FISCAL IMPACT ANALYSIS: AN OVERVIEW OF METHODOLOGIES ......................... 13  

  Per Capita Multiplier Method................................. 15  
  Case Study Method ............................................ 15  
  Service Standard Method .................................... 15  
  Comparable City Method ..................................... 16  
  Proportional Valuation Method .............................. 16  
  Employment Anticipation Method ......................... 17  

IV. THE PER CAPITA MULTIPLIER METHOD AS THE APPROPRIATE ANALYTICAL TOOL .. 20  

  Justification for Using the Per Capita Multiplier Method ......................... 20  

V. APPLICATION OF THE PER CAPITA MULTIPLIER METHOD TO THE PLAINS SITUATION . 24  

  COSTS ................................................................ 24  
  Per Capita Multiplier Method ......................... 24  
  Assumptions ................................................. 25

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
LIST OF ILLUSTRATIONS

Figure

1. Fiscal Impact Analysis Techniques .................. 14
4. Using the Per Capita Multiplier Method to Evaluate the Fiscal Impact of Alternate Development Proposals .......................... 38
5. Market Values for Development Alternatives on a 6-Acre Parcel Adjacent to the City of Plains, Montana, 1979 ....................... 40
6. Property Tax Revenues for Alternative Densities of Single Family Homes on 6 Acres .... 42
7. Interest Earning Revenues for Alternative Densities of Single Family Homes on 6 Acres .... 43
8. Revenue from Fees and Permits for Alternative Densities of Single Family Homes on 6 Acres .... 44
9. Revenue from Fines, Forfeitures and Penalties for Alternative Densities of Single Family Homes on 6 Acres .......................... 45
10. Revenue from User Charges for Special Services for Alternative Densities of Single Family Homes on 6 Acres .......................... 46
11. User Charges for Water for Alternate Densities of Single Family Homes on 6 Acres .......................... 47
12. Miscellaneous Revenues for Alternative Densities of Single Family Homes on 6 Acres .......................... 48
13. Liquor and Beer Taxes Redistributed to the Municipality as a Result of Alternative Development of Single Family Homes on 6 Acres .......................... 49
14. Motor Vehicle Registration & Title Fees Redistributed to the Municipality for Alternative Densities of Single Family Homes on 6 Acres .......................... 50
15. State Gas Tax Revenue - Residential Development (11 single family homes) .............. 53
16. State Gas Tax Revenue - Residential Development (24 single family homes) .............. 54
17. State Gas Tax Revenue - Residential Development (32 single family homes) .............. 55
18. Revenue Sharing Funds Resulting from Alternative Densities of Single Family Homes on 6 Acres........................... 56
19. Computation Sheet for Revenue Projection......... 57
20. Cost-Revenue Factors for Development Alternatives.......................... 59

Map
1. Alternative 1. Single Family 1.8 d.u./acre...... 35
2. Alternative 2. Single Family 4.0 d.u./acre...... 36
3. Alternative 3. Single Family 5.3 d.u./acre...... 37
CHAPTER I

FISCAL IMPACT ANALYSIS AS A PLANNING TOOL FOR PLAINS, MONTANA

This fiscal impact analysis is an examination of anticipated direct municipal costs and revenues associated with varying densities of new, detached, single family homes proposed to be annexed to the town of Plains, Montana. Examination of numerous factors relating to existing housing, development patterns, need and demand for housing in the Plains area determined the scope of the study.

According to the 1979 Plains Housing Survey, there are currently three basic housing types in Plains: single family homes (83 percent); mobile homes (8 percent); and apartments (9 percent). Of the non-single family households surveyed, 53 percent expressed a desire to move into single family housing. The housing survey also points out that 104 new housing units will be required by 1999 if the population continues to grow at its current rate of 2 percent per year. Thirty-seven of the anticipated 104 needed housing
units will be single family conventional construction dwellings. The housing study further states:

... Construction of these (single family) dwellings within or immediately adjacent to the town of Plains should be encouraged so that their residents will be able to support and be served by existing or soon-to-be provided public facilities and services.

This fiscal impact study was confined to single family homes for a number of reasons. Other types of housing, such as garden apartments and mobile homes, traditionally occupy vacant lots in existing built-up neighborhoods. Thus, there is significant variation in the size and value of the structures. Further, the small sample size and resulting lack of data for mobile homes and garden apartments make them unsuitable for this study.

The town of Plains has a water system. At the time of this study, the municipal sewer system was soon-to-be constructed. This raised speculation that annexation and subsequent subdivision development requests would be presented to the city. Thus, the study was narrowed to focus on potential single family subdivisions that could be annexed to the city of Plains.


2Ibid., p. 1.
A typical single family subdivision would request annexation to the city of Plains with the intent of obtaining municipal sewer, municipal water, or both. The Administrative Rules of Montana provide for minimum lot sizes if a proposed development connects to a community sewer system or to a community water system:

Where either an individual water supply system or an individual sewerage system is provided and the other service is to be provided by a public water or sewage system, the minimum lot size shall generally be 20,000 square feet of usable area, unless a smaller lot size can be justified.³

Lots larger than 20,000 square feet could be developed outside the city limits without city sewer and water. Therefore, the largest lot expected in an annexation request would be 20,000 square feet. The smallest lots expected would be in the range of 10,000 square feet to 6,000 square feet because these are the smallest lots anticipated to be marketable in the Plains area.⁴

This analysis only deals with new single family residential units adjacent to the town of Plains that would request annexation to obtain sewer and water services. For this reason, the fiscal impacts of three possible

---


⁴Interview B. VanDerhoff, VanDerhoff Realty, Spring, 1980.
alternative densities are examined: 1.8 dwelling units/acre; 4 dwelling units/acre; and 5.3 dwelling units/acre.

To measure fiscal impacts of the above densities, the author designed three alternative developments for a six acre site adjacent to the city of Plains. Each development alternative offers a different density of dwellings. For each development alternative, municipal costs and revenues were determined. This process, along with the results and conclusions of the study, are the subject of this paper.

A six acre development site, as previously mentioned, is used in the study to reflect accurately an anticipated housing development in the Plains area. The range of 11 to 32 additional units that could be placed on the site is sufficient for financial impacts to be measurable. Development of 11 to 32 units requires internal roads, water pipes, sewer pipes, curbs and sidewalks, and would thus be comparable to existing development in the town of Plains.

This study has limited applicability. The analysis measures direct costs and revenues to the city. No attempt is made to measure secondary costs of development such

5.1.8 dwelling units/acre represents +20,000 square foot lots. 5.3 dwelling units/acre represents +6,900 square foot lots.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
as social costs or the loss of agricultural land. Fiscal impact is only one factor among many items which must be weighed in the decision-making process.
CHAPTER II

FISCAL IMPACT ANALYSIS AND ITS LEGAL BASIS IN MONTANA

Plains, Montana, has a city planning board formed under the authority of Montana law. At the time this study was undertaken, in the spring of 1980, the city planning board was preparing a comprehensive plan and looking ahead to the subsequent adoption of zoning. Further, the town had successfully arranged financing of a central sewerage system with construction to begin in 1982. The city owns and operates a water system and, with the inclusion of central sewer, the planning board anticipated subdivision activity and/or requests for annexation. They began to search for a prudent method of analyzing the fiscal impacts of this anticipated development. Such an analysis could serve as a guide in preparing the comprehensive plan and zoning, as well as providing insight into the cost-effectiveness of annexation.

Fiscal impact analysis is an aid in formulating land-use decisions. However, a careful analysis of state law on planning, zoning, subdivision review and annexation

6Montana Codes Annotated, 76-1-105.
is necessary to determine what role, if any, fiscal impact analysis can play in determining land-use decisions.

Fiscal impact analysis can either be required, permitted or prohibited in the decision-making process. In subdivision review and annexation, fiscal impact analysis in some form is mandated. In comprehensive planning and zoning, fiscal impact analysis is permitted.

It is clear from a review of planning, zoning, subdivision and annexation statutes that the legislature never intended land-use decisions be based solely upon fiscal impact. Rather, fiscal impact analysis is intended to be used as one consideration among many in land-use decisions.

Comprehensive Planning

A community promotes orderly development by adopting a comprehensive plan. A comprehensive plan is not, in itself, legally binding. However, other regulations such as zoning, subdivision review and annexation must be in harmony with the comprehensive plan, if one has been adopted.

The statutes regulating comprehensive planning in Montana have, as part of their purpose, the efficient use of public funds:

Purpose. (1) It is the object of this chapter to encourage local units of government to improve the present health, safety, convenience, and welfare of their citizens and to plan for the future develop-

7Ibid., 76-2-304; 76-3-604; 7-2-4734.
ment of their communities to the end that highway systems be carefully planned; that new community centers grow only with adequate highway, utility, health, educational, and recreational facilities; that the needs of agriculture, industry, and business be recognized in future growth; that residential areas provide health surroundings for family life; and that the growth of the community be commensurate with and promotive of the efficient and economical use of public funds.

(2) In accomplishing this objective, it is the intent of this chapter that the planning board shall serve in an advisory capacity to presently establish boards and officials. 8

Parenthetically, the efficient use of public funds is recognized as a factor in planning in 26 other states. 9 Fiscal impact analysis is evolving as an important criterion in a municipality's ability to plan for future development. It is encouraging to note that Montana is in line with the majority.

Zoning

Logically, implementation of zoning follows closely the adoption of a comprehensive plan. Montana authorizes municipal zoning as a legitimate use of police power. State statutes are quite specific:

Municipal zoning authorized. For the purpose of promoting health, safety, morals, or the general welfare of the community, the city or town council

8Ibid., 76-1-102.

or other legislative body of cities and incorporated towns is hereby empowered to regulate and restrict the height, number of stories, and size of buildings and other structures; the percentage of lots that may be occupied; the size of yards, courts, and other open spaces; the density of population; and the location and use of buildings, structures, and land for trade, industry, residence, or other purposes.\textsuperscript{10}

The courts, as yet, have not established definitely the limits of the police power.\textsuperscript{11} In Montana, we must examine case law to define current limitations. In \textit{Lowe vs. City of Missoula},\textsuperscript{12} the court defined the purpose for municipal zoning in terms of twelve tests. However, this definition fails specifically to mention economic considerations as a legitimate function of zoning. While the enabling legislation does not specifically exclude fiscal impact analysis as a criterion in zoning, it also does not specifically include its use. On the other hand, we may assume fiscal impact analysis is permitted as a basis for zoning until such time as the courts determine otherwise.

\begin{itemize}
\item \textsuperscript{10}Montana Codes Annotated, 76-2-301.
\item \textsuperscript{12}Lowe \textit{vs.} City of Missoula, 165 Mont. 38 (1974).
\end{itemize}
Subdivision Review

Montana law required local governments to adopt subdivision regulations prior to July 1, 1974. Thus, subdivision regulations existed or have been promulgated upon every local government jurisdiction in the state. Montana requires that such regulations shall reasonably provide

... for the avoidance of subdivision which would involve unnecessary environmental degradation and the avoidance of danger of injury to health, safety, or welfare by reason of natural hazard or the lack of water, drainage, access, transportation, or other public services or would necessitate an excessive expenditure of public funds for the supply of such services.

Furthermore, Montana law is quite specific about standards to be in acceptance or rejection of a subdivision.

Criteria for local government review. (1) The basis for the governing body's decision to approve, conditionally approve, or disapprove a subdivision shall be whether the preliminary plat, environmental assessment, public hearing, planning board recommendations, and additional information demonstrate that development of the subdivision would be in the public interest. The governing body shall disapprove any subdivision which it finds not to be in the public interest.

(2) To determine whether the proposed subdivision would be in the public interest, the governing body shall issue written findings of fact which weight the following criteria for public interest:

(a) the basis of the need for the subdivision;

13Montana Codes Annotated, 76-3-501.

14Ibid., 76-3-501.
(b) expressed public opinion;
(c) effects on agriculture;
(d) effects on local services;
(e) effects on taxation;
(f) effects on the natural environment;
(g) effects on wildlife and wildlife habitat; and
(h) effects on the public health and safety.15

In the approval or denial of a subdivision, Montana law requires written findings of fact which weigh, among other criteria, the subdivision's effect upon local services and taxation. Therefore, in the case of subdivision review, it is quite clear that the legislature intended inclusion of some form of fiscal impact analysis.

Annexation

The annexation laws of Montana require municipalities to address the issue of providing services to areas they are considering for annexation. These statutory requirements define the Planned Community Development Act.16 This law requires a statement setting forth the plans of the municipality for extension to the annexation area of each major municipal service performed within the munici-

15Ibid., 76-3-608.

16Ibid., 7-2-47.
pality at the time of proposed annexation. The law further requires the municipality to state how it plans to finance extension of services into the area to be annexed. Therefore, annexation also requires some form of fiscal impact analysis as a necessary part of the process which determines the municipality's ability not only to provide, but also to finance the extension of services to the annexed area.
CHAPTER III

FISCAL IMPACT ANALYSIS: AN OVERVIEW OF METHODOLOGIES

Fiscal impact analysis is a term used interchangeably with cost-revenue analysis. It is not synonymous with the phrase cost benefit. Cost benefit analysis has a broader scope because it attempts to compare both the tangible and intangible costs and benefits of a proposal. Cost-revenue analysis focuses on the direct costs and revenues associated with a specific development proposal. The results of a cost-revenue analysis are expressed in terms of a dollars-and-cents surplus or deficit to local government. A cost-revenue analysis determines the difference between the cost of providing the municipal services the project requires and the expected municipal income it generates.17

There are two basic approaches to municipal cost allocation: Average costing and marginal costing. Average costing techniques assign costs to a new development according to the average cost per unit of service existing in the municipality multiplied by the number of service units the development is estimated to require. Average costing does

17Burchell, Fiscal Impact Guidebook, pp. 3-5.
not consider existing surplus or deficit capacity that may exist for particular services. Furthermore, it does not consider the possibility that a new development may fall at the threshold level calling for major new capital construction to service the proposed development. Fiscal impact analysis techniques utilize either the marginal or average cost approach to new development. There are six basic fiscal impact analysis techniques which can be used for estimating the likely cost-revenue impact of land-use developments. Three use a marginal cost approach and three use an average cost approach.

FIGURE 1
FISCAL IMPACT ANALYSIS TECHNIQUES

<table>
<thead>
<tr>
<th>Average Cost Techniques</th>
<th>Marginal Cost Techniques</th>
</tr>
</thead>
<tbody>
<tr>
<td>Per Capita Multiplier Service Standard Proportional Valuation</td>
<td>Case Study Comparable City Employment Anticipation</td>
</tr>
</tbody>
</table>

The Fiscal Impact Guidebook describes the six basic fiscal impact techniques as follows:

18 Ibid., pp. 4-5.
PER CAPITA MULTIPLIER METHOD

This is the most versatile fiscal impact analysis method. A sample of local fiscal impact analysis undertaken from 1970-1973 showed that 70 percent of the evaluations employed either this method or a slight variation of it. The Per Capita Multiplier technique relies on average municipal costs per person, average school costs per pupil, and the number of persons or pupils generated by various housing types to project future municipal and school district costs. It is most appropriately applied to moderately-sized municipalities . . . with moderate projected population growth. In such communities, it is assumed that the best estimate of future costs is current per capita cost multiplied by the future population increment.

CASE STUDY METHOD

The Case Study Method is the second most frequently used method . . . It is employed for both residential and nonresidential analysis in very large or very small cities which typically exhibit significant excess or deficient service capacity so great that average costs, extended into the future, appear inappropriate.

The method projects future local costs based on specific future service demand determined by interviewing municipal department heads and school district administrators. The Case Study Method assumes that each department head knows best the functional capacity of his agency and can respond most accurately to specific questions of future service extensions or retrenchments. Each determination of local service excess or deficiency is based on first-hand knowledge of existing local conditions. The results are either subtracted from or added to the best estimate of operating and capital demands imposed by growth.

SERVICE STANDARD METHOD

The Service Standard Method's . . . application is similar to that of the Per Capita Multiplier Method -- midsize, moderate growth communities.

The Service Standard Method provides more detail than the Per Capita Multiplier Method. Future manpower
estimates by specific service function are available from the former while only gross expenditures by service category are derived from the latter. This method uses U. S. Census of governments data to obtain averages of manpower per 1,000 population and capital-to-operating expenditures ratios for eight common municipal functions. Multiplying the expected municipal and school district populations by service manpower requirements and by local salaries, statutory obligations, and expenses per employee provides an estimate of future fiscal impact.

Manpower ratios are tabulated for municipalities and school districts by population size and geographic area. Tables have been prepared for four regions of the country, with eleven population categories per region.

COMPARABLE CITY METHOD

The Comparable City Method . . . is ideal for projecting long-term views of the future or large scale development, both situations which significantly change population size or growth rate. This method relies on these two variables to develop new service ratios based on economies or diseconomies of scale. The method assumes that cities of comparable population size and growth rate expend money for municipal services and education at relatively similar levels across five basic municipal service categories and education. If the fiscal impact analyst can predict a new population size obtained at a specific growth rate, he can adjust current expenditures based on communities of comparable size and growth rate. He thus applies ratio of future to current expenditures to existing per capita costs and multiplies by the total projected future municipal and school population of the community as a whole to obtain an estimate of the future local servicing obligation. Tables of expenditures multipliers are found within this method for municipal/school district size categories ranging from less than 1,000 to over 1,000,000, for positive and negative growth rates from 0 percent to over 2 percent, and for each of the five categories of municipal services and for school district services.

PROPORTIONAL VALUATION METHOD

The Proportional Valuation Method is a quick and easy procedure to determine the fiscal impact of nonresi-
The method is ideally suited to employment-generating facilities which exhibit neither relatively excessive nor slight numbers of employees per square foot. The analyst assigns a share of solely municipal costs to an incoming nonresidential facility (a shopping center, industrial complex, etc.) based on the facility's proportion of total local real property valuation. The method tends to overstate municipal servicing obligation for very large nonresidential facilities and understate them for very small ones. Refinement coefficients have been developed to scale down projected impact when new nonresidential facilities are significantly larger than the average local nonresidential facility and to scale up projected impact when they are significantly smaller than average.

EMPLOYMENT ANTICIPATION METHOD

The Employment Anticipation Method is also used for determining the municipal servicing costs for incoming nonresidential facilities. It is most appropriate for nonresidential facilities having either significantly more or significantly fewer employees per square foot than normal, thus imposing larger or smaller municipal costs based on the public service needs of these employees. The method assumes that municipal service costs are related to the number of employees a nonresidential facility introduces locally. For both industrial and commercial uses, coefficients are developed which state that for every new employee, service cost in the general government, public safety, public works sectors, etc. will increase by given percentages. The practitioner multiplies the number of future employees by these coefficients and obtains the percent increase in each service function expenditure. The percent increase times the existing dollar expenditure is the servicing cost assignable to the new nonresidential facility.19

Each of the six cost-revenue analysis techniques uses the same method to estimate local government tax revenues.

19Ibid., pp. 6-8.
associated with development proposals. These revenues are determined using relatively simple multiplier or ratio techniques. These techniques project the many different sources of service-supporting income which are relevant to a particular community.

Fiscal impact analysis has been part of the planning profession for the last four decades.\textsuperscript{20} The techniques themselves have been upgraded and refined, and today there are both manual and computer applications of fiscal impact analyses. The calculations of a fiscal impact analysis are routine and repetitive and lend themselves well to use of a computer program. While manual application may be appropriate for one-time studies of a particular proposal, the computer easily handles situations where the analyst wishes to compare alternative strategies or modify variables. However, a computer program requires large amounts of start-up time. Additional data collection and analysis are required to fit the program to a particular situation. The increased sophistication of analysis often results in solutions which are difficult to explain and justify to local governing bodies.\textsuperscript{21} However, computer programs, as with manual applications, provide a valuable tool in assessing impacts

\textsuperscript{20}Ibid., p. 319.

\textsuperscript{21}Ibid., p. 428.
of land-use decisions as long as the analyst is aware of the opportunities and constraints inherent in each particular technique.

The characteristics of the area, future growth patterns and community needs are considered in applying fiscal impact analysis to the community of Plains, Montana. The Per Capita Multiplier Method is the appropriate fiscal impact analysis technique and will be further discussed in the following chapter.
CHAPTER IV

THE PER CAPITA MULTIPLIER METHOD AS THE
APPROPRIATE ANALYTICAL TOOL

The study has focused on the anticipated costs and revenues resulting from annexation of three alternative density single family developments. The Per Capita Multiplier method will be used in the analysis.

Justification for Using the Per Capita Multiplier Method

As previously discussed, there are six basic methods for determining fiscal impact analysis.\textsuperscript{22} The Proportional Value Method and the Employment Anticipation Method are used solely for analysis of nonresidential uses and are not appropriate for our study. Thus, the Service Standard, Case Study, Comparable City and Per Capita Multiplier remain as potential methods.

The Service Standard Method is often used for general planning and budgeting because it provides an estimate of overall impact by service function. The Service Standard

\textsuperscript{22}For a detailed discussion of this matter, see Chapter III.
Method is also used in the examination of large scale annexation proposals or land use alternatives where data on the proposed housing types are incomplete. The Service Standard Method uses service personnel commitments per 1,000 population as the appropriate measures of future service costs.23

The data for the Plains study are too detailed for this method. Further, the size of the Plains study is significantly smaller than the size of development required for the Service Standard Method. Therefore, the Service Standard Method is not appropriate.

The Case Study Method is a suitable approach for redevelopment studies or studies of new public facilities. It also works well for nonresidential development.24 The Plains study is not concerned with redevelopment, nonresidential development or new public facilities, so the Case Study Method is also not appropriate.

The Comparable City Method is a relatively new technique. It is designed to analyze fiscal and geographic situations similar to the Case Study Method. It is also designed for use where there is surplus or deficit service system capacity, i.e., situations typical of cities which


24Ibid., p. 323.
are rapidly growing or rapidly declining in population. Plains is in a situation of near equilibrium in service system supply and demand. Further, Plains has a steady growth of two percent per year. Thus, the Comparable City Method is also not suitable.

The Per Capita Multiplier Method is the single most popular fiscal impact analysis strategy. It is simple to use, easy to understand and is quickly implemented. Impacts of alternative residential developments are best analyzed using the Per Capita Multiplier Method. This method's cost and time benefits relieve the arduous task of undertaking the multiple calculations associated with assessing alternative land use schemes. The authors of the Fiscal Impact Guidebook refer to the Per Capita Multiplier Method as follows:

It is interesting to note that the simplest and most easy to effectuate are the methods most preferred by practitioners and are those which are given the highest ratings as to both accuracy and completeness. As such, the Per Capita Multiplier Method is most preferred and most believed in terms of the results it produces.26

The Per Capita Multiplier Method is an average costing method. As such, it is applied in situations where future


costs can be projected from current average costs, i.e., where average cost equals marginal cost. Such is the situation in Plains. The existing services are in place. There exists neither a large deficit nor large surplus of services. The average population growth of two percent per year and the alternative densities of potential development chosen for analysis will require only incremental increases in municipal service operating costs.

Perhaps the largest selling point of the Per Capita Multiplier Method is its ease of understanding. A tool is not beneficial unless its users can understand the method and interpret the results. This is important when working with any community.
CHAPTER V

APPLICATION OF THE PER CAPITA MULTIPLIER METHOD

TO THE PLAINS SITUATION

COSTS

Per Capita Multiplier Method

The Per Capita Multiplier Method is the classic average costing approach for projecting the impact of population change on local municipal costs and revenues. It is the most versatile, easily understood, simple to implement, and thus, widely employed fiscal method.27

This method utilizes total household size and the average cost per person of municipal operating expenses to project the annual municipal cost of future development from the resultant population increase. The technique begins by separating municipal costs for nonresidential uses from municipal costs for residential uses. All residentially induced municipal costs are then expressed per capita. These per capita costs are multiplied by the estimated population increase to arrive at the total new anticipated costs.

27Ibid., p. 9.
Assumptions

A primary assumption of the Per Capita Multiplier Method is that the increase in municipal population resulting from occupancy of the proposed development will not result in an increase in growth in the nonresidential sector. The historic growth of the city seems to bear this out. The new homes will be occupied primarily by young people currently living with their parents, will be new households, or by established families migrating to the development from existing dwellings in the region. In either case, insignificant growth in the nonresidential sector would occur since future occupants are already living and working in the area.

Another basic assumption is that current average operating costs per capita are the best estimate of new costs. The development alternatives proposed in this study will not create threshold level demands. No new capital facilities will be required, nor will additional staff need to be hired to provide city services to the development.

---


29 From interviews and surveys undertaken with comprehensive planning in spring and summer of 1980.
A third assumption is that current local service levels are the most accurate indicators of future service levels and these service levels will remain consistent in the future. A fourth assumption is that the current population will have characteristics similar to the population characteristics of the growth increment. This is based in part on assumption one. A fifth assumption is that the current distribution of expenditures among the various sectors receiving municipal service will remain constant and will continue to be allocated in such a manner. Assumptions three, four and five are valid for the Plains community. Assuming future occupants of the proposed developments will be primarily residents of the existing community, it logically follows that service level demands, population characteristics and distribution of expenditures remain the same.

Information on Budgets, Population and Tax Assessments

The current land use map for the city of Plains indicates residential and nonresidential land uses. This information was correlated with county assessment records to obtain property values for all residential and nonresidential land uses. Assessment values are 60 percent of market value for nonresidential uses and 54.5 percent of
Thus, market values for nonresidential and residential properties are obtained by simple division.

\[
\text{Assessed nonresidential value} = \text{nonresidential market value} \\
\times 0.60
\]

\[
\text{Assessed residential value} = \text{residential market value} \\
\times 0.545
\]

Figure 2 shows the general relationship of assessed values and market values in the city of Plains.

The city clerk provided the municipal budget for 1979-1980. Local expenditures can be organized into the five municipal service categories: General government, public safety, public works, health and welfare, and recreation and culture. Figure 3 shows municipal expenditures by service category. The dollar totals for each category are also expressed as percentages of total municipal costs.

Assigning a Share of Annual Municipal Expenditures to Existing Nonresidential Uses

The municipal government of Plains, like any other municipal government, provides services to the residential sector as well as the nonresidential sector of the community. In order to project accurately future residential costs, we must first separate current residentially induced costs.

30 Montana State Department of Revenue figures, 1980.
### FIGURE 2

**FISCAL CHARACTERISTICS OF PLAINS, MONTANA, 1979**

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Total municipal assessed real property value</td>
<td>$8,937,726</td>
</tr>
<tr>
<td>2.</td>
<td>Total municipal real property value for nonresidential properties</td>
<td>$2,884,508</td>
</tr>
<tr>
<td>3.</td>
<td>Total municipal real property value for residential properties (#1 - #2)</td>
<td>$6,053,218</td>
</tr>
<tr>
<td>4.</td>
<td>Local equalization ratio for nonresidential properties</td>
<td>.600</td>
</tr>
<tr>
<td>5.</td>
<td>Local equalization ratio for residential properties</td>
<td>.545</td>
</tr>
<tr>
<td>6.</td>
<td>Municipal equalized real property value for nonresidential property (#2 + #4)</td>
<td>$4,807,513</td>
</tr>
<tr>
<td>7.</td>
<td>Municipal equalized real property value for residential property (#3 + #5)</td>
<td>$11,106,822</td>
</tr>
<tr>
<td>8.</td>
<td>Total municipal equalized real property value (#6 + #7)</td>
<td>$15,914,335</td>
</tr>
<tr>
<td>9.</td>
<td>Total number of nonresidential land parcels</td>
<td>90</td>
</tr>
<tr>
<td>10.</td>
<td>Average equalized nonresidential real property value per parcel (#6 + #9)</td>
<td>$45,417</td>
</tr>
<tr>
<td>11.</td>
<td>Total taxable land parcels</td>
<td>435</td>
</tr>
<tr>
<td>12.</td>
<td>Total taxable residential land parcels (#11 - #9)</td>
<td>345</td>
</tr>
<tr>
<td>13.</td>
<td>Average equalized residential real property value per parcel (#7 + #12)</td>
<td>$32,194</td>
</tr>
<tr>
<td>14.</td>
<td>Average equalized real property value per parcel (#8 + #11)</td>
<td>$36,585</td>
</tr>
</tbody>
</table>

---

31 Obtained from Sanders County Assessor.

32 Researched utilizing current land use map and county assessment records.

33 Obtained from Montana State Department of Revenue.


35 Information on current land use map includes vacant parcels.

36 Obtained from Sanders County Assessor.
### FIGURE 3
MUNICIPAL EXPENDITURES BY SERVICE CATEGORY
PLAINS, MONTANA, 1979

<table>
<thead>
<tr>
<th>Service Category</th>
<th>Salaries, Wages and Other Expenses</th>
<th>Percent of Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>General Government</td>
<td>$29,197</td>
<td>9.2</td>
</tr>
<tr>
<td>Public Safety</td>
<td>30,575</td>
<td>9.6</td>
</tr>
<tr>
<td>Public Works (sewer, water, and streets)</td>
<td>204,337</td>
<td>64.4</td>
</tr>
<tr>
<td>Health and Welfare</td>
<td>1,633</td>
<td>.5</td>
</tr>
<tr>
<td>Recreation and Culture</td>
<td>47,664</td>
<td>15.0</td>
</tr>
<tr>
<td>Capital Improvement</td>
<td>4,000</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>SUBTOTAL</strong></td>
<td><strong>$317,406</strong></td>
<td><strong>100.0</strong></td>
</tr>
<tr>
<td>Minus Cost of Rural Fire Service</td>
<td>(1,250)</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$316,156</strong></td>
<td></td>
</tr>
</tbody>
</table>


38 Other expenses include office supplies, printing and other overhead.
from nonresidentially induced costs. To do this, we must make the assumption that municipal costs increase with the intensity of land use. Further, we must assume that real property value correlates to land use intensity. This appears to be a valid assumption for Plains. High intensity uses such as commercial uses require wider streets, more police and fire protection than do residential single family uses. The assessment records confirm that high intensity uses have higher property values than do low intensity uses.

The first step in isolating the nonresidentially induced municipal expenditure is to determine the nonresidential share of total local real property value. Using the information contain in Figure 2, the analyst divides equalized nonresidential real property value by total local real property value.

\[
\frac{\text{Equalized Nonresidential Real Property Value}}{\text{Total Equalized Real Property Value}} = \frac{\text{Nonresidential Share of Total Property Value}}{}
\]

\[
\frac{\$4,807,513}{\$15,914,335} = .3021
\]

In this case, nonresidential uses (commercial, industrial and vacant) comprise 30 percent of the value of all locally taxable real property. Using the number of nonresidential land parcels and the total number of locally taxable land parcels (both obtained in Figure 2)
the analyst can then determine that the average value of a local nonresidential property exceeds the average value of all local property (residential and nonresidential) by a factor of 1.24.39

Step 2  
Nonresidential Real Property Value = Average Value of Nonresidential Parcels

\[
\frac{\$4,807,513}{90} = \$45,417
\]

Step 3  
Total Local Real Property Value = Average Value of All Land Parcels

\[
\frac{\$15,914,335}{435} = \$36,585
\]

Ratio of nonresidential to average parcel value

\[
\frac{\$45,417}{\$36,585} = 1.24
\]

The total existing municipal expenditure attributable to nonresidential uses is the product of total municipal expenditures and the proportion of nonresidential to total local real property value.

The municipal expenditures attributable to nonresidential uses in the city of Plains are $95,510 using a direct proportional value method. The direct proportional assignment of nonresidential costs is a relatively accurate method given the assumptions stated. Since the value on nonresidential property does not significantly differ from the average value of existing local property, the direct proportional assignment of costs will not overstate or understate the magnitude of assignable costs. As total annual municipal service costs were found to be $316,156 (Figure 3), the share of costs assigned to the nonresidential sector is $95,510.

\[
\text{Total Existing Municipal Expenditures} \quad = \quad \text{Total Municipal Expenditures} \times \text{Proportion of Nonresidential Expenditures to Total Local Real Value}
\]

\[
\$95,510 = \$316,156^{40} \times \frac{\$4,807,513^{41}}{\$15,914,335^{42}}
\]

40 From Figure 3.
41 From Figure 2.
42 Ibid.
43 Burchell, Fiscal Impact Guidebook, p. 146.
At this step, the analyst divides the net annual residential expenditures for municipal services by the number of people currently residing in Plains. This calculation yields the current per capita costs for existing residential uses and future costs to be assigned to new residential uses.

Net annual municipal total expenditures are the share of municipal operating expenditures which have not been assigned to nonresidential uses. Therefore, $95,510 of the $316,156 annual municipal total costs are assigned to existing nonresidential uses. The remaining portion, $220,646, is assigned to the residential sector. This figure, divided by the latest local population estimate (1,075), represents current municipal per capita costs ($205) borne by the residential sector.

Development Alternatives

As previously stated, the per capita costs of $205 will be used to compute costs for future development. For the purpose of this analysis we will examine three alternative densities of single family development. The
first alternative would place approximately 11 single family homes on a six-acre parcel resulting in a density of 1.8 d.u. (dwelling units) per acre (Map 1). The second alternative would place 24 single family dwellings on the six-acre parcel resulting in a density of 4 d.u. per acre (Map 2). The third alternative would place 32 single family dwellings on the six-acre site increasing the density to 5.3 d.u. per acre (Map 3).

The examples represent the expected density range of single family development which might request annexation into the city of Plains. The minimum density of 1.8 dwellings/acre meets State Health Department requirements for homes on either public sewer or public water. The maximum density of about six dwellings per acre is the upper range of densities for detached single family housing in today's market.

Cost Analysis

Figure 4 shows the increases in estimated costs for municipal services that would accompany the expected population increases resulting from more dense development. These expected costs will be compared to expected revenues.

44 For a full discussion, see pages 2 and 3.

45 The minimum lot size or highest density for current market conditions was obtained by interviewing Robert VanDerhoff, VanDerhoff Realty, Plains, Montana, in the spring of 1980.
**FIGURE 4**

**USING THE PER CAPITA MULTIPLIER METHOD TO EVALUATE THE FISCAL IMPACT OF ALTERNATE DEVELOPMENT PROPOSALS**

<table>
<thead>
<tr>
<th>Development Alternatives (1)</th>
<th>No. of Dwelling Units (2)</th>
<th>Demographic Multipliers Household (3)</th>
<th>Total Residents (4)</th>
<th>Annual Expenditures Per Capita (5)</th>
<th>Total Annual Expenditures (6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Single Family 1.8 d.u./acre</td>
<td>11</td>
<td>3.00</td>
<td>33</td>
<td>$247</td>
<td>$8,151</td>
</tr>
<tr>
<td>2. Single Family 4 d.u./acre</td>
<td>24</td>
<td>3.00</td>
<td>72</td>
<td>$247</td>
<td>$17,784</td>
</tr>
<tr>
<td>3. Single Family 5.3 d.u./acre</td>
<td>32</td>
<td>3.00</td>
<td>96</td>
<td>$247</td>
<td>$23,712</td>
</tr>
</tbody>
</table>

---


47 Equals demographic multipliers shown in column (3) multiplied by the number of units shown in column (2).

48 Includes operating and debt service for capital facilities.

49 Equals total residents multiplied by cost per resident.
REVENUES

The city of Plains obtains the majority of its funds from own-source revenues such as the property tax and miscellaneous charges. Additional revenue comes to the city by intergovernmental transfers from state and federal governments. In this portion of the analysis, we will project revenues which will be generated locally as a function of the three development alternatives.

LOCAL REVENUES

Real Property Tax

The real property tax is the most important single source of revenue to the city. It is a percentage levy on the value of land and improvements. The property tax is expressed in mils (one thousandth of a dollar). A tax rate of 20 mils equals a tax revenue of $20 per thousand dollars of taxable valuation. The first step in projecting real property tax revenue from the development alternatives is to establish the market value for each alternative. The purpose of the analysis is to determine the fiscal impact from alternative density proposals. Therefore, we will make the assumption that each lot will be developed with a single family home of 912 square feet and the homes will average three bedrooms each. The market value would be $30 per square foot or $27,360. The value of the lots
will vary slightly as a function of size. Figure 5 illustrates assumed market values for each of the three alternatives at complete development.\textsuperscript{50}

FIGURE 5
MARKET VALUES FOR DEVELOPMENT ALTERNATIVES ON A 6-ACRE PARCEL ADJACENT TO THE CITY OF PLAINS, MONTANA, 1979

Alternative 1: 11 single family homes; density of 1.8 d.u./acre

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Market value of a lot</td>
<td>$8,000</td>
</tr>
<tr>
<td>Market value of a 1,240 sq. ft. home</td>
<td>$27,360</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$35,360</strong></td>
</tr>
</tbody>
</table>

11 homes x $35,360 = $388,960

Alternative 2: 24 single family homes; density of 4 d.u./acre

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Market value of a lot</td>
<td>$7,500</td>
</tr>
<tr>
<td>Market value of a 1,240 sq. ft. home</td>
<td>$27,360</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$34,860</strong></td>
</tr>
</tbody>
</table>

24 homes x $34,860 = $836,640

Alternative 3: 32 single family homes; density of 5.3 d.u./acre

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Market value of a lot</td>
<td>$7,000</td>
</tr>
<tr>
<td>Market value of a 1,240 sq. ft. home</td>
<td>$27,360</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$34,360</strong></td>
</tr>
</tbody>
</table>

32 homes x $34,360 = $1,099,520

\textsuperscript{50}At the time a subdivision development is proposed for review and annexation, the size of dwelling and market value of home and lots is very sketchy. Typically, no information on number of bedrooms is supplied. The 912 sq. ft. home with three bedrooms was based upon housing needs identified by the Plains Housing Survey for low income homes for new household formation.
The real property tax revenue is the product of the market value of a unit times the equalization ratio times the taxable valuation factor times the city mil levy times the number of proposed units. As an example, Figure 6 shows that expected municipal property tax revenue from eleven single family homes on six acres is $1,314.
FIGURE 6
PROPERTY TAX REVENUES FOR ALTERNATIVE DENSITIES
OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Market Value/Unit</th>
<th>Equalization Ratio</th>
<th>Taxable Valuation Factor</th>
<th>City Tax</th>
<th>No. of Units</th>
<th>Total Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 d.u./acre</td>
<td>$35,360</td>
<td>.545</td>
<td>.0855</td>
<td>.0725</td>
<td>11</td>
<td>$1,314</td>
</tr>
<tr>
<td>4.0 d.u./acre</td>
<td>$34,860</td>
<td>.545</td>
<td>.0855</td>
<td>.0725</td>
<td>24</td>
<td>$2,826</td>
</tr>
<tr>
<td>5.3 d.u./acre</td>
<td>$34,360</td>
<td>.545</td>
<td>.0855</td>
<td>.0725</td>
<td>32</td>
<td>$3,714</td>
</tr>
</tbody>
</table>

51From Figure 5.
52From Montana State Department of Revenue.
53Ibid.
Interest Earnings

The municipality earns interest on its investments. The city invests a share of unused revenues during positive cash flow periods. As population increases, general revenues increase and more tax money is available for investment. The additional revenue resulting from interest on investment may be projected as shown in Figure 7.

FIGURE 7
INTEREST EARNING REVENUES FOR ALTERNATIVE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Current Estimate of Investment Income</th>
<th>Total Assessed Valuation of the New Development</th>
<th>Increment on Investment Earnings Attributable To Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 d.u./acre</td>
<td>$6,506 x</td>
<td>$211,983/$8,937,726 = $154</td>
<td></td>
</tr>
<tr>
<td>4.0 d.u./acre</td>
<td>$6,506 x</td>
<td>$455,969/$8,937,726 = $332</td>
<td></td>
</tr>
<tr>
<td>5.3 d.u./acre</td>
<td>$6,506 x</td>
<td>$735,488/$8,937,726 = $436</td>
<td></td>
</tr>
</tbody>
</table>

55Market value x equalization ratio x number of units.
56From Municipal Budget.
57From Figure 2.
**Fees and Permits**

The principal revenue source of fees and permits comes from animal licenses. This revenue represents money paid by local property owners for services extended to both existing and newly developed property. Figure 8 gives projected revenues from fees and permits.

**FIGURE 8**

REVENUE FROM FEES AND PERMITS FOR ALTERNATIVE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Permit/Revenue Per Dwelling Unit</th>
<th>Number of Anticipated Additional Dwelling Units</th>
<th>Total Additional Revenues from Fees and Permits Attributable to Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 d.u./acre</td>
<td>$0.54</td>
<td>11</td>
<td>$6</td>
</tr>
<tr>
<td>4.0 d.u./acre</td>
<td>$0.54</td>
<td>24</td>
<td>$13</td>
</tr>
<tr>
<td>5.3 d.u./acre</td>
<td>$0.54</td>
<td>32</td>
<td>$17</td>
</tr>
</tbody>
</table>

---

58 From Municipal Budget.

59 From Plains Housing Survey.
Fines and Forfeitures

Fines are levied locally for traffic and safety violations. Revenue may be projected for this source in the following manner:

FIGURE 9

REVENUE FROM FINES, FORFEITURES AND PENALTIES FOR ALTERNATIVE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Total Annual Revenues Collected From Fines and Forfeitures 60</th>
<th>Current Estimated Population 61</th>
<th>Per Capita Revenue From Fines and Forfeitures</th>
<th>Anticipated Development Population</th>
<th>Total Revenue From Fines and Forfeitures Attributable To Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 d.u./ac.</td>
<td>$7,500 * 1,075 = $7</td>
<td></td>
<td></td>
<td>33  x  $7 = $231</td>
<td></td>
</tr>
<tr>
<td>4.0 d.u./ac.</td>
<td>$7,500 * 1,075 = $7</td>
<td></td>
<td></td>
<td>72  x  $7 = $504</td>
<td></td>
</tr>
<tr>
<td>5.3 d.u./ac.</td>
<td>$7,500 * 1,075 = $7</td>
<td></td>
<td></td>
<td>96  x  $7 = $672</td>
<td></td>
</tr>
</tbody>
</table>

60 From Municipal Budget.

61 From Plains Housing Survey.
User Charges - Special Services

The city of Plains levies special charges for the following items: Maps, swimming pool, making copies and weed control. Future revenue can be projected as shown in Figure 10.

FIGURE 10

REVENUE FROM USER CHARGES FOR SPECIAL SERVICES FOR ALTERNATIVE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Per Capita Revenue From User Charges</th>
<th>Anticipated Development Population</th>
<th>Total Revenue From User Charges Attributable To Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 d.u./acre</td>
<td>$6.80 x 33 = $224</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.0 d.u./acre</td>
<td>$6.80 x 72 = $490</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5.3 d.u./acre</td>
<td>$6.80 x 96 = $653</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

62Maps, copies, weeds, swimming pool, and water hookup from Municipal Budget. The swimming pool is used by city and non-city residents. Error incorporated by including non-city residents is insignificant to the analysis.
User Charges - Water

The city of Plains assesses a user charge for water based on the amount consumed. Rates vary with the winter and summer seasons. Using the city water rates and standard water usage calculations, the average yearly water bill should be about $91.80 per household.

FIGURE 11

USER CHARGES FOR WATER FOR ALTERNATE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES

Assumptions:

- 3 persons per household
- 75 gallons/person per day
- 1,475 gallons per household for irrigation (summer months)
- 30 days to a month

Using the city water rate schedule, total average annual water use charge per household would be $91.80.

<table>
<thead>
<tr>
<th>Proposed Number of Homes</th>
<th>Average Annual Use Charge</th>
<th>Total Expected Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>$92</td>
<td>$1,012</td>
</tr>
<tr>
<td>24</td>
<td>$92</td>
<td>$2,208</td>
</tr>
<tr>
<td>32</td>
<td>$92</td>
<td>$2,944</td>
</tr>
</tbody>
</table>

---

63 Plains Housing Survey.
64 Montana Water Use Standards.
65 Ibid.
**Miscellaneous Revenues**

Revenues in the miscellaneous category include refunds, deposits, reimbursements and customer deposits. The method for projecting miscellaneous revenues is given in Figure 12.

**FIGURE 12**

MISCELLANEOUS REVENUES FOR ALTERNATIVE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Total Miscellaneous Revenue</th>
<th>Current Number of Households</th>
<th>Current Revenue Per Household</th>
</tr>
</thead>
<tbody>
<tr>
<td>$1,720</td>
<td>469</td>
<td>$4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Number of Homes</th>
<th>Revenue/Home</th>
<th>Expected Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>11</td>
<td>$4</td>
<td>$44</td>
</tr>
<tr>
<td>24</td>
<td>$4</td>
<td>$96</td>
</tr>
<tr>
<td>32</td>
<td>$4</td>
<td>$128</td>
</tr>
</tbody>
</table>

66Includes: Refunds and reimbursements, water customer deposits and sale of water materials.
INTERGOVERNMENTAL TRANSFERS

State Liquor and Beer

Liquor and beer tax revenue is redistributed back to the municipalities as a function of local population. Projected revenue is obtained using the formula in Figure 13.

FIGURE 13

LIQUOR AND BEER TAXES REDISTRIBUTED TO THE MUNICIPALITY AS A RESULT OF ALTERNATIVE DEVELOPMENT OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Alternative</th>
<th>Current Per Capita Revenue</th>
<th>Expected Population</th>
<th>Expected Additional Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.8 d.u./acre</td>
<td>$5.58 x</td>
<td>33</td>
<td>$184</td>
</tr>
<tr>
<td>4.0 d.u./acre</td>
<td>$5.58 x</td>
<td>72</td>
<td>$402</td>
</tr>
<tr>
<td>5.4 d.u./acre</td>
<td>$5.58 x</td>
<td>96</td>
<td>$536</td>
</tr>
</tbody>
</table>

67From Municipal Budget.

68From Plains Housing Survey. For exact formula of tax redistribution see 16-1-410 MCA.
**State Motor Vehicle Fees**

The state distributes a portion of the motor vehicle license and registration fees back to municipalities as a function of fees collected within the municipality. (Refer to 7-14-2512 MCA). In essence, vehicles registered is a function of population and revenues may be projected as in Figure 14.

**FIGURE 14**

**MOTOR VEHICLE REGISTRATION & TITLE FEES REDISTRIBUTED TO THE MUNICIPALITY FOR ALTERNATIVE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES**

<table>
<thead>
<tr>
<th>Current Revenue(^69)</th>
<th>Current Population(^70)</th>
<th>Current Revenue Per Capita</th>
</tr>
</thead>
<tbody>
<tr>
<td>$6,000</td>
<td>1,075</td>
<td>$5.58</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Revenue Per Capita</th>
<th>Expected Additional Population</th>
<th>Expected Additional Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5.58</td>
<td>33</td>
<td>$184.14</td>
</tr>
<tr>
<td>$5.58</td>
<td>72</td>
<td>$402</td>
</tr>
<tr>
<td>$5.58</td>
<td>96</td>
<td>$536</td>
</tr>
</tbody>
</table>

\(^{69}\text{From Municipal Budget.}\)

\(^{70}\text{From Plains Housing Survey.}\)
State Gasoline Tax

Montana redistributes to municipalities a share of the revenues raised from motor fuels taxes. The tax applies to sales of gasoline, diesel fuel and liquified petroleum gas, and compressed natural gas used in motor vehicles on public highways. Distribution is based on an equally weighted share of the locality's proportion of population and road mileage to total state population and road mileage.71

The analyst uses a two-step process to estimate new local revenues from the motor fuels tax attributable to development. First, he must estimate the new local revenue share and then the development's portion of this new amount. To estimate the new local revenue share, he must first obtain an estimate of the new total revenues from the motor fuels tax to be apportioned locally as well as estimates of both local and state population and local and state road mileage. He then multiplies the statewide total amount to be apportioned by the equally weighted proportion of new total local population divided by road mileage to new total state population divided by road mileage (including population and mileage added by the development). This product is the new local share of funds to be apportioned.

71The formula for reapportioning gasoline tax revenues to municipalities obtained in an interview with personnel from Montana's Department of Revenue in the spring of 1980.
The second step is to assign a share of the new local motor fuels tax revenue to the proposed development. The analyst uses the same formula. He multiplies the local share of statewide motor fuels tax revenue by the equally weighted proportion of the development's population divided by road mileage to the new local population divided by road mileage (including population and road mileage added by the development). The resulting figure is the amount of local revenues from the motor fuels tax which will flow to the municipality as a result of the development (Figures 15-17).72

FIGURE 15

STATE GAS TAX REVENUE

Residential Development (11 single family homes)

<table>
<thead>
<tr>
<th>Current Estimate of Statewide Fuels Tax to be Distributed to Localities</th>
<th>New Local Population (Including Development)</th>
<th>New Local Road Mileage (Including Development)</th>
<th>= Total Local Revenues from Fuel Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>$3,500,000</td>
<td>$(1075 + 33) / (402,308 + 33) = 2</td>
<td>$(11.125 + .240) / (3,377 + .240) = 2</td>
<td>$3,500,000 x .0028 + .0034 = $10,850</td>
</tr>
<tr>
<td>$3,500,000</td>
<td>.0028</td>
<td>.0034</td>
<td>$10,850</td>
</tr>
</tbody>
</table>

Total Local Revenues from Fuel Tax

| Development Population |
| Local Population (Including Development) |
| Development Road Mileage |
| = Attributable to Growth |

| $10,850 | $1075 + 33 / 1075 + 33 = 2 | $11.125 + .240 / 3,377 + .240 = 2 |
| .0298 + .0211 = .051 |

| $10,850 | .0255 = .051 |

$276
## FIGURE 16

**STATE GAS TAX REVENUE**

Residential Development (24 single family homes)

<table>
<thead>
<tr>
<th>Current Estimate of Statewide Fuels Tax to be Distributed to Localities</th>
<th>New Local Population (Including Development)</th>
<th>New Local Road Mileage (Including Development)</th>
<th>= Total Local Revenues from Fuel Tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 3,500,000</td>
<td>1075 + 72</td>
<td>11.125 + .48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>402,308 + 72</td>
<td>3,377 + .48</td>
<td></td>
</tr>
<tr>
<td>$ 3,500,000 x</td>
<td>.0029</td>
<td>+</td>
<td>.0034</td>
</tr>
<tr>
<td>$ 3,500,000 x</td>
<td>.0032</td>
<td>=</td>
<td>$ 11,200</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Local Revenues from Fuel Tax (Including Development)</th>
<th>Development Population</th>
<th>Development Road Mileage (Including Development)</th>
<th>= Attributable to Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>$ 11,200 x</td>
<td>72</td>
<td>.48</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1147</td>
<td>11.60</td>
<td></td>
</tr>
<tr>
<td>$ 11,200 x</td>
<td>.0628</td>
<td>+</td>
<td>.0414</td>
</tr>
<tr>
<td>$ 11,200 x</td>
<td>.0521</td>
<td>=</td>
<td>$ 583</td>
</tr>
</tbody>
</table>
### FIGURE 17

**STATE GAS TAX REVENUE**

<table>
<thead>
<tr>
<th>Residential Development (32 single family homes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Estimate of Statewide Fuels Tax to be Distributed to Localities</td>
</tr>
<tr>
<td>$3,500,000</td>
</tr>
<tr>
<td>$3,500,000</td>
</tr>
<tr>
<td>$3,500,000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Local Revenues From Fuel Tax x (Including Development)</th>
<th>Development Population</th>
<th>Development Road Mileage = Attributable to Growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>$11,200</td>
<td>(\frac{96}{1171} + \frac{.48}{11.60} = 2)</td>
<td></td>
</tr>
<tr>
<td>$11,200</td>
<td>(\frac{.0820}{2} + .0414 = 2)</td>
<td></td>
</tr>
<tr>
<td>$11,200</td>
<td>(\frac{.0617}{2} = $691)</td>
<td></td>
</tr>
</tbody>
</table>
Federal Revenue Sharing

The United States Treasury Department administers funds authorized by the State-Local Fiscal Assistance Act of 1973. Funds are allocated directly to states and units of local government. The formulation of exact revenues is complicated. For most developments, per capita estimates based on the prior year's allocation are much more reasonable than a detailed compilation (Figure 18).

FIGURE 18
REVENUE SHARING FUNDS RESULTING FROM ALTERNATIVE DENSITIES OF SINGLE FAMILY HOMES ON 6 ACRES

<table>
<thead>
<tr>
<th>Current Funds 73</th>
<th>Current Population 74</th>
<th>Current Per Capita Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>$17,518</td>
<td>1,075</td>
<td>$16</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Per Capita Revenue</th>
<th>Expected Population</th>
<th>Expected Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>$16 x 33</td>
<td>$528</td>
<td></td>
</tr>
<tr>
<td>$16 x 72</td>
<td>$1,152</td>
<td></td>
</tr>
<tr>
<td>$16 x 96</td>
<td>$1,536</td>
<td></td>
</tr>
</tbody>
</table>

Figure 19 is a summary of the revenues expected from the three alternative development proposals.

73From Municipal Budget.
74From Plains Housing Survey.

Reproduced with permission of the copyright owner. Further reproduction prohibited without permission.
# Figure 19

## Computation Sheet for Revenue Projection

<table>
<thead>
<tr>
<th>Revenue Sources</th>
<th>(11 dwellings)</th>
<th>(24 dwellings)</th>
<th>(32 dwellings)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Municipal</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>I. Own Source Revenues</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. Taxes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Real Property</td>
<td>$1,314</td>
<td>$2,826</td>
<td>$3,714</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>$1,314</td>
<td>$2,826</td>
<td>$3,714</td>
</tr>
<tr>
<td>B. Charges/Miscellaneous</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Interest earnings</td>
<td>$154</td>
<td>$332</td>
<td>$436</td>
</tr>
<tr>
<td>2. Fees and permits</td>
<td>6</td>
<td>13</td>
<td>17</td>
</tr>
<tr>
<td>3. Fines and forfeitures</td>
<td>231</td>
<td>504</td>
<td>672</td>
</tr>
<tr>
<td>4. User charges - special services</td>
<td>224</td>
<td>490</td>
<td>653</td>
</tr>
<tr>
<td>5. User charges - water</td>
<td>1,012</td>
<td>2,208</td>
<td>2,944</td>
</tr>
<tr>
<td><strong>TOTAL CHARGES/MISCELLANEOUS</strong></td>
<td>$1,671</td>
<td>$3,643</td>
<td>$4,850</td>
</tr>
<tr>
<td><strong>TOTAL OWN SOURCE REVENUE</strong></td>
<td>$2,985</td>
<td>$6,469</td>
<td>$8,564</td>
</tr>
<tr>
<td><strong>II. Intergovernmental Transfers</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A. State</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Liquor and beer tax</td>
<td>$184</td>
<td>$402</td>
<td>$536</td>
</tr>
<tr>
<td>2. Motor vehicle fees</td>
<td>184</td>
<td>402</td>
<td>536</td>
</tr>
<tr>
<td>3. Gasoline tax</td>
<td>276</td>
<td>583</td>
<td>691</td>
</tr>
<tr>
<td><strong>TOTAL STATE</strong></td>
<td>$644</td>
<td>$1,387</td>
<td>$1,763</td>
</tr>
<tr>
<td>B. Federal</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Revenue sharing</td>
<td>$528</td>
<td>$1,152</td>
<td>$1,536</td>
</tr>
<tr>
<td><strong>TOTAL FEDERAL</strong></td>
<td>$528</td>
<td>$1,152</td>
<td>$1,536</td>
</tr>
<tr>
<td><strong>TOTAL INTERGOVERNMENTAL TRANSFER</strong></td>
<td>$1,172</td>
<td>$2,539</td>
<td>$3,299</td>
</tr>
<tr>
<td><strong>TOTAL MUNICIPAL REVENUE</strong></td>
<td>$4,157</td>
<td>$9,008</td>
<td>$11,863</td>
</tr>
</tbody>
</table>
CONCLUSION

The fiscal analysis was performed in as careful a manner as possible, and thus gives the appearance of precision. However, results should be treated as general indicators only. There are many requisite assumptions. Further, costs and revenues are "best" estimates and any given number could be in error. The results are, none-the-less, good general indicators or estimates. The results were obtained using a well established Per Capita Multiplier Method and the results parallel those obtained in other studies.

In the preceding sections, costs and revenues were projected for three separate development schemes. Comparing the costs from Figure 4 with projected revenues from Figure 19 yields a cost-revenue deficit for each of the development alternatives, as shown in Figure 20.
### FIGURE 20

**COST-REVENUE FACTORS FOR DEVELOPMENT ALTERNATIVES**

<table>
<thead>
<tr>
<th>ALTERNATIVE</th>
<th>Dwellings</th>
<th>Revenue</th>
<th>Cost</th>
<th>DEFICIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>I. ALTERNATIVE 1</td>
<td>11 Dwellings</td>
<td>$4,157</td>
<td>(8,151)</td>
<td>-$3,994 or -$363/home</td>
</tr>
<tr>
<td>II. ALTERNATIVE 2</td>
<td>24 Dwellings</td>
<td>$9,008</td>
<td>(17,784)</td>
<td>-$8,776 or -$366/home</td>
</tr>
<tr>
<td>III. ALTERNATIVE 3</td>
<td>32 Dwellings</td>
<td>$11,863</td>
<td>(23,712)</td>
<td>-$11,849 or -$370/home</td>
</tr>
</tbody>
</table>

Each of the selected alternatives show a cost-revenue deficit. Strictly interpreted, over the long run and given the existing local financial parameters, the alternative growth scenarios, as presented, will impose more costs than revenues they generate. The deficits range from $363 per household for the lowest density development alternative to $370 per household for the highest density development alternative.

The total costs increase as intensity or density increases for several reasons. First, the methodology compares existing per capita costs and revenues to projected per capita costs and revenues for each of the three development alternatives. The existing persons per household in the city limits is less than three persons.
The number of three persons per household is used in each of the development alternatives because larger families would probably locate in the new homes. This is verified in the Plains Housing Survey. Thus, per capita costs per household in the proposed development alternatives are slightly higher than the existing per capita costs per household. Secondly, as density increases among development alternatives, the market value per lot decreased. Figure 19 shows that property tax revenue is the single most important component of all the revenue sources. The measurable costs used in this analysis remain fairly constant on a per capita basis. As revenues from property tax decreased, the methodology did not pick up equally significant cost savings.

The Housing Survey for Plains points out a need for lower cost housing; this need is especially apparent in the 26-54 year old age group. Therefore, as new two-person households form, they will cost the city less in terms of services demanded. However, as the households mature and the occupancy per household approaches the anticipated three persons because of births, costs to the municipality will increase. Revenues, principally from the property tax, will not increase to offset the expected cost increase. Higher value homes are not what is needed by the residents. If the town wishes to provide low cost housing, cost deficits must be absorbed by other sectors of the community.
As previously stated, direct municipal cost and revenues are the single subject matter for cost-revenue analysis. Logic requires, and state law mandates, that other factors be considered in any decision-making process involving planning, zoning, subdivision review or annexation. Such items as community need, preservation of agriculture and open space, and energy conservation are among the items which must be considered.

Although the analysis indicates that municipal costs increase as the density of 912 square foot homes increases, conversely economies of scale result which were not measured by this analysis. Streets and sewer lines are shorter per dwelling in higher density development. Thus, maintenance costs and replacement are reduced. Higher density reduces transportation costs not only to residents but also to police and street departments.

It is important to note that the fiscal impact while important, should not be the sole deciding factor in making land use decisions for the future.
SELECTED BIBLIOGRAPHY

BOOKS


PAPERS, REPORTS AND ARTICLES


