

**INSTITUTE FOR PUBLIC POLICY AND BUSINESS RESEARCH  
THE UNIVERSITY OF KANSAS**

**The Local Government Fiscal and Economic Impact Model**

**Cost-Benefit Analysis of New and Expanding Firms  
Requesting Property Tax Abatements**

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## EXECUTIVE SUMMARY

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### I. Overview

The Fiscal and Economic Impact Model is a sophisticated approach to estimate local government revenues and expenditures associated with a new development such as a new firm's location or an existing firm's expansion. Conceptually, the Model is based on a comprehensive cost-benefit analysis (CBA) which evaluates the fiscal and economic consequences of a new development on a community in terms of measurable tangible costs and benefits. In particular, the Model is equipped to estimate the costs and benefits associated with the granting of a property tax abatement to a new or expanding firm. By employing a set of approximately 200 inputs, the Model differs from a simple financial accounting framework because a much broader and complete range of impacts -- both direct and indirect -- are taken into account. Also, the Model adheres to standard practice of economic analysis such as discounting for future costs and revenues.

The Fiscal and Economic Impact Model of the Institute for Public Policy and Business Research at the University of Kansas is an extension and refinement of a cost-benefit model originally developed by Dr. David Darling of Kansas State University's Extension. For a detailed description of the Institute's new concepts and technical improvements, and for a proposed further development, refer to Appendix 1.

## II. Key Concepts, Assumptions and Input Variables

For an understanding of the basic ideas, capabilities and limitations of the Model, it is essential to briefly describe the Model's key concepts, underlying assumptions and most critical input variables.

- ***Average cost concept.*** Under the average cost concept, local government costs assigned to a new project are based on the average cost per capita or per service unit multiplied by the number of new people or new service units. Average costing is considered - over the long-term - as a more adequate approach for growing and stagnant cities than the marginal cost concept, because marginal costs increase abruptly when capacity limits are reached.
- ***Opportunity cost concept.*** This concept implies that costs are perceived as the value of the best forgone alternative course of action. This means that local government costs associated with a project are seen as resources spent that could have been used otherwise.
- ***Identification of all relevant impacts.*** The Model takes into account a relatively complete list of all relevant costs and benefits of a new development which incur to a community's three public sectors: city and county governments, and local public school districts. In addition, the Model reflects the economic impact on the private sector through incremental personal income, sales and employment. However, non-fiscal impacts that accrue for each individual resident in a community are not measured in the current Model (e.g. effects on personal income of old residents, effects on municipal service charges (water/sewer) as well as positive and negative intangible effects). External (spillover) impacts that occur outside the community due to the new development are ignored.
- ***Monetizing impacts.*** Generating a dollar value on the identified impacts is not straightforward for most input variables used in the Model. A substantial amount of data

collection and research is necessary to monetize impacts such as local government operational and capital expenditures, in-migration associated with new employment, company spending within the community etc..

- ***Balancing costs and benefits.*** The need to balance the identified impacts is essential. If, for example, indirect costs are taken into account then indirect benefits need to be considered as well.
- ***Net present value.*** The Model calculates the net present value of all future benefits and costs associated with a project by discounting over a selected 15-year period. The concept of discounting is necessary to account for the "time value of money" . After determining the present value of costs and benefits, the outcome provides an important basis for determining whether a project is acceptable or otherwise. In essence, it indicates whether or not the benefits outweigh the costs over a certain period of time.
- ***Project risk.*** A community granting a tax abatement to a new or expanding firm faces several risks: (1) some businesses may leave the community after the abatement expires; (2) some firms may be more prone to failure; and (3) other intangible consequences (costs and benefits) may result from the project, such as pollution, traffic congestion and environmental changes on the cost side, and time savings of better transportation, pleasures of more public facilities and services, better quality of life including increased job opportunities, and enhancement of further business location and entrepreneurship on the benefit side. Recognizing these externalities, the Model utilizes a risk-adjusted discount rate. The rate used to account for both time and risk is 7.5%.
- ***Benefit-Cost Ratio.*** The use of a benefit-cost ratio as an indicator for a project's acceptability requires the setting of a lower bound. It is suggested that the following guidelines

for the benefit cost-ratio should lead decision making: for a project's acceptance (50% abatement over 10 years) the benefit-cost ratio should exceed 1.25 to 1 instead of 1 to 1 to account for unmeasurable intangible costs and benefits as well as unmeasurable risk.

- ***The Model's Assumptions.*** The Model assumes that the tax abatement is needed to attract or retain a firm and does not count the amount of the abated tax as a cost. However, if the decision makers are not 100 percent certain that the abatement is needed, the Model's results need to be weighed with the respective locational probability derived from the decision makers studies or perceptions.
- ***Key input variables most sensitive to the outcome.*** A wide range of input variables -- all relating to the three sectors and to the new development -- are employed in calculating the economic impact. Of all input variables employed within the Model, several appear --from existing analysis-- to have the most impact on the outcome: (1) total number of new residents (in-migrants) associated with new development, (2) number of new school children related to new residents, (3) capital expenditures incurred to city, county and school district(s) to accommodate new firm, new residents and new school children, and (4) incremental operational cost incurred to city, county and school district(s) to accommodate new firm, new residents and new school children.

### **III. Reliability of the Model's Outcome**

The outcome of the cost-benefit analysis yielded through the Model represents a credible and defensible estimate of the magnitude of measurable costs and benefits. The outcome is intended to facilitate political decision making and does not represent precise values but reasonable approximations of the magnitude of the fiscal and economic impact of the project. The reliability of the Model's outcome is affected by conceptual and empirical limitations inherent to economic modeling: (1) the sensitivity of the Model to critical input variables such as the rate of in-migration of new employees and the capital costs to local government involved with a new development, (2) the ability to utilize variables which accurately reflect the "real world" situation; (3) the accuracy of the firm's information regarding its projected future employment and operating expenditures within the community, and (4) the ability to accurately capture capital cost of new government infrastructure associated with a new development. Because of these limitations, in particular the sensitivity of the outcome to some input variables the results should be viewed within a range rather than a single outcome. Furthermore, the results do not reflect the unmeasurable social or environmental costs or benefits, the benefits accruing during the construction phase of a project, and the costs associated with the chance that a firm might locate or expand in the community without a property tax abatement.

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# INTRODUCTION

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The Fiscal and Economic Impact Model is an assessment tool to estimate revenues and expenditures incurred to the public and private sectors of a local economy as a result of a new development or expansion. The Model is based on a cost-benefit analysis (CBA) which evaluates the fiscal and economic consequences of a new development. In particular, the model is equipped to estimate local government impacts of a new or expanding firm requesting a property tax abatement. The Model concentrates on monetary, tangible costs and benefits. Intangibles such as traffic congestion, pollution, and environmental changes on the cost side, and pleasures of more public facilities or services, enhanced living standards and quality of life including better job opportunities on the benefit side are not presently analyzed within the framework of the Model. However, intangible impacts are accounted for in a higher threshold for benefit-cost ratios (see threshold ratios later in this section).

The Model differs from simple financial accounting -- which may only focus on the amount of the abatement itself versus the number of jobs directly created -- by taking into account a much broader and relatively complete range of revenue and cost factors which may be directly or indirectly linked to the new firm. For example, when measuring the impact of new jobs created by the firm, the Model examines the direct economic impact of new residents who come to the community (e.g. spending in the local community, use of community services,

contribution to local governments' revenues, and use of local public facilities and schools). Indirect effects are simulated through an employment and income multiplier on the one hand, and are accounted for by using variables such as the number of vacated jobs, displaced worker etc. on the other hand. Overall, the Model investigates the consequences of a new development across three sectors: city and county governments and local school districts. Private sector impacts on local income and sales are also estimated. However, the full impact of a new development for each individual resident of a community are not measured in the current Model. This would imply an analysis of changes in personal income, in municipal service charges, tax rates, intangible effects, etc. associated with a new development.

#### **Development and Current Developmental Stage of the Model**

An original cast for the Model was created by Dr. David Darling, an economist with the Agricultural Extension Services at Kansas State University. Based on this original cast, which was in the early stages of development in terms of applicability, the Institute for Public Policy and Business Research (IPPBR) at the University of Kansas has developed a more sophisticated and workable model. Substantial conceptual and technical improvements, refinements and alterations were necessary to generate a satisfactory model and ensure a higher degree of reliability: identifying and researching additional relevant impacts, generating meaningful data for variables capturing these impacts, differentiating between salary levels, fringe benefits and tax rates of newly created jobs, incorporating the concept of discounting future benefits and costs to present values, including the calculation of depreciation of equipment and machinery over a 1-7 year time span, generating benefit-cost ratios, etc. (refer to Appendix 1 for complete listing).



Despite the Model's complexity at this stage of development, additional improvements can still be made to the current Model to further increase the validity of the outcome. Additional conceptual improvements and possible future investigations are compiled in Appendix 1. Since some of the concepts or variables are changing rather than being static, further study may yield to better estimates for particular variables. However, with the information that exists today, the Model is an effective tool in evaluating the effect of property tax abatements on a community.

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## **SECTION I**

# **KEY CONCEPTS AND ASSUMPTIONS**

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Unlike a simplified accounting method which often focuses only on the amount of the abatement versus the jobs created and wages earned, a cost-benefit analysis that meets professional standards will consist of a more systematic approach of weighing pros and cons of a project. A dependable cost-benefit analysis must adhere to the following principles and concepts which have been developed over the past 50 years by scholars of various backgrounds:

- Identifying all Relevant Impacts
- Balancing Costs and Benefits
- Monetizing Impacts
- Accounting for Future Benefits and Costs by Discounting
- Presenting Meaningful Results (Net Present Value, Benefit-Cost Ratios) for Various Courses of Action Regarding the Undertaking of the Project

In addition to these basic principles which will be described in more detail in this section, the Model is based on economic concepts such as average costing and opportunity cost calculation. These concepts will be described at the end of this section with the Model's underlying assumptions.

- *Identify, Balance and Monetize Impacts.* It is imperative for a thorough cost-benefit analysis to identify all relevant impacts associated with a new project. Second, it is necessary to balance costs and benefits in the sense that if indirect costs are assigned to a project then the indirect benefits need to be taken into account as well. A third step implies monetizing the identified impacts and generate a dollar value for the identified costs and benefits. Although, the Model is only concerned with the measurable tangible costs and benefits, the intangibles are of equal importance. However, monetizing intangible costs and benefits would require a major research effort, which is beyond the framework of this analysis (e.g. survey of the local population on their perception of social and environmental impacts based on the willingness-to-pay criteria).

The problems encountered by monetizing the identified tangible costs and benefits range from simple accounting to complex tasks such as generating primary data on household characteristics of new employees through a survey, determining spending patterns of employees, analyzing city/county and school district budgets, and generating data on local government capital and operational expenditures. Furthermore, national data on local government expenditures and revenues have been compared with the respective local data since costs and revenues vary predictably by community size and region.

The complexity of these tasks required a substantial amount of background research and analysis regarding the Model's inputs. It is crucial to establish valid measures of the inputs because some are extremely sensitive regarding the outcome of the CBA, such as the number of new residents associated with a new development. However, some of the variables or inputs were more readily available through existing data from the city or state government. Therefore, the main task in dealing with some 200 inputs consisted of generating a set of community-

specific input variables which could be used as default variables for future CBA. The search for proxies for some of the variables included: (a) conducting a survey of recently hired employees in order to generate reliable input data to estimate the impact of incremental employment; (b) a thorough analysis of the city, county and school districts budgets; (c) a literature search of estimates of per capita expenditures for public services and infrastructure; and (d) a data search for variables which are part of other calculations.

- ***Accounting for Future Benefits and Costs.*** An essential component of the Model is the concept of discounting for time and risk. This implies the calculation of the present value of a project's future benefits and costs and future risk. Discounting is a method to account for the "time value of money" and implies that the Model determines the direct and indirect economic impact on the community, over time, in a present dollar amount. It is an important economic concept to discount future costs and revenues to present values, since a dollar obtained today is worth more than a dollar obtained in the future. This implies that receiving the full value of property taxes after a 10-year abatement period is worth much less than if it would be received in the first year.

By selecting various time periods for discounting future benefits and costs, various project outcomes can be compared such as the benefits or costs resulting from a company that would relocate at the end of the 10-year abatement period versus a company which would remain in the community for a period of 15, 20 or more years.

After choosing an appropriate discount rate reflecting financial market conditions, a risk premium can be attached to the discount rate to account for such risks as a company relocating after a few years.

The method for accounting for future benefits and costs attempts to logically weigh the pros and cons of a proposed project. The purpose of the CBA is to determine whether or not the project is acceptable: the benefits outweigh the costs over a certain period of time. In order for the CBA to be effective, clearly stated objectives, such as which costs and benefits should be included, must be effectively determined, measured, and included in the analysis. Such objectives can range from financial (maximizing profits) to social welfare (increase living standards, guarantee employment, or public interest) considerations. Although it is difficult to measure and value all social welfare objectives, CBA experts have argued that a CBA must consider both financial and social welfare objectives.

A commonly accepted standard for good practice of CBA implies:

- 1) creating clearly stated objectives (see above);
- 2) allowing a comparison of alternative courses of action (e.g. outcome of a CBA when a firm is not granted a property tax abatement);
- 3) remaining consistent regarding the criteria used in CBA;
- 4) tackling the problem of time dimension for future benefits and costs (e.g. benefits incurring after the 10-year abatement period); and
- 5) providing a useful tool for decision-making.

While it is important to discount future costs and benefits for the time dimension, it is essential to also discount for a project's risk. Some projects and investments will inherently be riskier than others. For example, some firms may be less likely to stay in a community after the abatement period expires. The Model accounts for risk through three variables: the risk-adjusted

discount rate, the project's time period, and the benefit-cost threshold ratio.

- **Risk-adjusted discount rate.** The Model uses a risk-adjusted discount rate of 7.5 percent in determining the net present value of the future direct and indirect costs and benefits.<sup>1</sup> Inherent within the rate is a risk premium for undertaking the proposed project.
- **Project time period.** In discounting the cost-benefit cash flows a 15-year time period is used to account for benefits accruing after the 10-year abatement period. However, different time periods may be selected, depending on the length of the abatement period or type of firm. If the firm is an existing firm within the community and is expanding, the future cost-benefit flows may be discounted over a fifteen year period. Firms which are new to the area may be discounted over a ten year period. The rationale for this difference is based on the fact that firms which are attracted to the community by the abatement may not be as likely to stay after the abatement expires as an established firm. In addition a comparative analysis based on various time periods taken into account may be offered for decision making.
- **Threshold ratio.** In order to account for intangible costs and benefits, it is suggested that a benefit-cost threshold ratio of 1.25 to 1 be used as a guideline for granting a 50% property tax abatement for 10 years and discounting future costs and benefits over a 15-year period. Because intangible costs associated with the project are likely to exceed its intangible benefits, the purpose of the threshold is to account for intangible risks which are presently not included within the variables of the Model, such as: a) the case where a firm either leaves prematurely or goes out of business; b) circumstances where the firm would have located in the community without the

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<sup>1</sup>This is calculated by the following formula: (tax free municipal bond rate - current expected inflation rate) + risk premium. Current municipal bond rate determined through range provided by Kansas State Treasurer's office; current range for May 1991 was 5 - 8 percent.

abatement; and c) intangible costs like increased traffic and pollution. All else equal, a ratio of 1.25 to 1 reasonably accounts for all intangible risks. Projects which have a ratio in the range of 1.25 - 1.0 to 1 are considered only marginally acceptable and suggest closer scrutiny by the decision makers. With further study and refinements, estimates for these risks may be incorporated directly into the Model.

- **Average cost concept.** The average cost concept implies that local government costs are assigned to a new project based on the average cost per capita or per service unit multiplied by the number of new people or new service units. Average costing is considered - over the long-term - as a more adequate approach for growing and stagnant cities than the marginal cost concept because the latter concept implies an abrupt increase of costs whenever capacity constraints are reached.

- **Opportunity cost concept.** This concept implies that costs are perceived as the value of the best forgone alternative course of action. This means that local government costs associated with a project are seen as resources spent that could have been used otherwise.

- **The Model's Assumptions.** The Model assumes that the tax abatement is needed to attract or retain a firm and does not see the amount of the abated tax as a cost. However, if the decision makers are not 100 percent certain that the abatement is needed, the Model's results have to be weighed with the respective locational probability derived from the decision makers studies or perceptions.

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## SECTION II KEY INPUT VARIABLES

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The Model bases its calculations on a series of input variables relating to specific areas of impact. Obtaining data for the Model's 200 inputs requires reliable information from the company or project for which the analysis is conducted, community information and carefully researched data on such areas of impact as in-migration, capital and operational costs incurred to the community due to the new development. To assure high quality of input data, all data generated for the Model need to be compared to the research literature and to national standards for comparable community size.

Of all the variables within the model, several appear -- from existing analysis -- to have the most impact on the outcome: total number of new residents migrating to the community, per capita city/county revenues and expenditures, capital cost to city/county governments incurring from new plant and new residents, number of new school children, and cost of the community's share of capital expenditures to accommodate one new student. The Model categorizes inputs within three areas: firm-related, local government-related, and school districts. The following sections describe the key variables within each section and tell: a) what the variable implies; b) how its data are generated and c) its use in the Model.

### **B. Firm-Related Inputs**

Firm-related inputs comprise an array of variables which account for the direct and



indirect economic impact of the new firm and its employees on the community. These variables measure the potential cost and revenue of the firm with respect to the city, county and the school districts. The benefits of increased spending in the local economy from the firm and its employees are calculated, and the incremental operational and capital costs incurred to the three sectors are determined. Additionally, the residual impact -- or multiplier effect -- of spending and job creation are incorporated in this section.

1) ***New firm's taxable investment.*** The firm's investment includes its financial stake in real estate and machinery/equipment for the new plant or facility. The actual figures are provided by the applicant (or firm). These figures are used to calculate the value of the property tax abatement and future property tax revenues.

2) ***New firm's operating expenses.*** This figure, also provided by the firm, focuses on the proportion of operating expenses by the firm within the local community, excluding labor costs, taxes and debt service. The Model utilizes this data in calculating the economic effects (direct and indirect) of firm expenditures within the area and on local sales taxes.

3) ***Square footage of new firm.*** The square footage of the new facility is obtained from the firm and employed in calculating capital costs incurred to the city and county and for estimating utilities consumption.

4) ***Total number of new firm's employees.*** The company is asked to estimate the number of immediate, new employees for the new plant by type of employee: manager, professional staff, and production worker. The number of new employees is a critical component in calculating many of the following variables.

5) ***Number of commuters.*** The new jobs created in a community are not filled exclusively

by residents of the community. Some employees may be transferred to the community by the new firm. Some may commute to work from other parts of the county or neighboring counties. In order to determine the average proportion of commuters within a firm, primary data on commuting patterns need to be generated through a survey of recently hired employees in the community. The proportion of commuters can range between 10 and 30% of all new employees, depending on the geographic location of the community and the type of industry. (See Table 1 for results of a survey for Wichita/Sedgwick County).<sup>2</sup> The purpose of determining the number of commuters is to see how many new employees will actually be residents of the community and generate revenues as taxpayers on the one hand, but also require public services and facilities on the other. Commuters spend a relatively insignificant proportion of their income within the area.

**Table 1**

**Current Residence of New Employees:  
Wichita/Sedgwick County Firms**

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Wichita	69.4%
Other areas of Sedgwick County	19.3%
Outside Sedgwick County	11.3%

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**Source: 1992 Survey of New Employees,  
IPPBR/KU and CEDBR/WSU.**

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<sup>2</sup> "Survey on In-Migration and Household Characteristics of Manufacturing Employees in Sedgwick County Hired Between 1988 and 1991" *Institute for Public Policy and Business Research, University of Kansas and Center for Business and Economic Research, The Wichita State University* , (April 1992).

6) ***Average annual wages and benefits.*** The annual salaries and fringe benefits for the newly created jobs broken down by management, professional/technical, and production are requested from the new firm. These figures provide the basis for calculating the disposable income by adding fringe benefits to the base salary and subtracting state and federal taxes and the contributions to social security. The fringe benefits which are included in the Model are contributions towards unemployment insurance, worker's compensation, all health care premiums, and child care. However, two fringe benefits, including FICA and paid vacation/holidays, are excluded from the analysis because they do not increase disposable income. Generally, the fringe benefit package does not exceed one-third of total compensation.<sup>3</sup> After-tax income plus adjusted fringe benefits are used in the Model to determine the immediate and future economic impact of the new jobs on the community through employee spending. Some of the fringe benefits are assumed to be directly or indirectly spent in the community, such as health care, while other benefits may not return to the community until an employee reaches retirement age or is disabled.

7) ***Total number of displaced workers.*** Displaced workers include those who lost their jobs because their employer could not compete with the new firm and either had to lay off workers, go out of business, or move elsewhere. For the majority of firms in Sedgwick County it is assumed that no workers will be displaced as a result of the entry of a new firm. This assumption is based on the notion that because the product reach of most new firms will extend

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<sup>3</sup> A survey of 108 companies in 1988 revealed that fringe benefits average 16.4 percent in Lawrence, ranging from a legally required minimum of 8-10 percent to a maximum of 40 percent. The majority of establishments contributed 8-25 percent.

beyond the immediate area, the Wichita/Sedgwick County area can support several producers/suppliers of a particular product which is exported to other areas of the state, nation, and world. Therefore this assumption does not apply to firms which sell their products or services inside Sedgwick County.

8) *Rates of In-Migration Due to New and vacated jobs.* Rates of in-migration have been obtained through a survey of the newly hired workforce in Wichita/Sedgwick County conducted by CEDBR at WSU and the analysis of survey results provided by IPPBR at KU. In-migration occurs as a direct result of the new jobs openings, and because of the job vacancies that are created due to 'job changers'. (For a detailed discussion see Survey, Section V and Table 12A.)

**Table 2**

**Overall Impact of In-Migration  
Due to New Job Creation: Sedgwick County**

<b>Occupational Category</b>	<b>Initial Round (Surveyed)</b>	<b>Real Migration Ratio (Calcul. from Survey)</b>
All Employees	16.5%	29.4%
Managers	26.2%	44.5%
Professionals	34.4%	50.1%
Technicians	29.1%	47.4%
Secretarial/Clerical	5.3%	12.1%
Sales	20.0%	43.4%
Production Wkr.	8.81%	17.5%

**Source: 1992 Survey of New Employees, IPPBR/KU and CEDBR/WSU.**

When a current resident of the community takes a job in the new firm, he may be leaving another job vacant (95% assumed temporarily and 5% assumed permanently). In fact, survey results for Wichita/Sedgwick County revealed that 49.6% of all new FTE-employees were previously employed in Sedgwick County (Table 3). Nineteen percent were unemployed, and only 2.1 percent were new entrants into the labor force.

**Table 3**

**Job Status of Wichita/Sedgwick County Residents Prior to Current Employment**

Prior Status	Percent of Total <sup>1</sup>		Total
	Old Resid.	New Resid.	
Full-time Employee in Sedgwick	56.4%	--	49.6%
Full-time Employee Elsewhere	--	55.0	17.0
Half-time Employee in Sedgwick	12.0	--	10.2
Half-time Employee Elsewhere	--	7.2	1.7
New Labor Force Entrant	2.2	0.1	2.1
Unemployed	19.2	19.1	19.2
Other <sup>2</sup>	10.2	18.6	.2

<sup>1</sup>unadjusted for additional rounds of employment

<sup>2</sup>includes underemployed and disabled

Source: 1992 Survey of New Employees, IPPBR/KU and CEDBR/WSU.

Permanently vacated jobs result in lost personal and disposable income for the community, which is the salary and fringe benefits of the vacated positions. The Model is not concerned with jobs vacated in the short-term, under the assumption that vacant positions will

be filled in the long-run by a ready pool of labor, such as current residents of the area (including college students) and in-migrants.

9) *Total number of new workers in the area.* Because the new firm will be hiring people already living in the community, the vacated jobs will have to be filled in a similar manner as the new jobs for which data is available through the survey. The Model assumes that vacated jobs will be filled by a mix of current residents, in-migrants and commuters, similar to the pattern of recruitment in the new firm. The results of the survey showed that 34.4 percent of professionals, 29.1 percent of technicians, and 8.8 percent of production workers were new residents who moved to the area because of a job opportunity with a new or existing firm (Table 2). However, this percent applies only to the first set or "round" of jobs created by the new firm. As current residents left their prior jobs to take their present job, there will be additional job vacancies. These vacancies also open up the possibility for in-migrants. The real migration ratio adjusts the percentage of in-migrants due to the new firm to account for additional rounds of job creation and captures the full impact of in-migration due to the original new jobs created by the new firm (see Survey on In-migration, Table 12A).

The total number of in-migrants in the area, then, is the result of the jobs created by a new firm and the short-term job vacancies that it creates in the community. For example, if a new firm creates 100 new production jobs, then approximately 8.8 of those jobs will be filled by in-migrants or persons living outside of the area. However, the cumulative impact of those 100 jobs will actually be 17.5 in-migrants as current residents left their jobs for ones with the new firm, opening up additional employment opportunities.

The purpose of calculating the total number of in-migrants in the area is to determine the total impact of the new jobs created, in terms of payroll, spending, and public services needs, as well as calculate the overall increase in population due to families and partners.

10) **Total number of new residents.** The total number of new residents to the area includes workers -- those filling the positions in the new firm and subsequent vacant positions -- and their families or partners who also move with them to the area. To determine the total number of new residents to the area, the average household size for new employees is used (Table 4). For example, if the new firm creates 100 jobs for production workers, about 8.8 employees will migrate to the area as a result of taking the new job in the new firm. On average, the household of a production worker in Sedgwick County is 3.01 persons. Therefore, the total number of new residents associated with the new firm's hiring will be approximately 26 persons.

When taking the cumulative impact (17.5%) into account that results from the additional in-migrants who fill the vacated jobs of production workers who took the new jobs, the total number of new residents to the area will be 52 persons. As a comparison to the survey figures, the average household size for Kansas was used as a reliability check (Table 4). The total number of new residents is applied to calculations involving per capita city/county expenditures and revenues.

11) **New housing units.** The number of new housing units generated due to the new firm is important in calculating additional tax revenues for the community, and

**Table 4**

**Average Household Size of New Residents and Occupational Categories: Sedgwick County**

<b>Category</b>	<b>Persons Per Household</b>
New Residents	2.66
Professionals	2.84
Maint./Prod.Wkrs.	3.01
<b>AVERAGE (all employees)</b>	<b>2.94</b>
Kansas Average <sup>1</sup>	2.53
U.S. Average (total pop.)	2.63

<sup>1</sup> U.S. Bureau of the Census, Current Population Reports, Nov. 1989.

**Source: 1990-1991 Survey of New Employees, IPPBR/KU and CEDBR/WSU.**

additional expenditures, such as new roads and utilities.<sup>4</sup> It is assumed that not every new employee migrating to the community will create one additional housing unit. However, the survey suggests that 95 out of 100 manufacturing employees occupy a housing unit (rent or own a house or apartment). To account for the market value of housing units generated by in-migrants, an adjustment factor based on income is used to approximate the total value of new

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<sup>4</sup>The calculation for determining the number of new housing units equals the total number of employees x percentage of in-migrants times the employment multiplier and then divided by the adjustment factor for housing.



houses as a result of in-migration.<sup>5</sup> The value is used to calculate property taxes.

12) *Spending patterns of employees - local household expenditures.* The spending patterns of the new firm's employees are estimated in order to reflect the proportion of disposable income which is spent within the community. For the purposes of the Model, the proportion of local spending by employees is estimated to be 85% (estimate by CEDBR based on information by the Bureau of Labor Statistics (BLS) Consumer Expenditure Survey ).<sup>6</sup> Local spending by new employees includes a portion of BLS-categorized expenditures in the areas of food, housing, apparel and services, vehicles and gasoline/motor oil, health care, and other.<sup>7</sup> A more accurate way to determine information on local spending patterns could be developed through a survey of employees. However, the drawback of such an approach is that most employees do not keep accurate spending records. The purpose of calculating the spending patterns of new employees is to ascertain the full impact on the local economy in terms incremental spending due to the new jobs created and additional spending due to the multiplier effect (*see Income and Employment Multiplier below*).

13) *Proportion of local employee's spending subject to local sales tax.* From the local expenditures estimated through BLS data, the percentage of expenditures subject to local sales tax was calculated to be 45%. Some expenditures -- including housing, gasoline, services, and

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<sup>5</sup>The number of new housing units is calculated by occupational category and is calculated by the following formula: (total number of employees \* percent of in-migrants) \* employment multiplier/adjustment factor for housing. The adjustment factor for housing has been estimated at 1.05.

<sup>6</sup>Consumer Expenditures in 1989, Bureau of Labor Statistics, U.S. Department of Labor, November 30, 1990.

<sup>7</sup>Other includes alcoholic beverages, entertainment, personal care, reading, education, tobacco and smoking supplies, miscellaneous expenditures, and cash contributions.

health care -- are not subject to local sales tax and are therefore not included in the percentage. The effect of increased local sales taxes as a result of the new residents is added to city/county revenues.

14) *Income multiplier for employees' income.* The income multiplier for employees' income calculates the impact of employee spending on the community. As employees spend their income locally on goods and services, their purchases lead to an increase in local income and to an expansion of existing businesses and the creation of new businesses, all to accommodate the increased demand.<sup>8</sup> The income multiplier is an important concept to account for indirect effects on income. For example, a new employee's income is used to make purchases and buy services which generates indirect income to other people in the community. This chain of spending continues in the area until the initial purchase "leaks out" of the community through taxes, savings, or purchases in other areas. Income multipliers demonstrate the indirect effect that expenditures have on the local economy.

15) *Proportion of firm's total operating expenses spent locally.* The new firm, like its employees, may spend money in the local area for supplies, materials, services, training, entertainment, and utilities. After the firm's estimated operating expenses are obtained from the company, it is also asked to gauge what proportion of total operating expenses will be spent locally. This figure must be provided by the company after a careful review of their bills on local expenditures. This estimate is used to compute the proportion of plant spending subject to

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<sup>8</sup>The formula used for calculating the income multiplier equals (spending patterns of employees in the plant community \* proportion of employees' income spent which becomes income to other residents)/ [1 - (spending patterns of employees in the plant community \* proportion of employees' income spent which becomes income to other residents)]

local sales tax and in calculating the income multiplier for plant spending.

16) ***Proportion of new firm's spending subject to local sales tax.*** After the company is asked to estimate the type and proportion of its total operating expenses spent locally, the proportion of those expenditures which are subject to local sales taxes is estimated. The effect of increased local sales taxes as a result of the new firm's spending has an impact in adding to city/county revenues.

17) ***Income multiplier for company spending.*** The rationale behind the income multiplier for spending by the new company is similar to that for employee spending: the first "round" of firm expenditures create additional "rounds" of expenditures on goods and services throughout the area.<sup>9</sup> Income multipliers show the direct and indirect effects of expenditures on the local economy.

18) ***Employment multiplier.*** The employment multiplier estimates the number of jobs which result from the spending related to the new firm and the spending by the firm's new employees. Just as income spent in the community creates additional income through a multiplier effect, spending creates additional jobs (sales jobs, cleaning, and other secondary jobs) which are calculated by the employment multiplier. As discussed earlier, some employment opportunities are the result of vacated jobs. However, the employment multiplier is used to calculate the number of new jobs -- within existing and new businesses -- that are created to fulfill the goods

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<sup>9</sup>The income multiplier for plant spending is calculated by the following formula (proportion of operating expenses spent locally \* proportion of plant operating expenditures which becomes income to other residents) / [1 - (proportion of operating expenses spent locally \* proportion of plant operating expenditures which becomes income to other residents)]

and services demands of the new firm and new area residents.<sup>10</sup>

### **C. Local Government Sector Inputs**

Government sector inputs relate to city and county revenues and expenditures associated with the new firm and new residents. In calculating the impact on the city and county, the Model allocates the cost of providing public services to in-migrants on a per capita basis and to the company's facility on the basis of square footage and employment size. Revenues are also accounted for in a similar fashion. In distributing total city/county expenditures and revenues to residential units and to businesses, it has been estimated that the residential sector receives two thirds of all city services, while the business sector requires one third of city services. It is assumed that residents create approximately two thirds of all revenues and business contribute the remaining one third percent.<sup>11</sup> This allocation may not be completely accurate but will not matter much for the calculations in the Model since local government revenues and expenditures associated with a new company that creates a facility and new residents will be attributed to both the facility and the new residents. This means that if more public expenditures are attributed to the facility the per capita employee expenditure will be less, and the combined total will not differ much with various allocations for the average company that generates a facility and employment. However, for a company that builds a large facility and creates only a very few jobs, the accuracy of the allocation becomes a critical issue.

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<sup>10</sup>The employment multiplier is calculated by the following formula: (disposable personal income + secondary induced income + secondary internalized income)/disposable personal income.

<sup>11</sup>*Service Cost Recovery System*, City of Loveland, Colorado, 1983, p 5.

When new businesses and families move into the community, the city and county incur two kinds of new costs: (1) operational costs to meet the increased demand on public services due to the new development consisting mainly of expenses for salaries and supplies, and (2) capital costs to build new roads, bridges, libraries, parks, police and fire stations and other infrastructure. Capital costs are usually one-time capital outlay or long-term bond obligations associated with expanding the total capacity of local government facilities or services (expanding sewers, water mains, water and sewage treatment plants; acquisition of water rights, police and fire vehicles and stations, and road equipment. Therefore, the Model makes a distinction between these two types of costs (*see Municipal/county expenditures and capital expenditures*).

1) *Increase in municipal revenue.* Increased local government revenues as a result of the new firm and its employees are also calculated as a benefit to the community.<sup>12</sup> Both the firm and its new employees will have an effect on city revenues. New residents -- and current residents who are new to the labor force or experience salary increases -- contribute to city revenues through increased taxes, redistributed state sales taxes, licenses and permits, fines, motor vehicle property taxes, and other revenue sources.<sup>12</sup> Additionally, the company and new employees provide revenue to the city through franchise fees on utilities (gas, electric, telephone, cable TV), which can be considerable if the company is a high energy user. Per capita revenues can be calculated for all sources of revenue (see Appendix 2). However, an allocation of municipal revenues by what is provided by businesses versus private residents is necessary to account for extreme cases where a firm would build a large facility and hire only a very few new employees

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<sup>12</sup>Listed in Budget, City of Wichita.

(e.g. warehousing). In this case, the model would not account appropriately for revenues coming from this firm if no allocation was made. For the average firm, the results should not differ if the model is run with data based on allocation or based on a per capita concept.

2) ***Increase in county revenue.*** County revenue sources other than property and sales tax include motor vehicle property tax revenues, franchise fees, and other revenue sources. For a detailed breakdown see Appendix 3. In breaking down the increase in revenues by residential and nonresidential, the residential portion is again assumed to amount to two thirds versus one third for nonresidential.

3) ***Increase in municipal expenditures.*** Of all municipal expenditures, those for water and sewer, the Golf Course System, and the Airport Authority were subtracted because those agencies have a full cost recovery system in place. ( See Appendix 4.) Selected expenditures were calculated on a per capita basis. The allocation is again essential to account for extreme cases.

4) ***Increase in county expenditures.*** An overview of all county expenditures is provided in Appendix 5. The county's cost of providing services can again be allocated in residential and nonresidential expenditures using two thirds for residential and one third for nonresidential (Appendix 5).

5) ***Annual franchise fees from new plant.*** This incorporates franchise fees for utilities paid by the new firm to the city and county. If electricity and gas are used in the production process franchise fees to the city and county can be substantial. For the new plant, the franchise fees will be: gas - 5 percent of bill; electric - 5 percent of bill; telephone - \$0.4 per line, cable TV -5 percent of bill.

6) ***City/county capital investments.*** The Model examines the city and county capital investments which are necessary to accommodate the new firm and its employees. A long-run average cost system is used to account for local government capital costs associated with a new development. A marginal cost concept, based on the perception that there are no capital costs associated with accommodating a new company and its new employees (in-migrants) is not an appropriate assumption for growing cities. While this may be a more realistic assumption for declining communities, especially those in less populated areas, this approach is not appropriate for growing communities which reach capacity thresholds for facilities and services in the long run. Under a marginal cost concept, if a new public facility were to be constructed to meet additional growth, the full cost of the new facility would be charged against the new businesses moving into the city. However, this would tend to cause an impasse, freezing growth at a moment at which no single new business could pass a cost-benefit analysis.

Therefore, the Model utilizes a long-run average cost concept. This means that the total needed amount of public infrastructure of each type is expected to grow in direct proportion to the total number of families and businesses in the area. This assumption is acceptable if the area is expected to experience reasonably steady growth in the future and if public services are approximately constant returns to scale, as many studies have found. To estimate these costs in the Model, a literature survey of nationwide averages for each item was utilized, adjusted only for the general price level.<sup>13</sup> The main available sources for estimates of this type turned out to be studies in support of impact fees. However, community-specific data could be developed

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<sup>13</sup>For an overall average of capital investments and listing of sources, see Appendix 6.

in the future through further research on the municipal and capital cost system.

**D. School District Sector Inputs**

School district section will be re-written after new School District Finance Plan is analyzed and incorporated into the Model.



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## SECTION III CONCLUSION

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The Fiscal and Economic Impact Model of the Institute for Public Policy and Business Research at the University of Kansas employs a comprehensive cost-benefit analysis to estimate the net economic impact of granting a property tax abatement to a new or expanding firm in the community. The Model differentiates between the outcomes on the city and county, the school district, and the private sector economy. The reliability of the Model is dependent on several constraints: 1) its ability to utilize variables which accurately reflect the "real world" situation; 2) the accuracy of the firm's information regarding its expenses, property, and employees; and 3) the credibility of critical input variables, such as the number of in-migrants associated with the new plant, the number of school children per new resident, the number of housing units created, and local spending patterns.

Since some of the variables and concepts contained within the Model required extensive investigation and analysis, additional research can provide more precise indices of some key input variables. Overall, the Model is an effective tool for estimating the value of property tax abatements and will give the decision maker a perspective on the magnitude of costs and benefits associated with the project. The results should allow officials to deal more effectively and realistically with a particular request for tax abatement.

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## **APPENDIX**

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## APPENDIX 1

### IPPBR'S CONCEPTUAL IMPROVEMENTS, ADDITIONS AND REFINEMENTS TO THE MODEL CREATED BY DAVID DARLING (KSU)

#### identification of additional relevant impacts

- full demographic impact including children and family members of workers

- full array of school district revenues and expenditures

- franchise fees to city, local sales tax from utility bills to city

- payment in lieu of tax

#### direct employment impact on households: survey of firms

#### indirect employment impacts:

- equilibrium labor model

- employment multiplier

#### household impact methods:

- estimate of local versus non-local consumption shares from CES

- estimate of house value to income ratio from bank data

#### effect of wage levels on personal income, sales, home purchase, household characteristics etc.

- investigation for three income categories

#### differentiation of private-sector benefits

- disposable and other income, taxable and nontaxable sales

#### alternate capital cost concept (LRAC)

#### capital cost methods:

- literature survey on impact fees

- Lawrence school cost estimate

#### aggregate balancing concept (model should predict present government budgets)

#### allocating city operation costs to households vs. businesses (unit cost concept):

- survey concept

- survey implementation

#### allocating public operating and capital costs between businesses:

- employment

- square footage

- real estate values

- per business

#### present value accounting software including

#### average long-run flow concept for costs and benefits

#### discount rate method: real tax free bond rate plus risk premium and depreciation of firm's equipment

#### choice of a benefit/cost criteria: four considerations

- data and model uncertainty

- omitted intangible costs

- investment risk (the firm may leave prematurely)

- probability of location of firm without abatement

#### correction of errors contained in the initial model

- proper assessment ratios for industrial real estate (30%) and equipment (20%)

**APPENDIX 1 (continued)**

**TECHNICAL IMPROVEMENTS AND ADDITIONS**

generate a technical document describing the model and its input variables

-explanation of inputs and how inputs can be generated

-explanation of benefit-cost ratios

laying out a prototype document summarizing the results for a specific company

alter calculation for property taxes to take into account different assessment ratios for real property (30%) and personal property (12%)

introduce concept of depreciation of equipment and machinery for proper property tax calculations over a 10-year time period

**PROPOSED FURTHER DEVELOPMENT OF MODEL**

study the asset value of public capital

add separate household types for occupational categories

check the aggregate balance

survey the contingent evaluation of intangibles

study the rates at which new and old firms die off or leave

study the rates at which abatements have no impact on location

formalize a sensitivity analysis method

replace multipliers and parts with consistent input-output framework

study the effect of growth on unit operating costs

study the marginal effect of households and businesses on operating costs

generate a submodel to estimate impact of the construction phase of the project

**APPENDIX 2**

**CITY OF LAWRENCE: 1989 MUNICIPAL REVENUES  
EXCLUDING AD VALOREM TAX, DELINQUENT AD VALOREM TAX,  
MOTOR VEHICLE TAX, LOCAL SALES TAX,  
& FRANCHISES FEES  
*fund balance not considered a revenue***

Motor Vehicle Property Tax (all funds) ..... 1,564,908

**GENERAL FUND REVENUES ONLY:**

Alcoholic Beverage Tax .....	403,242
LAVTR (state sales tax redistribution) .....	375,300
Consumer Use Tax .....	37,861
Licenses & Permits .....	241,068
Intergovernmental Revenue .....	499,896
Charges for Services .....	165,667
Fines & Forfeits .....	526,285
Use of Money & Property .....	684,393
Other Financing Sources .....	14,946

**OTHER REVENUE SOURCES:**

<b>CEMETERY</b>	Charges for Services/Use of Money .....	58,000
<b>EMPLOYEE BENEFIT</b>	Miscellaneous .....	763
<b>LEVEE MAINTENANCE</b>	Use of Money .....	3,864
<b>RECREATION</b>	Charges for Services/Misc. ....	452,700
<b>SPECIAL ALCOHOL</b>	Intergovernmental Revenue .....	134,414
<b>SPECIAL GAS TAX</b>	Intergovernmental Revenue (gas tax return) .....	1,122,208
<b>SPECIAL LIABILITY</b>	Miscellaneous .....	5,916
<b>SPECIAL RECREATION</b>	Intergovernmental Revenue/Miscellaneous .....	136,400
<b>STREET LIGHT UTILITY</b>	(only property tax funded) .....	0
<b>STREET MAINTENANCE</b>	Misc. ....	24,589
<b>MISCELLANEOUS OTHER SPECIAL REVENUE FUNDS (not investigated)</b>	.....	0

<b>TOTAL</b>	6,452,420
	1,935,726
	<hr/>
	4,516,694

Subtract Business Portion 30%

Per capita municipal revenue (pop. 65,608) ..... \$68.84  
excluding business portion

\*Excluding Ad Valorem Tax, Delinquent Ad Valorem Tax,  
Payments in Lieu of Tax, Transfers from other Funds,  
Motor Vehicle Tax, Fund Balance,  
Local Sales Tax, Franchise Fees)

**APPENDIX 3**

**1989 DOUGLAS COUNTY REVENUES  
EXCLUDING AD VALOREM TAX, DELINQUENT AD VALOREM TAX,  
PAYMENTS IN LIEU, & TRANSFERS FROM OTHER FUNDS**

TOTAL GENERAL FUND REVENUES .....	2,779,257
including Mortgage Registration \$465,035, Interest \$1,066,047, City/County Revenue Sharing \$349,475, Fees, Charges and Other	
MOTOR VEHICLE PROPERTY TAX .....	1,701,532
LAVTR (state sales tax redistribution) .....	428,643
 OTHER REVENUE SOURCES:	
AMBULANCE (other than prop. tax, LAVTR, Motor Vehicle) .....	355,095
APPRAISER .....	200
COUNTY ADMINISTRATOR .....	0
COMMUNITY COLLEGE TUITION .....	2,423
DIRECT ELECTION FUND .....	15,853
EMPLOYEE BENEFITS (p. 45 KPERS, KPF not included) .....	4,487
EXTENSION COUNCIL .....	0
FAIR FUND .....	15,472
HEALTH .....	0
HISTORICAL FUND .....	0
INDIRECT ELECTION .....	0
MENTAL HEALTH .....	0
MENTAL RETARDATION .....	0
NOXIOUS WEED .....	76,291
PARK MAINTENANCE .....	9,068
PHYSICALLY HANDICAPPED .....	0
REAPPRAISAL (p. 90 Reimbursed Expense) .....	134,407
ROAD & BRIDGE (p. 95 City/County Highway Gas Tax) .....	980,420
SERVICE FOR THE ELDERLY .....	0
SOIL CONSERVATION .....	0
SPECIAL ALCOHOL .....	3,929
SPECIAL AUTO FEES .....	168,088
SPECIAL BRIDGE .....	1,570
SPECIAL BUILDING (Community Correction Grant) .....	67,531
SPECIAL LIABILITY .....	0
SPECIAL PARKS & RECREATION .....	3,929
UTILITY SERVICE FUND .....	39,078
VALLEY VIEW HOME CARE (no revenues in 1990 and beyond) .....	902,675
.....	7,875
EQUIPMENT RESERVE (transfers only) .....	0
SPECIAL HIGHWAY (transfers only) .....	0
RISK MANAGEMENT (interest, reimbursements) .....	83,221
SPECIAL ROAD & BRIDGE .....	0
	<hr/>
	TOTAL 7,781,044
Subtract Business Portion 30%	2,334,313
	<hr/>
	5,446,731
 Per capita county revenue (1989 population 81,798)* (excluding bus. portion)	 \$66.59

APPENDIX 4

EXPENDITURES BY VARIOUS CITY FUNDS FOR BUSINESS SECTOR AND PRIVATE RESIDENTS  
LIST OF CITY REVENUES  
CITY OF LAWRENCE, 1989 BUDGETARY DATA

GENERAL FUND	1989 Actual	Current Capital Outlay	Operating Expenditures: Commodities & Personnel	Allocation Ratios for Business Sector	Proportion of Expenditures for Business Sector	
City Commission	26,207	0	26,207	0.66	17,297	
City Manager	98,086	85	98,001	0.5	49,001	
Planning	220,086	9,593	210,493	0.33	69,463	est. P. Banks
Human Resources	122,379	780	121,599	0.33	40,128	est. R. Samuel
Administrative Services	89,707	14,754	74,953	0.25	18,738	
Employee Relations (personnel)	95,561	340	95,221	0.25	23,805	
Finance	185,107	85	185,022	0.25	46,256	Julia Karr, Dir.
General Overhead	450,309	19,674	430,635	0.3475000	149,646	AVERAGE
Legal	104,850	0	104,850	0.01	1,049	Tom Porter, Prosecutor
Municipal Court	76,571	1,425	75,146	0.2	15,029	
Police	3,350,338	135,689	3,214,649	0.33	1,060,834	
Animal Control	130,996	105	130,891	0.1	13,089	
Fire	2,413,610	47,286	2,366,324	0.41	970,193	based on assess. prop. value
Building Inspection	195,236	11,183	184,053	0.4	73,621	est. R. Shaughnessy
Engineering	342,128	15,337	326,791	0.4	130,716	est. 2 Terese Gorman
Central Maintenance	299,872	21,379	278,493	0.2	55,699	est. J.Karr
Airport Maintenance	43,281	2,255	41,026	0.75	30,770	est. J.Karr
Property Maintenance	299,946	0	299,946	0.2	59,989	est. J.Karr
Parks	539,928	20,648	519,280	0	0	
Forestry	158,221	31,821	126,400	0	0	
Health	217,891	0	217,891	0	0	
General Fund Total	9,460,310	332,439	9,127,871		2,825,321	30.95%
CEMETARY FUND	126,293	13,595	112,698	0	0	

(continued)	1989 Actual	Current Capital Outlay	Operating Expenditures: Commodities & Personnel	Allocation Ratios for Business Sector	Proportion of Expenditures for Business Sector	AVERAGE
EMPLOYEE BENEFITS	1,646,727	0	1,646,727	0.32875	541,362	
(transfer \$248,000 sanitation, \$317400 water & sewer, \$50300 + 47500 recreation + gas tax)						
GUEST TAX FUND	not investigated because guest tax is not a city revenue					
LEVEE MAINTENANCE	63,791	18,217	45,574	0	0	water, sewer, sanitation
LIBRARY	770,881	0	770,881	0	0	
NOXIOUS WEED	80,638	102	80,536	0	0	
RECREATION	823,535	16,547	806,988	0	0	
SPECIAL ALCOHOL FUND	118,455	11,331	107,124	0	0	\$30.32 per wage earner
SPECIAL GAS TAX FUND (street repair, traffic signals)	1,088,578	129,651	958,927	0.25	239,732	est. J.Karr
SPECIAL LIABILITY FUND (self-insured risk management)	223,127	0	223,127	0.05	11,156	est. J.Karr
SPECIAL RECREATION (swimming, tours, activities)	114,442	47,775	66,667	0	0	
STREET LIGHTS UTILITY	258,424	0	258,424	0.25	64,606	est. J.Karr
STREET MAINTENANCE (snow removal, paving, etc.)	262,181	0	262,181	0.2	52,436	est. J.Karr
TOTAL	15,037,382	569,657	14,467,725		3,734,613	(25.8%)



**MISC. NON-BUDGETED FUNDS** not investigated because of special funding (gov. agencies)

(Aging Advocacy, Airport Improvement, Community Development Grant, Equipment Reserve, Fair Housing Assistance, Justice Assistance Liability Reserve, Rehabilitation Escrow Summer Youth, Transportation Planning, Workers Comp. Reserve)

**AGENCY AND TRUST FUNDS** not investigated

**SPECIAL RESERVE FUNDS** not investigated  
(Equipment Reserve, Liability Reserve, Workers Comp. Reserve)

**DEBT SERVICE FUND AND CAPITAL RESERVE FUND** not investigated in context with operating expenditures

**Current account per capita operating expenditures:**

**a. including business portion: \$220.52**

**b. excluding business portion: \$163.59**

**City operating expenditures for businesses by size of firm: \$162.37 per employee**

**(\$3,734,613 div. by 23,000 private sector employees)**

APPENDIX 5

EXPENDITURES BY VARIOUS COUNTY FUNDS, DOUGLAS COUNTY, 1989 BUDGET

GENERAL FUND	1989 Actual	Allocation ratios for Businesses	Proportion of County Expenditures for Business Sector	Capital Outlay
Administrator	\$122,157	0.30	36,647	115
Auditor	2,200	0.30	660	0
Budget	82,908	0.10	8,291	345
Buildings & Grounds	369,500	0.00	0	23,882
Clerk	154,303	0.30	46,291	284
Commissioners	257,864	0.30	77,359	12,082
Community Service Coordinator	27,696	0.20	5,539	0
Coroner	21,327	0.10	2,133	0
Countywide Oper.	300,737	0.10	30,074	0
Data Processing	258,128	0.10	25,813	416
District Attorney	598,478	0.15	89,772	16,913
Emerg. Preparedness	115,227	0.10	11,523	7,206
Grants and Matching Funds	140,690	0.10	14,069	0
Industrial Development	151,929	1.00	151,929	75,000
Juvenile Detention	0	0.00	0	0
Purchasing and Accounting	106,955	0.01	1,070	6,109
Reappraisal Advis. Services	10,331	0.36	3,719	0
Register of Deeds	111,053	0.05	5,553	5,921
Sheriff	2,048,840	0.10	204,884	78,672
Treasurer	200,100	0.10	20,010	358
Unified Courts	243,413	0.01	2,434	10,732
Public Works	130,506	0.20	26,101	13,412
General Fund Total	\$5,454,344		\$763,870	\$251,602
::				
<b>MISCELLANEOUS FUNDS</b>				
Ambulance	\$955,613	0.00	0	4,441
Appraisers Cost	245,899	0.36	88,524	500
Bond & Interest	1,358,116	0.15	203,717	0
Community College Tuition	210,912	0.00	0	0
Direct Election	64,101	0.00	0	0
Emergency Telephone Service	0	0.00	0	0
			Based on ass. prop. value	

MISCELLANEOUS FUNDS (continued)

	1989 Actual	Allocation ratios for Businesses	Proportion of County Expenditures for Business Sector Average	Capital Outlay
Employee Benefits	\$1,611,134	0.19	305,076	0
Extension Council	236,191	0.01	2,362	0
Fair Fund	67,144	0.10	6,714	3,618
Health	313,625	0.00	0	0
Historical Societies	55,597	0.00	0	0
Indirect Election	29,304	0.00	0	0
Mental Health	300,000	0.00	0	0
Mental Retardation	240,879	0.00	0	0
Noxious Weed	186,668	0.00	0	0
Park Maintenance	99,270	0.00	0	2,320
Physically Handicapped	105,000	0.00	0	0
Reappraisal	448,777	0.36	161,560	1,092
Road & Bridge	2,360,549	0.20	472,110	1,117
Service Program for the Elderly	252,587	0.00	0	0
Soil Conservation	60,000	0.00	0	0
Special Alcohol Programs	2,732	0.00	0	0
Special Auto Fees	168,105	0.00	0	5,219
Special Bridge	605,817	0.20	121,163	15,928
Special Building	101,373			100,407
Special Liability	61,897	0.10	6,190	0
Utilities Service	237,146	0.00	0	11,667
Valley View Care Home	1,242,280	0.00	0	0
<b>RESERVE FUNDS</b>				
Ambulance Reserve	\$14,293	0.00	0	14,293
Equipment Reserve	\$40,900	0.00	0	40,900
Risk Management	\$105,720	0.01	1,057	0
Special Highway Improvement	\$194,061	0.20	38,812	172,955
Spec. Road & Bridge	\$3,770	0.20	754	3,770
<b>TOTAL</b>	<b>\$17,433,802</b>		<b>\$2,171,909</b>	<b>629,830</b>

Current account per capita operating expenditures:

a. including business portion: \$205.43

b. excluding business portion: \$178.88

City operating expenditures for businesses by size of firm: \$ 90.12 per employee  
(\$2,171,909 div. by 24,100 private sector employees)



**APPENDIX 6**

**AVERAGE IMPACT FEES IN U.S. COMMUNITIES  
ACCORDING TO NATIONAL SURVEYS**

<u>Type of Impact Fee for Single-Family Unit</u>	<b>Average National Surveys I (Nelson)<sup>1</sup> infl. adj.</b>	<b>Average National Surveys II (Center, FL)<sup>2</sup> 1990</b>	<b>Average Colorado Survey 1983<sup>3</sup> infl. adj.</b>	<b>Lowest Average</b>
Water Plant Investment Water Meter/Other Water Resource <b>TOTAL WATER CHARGE</b>	674	1,261	13,618	674
Sewer Plant Investment Sewer Connection <b>TOTAL SEWER CHARGE</b>	928	1,467	1,384	928
ROAD (street oversizing)	869	1,547	385	385
PARKS	769	526		526
OTHER PUBLIC FACILITIES		95	984	95
FIRE PROTECTION	273	135	194	135
POLICE	141	53	194	53
LIBRARY		86		86
BUILDING PERMIT/Building Fees	881		473	473
PLAN CHECK/Planning Fees	74		228	74
USE TAX on construction material			1,347	1,347
LAND DEDICATION (or fee in l			723	723
OFF-SITE STORM DRAINAGE	222		296	222
SCHOOLS	1,061	559		559
<b>TOTAL (Comprehensive Fee)</b>	<b>5,218</b>	<b>4,468</b>	<b>6,208</b>	<b>5,607</b>
<b>Type of Impact Fee for Industrial &amp; Comm.</b>	<b>industrial and commercial impact fees (50,000 sq.ft. facility)</b>			
Water Plant Investment Water Meter/Other Water Resource <b>TOTAL WATER CHARGE</b>	no data	39,959 blown up proport.	42,975	39,959
Sewer Plant Investment Sewer Connection <b>TOTAL SEWER CHARGE</b>		18,272 blown up proport.	11,115	11,115
ROAD (street oversizing)		92,017 ind+comm.	10,726	10,726
PARKS		no fee	no fee	
OTHER PUBLIC FACILITIES		3,983 ind+comm.	2,361	2,361
FIRE PROTECTION		7,450 ind+comm.	1,630	1,630
POLICE		4,117 ind+comm.	1,630	1,630
LIBRARY		no fee	no fee	no fee
BUILDING PERMIT/Building Fees			6,728	6,728
PLAN CHECK/Planning Fees			3,785	3,785
USE TAX on construction material			33,488	33,488
LAND DEDICATION (or fee in l			14,497	14,497
OFF-SITE STORM DRAINAGE			7,098	7,098
SCHOOLS		no fee	no fee	no fee
<b>TOTAL (Comprehensive Fee)</b>	<b>165,798</b>	<b>136,034</b>	<b>133,018</b>	

<sup>1</sup>Nelson, Arthur C., *Development Impact Fees: Policy Rationale, Practice, Theory, and Issues*. Chicago, 1988 (American Planners Association), p. 9.

<sup>2</sup>Survey by Center for Governmental Responsibility, University of Florida, *Growth Management Studies Newsletter*, June 1990, Vol. 5, No. 2.

<sup>3</sup>Comparative Impact Fees for Colorado Communities: City of Loveland, Service Cost Recovery System June 1983, p. 10-15.

**School District Sector Inputs**

One of the greatest impacts that new residents -- and their children -- will have on the community will be felt in local school districts, and the economic consequences associated with them represent the most sensitive set of variables within the Model. The following section outlines the variables within the Model which are used to measure the costs (expenditures) and benefits (revenues) relating to additional children in local public schools.

1) *Number of school children per new resident.* The Model estimates the number of new school children which will enter local public schools as their parents move to the Lawrence/Douglas county area. In calculating this figure, the Model relies upon data from the survey of new residents.<sup>14</sup> These results suggest that new residents have, on average, 0.53 children per employees in area public schools in 1990 and estimate 0.85 children (per employee) in 1995 (Table 5).

**Table 5**

**School Children in Local Public Schools:  
Ratios Per New Employee and Working Household Members**

	Per New Employee (total)	Per Working Household Member
School Children in 1990	0.53	0.35
School Children in 1995 <sup>1</sup>	0.85	0.56
<b>Average</b>		<b>0.46</b>

<sup>1</sup> expected number of children who will be enrolled in local public schools (K-12) in 1995 according to survey responses.

Source: 1990-1991 Survey of New Employees, IPPBR/KU.

The effect of new residents on the school district can be seen in the following example: if a new firm hires 100 production workers, seven will be new residents to the Lawrence/Douglas county area and 8 additional new residents move to the area to fill vacated jobs. Applying the ratios from the new employee survey, those new employees will have approximately 8 children -- on a per employee basis -- who will attend local public schools.

However, some of the in-migrants may have spouses or partners who also work, and when taking this into account, the fifteen new residents actually have about 5 children -- per working household member -- attending local public schools.

2) *Public education costs per student (in 1989-90).* The budget per pupil, or public education cost per student, is the school district's general fund expenditure for K-12, excluding capital outlays and special funds. For the 1990/1991 school year, the per pupil expenditure was equal to \$3,653.23.<sup>15</sup>

3) *Cost of capital expenditures to accommodate one new student.* School district capital expenditures have two components: a) remodeling/repair, and b) replacement/addition of school facilities. By allocating the cost of new school facilities to the new residents, the Model utilizes a long run average cost concept which assumes that the community will continue to experience reasonable growth within the future. This is similar to the approach employed in allocating city/county capital expenditures.

Calculating the cost of remodeling and repair per student is relatively straightforward; it equals \$58.56 per

<sup>14</sup>Upmeier, p 4.

<sup>15</sup>Division Director Business and Facilities, Lawrence Public Schools, 1991.

housing unit in the district.<sup>16</sup> In determining facilities' replacement costs, estimated school size and construction costs were utilized. On a per housing unit basis, then, the replacement cost of a new facility is \$6343.90.<sup>17</sup> From these calculations, the Model estimates that total capital expenditures per housing unit are \$6,402.50 per year.

4) **Property taxes related to new residents.** One main source of school district revenue is property taxes from the new firm and residences. The Model calculates the total property tax revenues which are forwarded to the district through two key components: a) the property taxes of the new firm, which are figured through the value of the firm's building, equipment, and land, and b) property taxes on the new residences. Determining the taxes on the firm is fairly straightforward; estimated property values are obtained through the firm. For new residents, however, the Model first computes the average value of their homes and then figures the appropriate property taxes.<sup>18</sup>

5) **State equalization aid per student.** State equalization aid is public education funding from the state of Kansas which seeks to "equalize" expenditures across all schools, regardless of wealth inequities. The estimate for the 1991/1992 school year is \$700,000 for the district, which is significantly lower than the previous school year (1990/1991 - approx. \$3 M).<sup>19</sup> When calculated for the 1991/1992 school year (8,590 students projected), state aid totals \$81.50 per student.

6) **State income tax return to school district due to new employment.** The state returns 25 percent of resident income tax receipts to school districts, and the increase in employment will also represent an increase in the amount of income tax revenues returned to the district. The projected figure for 1991/1992 school year is \$4,627,547.<sup>20</sup> For every new student, then, the district gains approximately \$538.71.

7) **Motor vehicle tax return to school district due to new employment.** County receipts from motor vehicle taxes are allocated to the school district. School district general fund revenues from this source are projected to total

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<sup>16</sup>Based on average annual district expenditure divided by housing units in the district (\$1,500,000/25,615). Figure includes repair on present facilities and site improvements; excludes new structures. Source: Division Director Business and Facilities, Lawrence Public Schools, 1991.

<sup>17</sup>The total sq. footage of Lawrence public school buildings is approx. 1,625,000 sq.ft.: high school (1) - 275,000 sq.ft.; junior high schools (3) - 90,000 sq.ft. each; and elementary schools (18) - 60,000 sq.ft. each. The total square footage is divided into the number of housing units in Lawrence (25,615) and multiplied by a school cost (including construction, land, and other costs) of \$100 per square foot. This figure equals \$6343.9 per housing unit.

<sup>18</sup>Average value of homes differs by occupational categories and salary levels. Housing factors, or the relationship between purchase price and income, are used to approximate value of residence. For the Model, the following factors have been used; under \$20,000 - 3.31; \$20,000 to \$30,000 - 2.61; \$30,000 to \$40,000 - 2.30; \$40,000 to \$50,000 - 1.92; \$50,000 and up - 1.52. Source: *Primary Income to Purchase Price for 1990: Lawrence Area*, Capitol Federal Savings.

<sup>19</sup>*Proposed School Finance Plan*, Kansas State Department of Education, 1991.

<sup>20</sup>Kansas State Department of Education, 1991.



\$2,663,870 in 1991/1992.<sup>21</sup> Each new student represents about \$310.11 in additional revenue.

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<sup>21</sup>Division Director Business and Facilities, Lawrence Public Schools, 1991.