Community Impact Model

Fiscal Impacts of Land Development

MODEL DESCRIPTION

By
Eben Fodor

FODOR & ASSOCIATES LLC
Community
Planning Consulting

Eugene, OR
www.FodorandAssociates.com

Final Draft
May 1, 2013

Contents

Introduction

Fiscal impact analysis is a tool for making better land use and urban planning decisions. The *fiscal impact* is the financial impact of a project, policy, or decision on one or more units of government. For local land use decisions, the impact on local governments (and local taxpayers) is typically the primary interest.

New urban development generates new revenues for local governments from new taxes and new fees and charges. However, local governments will also need to provide a menu of urban services to the development. New development requires expenditures for public infrastructure to expand the capacity of schools, roads, sewage treatment, water supply, police and fire protection, and so forth. Once built, this infrastructure will need to be operated and maintained. Will the proposed land use generate a surplus or a deficit for local governments?

The Community Impact Model provides a convenient and flexible tool for estimating both revenues and expenses generated by a proposed development. The model compares the anticipated costs and revenues to establish a net fiscal impact and produces a detailed report.

This document provides a description of how the model works. Instructions for using the model are available in a separate document called ***Model Instructions*** available for download on the FodorandAssociates.com website. The model itself incorporates basic instructions, along with additional documentation and explanation. For more information on fiscal impact analysis, see the *References* listed at the end of this document.

Features

The Community Impact Model (CIM) performs a fiscal impact analysis of development with a simple and easy-to-use interface that can be used by public officials, professional planners, community groups, non-profit organizations, and civic-minded individuals to quickly obtain an estimate of a proposed land development's likely impacts.

The model is intended to be a tool for helping decision-makers and the public understand a proposed development's likely impacts early in the decision-making process before significant resources are expended or commitments are made by the local government. It can also be used to inform public policy

decisions related to proposed land use changes, comprehensive plan amendments, and land conservation opportunities.

CIM quickly generates a reasonable estimate of the fiscal impacts of a proposed development or land use change on the local government. The model evaluates costs and revenues to determine the net impact. Any type, size, or combination of residential, commercial, industrial, and mixed-use development can be modeled. Once basic information about the development is obtained, the data can be entered and the modeling completed in under an hour.

The model does not require any special training or background by the user. To apply the model, the user completes highlighted entries to provide an essential description of the development characteristics. Guided by accompanying instructions, the user can customize settings and default values to reflect local conditions (taxes, fees, and services).

The model uses average service levels and costs for local governments from the ***U.S. Census of Governments Finance*** survey database. All operating costs and capital costs are included. The average operating costs are adjusted to reflect local wage rates, and are applied by the model on a per-unit-of- development basis. Revenue is calculated by applying the local property tax rate to the added value of the development. Impact fees (if any) are credited towards the development revenues. The model also credits development for its future share of tax revenues that will repay capital facilities bonds.

The model evaluates the direct impacts of a development on local governments and does not include secondary or induced impacts. The focus is on urban-type development occurring within municipal boundaries that requires a full menu of urban services, as opposed to rural development. Rural development has a different set of infrastructure requirements, with some services provided by the homeowner (septic system, water wells).

The model is intended to provide an initial estimate of the fiscal impacts of a land development proposal and is not intended for calculation of local development impact fees, or for any other legal purpose, which requires greater precision.

By making this model readily available and easy to use, past obstacles to performing fiscal impact analyses have been removed. The model is intended to promote better land use decision-making through a better understanding of fiscal impacts.

Estimating Methods

The local development proposal is characterized in the model by basic development parameters, such as the type and number of residential units and the total floor area for each type of commercial use. Local property tax rates and applicable impact fees (if any) are user inputs to the model.

To facilitate modeling, the model uses default values based on the typical characteristics for new development in the U.S. For example, house sizes and occupancy are assumed to be the national average for new homes based on the latest available data. National average building costs are used to estimate the value of the development for the purposes of calculating property tax revenues. The number of new residential occupants and new commercial employees is used to estimate the additional demand for public services. When development differs significantly from the typical characteristics, model default values can be adjusted accordingly.

Local government costs for providing 18 categories of public services are based on the actual national averages reported in the US Census Bureau's *Survey of Government Finance*. Average costs are adjusted based on local variations in government employee costs in each state. Other non-employee costs, such as office supplies, computers, police cars, and fire trucks are assumed to be fairly similar across the county.

The model assumes average levels of service are provided by local governments. Localities with higher-than-average or lower-than-average service standards will have accordingly higher or lower costs. For example, some local governments maintain higher park service standards with more parkland per capita. This will result in a higher cost to maintain this same standard for new development.

The model evaluates the impact of the proposed development by treating it as fully developed right away. This creates a useful scenario that is not complicated by phasing of development, delays, and uncertainty. The impacts can be evaluated in terms of current values, rather than future monetary flows. By examining a development scenario in terms of its impacts today, it is not necessary to rely on predictions and forecasts about growth, inflation, and market conditions. In reality, the pace of a development, and its ultimate completion, are rarely certain, so the model presents the most optimistic development scenario. The model results tend to be more intuitive, since they do not involve confusing cash flow tables.

The model evaluates direct impact (revenues and expenses) associated with a development, and does not include indirect, secondary, or induced impacts. This is standard practice for fiscal impact analysis. As an example of secondary

impacts, new commercial development may create new jobs which will be filled by newcomers. These newcomers may need new housing, which would generate secondary impacts. Also, the addition of new workers may cause nearby retail and restaurants to expand. As another example, the addition of a large retail facility may have the secondary impact of taking business away from existing retailers and causing stores to close, scale back their businesses, and reduce employees. New development can also impact nearby property values, causing them to go up or down and thereby impacting property tax revenues. If the secondary impacts are known, they can be modeled separately.

The model does not apply any "multiplier effects." Multipliers are used by some economists to model the effects of changes on the local economy, however they are generally not appropriate for fiscal impact analysis.

While the revenues and costs estimated by the model are intended to be representative, it is important to recognize that each local government is unique and has its own set of regulations, service-level standards, land costs, and materials and labor costs that will affect its revenues and its service and infrastructure costs. If a high level of precision is required, a detailed custom analysis may be necessary.

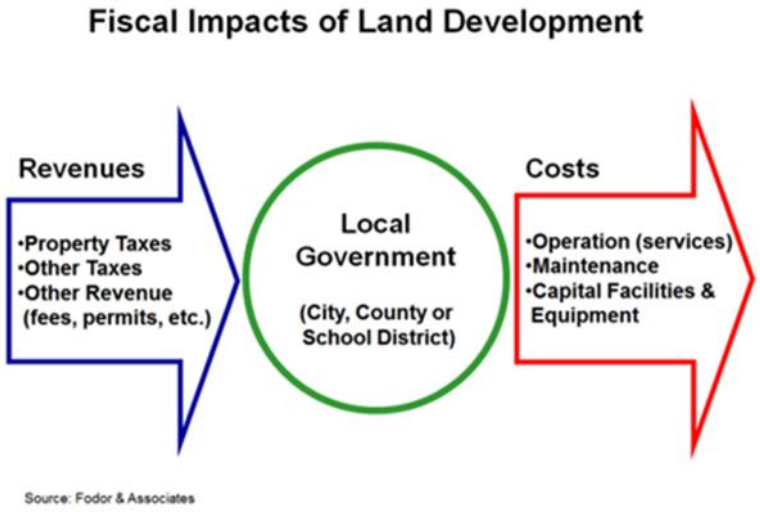
Certain unique development types may require special attention. For example, age-restricted housing for 55 and older residents should not add school-age children to the area, and therefore would generate no demand for school facilities or school operating costs. However, unless housing use is restricted by deed or legally-binding, permanent covenants, it could revert to market-driven housing at any time. The same caveat applies to houses built as "vacation homes." Such houses may be rented and occupied for only a fraction of the year, or they may become year-around, owner-occupied homes. Heavy industrial manufacturing can have unique characteristics that may not be properly reflected by the typical industrial classifications used in the model.

Local Government Impact

The model examines impacts on local governments. Local governments include the municipal government, townships, county government, school districts, and special districts. A complete description of the five types of local governments included in the model can be found in the Appendix (*Categories of Local Government*). Local governments do not include state and federal governments.

The basic elements of fiscal impact analysis are shown in Figure 1 (below). Revenues generated by land development are compared with costs to identify the net fiscal impact on local governments. Each category of cost and revenue shown in Figure 1 is described in greater detail later in this document.

Figure 1



Local public schools are commonly operated by independent districts, but they can also be operated by the city or county. In many areas, there are utility districts that provide regional public services, such as a regional wastewater treatment district or a municipal water service district. These local variations will not significantly affect the modeling, since the model is based on the provision of services, not on which district provides the service.

The model also includes services provided by the following types of local public utilities:

- Water Supply
- Sewerage
- Public Electric Utilities
- Public Gas Utilities
- Public Transit

These utilities are supported primarily by their fees and rates, rather than through local taxes. Utility revenues are usually sufficient to cover all costs (except for public transit utilities) and are included in the model to directly offset operating costs. In the model, the capital costs associated with expanding capacity to serve new growth are reported separately. This results in low (or even negative) apparent operating costs reported for these service categories. This reflects an accounting difference. The utilities are including some, or all, of their capital costs in their operating rates, rather than budgeting these cost separately and recovering these cost through connection fees and capacity charges to new development.

Some areas are served by private gas and electric utilities. Since these private utilities are not included in the local government finance data, the revenues and expenditures reported for public utilities will tend to be understated because they are distributed over a larger population base than they actually serve.

The model uses actual expenditure data for local governments, so it estimates the direct costs that local governments actually include in their budgeted expenditures. However, there can be unpaid (and unreported) costs associated with land development when local governments face fiscal shortfalls. These can be reflected in service reductions, deferred maintenance, inadequate infrastructure provision, and lowered service standards. Governments may also increase borrowing to overcome budget shortfalls, resulting in added financing costs that are carried forward into the future.

Types of Development Modeled

The model is capable of evaluating any type, size, and combination of development. It is intended primarily for residential and commercial types of development, and a full range of common subcategories is included. Several types of industrial development are also included in the model, however the impacts of heavy industrial development can be highly variable. The model's approach to residential and commercial development are described in detail in the following sections.

Residential Development

Residential development impacts are based on the number of typical new single-family detached dwelling units, or their equivalent. The demand for public services and facilities is based on the number of new residents likely to be associated with the new housing. A typical (median) new, single family detached house in the U.S. is reported in the *2011 American Housing Survey* as having 2,200 square feet on a 0.32-acre lot. The Census reports a similar figure of 2,233 square feet for new single-family houses sold in 2011.[1]

New houses are about 29% larger than the median for all houses.[2] Since the number of occupants in a housing unit tends to correlate with size of the housing

[1] Median and Average Square Feet of Floor Area in New One-Family Houses Sold by Location, US Census, Characteristics of New Housing, http://www.census.gov/construction/chars/completed.html.

[2] The median size for "all houses" from the ***2011 AHS*** also includes both new and existing houses, so the size difference between new and existing is understated.

unit, a new housing unit will tend to have more occupants, and therefore more impact, than an average existing housing unit. This is one reason why data from the Census for *average housing units* is not appropriate for evaluating the impacts of new housing.

According to the 2011 ***American Housing Survey***, new, single-family detached housing built within that past four years will have a median of 2.59 occupants. This figure is for occupied units only. When the vacancy rate applied by the model is taken into account (default vacancy rate is 5%) the median occupancy for all new single-family detached housing is 2.46 persons. This is the number of new residents assumed to be generated by new housing.[3]

Table 1

Median New Single-family Detached Housing Characteristics

Characteristic	Value	Units
Floor Area	2,200	Sq.ft.
Lot size	0.32	acres
Occupancy	2.59	people

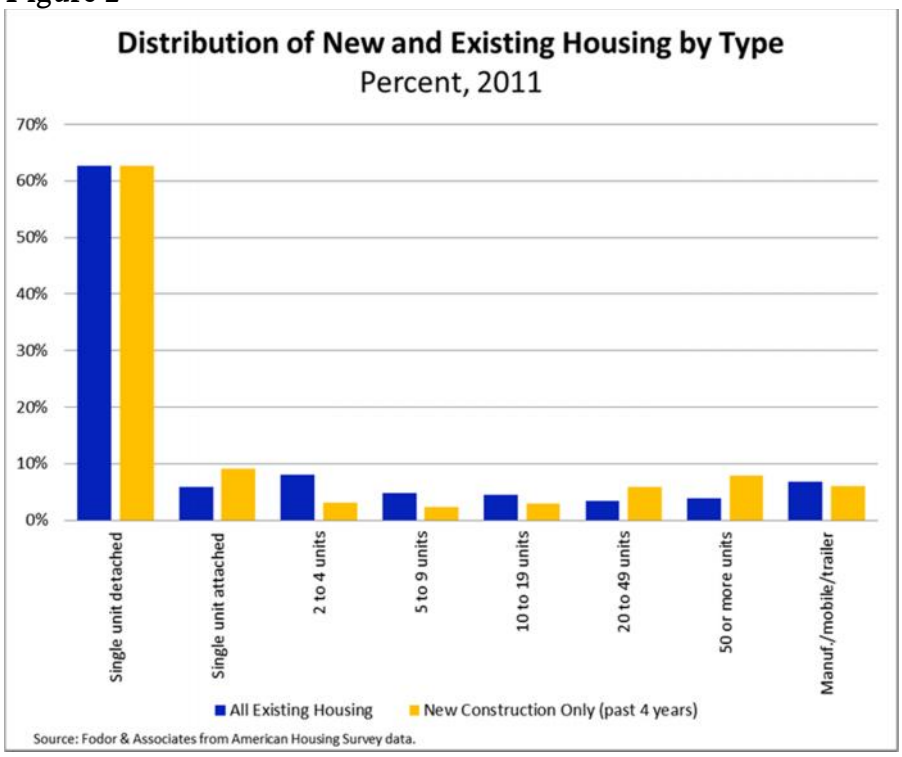
Source: 2011 American Housing Survey for new, occupied units constructed during past four years. Includes manufactured housing.

Single-family detached housing comprises 63% of both new and existing housing (see Figure 2). When combined with manufactured housing and mobile homes, this single-family-detached category represents 70% of all existing housing units and 69% of all new units built.[4] The single-family detached house is treated as a standard unit of housing for impact analysis purposes in this model and is referred to as an *equivalent dwelling unit* or *EDU*.

[3] While some new housing may be occupied by existing residents, the existing resident will vacate their previous local residence. Therefore, new housing adds new residential capacity to a locality, and is assumed to generate new residents.

[4] Source: ***2011 American Housing Survey***, General Housing Data – All Housing Units, Table C-01-AH, Released by U.S. Census on October 16, 2012.

Figure 2



Other types of housing, such as attached single-family (townhouses) and multi-family housing are modeled based on a percentage of the impacts of an EDU. According to 2008 Census data, attached single-family housing units are about 77% of the median floor area of detached units.[5] The model default value assumes single-family attached units are 0.8 EDU, or about 80% of the impact of a single-family detached unit.

The median size for a new multifamily unit is 1,124 square feet, which is slightly more than half (51%) the size of a single-family detached unit.[6] Multifamily units built for renting are slightly smaller (1,117 ft2) than those built for sale (1,326 ft2). The model default assumes that a multifamily unit is 0.6 EDU, or about 60% of the impact of a single-family detached unit.

The assumed impacts of various types of housing relative to an EDU are shown in Table 2. If necessary these values can be adjusted in the model *Default Values* tab, as described in the *Model Instructions*.

[5] 2008 was the last year for which the US Census published data for new single-family housing based on whether they were attached or detached units.
[6] Source: *Median and Average Square Feet of Floor Area in Units in New Multifamily Buildings Completed*, U.S. Census, http://www.census.gov/construction/chars/mfu.html.

Table 2

Equivalent Dwelling Units
Model Input Assumptions (default)

Housing Type	EDU
Single Family Detached	1
Single Family Attached	0.8
Multifamily	0.6

Commercial Development

The term "commercial development" is used here to refer to all non-residential development and would include all types of retail, services, lodging, office buildings, movie theaters, medical offices, warehouses, industrial parks, and manufacturing. Public buildings and facilities are not included in commercial land uses, even though they are technically non-residential development.

This model uses information about the type of building and the total floor area to generate estimates of demand for local government services and facilities. The model estimates the number of employees generated by the development based on building use and floor area using typical employee/sq.ft. data.

For the purposes of matching building floor area to local government costs, total non-residential building floor area was estimated at 84.8 billion square feet in 2007 to correspond with the ***2007 Census of Governments Finance*** survey year, as shown in Table 3. The national average floor area per full-time employee is 700 square feet for all building types (see Appendix: Commercial Buildings Included in Model).

Table 3

Total Non-Residential Building Floor Area
Thousands of Square Feet

Non-Residential Building Category	Floor Area in Study Year	Population-Weighted Adjustment to 2007	Estimated 2007 Floor Area
All Commercial Buildings, 2003	71,658,000	1.038	74,405,500
All Manufacturing Enclosed Structures, 2006	10,274,000	1.010	10,372,178
Total			**84,777,678**

Source: Fodor & Associates from U.S. Energy Information Administration building survey data. Most recent available survey years were used. Data were adjusted from the indicated survey years to 2007 based on population growth over the same time period.

The model estimates demand for local government services and facilities based on the number of new employees generated by commercial and industrial development. The model uses information about the building uses, the total floor area for each use, and data for typical employees per 1,000 square feet, to generate an estimate of the number of new employees added by the development. Floor area per employee figures for all common commercial and industrial building uses are reported in the model, along with reference sources, in the *Com/Ind Inputs* tab.

Local government's cost per employee to serve new commercial and industrial development is based on the total national employment of 146 million in 2007, corresponding to the 2007 survey year for the ***Census of Governments Finance***. Employment data is from the Bureau of Labor Statistics' ***Labor Force Statistics from the Current Population Survey***.

Cost Allocation Between Residential and Commercial

The costs for local government services must be allocated between residential and commercial land uses. This can be done in a number of ways. Some services, such as fire protection, can be reasonably allocated based on buildings and structures. Police protection can be allocated based on where people are over the 24-hour day. Transportation system costs can be based on the expected travel demand generated by each specific type of land use. Travel demand is reflected in daily vehicle miles traveled (VMT). Some services, such as schools, parks, and libraries, are traditionally allocated only to residential land uses, even though some benefit does accrue to commercial land uses. Various sources were consulted for determining the appropriate allocation of costs between residential and non-residential (commercial and industrial) land uses.

The relative amount of total building floor area can provide an indication of the demand for certain services. As shown in Table 4, residential buildings totaled 223.9 billion square feet in the U.S. in 2009 and comprised about 72% of all building floor area. Commercial buildings represent 24% of the floor area and, when combined with manufacturing, make up the "non-residential" land use category, comprising 28% of total building floor area.

Table 4

Relative Share of Residential, Commercial & Industrial Building Floor Area in the U.S.

Thousands of Square Feet

Building Type	Total Floor Area	% of Total
All Residential Buildings 2009	223,900,000	**72.2%**
All Commercial Buildings (adjusted to 2009)[1]	75,773,985	**24.4%**
All Manufacturing Buildings (adjusted to 2009)[1]	10,562,945	**3.4%**
Total	310,236,931	100.0%

Source: Fodor & Associates from U.S. Energy Information Administration survey data for all U.S. buildings.
(1) Data from older surveys was adjusted to the most recent 2009 residential survey based on U.S. population change. The 2003 commercial building data reporting 71,658,000 kft2 was adjusted based on population growth from 2003 to 2009. The same procedure was applied to the 2006 manufacturing survey figure of 10,274,000 kft2. Manufacturing buildings include floor space for enclosed structures.

The relative land area devoted to various land uses can provide a reasonable basis for allocating certain service costs. The 2004 American Planning Association publication, ***Planner's Estimating Guide: Projecting Land-Use and Facility Needs*** cites a study from 1992 allocating land uses for large and small cities.[7] According to this source, residential land uses take up 71-75% of the land area, with the balance in non-residential uses. It appears from this data that smaller cities (under 100,000 population) have a slightly higher share of commercial land than larger cities, but the difference is small. This source reports a greater share of land used for public purposes (31-32%), which may be due to the fact that rights-of-way for streets, alleys, and utilities have been included as public uses.

Table 4A

Land Use Distribution by City Size

Percent of Land Area, 1992

	Percent of Total Land Area			Percent of Non-Public Land Area	
City Population	Residential	Com/Ind	Public Use	Residential	Com/Ind
<100,000	52%	17%	31%	75%	25%
>100,000	48%	20%	32%	71%	29%

Source: Fodor & Associates from data in Planner's Estimating Guide: Projecting Land-Use and Facility Needs, by Arthur C. Nelson, Planners Press, American Planning Association, Chicago IL, 2004, 183 pages (p 14).

Note: Public use includes public rights-of-way.

As part of a comprehensive plan update in 2009 the City of Eugene, Oregon, performed an inventory of current land uses. As shown in Table 5, public parks, open spaces, and public facilities occupied 4,043 acres, or 12% of the total land

[7] ***Planner's Estimating Guide: Projecting Land-Use and Facility Needs***, by Arthur C. Nelson, Planners Press, American Planning Association, Chicago IL, 2004, 183 pages (p 14).

area. Of the remaining non-public land uses, 73% was residential and 27% was commercial and industrial.

Table 5
Residential versus Non-Residential Land Use
Eugene, Oregon, 2009 (Population 179,338)

Category	Current Acres	Percent of Land	Percent Non-Public Land
Residential	22,154	64%	**73%**
Commercial & Ind.	8,247	24%	**27%**
Parks & Public	4,043	12%	NA
Total:	34,444	100%	100%

Source: Fodor & Associates from ***Eugene Comprehensive Lands Assessment*** (ECLA), Buildable Lands Inventory, Final Report, Lane Council of Governments, 2009.

A study performed for the City of Austin's municipal water utility in 2009 found that residential water users consume about 67% of the water delivered by the utility to non-government customers (see Table 6).[8] Commercial customers consumed the remaining 33% of water. A study for Lincoln, Nebraska, reported that residential water users also represent 67% of peak day water demand.[9]

Table 6
Allocation of Water Use in Austin, TX

Customer Class	Estimated Annual Water Sales, Kgal	Percent of Sales
Residential	27,747,224	**67.3%**
Commercial	13,493,324	**32.7%**
Total Non-Government	41,240,548	100.0%

Source: Fodor & Associates from ***Austin Water Utility Cost of Service Rate Study 2008***, by Red Oak Consulting, August 2009, Table B-1.

For new development in Austin, residential land use represents approximately 70% of the land area and non-residential development represents 30%, according to one municipal report.[10]

[8] Source: *Austin Water Utility Cost of Service Rate Study 2008*, by Red Oak Consulting, August 2009, Table B-1. Austin Water Utility also sells water to other local governments and to the University of Texas which was not included in the this allocation.
[9] ***Infrastructure Financing Study: Capital Cost of Growth***, Memorandum by Duncan & Associates, for City of Lincoln, Nebraska, 2000, 61 pages (page 13).
[10] Cost allocated based on 70/30 residential/non-residential land use split from *SH 130 Infrastructure District Report*, City of Austin, January 26, 2006, page 1-6.

Development impact studies often determine allocation of local government services between residential and non-residential uses by calculating the distribution of where people spend their time. This method estimates the total hours people spend at homes and at jobs for a given location. A 2009 study of Boulder, Colorado, found that 72% of municipal cost should be allocated to residential development and 28% allocated to non-residential development.[11]

Another way to allocate service costs is by relative value of each land use category. This might be most appropriate for services where property value is a consideration, like fire protection. Property values in the City of Austin show that the total value of residential property (land and buildings) is about equal to the value of non-residential property (see Table 7). Because Austin serves as the commercial center for a larger area, relatively more residential property value exists outside the city limits. Property values for all of Travis County, which includes Austin and some smaller cities, show a higher percentage of residential property value (57%) compared with non-residential (43%).

Table 7
Relative Share of Property Values

City of Austin, TX, 2010

	Residential	Non-Residential	Combined
Land Value	$13,881,690,726	$14,608,209,742	$28,489,900,468
Improvement	$24,448,141,831	$23,494,964,153	$47,943,105,984
Total	$38,329,832,557	$38,103,173,895	$76,433,006,452
Percent of Combined	**50%**	**50%**	100%

Travis County, 2010 (includes Austin)

	Residential	Non-Residential	Combined
Land Value	$21,653,457,701	$18,952,443,756	$40,605,901,457
Improvement	$41,255,083,973	$27,695,724,601	$68,950,808,574
Total	$62,908,541,674	$46,648,168,357	$109,556,710,031
Percent of Combined	**57%**	**43%**	100%

Source: Fodor & Associates from TCAD 2010 Certified Totals for Austin and Travis Co., dated 12/17/2010.

Similar results for the distribution of property values in Lane County, Oregon (which contains the cities of Eugene and Springfield), are shown in Table 8.

[11] ***Development Impact Fee Study***, by TischlerBise, for City of Boulder, Colorado, January 8, 2009, 67 pages (page 33).

Table 8

Relative Market Values of Residential and Commercial Land in Lane County, Oregon, 2012

(Includes Cities of Eugene and Springfield)

Values	Residential	Comm./Industrial	Combined
Land	$5,535,870,656	$3,747,132,844	$9,283,003,500
Improvements	$10,573,892,874	$8,676,225,170	$19,250,118,044
Total	$16,109,763,530	$12,423,358,014	$28,533,121,544
Percentage of Combined	**56%**	**44%**	100%

Source: Fodor & Associates from Lane County Department of Assessment and Taxation, Tax Reports, Table 7a for tax year 2012-13

There are some public services in which the property-value allocation of services does not seem to be the best approach. In the case of fire protection, response time guides most fire station siting decisions. Response time is dependent on proximity and proximity is more a function of land area than property value. For services like public safety that are directly related to the presence of people, the fact that commercial property tends to be occupied less than does residential property skews the demand towards residential uses.

Based on this research and review of literature, a simple 70-30 (residential-non-residential) split of cost is used for all services and facilities shared by both residential and non-residential development. School cost are attributed 100% to residential development by convention. Similarly, parks and recreation costs, library cost, and public health/housing/welfare costs are attributed entirely to residential development. Table 9 summarizes how the costs associated with each type of local government service and facility are allocated between residential and non-residential (commercial & industrial) land uses in this model.

Table 9

Allocation of Costs for Public Services and Facilities Between Residential and Non-Residential Land Uses for Impact Model

	Type of Service/Facility	Residential Share	Comm/Ind Share
1	Schools (K-12)	100%	0%
2	Roads and Highways	70%	30%
3	Police Protection	70%	30%
4	Fire Protection	70%	30%
5	Parks & Recreation	100%	0%
6	Natural Resources	70%	30%
7	Libraries	100%	0%
8	Solid Waste Disposal	70%	30%
9	Corrections & Jails	70%	30%
10	Public Health/Housing/Welfare	100%	0%
11	General Government & Admin.	70%	30%
12	Public Hospitals	70%	30%
13	Water Supply	70%	30%
14	Sewerage	70%	30%
15	Public Electric Utilities	70%	30%
16	Public Gas Utilities	70%	30%
17	Public Transit	70%	30%
18	Other Miscellaneous	70%	30%

Source: Fodor & Associates, Community Impact Model, 2013

Local Government Cost Data

The Model uses the latest complete survey from the ***U.S. Census of Governments: Finance*** for the 2007 survey year to estimate local government operating and capital costs. This is the most comprehensive data source available on actual local government revenues and expenditures. A detailed description of this data source, and why it was selected, is provided in the appendices. The 2007 costs were adjusted to 2013 values using the Consumer Price Index (CPI). The same CPI adjustment value was applied to both operating and capital costs to maintain uniformity.[12]

The costs for all types of local governments are included in the model. State and federal government revenues and expenditures are specifically excluded from the model so that only local impacts would be calculated. In reporting only local

[12] The CPI-U for all urban consumer was selected as the broadest inflation index available. Capital costs for facilities could have been adjusted separately with the ENR Construction Cost Index. This would have increased capital costs about 5% more over the same period (2007-2013).

government costs, the model does not report the full cost of providing public services and facilities to new development. For example, local governments pay only about one-third of the total cost for building new local roads and less than half the cost of operating local schools, with state and federal governments funding the balance.

The model reports only the costs to local governments that are paid locally. State and federal governments also give money to the local governments to spend. These are classified as "intergovernmental transfers." State and federal governments fund about one-third of the total cost for providing the public services included in this model. However, all of the intergovernmental revenues from state and federal governments are subtracted from the local government expenditures in the model so that only direct local expenses are reported. For example, state government provides about 44% of the cost of elementary and secondary education and the federal government provides about 12%, so local governments directly fund the remaining 44 percent. Only the locally-funded 44% of the total school cost is reported.

The Model compares local government costs with the direct local revenues from property taxes. Property tax revenues are calculated and reported for each local taxing jurisdiction based on the tax rate and the estimated value of the development. Revenues from income and sales taxes that are collected from new development by state and federal governments and re-distributed to local governments are classified as "intergovernmental transfers" and are specifically excluded from the model. This maintains a consistent accounting framework for fiscal impacts that includes only local, direct costs and local, direct revenues for each service category.

Service Categories

The *Census of Governments Finance* specifically breaks out 20 categories of local services and reports expenditure and revenues. Eighteen of these categories of services were included in the model (see Table 10). Two of the 20 categories were excluded from the model because they were considered regional, or non-local, in nature: airports and higher education (universities and community colleges). Of the 18 categories included, five are technically considered utilities: water supply, sewerage, public electric, public natural gas, and public transit. Each of these five utilities generates revenues from rates and fees that fund most, or all of the costs. This differs from the other 13 service categories which are funded primarily by taxes (K-12 Schools, Roads and Highways, Police Protection, Fire Protection, Parks & Recreation, Natural Resources, Libraries. Solid Waste Disposal, Corrections & Jails, Public Health/Housing/Welfare, General Government & Administration, Public Hospitals, and Miscellaneous Other). Stormwater management is not reported individually in the Census data, however it is

included primarily under the *Sewerage* category. Some stormwater management costs (such as flood control) are included under *Natural Resources*.

Table 10
Categories of Public Services and Facilities Included in Community Impact Model

	Type of Service/Facility	Service Included?	Facilities Included?
1	Schools (K-12)	Yes	Yes
2	Roads and Highways	Yes	Yes
3	Police Protection	Yes	Yes
4	Fire Protection	Yes	Yes
5	Parks & Recreation	Yes	Yes
6	Natural Resources	Yes	Yes
7	Libraries	Yes	Yes
8	Solid Waste Disposal	Yes	Yes
9	Corrections & Jails	Yes	Yes
10	Public Health/Housing/Welfare	Yes	Yes
11	General Government & Admin.	Yes	Yes
12	Public Hospitals	Yes	Yes
13	Water Supply	Yes	Yes
14	Sewerage (including Stormwater)[1]	Yes	Yes
15	Public Electric Utilities	Yes	Yes
16	Public Gas Utilities	Yes	Yes
17	Public Transit	Yes	Yes
18	Other Miscellaneous	Yes	No

[1] Stormwater management functions are not broken out by the ***Census of Governments***, but are included under the *Sewerage* and *Natural Resources* categories.

Deducting Non-Tax Revenues

Most of the public services have some non-tax revenues associated with them, such as park entrance fees, landfill dumping fees, hospital charges, school lunch revenues, and building permit fees. All of the non-tax revenues for each of the 18 service categories were deducted from the costs to calculate the net costs for each category. For the five utility categories, revenues include the rates charged to customers. Since utility rates are typically set to recover costs, the net costs are likely to be close to zero. Since this model separates capital cost from operating costs, the model may show some utilities with an apparent negative operating cost, or an operating surplus. This is because utilities usually include capital costs in their rates. However, the model assigns a portion of these capital cost to capacity increases required by new development.

Costs

Local government costs are incurred in two basic categories:

1. **Capital Costs**: Initial, one-time costs for the increment of new or expanded capital (facilities, infrastructure and equipment) necessary to provide adequate levels of service to the development; and,

2. **O&M Costs**: Annual costs for operation and maintenance (O&M) of the services provided to the development.

Each of these cost categories is described in more detail below, along with a description of the methodology used by the model for calculating them.

Capital Costs

The public infrastructure improvements required by new development include the incremental additional capacity for all the types of capital facilities required to meet the development's needs. Only offsite facilities are included in the model, since these are what local governments fund. Onsite facilities, such as local streets, sidewalks, and water/sewer lines are part of the development and are typically funded by the developer. Seventeen infrastructure categories are included in the model, as shown previously in Table 10.

Only capital costs for capacity-increasing facility expansions are included, since facility maintenance and replacement is considered part of the operations and maintenance (O&M) budget. Also, only costs paid by the local government are included in this model. For example, local roads get most of their funding from state and federal sources, but only the local (city and county) contribution is estimated by the model.

Infrastructure costs are based on the current cost of constructing the additional increment of system capacity required by the development. While each new development may not require expansion of all types of facilities, it does place additional demand on the system and the proportional share of facility cost can be calculated to meet the new demand. For example, each typical new house will require local governments to provide additional water treatment capacity, sewage treatment capacity, road capacity, school capacity, and so forth.

In some cases local governments have additional capacity in their systems to accommodate new growth, known as "excess capacity." Such capacity is really not "excess" at all. Taxpayers have already paid to build it and finance it so that

it can be ready and available to serve the new development. The value of this excess capacity can be captured by estimating its full, non-depreciated, replacement value today.[13] This replacement value is essentially the same as the cost for new facilities, so there is no need to distinguish in this model between infrastructure for which there is extra capacity and that for which there is not.

What about situations where there is already insufficient capacity? When a city already has inadequate capacity for a certain type of infrastructure, such as roads or parks, this is indicative of a fiscal imbalance whereby past development has not contributed sufficient revenues to assure adequate infrastructure provision. In such cases, the demand placed by the new development should be based on the existing service level, even if it is inadequate. The rationale for this is that it is improper to charge new development for a higher standard of service than local government is currently maintaining.

Growth-Related Capital Costs

Most local governments perform capital facilities planning, but few keep track of which capital expenditures are made to serve growth (through expanded capacity) and which are for maintenance or repair of existing facilities. Due to this lack of this specific accounting, it can be difficult to know which portion of capital expenditures by local governments are growth-related and which should be included with O&M. Generally, if a capital expenditure is made to increase capacity, it is a growth-related expenditure. In the case of roads, this would include new roads, added lanes, and capacity-increasing improvements such as new turn lanes, intersection upgrades, and new signalization. It would not include re-surfacing or repairing an existing road, which is considered a maintenance expenditure. Capital expenditures made to upgrade service standards that do not increase capacity would not be considered growth-related. For example, adding curbs and gutters to an existing road improves the service standard of the road, but does not necessarily increase its capacity.

The question of what constitutes a growth-related capital expenditure can be clarified by considering which capital expenditures would still be required if a locality had no growth at all. These repair, remodeling, and replacement expenditures will be the *maintenance* expenditures. Sometimes this question is confused when a local government assigns capital expenditures to meet the needs of past growth. The fact that a local government is retroactively funding the needs of growth is an indication of a fiscal imbalance. Unless the local government has adopted new revenue policies to address the shortfall, this

[13] Public facilities can be treated as perpetual assets because, one constructed, the public will maintain and replace them indefinitely. The cost of replacing an existing facility is not considered a growth-related capital expense and it technically part of O&M.

imbalance will likely continue and growth infrastructure will be funded in arrears. The only time these expenditures for past growth should not be treated as growth-related, is when the local government is performing a study or calculation to establish a new impact fee that will recover the full cost from future development.

There are various alternative methods for calculating the capital costs associated with new development. If both the capital cost and the capacity of a new facility are known, it is possible to determine the cost per unit of capacity. For example, if a new middle school costs $30 million to build, furnish, and equip (including land value) and has a capacity of 500 students, then the cost per student is $60,000. If demographic data show that the average new house generates 0.5 new public school students, then the cost for providing the school capacity to serve the house is $30,000 (0.5 x $60,000). This same technique can be applied to each type of public infrastructure based on recent facility costs.

In order to use the Census of Government: Finance data, it was necessary to estimate the portion of capital expenditures that is typically growth-related. Numerous sources were consulted to establish reasonable parameters, and various local government budgets were analyzed to how actual governments were spending their capital budgets. While most local governments were found to use a majority of their capital outlays for growth-related expenditures, the percentage for a given locality can vary significantly. The sources examined showed that local governments spend about 58% to 92% of capital budgets on growth-related, capacity increasing investments (see Appendices). This percentage will significantly affect the capital costs assigned to growth by the model.

Rather than pick from a range of possible percentages, this figure was selected so that the percent of capital costs allocated to growth matched the calculated costs for the most expensive public infrastructure category by far: schools. Cost data for building new schools was collected from around the country and analyzed to determine a reasonable school facility cost to associate with a typical new house, as described in the next section.

School Facility Costs

Schools are the single most expensive category of public service with regard to both facilities and school operations. For this reason, school facility costs were used to calibrate the Model in terms of the portion of the capital budget that is treated as capacity-expanding or growth-related (rather than as an operating cost).

School costs are allocated entirely to residential development for fiscal impact analysis purposes. New housing units are assumed to generate new students

based on typical demographics. New housing creates a perpetual demand for additional school capacity based on the number of school age children that can statistically be expected to live in the housing.

Based on data from the ***2011 American Housing Survey***, new housing units are 26% more likely to have children under 18 years old than the average housing unit. New housing units built in the last four years had 22% more children than the average for all houses. This correction is applied to average demographic data for housing in order to correctly estimate new student generation data from new residential construction.

Average demographics for new housing units will include a mix of housing types, as reported earlier. Therefore it is necessary to estimate the relative demographics for each housing type: single-family detached; single-family attached; and multifamily. The Model uses the single-family detached housing unit as the reference unit for impact analysis. It is referred to here as an equivalent dwelling unit, or EDU.

By adjusting for private school attendance and the vacancy rate in new housing, it is possible to estimate the number of school age children generated by residential development. About 10% of school age children attended private schools in 2010, according to the National Center for Education Statistics.

Capital costs per additional student are based on the total cost for a new school divided by the design capacity of the school. Capital costs include the building design and construction, land, furnishings, and equipment. As shown in Table 11, building costs vary by school level. There is also variability around the country, as shown by the high and low quartiles.

Table 11
Building Costs for Schools Completed in 2011

	Building Cost, $ Per Student Capacity		
School Level	National Median	Low Quartile	High Quartile
Elementary Schools	$24,000	$19,871	$32,170
Middle Schools	$28,182	$19,747	$41,207
High Schools	$35,833	$27,826	$44,444

Note: Costs are for buildings and do not include capital costs for land, equipment, and furnishings.
Source: *2012 Annual School Construction Report*, February 2012, School Planning & Management, Table 5.

Using various capital cost sources for new school facilities, the total capital cost for schools (including land costs) ranges from about $32,000 to $58,000 per new student in 2013 dollars. Based on 0.56 public school students per EDU, the

school facility cost per new EDU ranges from about $18,000 to $32,000. The Model was calibrated to reflect the lower end of this cost range with a value of $22,600 per EDU. This adjustment is achieved by allocating 40% of all school capital expenditures to new, capacity-expanding facilities required to serve growth. The remaining 60% of the capital expenditures are then allocated to O&M costs and assumed to be for facility maintenance, repair, and replacement.

In some states, state governments contribute toward capital costs for schools. A limited review of these programs found that state contributions were often sporadic and unpredictable. State contributions may be limited to a single, one-time bond issue made by the legislature in an effort to address an urgent backlog of capital needs. Some states match 15% to 20% of the local school district's capital costs. As a result of this review, the Model assumes all capital costs for schools are funded locally and does not apply any credit for state contributions towards capital costs.

Electric Utility Capital Cost

The actual capital costs for electric generation facilities will tend to be higher than reported in the model. This is because new power generation capacity is often built by private-sector businesses and the power is sold to the public utilities. Thus, the capital costs are buried in the electricity costs paid by the utilities and are therefore not reported in the ***Census of Governments*** survey as capital outlays. As a result, growth-related capital cost will be underreported.

Capital Cost Offsets

The capital infrastructure costs required to serve a new development are commonly offset by two potential revenues (or credits). One is the impact fees (if any) paid by the developer, which are directly deducted from capital costs. This is straightforward, since impact fees are charged specifically to recover these costs directly from new development. The model facilitates this credit by providing a user input for the impact fee revenues that the development is expected to generate. These are automatically subtracted from the capital costs in the *Output Report*.

The other offset is the portion of future tax payments made by the new development that should be applied towards repayment of the bonds issued to pay for the capital improvements associated with the development. If there is an impact fee for the category of infrastructure under consideration, and the fee is designed to recover the full cost, and it is properly calculated and implemented, then it will already contain a credit for future tax payments that go towards

repayment of capital facility bonds. The model assumes this is the case and applies a credit for future tax payments in all instances.

There is some variation in the methods described in the literature and in planning practice for calculating the credit for future tax payments toward capital cost repayment. Some of these methods grossly overstate the credit. This may be due to either overly-simplistic analysis or to political influence from the development industry to reduce the impact fee amount.

With conventional capital financing, general obligation bonds are used to fund all major capital improvements. The bonds are repaid through property taxes paid by all property owners within the local government's jurisdictional boundaries. These bonds are typically repaid over 20 years and interest is paid along with principal, just like a home mortgage.

The contribution of new development (via its property taxes) toward repayment of these bonds will be quite modest. This is because the entire tax base of the community is used to repay the bonds. As a result, the contribution of any new development will be equal to its share of the tax base. In any given year, the new development will typically represent only about 1% to 2% of the total tax base, assuming a local growth rate of 1% to 2% per year. Existing development will repay the balance, or roughly 98% to 99% of the debt generated by new development. At the national level, growth has been about 1% a year or less. The model uses a 1% growth rate as the default for estimating this credit. The credit is applied in Table 6 of the *Output Report* tab and is listed as "Credit for Future Bond Repayment."

Service Costs (Operations and Maintenance)

Operations and maintenance (O&M) costs are those annual local government costs associated with providing ongoing public services and may also be referred to simply as *service costs*. Future O&M costs are often based on recent per-capita or per-unit service costs. These cost rates are then applied to the number of people or housing units a prospective development will bring to estimate the likely new costs. Of course this approach assumes that the per-capita costs will remain constant. This is a fairly reasonable assumption in the near term, but may tend to understate costs in faster-growing areas where the per-capita service costs can sometimes rise dramatically over time.[14]

In the model, service costs are calculated based on the Census of Governments Finance data for all local governments. Costs are divided between residential and commercial land uses, as described previously. Residential service costs are calculated on a per-capital basis and assigned to new residential development based on the number of new residents generated. Commercial service costs are calculated on a per-full-time-employee basis and assigned to new commercial development based on the estimated total full-time employees generated.

Local Operating Cost Adjustment

All service costs are adjusted by the model to reflect local variations in costs for public employees. The model uses the state where the development is located to look up the appropriate employee cost adjustment to apply. This cost adjustment is based on the actual average employee pay for local government workers in each state from the ***2011 Annual Survey of Public Employment and Payroll*** by the U.S. Census Bureau.[15] Wages and salaries were found to represent 43% of local government operating costs, so this portion of the operating cost is adjusted to better reflect local costs. Other types of non-employee operating costs tend to be less variable. For example, the costs for office supplies, computers, office equipment, vehicles, and fuel tend to be fairly similar across the country.

---

[14] In fast-growing Loudon County, VA the per-capita operating costs for public works functions increased 353% in 12 years from 1985 to 1997 according to ***Developments and Dollars: An Introduction to Fiscal Impact Analysis in Land Use Planning***, Natural Resources Defense Council, New York, 2000, Chapter 4.

[15] Excel Table titled: *Local Government: Employment and Payroll Data, By State and by Function: March 2011*.

Schools (K-12)

Local governments fund only about 44% of the $10,652 per year average cost per pupil to operate public schools, according to the National Center for Education Statistics for fiscal year 2010.[16] The rest of operational funding comes from the state (44%) and federal (13%) governments. These operating expenditures reported by the NCES do not include any capital costs. As noted previously, the Model allocates a portion of capital expenditures to growth-related improvements, and the remainder is added to the operating budget as facility repair, maintenance, and replacement costs. The result is that the total annual operating cost is higher than the $10,652 cost per pupil, however, only the locally-funded component of this cost is reported in the Model.

[16]The Model adjusts all cost to 2013. Source: ***Revenues and Expenditures for Public Elementary and Secondary Education: School Year 2009–10***, National Center for Education Statistics, Table 3, http://nces.ed.gov/pubs2013/2013305.pdf.

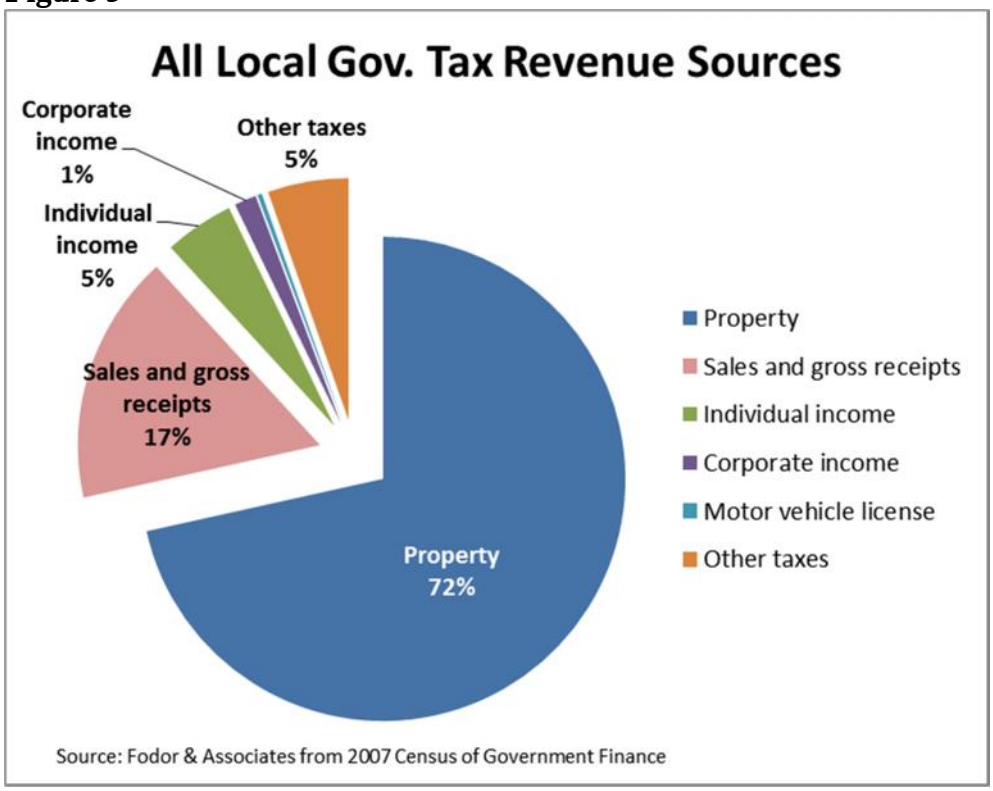
Revenues

Local government revenues consist of property taxes, other taxes, and other non-tax revenues. The model includes revenues from property taxes and accounts for other non-tax revenues in calculating the cost of services. Other taxes may include the local-option portion of any sales or income taxes.

Property Tax Revenue

Property taxes are the primary source of local government tax revenue, representing 72% of all local tax revenues (see Figure 3). Property taxes may also be referred to as "ad valorem taxes." Property taxes are assessed based on the real estate value of the property.

Figure 3



Property tax revenue estimates calculated by this model are based on the taxable value of the proposed development and the local assessment rate. Land value may be included as part of the development value in the model for revenue estimating purposes. The model default is to exclude land values, because the land value may not technically be created by the development.

The value used by local governments to calculate local property taxes is either the actual market value of the property, or an *assessed value* which reflects an adjustment of the real market value for tax assessing purposes. The model provides an input for a *Property Tax Assessment Ratio* in order make the proper correction for areas that do not use actual property values.

Some jurisdictions have a *homeowner exemption* for owner-occupied residential property tax assessments that deducts a fixed amount of valuation from taxation (such as the first $50,000 in value). If there is a homeowner exemption and the development is to contain owner-occupied homes that will qualify for the exemption, this can be included in the model.

Estimated market values for residential development are based on a cost-per-square-foot for the building, combined with a cost per acre for the land. Data from the US Census shows that the median value of a new single-family detached house in 2010 was $77 per square foot of floor area.[17] This figure varied by region from $72/ft2 in the South to $108/ft2 in the Northeast. A default value of $85 per square foot is used by the model. Land values vary widely, so the model default land value of $100,000 per acre may need to be adjusted if land values are to be included in the analysis.

The model's default values for residential buildings and land result in total property value for an EDU of $219,000 (see Table 12). This figure is comparable to the median sale price for new homes in the most recent 2011 Census data of $212,300.

Table 12
Property Value of Typical New Single-Family Detached House

Cost category	Area	$/area	Cost
Building Cost (square feet)	2,200	$85	$187,000
Land Cost (acres)	0.32	$100,000	$32,000
Total Cost per EDU			**$219,000**

The model estimates property tax revenues from new development by applying local property tax rates (user inputs) to the assessed value of the development. The assessed values is the estimated market value, multiplied by any tax assessment ratio, less any applicable homeowner exemptions. Development value is based on a typical building cost per square foot and can be adjusted in the *Default Values*.

[17] Based on 2010 data from *Median and Average Price per Square Foot of Floor Area in Detached New Single-Family Houses Sold by Location* by the U.S. Census. Average 2010 price was $83 per square foot. http://www.census.gov/const/C25Ann/soldmedavgppsfdetach.pdf

The model includes property tax revenues for each category of local government, including school districts and special districts. To model revenues correctly, only tax rates for those entities providing the services selected by the user should be included. For example, if school costs are not included by the user, school district tax revenue should also not be included. Otherwise the model will overstate total revenues for the services reported.

Other Tax Revenues

Other tax revenues for local governments may include a local component of personal income taxes and sales taxes. The use and collection formula for these taxes varies widely from state to state. States with sales taxes may have a *local option* sales tax allowing the local governments to add onto the state tax. In some cases the state collects all sales taxes and redistributes a portion back to local governments based on population, or some other formula. Sales taxes are usually point-of-sale taxes and are therefore associated with retail establishments. Income taxes can be associated with either place of residence or place of employment.

Most sales tax and income tax is collected by the state for state purposes. Some may be distributed back to the locality through intergovernmental transfers. However, in order to accurately reflect local impacts (both revenues and costs), the model does not include any intergovernmental transfers from the state or federal governments. If the local government collects a local-option sales tax or a local income tax, any revenues generated by the development should be estimated and added to the property tax revenues calculated by the model.

Other Revenues

In addition to tax revenues, local governments receive revenues from other sources. The federal and state governments provide the second largest source of funding to local governments after local taxes. These "intergovernmental transfers" may be directed towards specific purposes, such as school operations or affordable housing subsidies. Because the focus of this model is on impacts to local governments, revenues from federal and state governments are not included in the analysis. Likewise, expenditures from intergovernmental funds are excluded from the cost side of the analysis.

Local governments also receive revenue from fees charged for services ranging from building permits to park entrance fees. The largest source of such fees is from publically-owned hospitals. Generally these fees recover the cost of providing services, and therefore tend to be neutral in terms of fiscal impact. These revenues are included in the model and used to directly offset services

costs. The "net cost of services" figure used by the model is the total cost of providing the service, minus all revenues generated by the service.

What results should be expected from a fiscal impact analysis?

Fiscal impacts of new development typically range from slightly positive to very negative. Analysis methods that include a complete assessment of capital costs (as well as operating costs) tend to show very negative impacts for most residential development and some commercial development. The simple explanation for this is that the capital costs for the facilities to serve urban development are substantial and are not usually recovered from the development itself. Instead, these costs are distributed across the entire local tax base and are primarily repaid by other property owners via property taxes. These capital costs are also likely to be the single most significant factor affecting the net fiscal impact of a development.

The largest and most-recent federally-funded study of the cost of sprawl (performed in 2002) found that, on a national level, both compact and sprawling development patterns generated substantial fiscal deficits.[18] While the authors found that compact, "smart growth" development fared slightly better than sprawl, it still generated revenues that covered only 71% of the costs it created. The "smart growth" scenario is the best-case scenario for urban growth and, arguably, this study understated the full costs of growth with the real deficits likely to even larger.

One source found that the local government's capital costs for the infrastructure to serve each new single-family detached dwelling unit could reasonably be estimated at more than $50,000 in 2004.[19] This analysis did not include the cost of transportation infrastructure, which is typically the second most expensive infrastructure category after schools.

Local governments can influence the fiscal impact of development by adjusting revenues associated with new development to better match costs. Impact fees are a mechanism for directly recovering some, or all, of the capital costs associated with development. Local improvement districts (LIDs) can also be used to help assure that capital costs are repaid in an equitable manner by those who benefit.

Most local governments, school districts, and special districts have no accounting system that would make it possible to identify and report the costs associated with serving new development. Instead, these cost are buried in budgets with thousands of other line items. For public utility services like water,

---

[18] ***The Cost of Sprawl – 2000***, by the National Research Council, 2002. The research report is summarized by its authors in the book, ***Sprawl Costs: Economic Impacts of Unchecked Development***, Robert Burchell, Anthony Downs, Sahan Mukherji , and Barbara McCann, Island Press, Washington DC, 2005, 197 pages (see page 79).

[19] ***Planner's Estimating Guide: Projecting Land-Use and Facility Needs***, by Arthur C. Nelson, Planners Press, American Planning Association, Chicago IL, 2004, page 126.

sewer, and municipal electric utilities, the capital costs to serve new development are typically included in the rates charged to customers, so that they are paid by all customers in the form of higher utility bills.

A 2012 survey of 271 local governments charging impact fees for one or more categories of infrastructure reports that the average of all fees charged is $11,583 per jurisdiction.[20] However, most cities and counties have no impact fees. The fees that are reported in the survey are an indication that many independent local studies have been performed to calculate the fees, and that the capital costs associated with serving new development can be substantial. Average impact fees reflect the average of those local governments which have undertaken the expense of an impact fee study, and then subsequently adopted a fee, which in many cases is less than the full cost estimated by the study. Even though these impact fee studies are subject to numerous legal and technical restrictions, it is not uncommon for them to report the cost for road capacity associated with a new, single-family house at more than $10,000 and the cost for the associated school capacity at $10,000-$20,000 or more.

Figure 4: Summary of *2012 National Impact Fee Survey*.

Table 1. Average Fees by Land Use and Facility Type, 2012

Facility Type	Single-Family (Unit)	Multi-Family (Unit)	Retail (1,000 sf)	Office (1,000 sf)	Industrial (1,000 sf)
Roads	$3,228	$2,202	$5,685	$3,430	$2,076
Water	$3,863	$1,440	$690	$629	$656
Wastewater	$3,725	$1,771	$741	$690	$765
Drainage	$1,476	$790	$1,013	$868	$983
Parks	$2,774	$2,086	**	**	**
Library	$402	$305	**	**	**
Fire	$512	$376	$402	$358	$248
Police	$372	$295	$401	$260	$180
General Government	$1,699	$1,285	$618	$607	$385
Schools	$4,677	$2,494	**	**	**
Total Non-Utility*	$8,111	$5,359	$6,174	$4,172	$2,763
Total*	$11,583	$6,718	$6,347	$4,483	$3,190

* Average of total fees charged by jurisdictions, not sum of average fees by facility type (non-utility excludes water and wastewater

** rarely charged to nonresidential land uses, with the exception of school fees in California

[20] ***National Impact Fee Survey: 2012***, by Clancy Mullen, Duncan Associates, Austin, Table 1. (Available at www.impactfees.com.)

Appendices

Government Finance Data Selection

The ***U.S. Census of Governments: Finance*** for the 2007 survey year was selected for the local government finance data used in this model. The data represents the latest complete national survey of local government finances. The survey covers all 87,525 government entities in the U.S. and is repeated every five years. It will be performed for 2012, however the 2012 survey data will not become available until late 2014.

The Census also produces annual estimates to fill in years between the complete surveys. These estimates are based on samples, rather than a complete survey. The most recent annual estimate available for use with this model was 2010. In addition to being lower-quality sample data, 2010 represents the depth of the recession for most local governments. Growth was stalled, property values were declining, government revenues were falling, and budget cuts and layoffs were common. As a result, 2010 is not an ideal year to capture the typical impacts of urban growth on local governments.

The full survey year of 2007 was just before the recession occurred and reflects the end of a long period of growth. Growth impacts are likely to be well reflected in the 2007 data. However this data may not reflect the post-recession future where growth and the economy remain in the doldrums. The future may have leaner local governments with pared back services and aging infrastructure. None-the-less, the 2007 data was selected due to the higher quality of the complete survey data and the likelihood of this year to capture growth and development impacts more accurately.

The *Census of Local Governments: Finance* contains sufficient detail of data reporting and suitable quality for use in this model. It was selected as the best data source for estimating costs in the model for a number of reasons. First, it is a comprehensive federal survey of all local governments in the U.S. Second, it includes all costs by local governments, so that costs cannot be overlooked, exaggerated, or understated. The reported expenditures must equate to revenues so that the local budgets balance. Third, the complete nature of this data set makes it difficult to either overcount or undercount any cost items, since the totals can be readily verified. Fourth, because it is a comprehensive reporting of government expenditures, it is possible to break out 18 categories of local public services and 17 categories of capital facilities. These include five categories of utilities (water, sewerage, gas, electric, and transit), which are often overlooked in fiscal impact analysis because they are rate-supported. None-the-less, fiscal

impacts appear in the utility rates, just as they appear in the tax assessments for other services.

Finally, the nature of this federal survey is to provide a comprehensive, objective, unbiased, and undistorted source of empirical data on local government finance that is generally considered the best available. The *Census of Local Governments: Finance* is relied on by leading experts in the fiscal impact analysis field and is recommended as a primary data source by fiscal impact analysis guidebooks.

The *Census of Governments: Finance* data has some limitations for fiscal impact analysis purposes. Because the data reflects only what governments actually spend, it does not capture the costs for unmet needs that result in declining levels of services. This is particularly evident with transportation spending, where local governments have historically been unable to fund enough road infrastructure to keep up with the demands of growth. The result is a declining level of service, with increasing congestion, delays, and reduced mobility. The unpaid costs for new roads is paid indirectly by local travelers. If local governments were to maintain their service standards for roads, their capital costs would be much higher than is reported by the *Census* (and hence this model).

The *Census of Governments: Finance* data does not separate local improvement districts (LIDs) from other government entities. LIDs are designed to raise and repay capital funds from only the area that is served by – and benefits directly from – the capital improvement. LIDs typically provide an equitable means of funding capital improvements required for large-scale developments because they avoid spreading the impacts to other taxpayers who are not benefitting. Including the capital costs funded through LIDs in the analysis results in slightly overstating the net capital costs associated with new development.

Another limitation on using the *Census of Governments: Finance* data is that costs and revenues associated with rural development cannot be separated from urban development. Rural development typically occurs outside of cities and requires fewer public services because some of these costs are privatized. This occurs when rural homebuilders drill their own water wells and build their own septic systems. Rural residents also typically have reduced expectations for urban services like parks and recreation facilities. Since this model is intended to reflect urban development impacts, the effect of including rural development in the model is to slightly understate some of the unit costs estimated, particularly for water and sewerage.

Categories of Local Government

In addition to the Federal Government and the 50 state governments, the *Census of Government: Finance* recognizes five basic types of local governments, as described below:

- **County Governments** (3,034). Organized county governments are found throughout the nation, except in Connecticut, Rhode Island, the District of Columbia, and limited portions of other states where county areas lack a distinct county government. They are created to provide general government activities in specified geographic areas. In Census Bureau statistics, counties include those entities called boroughs in Alaska and parishes in Louisiana.

- **Municipal Governments** (19,429). Municipalities are sub-county general purpose governments established to provide general services for a specific population concentration in a defined area. Municipal governments include cities, boroughs (except in Alaska), villages, and towns (except in the six New England states, Minnesota, New York, and Wisconsin). Consolidated city-county governments are treated as municipal governments for Census Bureau statistics.

- **Township Governments** (16,504). Townships are sub-county general purpose governments established to provide general services for areas without regard to population concentrations. They include towns in the six New England states, Minnesota, New York, and Wisconsin, and townships in eleven other states.

- **Special District Governments** (35,052). These are established to provide only one or a limited number of designated services (functions) and have sufficient administrative and fiscal autonomy to qualify as independent governments.

- **School District Governments** (13,506). These are created to provide public elementary, secondary and/or higher education services and have sufficient administrative and fiscal autonomy to qualify as independent governments. They exclude school systems that are "dependent" on a county, municipal, township, or state government.

Capital Expenditures Allocated to Growth

In order to establish reasonable parameters for allocating capital expenditures by local governments to new growth, research was performed and relevant sources were consulted. As described in the main document, growth-related capital expenditures are those which increase the capacity of public infrastructure, such as water treatment plants, roads, schools, and parks. Most local governments do not distinguish growth-related capital expenditures from capital expended for operations and maintenance, such as facility repair and replacement.

Fodor & Associates examined the City of San Diego's detailed budget and reviewed line-item budget descriptions in the 10-year capital facilities plans to determine what overall percentage of capital outlay was for expansion of capacity. Table 13 reports the estimated growth-related portion of the capital budget for each of the four service categories managed by the City. Capital outlays ranges from a low of 62% growth-related for transportation facilities to 92% growth-related for police facilities. The overall average for all types of facilities was 70% of capital expenditures for growth-related capacity expansion. The balance of these capital facilities budgets was for repair and replacement of existing facilities (O&M).

Table 13

Growth Related Capital Costs for City of San Diego

10-Year Capital Facilities Plan, 2008-2018

Service Category	Total Budgeted Capital Cost	Estimated Growth-Related Capital Cost	Percent Growth-Related
Fire & Rescue Facilities	$128,715,007	$109,975,246	**85.4%**
Police Facilities	$98,154,204	$90,654,204	**92.4%**
Parks and Recreation Facil.	$904,597,255	$732,340,301	**81.0%**
Transportation Facilities	$1,636,843,009	$1,016,457,608	**62.1%**
Total	$2,768,309,475	$1,949,427,358	**70.4%**

Source: Fodor & Associates from City of San Diego Fiscal Year 2008 Proposed Budget

A similar, project-by-project review by Fodor & Associates of the Deschutes County, Oregon, 20-year road project list resulted in an estimated allocation of 73% of road capital expenditures to expanded capacity to serve growth (see Table 14).

Table 14

Deschutes County Growth-Related Road Costs

Deschutes County SDC Project List, 2008

Service Category	Total Road Capital Cost	Growth-Related Capital Cost	Percent Growth-Related
Roads[1]	$96,614,339	$70,165,715	**72.6%**

(1) Only the costs paid by the county are reported here. Two-thirds of county road costs are paid by the state and federal governments.
Source: Fodor & Associates from 20-year Transportation System Project List for Unincorporated Area of Deschutes County (2008-2028) from the Deschutes County SDC Project List, 2008.

The Austin, Texas, metro area planning organization, CAMPO (Capital Area Metropolitan Planning Organization), produces a 25-year regional transportation plan that breaks out cost for capacity-increasing capital improvements from other operation and maintenance costs. As shown in Table 15, capital improvements are 73% of planned transportation expenditures for the most-current 10-year period (2010-2019). Over the entire planning period capital improvements declined to 58% of expenditures. This change is partly due to a large capital project planned for 2015. But it may also be the result of the difficulty identifying specific road infrastructure needs 25 years in the future.

Table 15

Allocation of 25-Year Transportation Costs for Austin Metro Area

2010-2035

Type of Expenditure	Costs 2010-2019	Percent of Costs 2010-2019	Costs 2010-2035	Percent of Costs 2010-2035
Capital Improvements	$8,600,810,000	**72.8%**	$16,520,450,000	**58.1%**
Operation & Maintenance	$3,215,700,000	27.2%	$11,922,470,000	41.9%
Total	$11,816,510,000	100.0%	$28,442,920,000	100.0%

Source: Fodor and Associated from Capital Area Metropolitan Planning Organization (CAMPO) ***2035 Regional Transportation Plan***, Appendices, Adopted May 24, 2010, Page 15.

Based on this review of three different types of capital facilities plans for three different locations around the country, it appears that growth-related, capacity-increasing capital expenditures typically constitute from about 60% to 90% of the capital facility budget.

The *2007 Census of Governments* reports capital expenditures for all local governments. As shown in Table 16, capital expenditures for construction account for 76% of all capital outlays.

Table 16

Total Capital Outlays for All Local Governments

2007, Thousands of Dollars

Capital Expenditures	Amount	Percent of Capital
Capital Outlay for Construction	$163,070,168	**76.1%**
Other (non-construction) Capital Outlay	$51,352,412	23.9%
Total Capital Outlay	$214,422,580	100.0%

Source: Fodor & Associates from ***2007 Census of Governments: Finance***, Table 2. Local Government Finances by Type of Government.

To determine how much of each type of capital is growth-related, the survey instrument was examined to see how each category is described. According to the Census survey form:[21]

- *Construction* includes "production, additions, replacements, or major structural alterations to buildings and other improvements."
- *Other capital outlay* includes "purchase of equipment, land, and existing structures. Include capital leases."

Most "construction" is likely to be capacity increasing, but some may be associated with replacement of existing facilities, which is actually a maintenance function. Therefore not all of the construction category is growth-related. However, "other capital outlays" includes land purchases. Land purchases are largely associated with current or planned future facility expansions. Also, some of the equipment purchases and capital leases will be growth-related. Therefore a portion of "Other capital outlay" must be included as a growth-related expense. While it is not possible to make any conclusive finding from this data, it appears reasonable to estimate that about 70% of local governments' capital outlays are growth-related.

The U.S. Department of Education's National Center for Education Statistics produces detailed reporting of the revenues and expenditures of the nation's schools that includes a breakdown of capital expenditures. A total capital outlay of $55,650,868,000 is reported for fiscal year 2010.[22] This figure does not include any costs for repairs to existing structures, which are counted under the "operations" budget. As shown in Table 17, "Facilities acquisition and construction services" comprises 82% of capital expenditures for schools. This category is defined as:

[21] *Survey of Local Government Finances*, Form F-28, U.S. Census Bureau, page 13.

[22] The most recent fiscal year available. Source: Table 1 of ***Revenues and Expenditures for Public Elementary and Secondary Education: School Year 2009–10***, November 2012, National Center for Education Statistics, U.S. Department of Education.

"An expenditure function that includes the acquisition of land and buildings; building construction, remodeling, and additions; the initial installation or extension of service systems and other built-in equipment; and site improvement."

These capital expenditures are largely capacity-increasing and therefore growth-related. However the category does include some remodeling and building replacements that would not add to capacity. Again, it is not possible to make a conclusive determination about the nature of these expenditures, but an assignment of 70% of the total capital outlay toward growth appears reasonable.

According to a school construction tracking company, 70.2% of school construction expenditures in the U.S. in 2012 was for new schools and 15.6% for additions, with the balance (14.2%) for remodeling.[23]

Table 17
Capital Expenditures for Public Elementary and Secondary Education: Fiscal year 2010

Capital Expenditures	United States Totals ($1,000)	Percent of Capital Outlay
Facilities acquisition and construction	$45,628,686	**82.0%**
Land and existing structures	$3,267,317	5.9%
Equipment	$6,754,865	12.1%
Total Capital Outlay	$55,650,868	100.0%

Source: Fodor & Associates from ***Revenues and Expenditures for Public Elementary and Secondary Education: School Year 2009–10***, November 2012, National Center for Education Statistics, Tables 1 and 8.

[23] ***2012 Annual School Construction Report***, February 2012, by School Planning & Management. http://www.peterli.com/spm/pdfs/SchoolConstructionReport2012.pdf

Commercial Buildings Included in Square-Footage Analysis

Data from the U.S. Energy Information Administration's Commercial Buildings Energy Consumption Survey (CBECS) was used to calculate total non-residential building floor area. This description of building types from the survey may be helpful in classifying new development.

Description of CBECS Building Types
http://www.eia.gov/emeu/cbecs/building_types.html

Building Type	Definition	Includes These Sub-Categories from 2003 CBECS Questionnaire
Education	Buildings used for academic or technical classroom instruction, such as elementary, middle, or high schools, and classroom buildings on college or university campuses. Buildings on education campuses for which the main use is not classroom are included in the category relating to their use. For example, administration buildings are part of "Office," dormitories are "Lodging," and libraries are "Public Assembly."	• elementary or middle school • high school • college or university • preschool or daycare • adult education • career or vocational training • religious education
Food Sales	Buildings used for retail or wholesale of food.	• grocery store or food market • gas station with a convenience store • convenience store
Food Service	Buildings used for preparation and sale of food and beverages for consumption.	• fast food • restaurant or cafeteria
Health Care (Inpatient)	Buildings used as diagnostic and treatment facilities for inpatient care.	• hospital • inpatient rehabilitation
Health Care (Outpatient)	Buildings used as diagnostic and treatment facilities for outpatient care. Medical offices are included here if they use any type of diagnostic medical equipment (if they do not, they are categorized as an office building).	• medical office (see previous column) • clinic or other outpatient health care • outpatient rehabilitation • veterinarian

Lodging	Buildings used to offer multiple accommodations for short-term or long-term residents, including skilled nursing and other residential care buildings.	• motel or inn • hotel • dormitory, fraternity, or sorority • retirement home • nursing home, assisted living, or other residential care • convent or monastery • shelter, orphanage, or children's home • halfway house
Mercantile (Retail Other Than Mall)	Buildings used for the sale and display of goods other than food.	• retail store • beer, wine, or liquor store • rental center • dealership or showroom for vehicles or boats • studio/gallery
Mercantile (Enclosed and Strip Malls)	Shopping malls comprised of multiple connected establishments.	• enclosed mall • strip shopping center
Office	Buildings used for general office space, professional office, or administrative offices. Medical offices are included here if they do not use any type of diagnostic medical equipment (if they do, they are categorized as an outpatient health care building).	• administrative or professional office • government office • mixed-use office • bank or other financial institution • medical office (see previous column) • sales office • contractor's office (e.g. construction, plumbing, HVAC) • non-profit or social services • research and development • city hall or city center • religious office • call center
Public Assembly	Buildings in which people gather for social or recreational activities, whether in private or non-private meeting halls.	• social or meeting (e.g. community center, lodge, meeting hall, convention center, senior center) • recreation (e.g. gymnasium, health club, bowling alley, ice rink, field house, indoor racquet sports) • entertainment or culture (e.g. museum, theater, cinema, sports arena, casino, night club) • library • funeral home • student activities center • armory

		• exhibition hall • broadcasting studio • transportation terminal
Public Order and Safety	Buildings used for the preservation of law and order or public safety.	• police station • fire station • jail, reformatory, or penitentiary • courthouse or probation office
Religious Worship	Buildings in which people gather for religious activities, (such as chapels, churches, mosques, synagogues, and temples).	• No subcategories collected.
Service	Buildings in which some type of service is provided, other than food service or retail sales of goods	• vehicle service or vehicle repair shop • vehicle storage/ maintenance (car barn) • repair shop • dry cleaner or laundromat • post office or postal center • car wash • gas station • photo processing shop • beauty parlor or barber shop • tanning salon • copy center or printing shop • kennel
Warehouse and Storage	Buildings used to store goods, manufactured products, merchandise, raw materials, or personal belongings (such as self-storage).	• refrigerated warehouse • non-refrigerated warehouse • distribution or shipping center
Other	Buildings that are industrial or agricultural with some retail space; buildings having several different commercial activities that, together, comprise 50 percent or more of the floorspace, but whose largest single activity is agricultural, industrial/ manufacturing, or residential; and all other miscellaneous buildings that do not fit into any other category.	• airplane hangar • crematorium • laboratory • telephone switching • agricultural with some retail space • manufacturing or industrial with some retail space • data center or server farm
Vacant	Buildings in which more floorspace was vacant than was used for any single commercial activity at the time of interview. Therefore, a vacant building may have some occupied floorspace.	• No subcategories collected, but a question was asked to determine whether the building was completely vacant.

Helpful References

The references below are available online at no cost. ***Development and Dollars*** is the best single reference on the subject.

Developments and Dollars: An Introduction to Fiscal Impact Analysis in Land Use Planning, Natural Resources Defense Council, New York, 2000, Chapter 4. The text may be downloaded from NRDC's web site at: http://www.nrdc.org/cities/smartGrowth/dd/ddinx.asp.

Fiscal Impact Analysis: Methods, Cases, and Intellectual Debate, Zenia Kotval and John Mullin, September 2006, 44 pages. Available at: http://www.lincolninst.edu/subcenters/teaching-fiscal-dimensions-of-planning/materials/kotval-mullin-fiscal-impact.pdf
Contains information on fiscal impact methods and calculation examples.

Be careful of guidebooks that don't fully address capital costs or don't include all the categories of public infrastructure required by urban development. Several of the popular guidebooks rely on data that is no longer available. For example, *Fiscal Impact Analysis: Methodologies for Planners* (2010) relies on an "operating expenditure multiplier" that has not been produced by the federal government since 1992 and is no longer available.

◊◊◊