

**Documenting the Economic Contribution of Office,
Industrial, and Retail Real Estate to the Local Community**

Prepared for

**The National Association of Office and Industrial Properties
Research Foundation**

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Introduction

New and existing commercial real estate constitute a major source of economic activity within local communities. Many of these contributions can be documented and measured in terms of dollar value, jobs supported/created and housed, personal earnings generated, sales and value added, and tax revenues produced.

The measurement of these economic and fiscal impacts often involves complex calculations and requires extensive data collection. However, these benefits also can be estimated employing more simple methods that rely on public information and widely accepted industry standards. This simplified approach to the measurement of economic and fiscal impacts focuses on identifying the larger and more visible sources of impacts and does not attempt to represent an all-inclusive scope. While providing a less-than-100 percent accounting, this approach can be represented as providing a conservative estimate of impacts, one that does not overstate the importance of the industry; that is, one that demonstrates its value without overstatement or subjectivity.

The analytical methods outlined herein for calculating the economic impacts of office, industrial and retail real estate rely on common data sources and techniques while also reflecting necessary differences that may characterize the specific class of land use. These methods will distinguish between new construction and the existing stock of buildings. It will also distinguish between the direct and the total economic impacts.

Lastly, the analyses will distinguish between economic impacts that flow from the building type being analyzed and the economic impacts generated by the building's use following construction. These later impacts magnify the value of the commercial base by accounting for the work being done within the buildings—the workers housed, the payroll generated, and the value added to the economy. With the exception of government and non-profit activities, the productive output of the community is done within the commercial base; this is where the value of goods and services that constitutes the local GDP is generated. Consequently, the value of commercial buildings is much more than the sum of their construction outlays or their assessed valuation.

The methods outlined herein provide the guidance required to identify and measure the full range of economic impacts of office, industrial and retail real estate emphasizing the sources of benefits that comprise the large majority of economic impacts and that are widely appreciated and understood by the general public. The results of these analyses can be used to educate the public regarding the broad value of the commercial real estate industry and to establish the range of benefits that would flow to the community as a result of the construction of a proposed commercial building. Finally, as public attitudes towards any new growth harden, having facts that demonstrate the critical contributions made by commercial development to the community's economic vitality becomes even more important in balancing the debate.

General Guidelines

To undertake the measurement of economic impacts of the accumulated stock of buildings or the new construction during a given year or span of years in a given community requires planning and training prior to data collection and analysis. While the exact sequence of steps may vary, they should include the following:

1. Establish a technical committee or panel to manage the process and to act as an advisory resource to revolve questions that may arise during the analyses;
2. Determine the geographic and industry focus of the analysis; is the analysis to report the economic and fiscal impacts of the entire stock of a specific type or class of commercial buildings or of new construction during a set time span?
3. Identify the responsible person who will conduct the analysis:
 - staff
 - intern with supervision
 - volunteers
 - outsource to a consultant
4. The technical committee and staff person/intern should meet to review procedures, clarify assumptions and data sources, develop a contact list, establish the data collection schedule, review the computational steps and assignments (who will do what and when?);
5. The first step should be to collect information that is published, available on websites, and available from industry sources and then pursue remaining, hard-to-collect data from identified sources (people in local government offices)—these contacts need to be protected as sources of information that only they can provide; that is, do not wear out your welcome with key data providers by asking them for data that are easily available elsewhere; public sources are generally considered more objective than industry or proprietary sources.
6. Document all data collected by source for future reference or for follow up (name, place, date); keep complete records throughout the process;
7. Do not collect data you do not need; be disciplined or the data collection process could become too time consuming and confusing;
8. After collecting all of the required information, calculate impacts following the guidance provided in this manual; always total your rows and columns and make sure they add up; and,

(9) Assign the report writing to someone knowledgeable about the analyses process, the industry and the objectives of the report; use summary tables to simplify the communications of findings, keep the report short, place data tables and supporting materials in the appendix.

(10) Determine the audience and dissemination procedures for the results of the analysis.

Analytical Procedures

To identify and calculate the economic and fiscal impacts of a commercial building or the total inventory of commercial real estate within a community, follow these steps:

Define the Problem: This phase involves establishing the objectives of the exercise. This would include determining whether the scope is restricted the totality of office buildings and uses existing in the local community, some other set of structures (e.g., all Class A office structures or to a single building (e.g., a proposed new office complex). These objectives must be realistic in terms of available time and budget as well as the skill of the staff and availability of data. While a full fiscal analysis might be desirable, such an analysis will be far too complex to accomplish with voluntary labor and with little or no professional experience in public finance. Still, some fiscal impacts can be identified, such as real estate tax revenues or sales taxes generated. These should be represented for what they are and not used to suggest the net fiscal benefit; that would require all local public expenditure demands to be totaled and subtracted from the total revenues generated by the commercial properties being analyzed.

This phase would also specify the geographic scope of the analysis. The best jurisdictional scale (because the best economic information is available) is the county. At the city scale or any subdivision of a city or county, there are serious data constraints. The state level may also provide a useful analytical scale as the economic multipliers increase in value with larger geographic scales; that is, the county multipliers are smaller than the encompassing metro area's multipliers and these are both smaller than the state's within which the county (metro area) is located.

All analytical assumptions should be established at this early stage of the analysis. These assumptions should include: the amount of gross square feet per office worker, retail worker, and warehouse/industrial worker; hard cost-soft cost splits if not established in fact; pricing and value information if not known in fact; mean salary levels for jobs housed as a result of the completed buildings if not known in fact (these must be mean or arithmetic averages and not median values); average inventory-wide annual per square foot values for building maintenance and repair and for operations (HVAC, custodial services, utilities, management) should be determined; other data requirements for which actual official data are not available will also need careful estimating based on industry standards. These values should be documented and referenced to a published or accepted source such as NAIOP, ULI, or a recognized trade publication.

Collect and Analyze the Data: see General Guidelines and Informational Sources. Data collection table shells with explanatory notes are provided herein to assist in the data collection and analysis process. Whether all of the indicated information is actually required or some other form of this information would be more appropriate will be determined by the specification of research objectives. This should be accomplished in the initial problem definition phase where the research scope and data requirements are established.

Prepare and Disseminate the Report: While the staff assigned to collect the required information for calculating the economic and fiscal impacts may have the analytical and expository skills to prepare the report, this assignment might be better fulfilled by a more senior professional. It could also involve joint authorship. The technical committee/panel should make this assignment.

Before preparing a report, determine to whom the report is being directed. For almost any audience, a short report is more effective. A one-page summary of impacts—a fact sheet—is an effective device for disseminating the big picture values. A question and answer sheet can also be effective. A model for a three-page Executive Summary is as follows:

- (1) an introduction that briefly presents the objectives and scope of the report,
- (2) the key findings of the research as one-line bullet points organized from macro to micro (general to specific), and
- (3) a conclusion that states the importance of the findings supported by one simple summary table. This Executive Summary could be attached to a full report if that was determined to be useful or it could be supported solely by appendix materials. Such an executive summary would imply a full and detailed report but none would have to be available for distribution.

How to disseminate the findings? The answer to this question is best determined by the reason for conducting the analysis in the first place. If it is to support a specific project application, then that is the sole audience. If it is to educate the elected officials and broader business community, the scope and packaging of the report needs to be different. If it is to provide response materials for a no-growth debate or to inform the media, the release of the findings could be accomplished through an open press briefing or through a selected newspaper columnist, which ever best achieves the purpose. Consulting a communications professional would be beneficial in determining the most favorable PR strategy for achieving the appropriate placement of facts and findings.

Definitions

Area of Analysis – the geographic unit of analysis, normally a political unit for which economic, demographic and fiscal information is reported.

Building Value – construction value would include hard costs (costs of the structure) and soft costs (management, engineering, design, taxes, fees); the finished commercial value would reflect cash flow potential or current performance; assessed valuation for tax purposes may be accepted as an appropriate substitute for actual market value.

Direct Benefit – the dollar value of the **output** of an industry or firm produced either as An intermediate good or service or for final demand; for real estate this would include the actual expenditures associated with a construction project, operating outlay, or spending for maintenance and repair.

Gross Domestic Product (**GDP**), Gross State Product (**GSP**), Gross County Product (**GCP**)
- the value of goods and services produced within the economy of the respective geographic area (nation, state, county/city).

Gross Square Feet – as a measure of an individual building size or aggregate inventory of building space reflecting the total envelope of the structures and not the occupied or usable building area.

Indirect Benefit – the additional economic benefits—measured in dollars or jobs—resulting from the accumulated additional value generated by the direct outlays or expenditures, as these dollars are re-spent within the economy (e.g., payroll and purchases of goods and services inclusive of **induced effects**).

Induced Effects – the impacts of the payroll spending of workers in the specific industry or sector on local businesses providing goods and services to households.

Infrastructure – utilities, roads, parking lots, storm drainage structures; other site improvements could be included in estimating these costs if not included elsewhere; if these improvements are financed by the private sector, whether on- or off-site, their cost should be reflected in the base values for calculating industry economic impacts.

Land Value – either assessed land value exclusive of structures or purchase price.

Multiplier – a numerical factor that captures the total value of a direct outlay of or benefit produced by an industry (firm) on the economy as it is re-spent within that economy; an output multiplier measures the contribution (impact) of a direct outlay on the overall economy, an employment multiplier measures the total

number of jobs that can be supported by a direct outlay; and a personal earnings multiplier measures the total personal earnings (wages and salaries) generated within the jurisdiction as a result of a direct outlay and the jobs its supports.

Output – the goods and services produced for sale to other firms or industries as intermediate goods or services or for sale to consumers as final good or services.

Sector – a grouping of industries or firms by similar characteristics of operations (e.g., retail trade sector, manufacturing sector, construction sector, mining sector, service sector, government sector).

Total Output – the sum of the **direct and indirect benefits** (outlays) reflecting the combination of the initial sales of a firm (cost of an **output**) and its subsequent accumulated value as it is cycled through the economy inclusive of benefits (**induced**) generated by the re-spending of personal earnings; contribution to **GDP, GSP or GCP**.

Value Added – a measure of the incremental dollar value created by an industry, firm or individual employee as a result of its production (work performed) process; the value created beyond the value of the individual inputs.

Information Sources

(1) Regional Input-Output Multipliers (available at county or state levels; not available at city or town level) may be purchased from the Bureau of Economic Analysis (BEA), US Department of Commerce as follows. The current price for one report (jurisdiction) is \$275.00. The delivery times ranges from one to two weeks. Hard copy of multiplier tables and on disk sent via federal express.

- a) Go to www.bea.doc.gov/bea/regional/rims/orderform.htm
- b) Complete the form on-line and then print out the form.
- c) Fax the completed form to: (202) 606-5321
- d) The BEA will fax to you a completed purchase order for confirmation.
- e) Call BEA at (202) 606-5343 to confirm order and to pay by credit card.

(2) Building/Inventory Information will generally be developed from industry (private, sometimes proprietary) sources. For new or proposed structures, respective developers would be the logical sources. For the total inventory, local real estate research firms can provide most of the required information; some may need to be estimated. The technical committee or other local experts may be able to fill in the data gaps on the size of the inventory and building operating costs.

(3) Real Estate Tax Information may be available on line for the jurisdiction being analyzed. Each year, local governments release what is generally titled a Comprehensive Annual Financial Report (CAFR) that presents the audited revenues and expenditures for the previous fiscal year. Many jurisdictions have their CAFRs on-line. If not on-line, the CAFR would be available from the city/county Department of Finance or the Executive's office. Real estate tax revenues and tax rates are included in the CAFR as are all other financial information concerning the jurisdiction. The CAFR is a superior source to the budget as it documents actual revenues and expenditures while budgets only specific expected outcomes.

The total assessed valuation of all real estate in the jurisdiction may not be included in the CAFR. Also, its division between commercial and non-commercial land uses is not likely to be reported in the CAFR. For these data, a call or visit to the Department of Finance (or equivalent office) to gather this information for the most recent year; historic trends would also be available.

(4) Economic Data, including employment by sector, unemployment, and income, are available from several standard sources: local economic development agency (government office or Authority), state-level employment commission (these issue quarterly reports for most jurisdictions within their state with a 6 to 9 month—commonly referred to as the 202 survey), or employment and income data can be purchased commercially from local and national vendors. Obtain the most recent release as these reports may change monthly or quarterly. Annual values are also available. The most recent year is subject to revision during the first quarter of the following year (e.g., 2004

employment data released during the year are revised after one month and both monthly and annual values will be revised again by March of 2005).

One national vendor is NPA Data Services, Inc. of Arlington, Virginia (703-979-8400). For a small fee, a county-level report can be purchased presenting employment by sector, income generated by corresponding sector, population, per capita income, households and household income for the period 1968-2030. These are available for every county, state, and metropolitan area in the US as well as for the nation, but not for cities as cities are always part of an economy that extends into a surrounding jurisdiction(s). When purchasing county-level data, also purchase the state; also acquire the metro area if the county is part of one, and the nation in order to be able to show relative sizes and comparative trends. A service fee (less than \$100) plus a charge for each jurisdiction ordered would bring the total for four jurisdictions (county, metro, state and US) to under \$200. Orders are usually filled within 48 hours. These data are updated and revised two times a year.

Other vendors are available. Local universities that have an economic or business research center may be able to provide these data at no costs or for a small fee.

(5) Operating, Repair and Maintenance Expenditures. Per square foot annual operating outlays associated with occupied buildings will vary from market to market and therefore are best developed from local industry sources. Major brokerages would be a primary source for these data. For annual repair and maintenance expenditures associated with maintaining the building stock, local industry sources may provide reliable data. Alternatively, office building income and expense data is available from BOMA (Building Owners and Managers Association, 202-408-2662 or www.boma.org) and office building and shopping center information from IREM (Institute of Real Estate Management, 800-837-0706 or www.irem.org). NAIOP also has information about industrial properties in its 2001-2002 Industrial Income and Expense Report (703-904-7100) or go to www.naiop.org.

Work Sheets

The work sheets presented herein are designed as general guides for the identification of data inputs for the analysis of economic impacts. As such they may require modification to fit a specific application. The analysis of a single building's impacts (which is not the focus of this report) would require some modification of scope and may involve additional data sources.

Before commencing any data collection, a data collection plan should be developed that focuses the data requirements specifically to the end product. It is important for the person collecting data to know exactly what data are required and why, so that the requests are clear to the provider. It is not unusual that the provider of the requested data will misunderstand the request and provide what is thought to be the data requested even though they are not quite the right information. If the person collecting the data cannot distinguish the requested data from the provided data, getting the correct data will at least require a second request and extra time, but could also produce incorrect analytical results if no one else has noticed the error. It is also important that the data sources be recognized as being objective sources. Objectivity should take precedence over convenience. Usually, implies that public sources are to be preferred over private or proprietary sources. "Garbage in garbage out" is a constant threat to the credibility of the research results.

Office Building Economic Impact Work Sheet

Total Inventory Impact Analysis

Total assessed value (1)	\$ _____
Total real estate tax revenue (2) (Tax rate/\$100 x value)	\$ _____
Total square feet (3)	_____
Total estimated work force (4) (Total sf divided by sf/worker)	_____
Total estimated payroll (5) (Workers times mean salary)	\$ _____
Total building operating outlays (6) (Cost/sf times total sf)	\$ _____
Total repair and maintenance outlays (7) (Cost/sf times total sf)	\$ _____

1. See Information Sources paragraph #3.
2. See Information Sources paragraph #3.
3. See Information Sources paragraph #2.
4. Multiply the total inventory square footage by the accepted number of workers per gross square feet in the locale (e.g., 250 gross sf per worker)*
5. Multiply the mean annual salary for office workers (service sector employment may be used) developed from local sources (Chamber of Commerce, Department of Economic Development) times the number of office workers being housed.
6. Multiply the annual average per square foot operating costs (excluding utilities) reflecting local prices or use industry standard from appropriate source (e.g., Property Managers Association) times the inventory's total number of square feet.
7. Multiply the annual average per square foot repair and maintenance cost for office uses (from local sources or industry association publications [e.g., BOMA, IREM]) times the number of gross square feet in the inventory.

The total economic impacts of the dollar values developed for the spending potential of the work force housed in the office inventory and the outlays associated with operating and maintaining this inventory as determined in the work sheet above can be calculated by applying the appropriate economic multiplier to each category of impact. As each source of spending has an indirect effect on the local economy as these new dollars are re-spent locally, the value of this additional spending represents an important contribution to the economy's overall vitality. The magnitude of these combined economic impacts (direct and indirect) are represented by the "multiplier" for each respective source of new spending; for example, for each new dollar of spending for building operations in Fairfax County, Virginia, the total economic impact in the County is \$1.55. The source of these multipliers (by county) is provided in paragraph #1 under Information Sources.

New Construction Analysis (total current year construction or cumulative years)

Also, the economic impacts associated with one year's (or the cumulative impact of several year's) of new construction can be calculated by applying the appropriate construction multipliers as outlined below.

Value of construction in dollars (round to thousands or millions for presentation)

Hard Costs (1)	\$ _____
Soft Costs (1)	\$ _____
Total Building Costs (sum of hard and soft \$s)	\$ _____
Land Costs (1)	\$ _____
Associated Infrastructure (value)	
On-site (1)	\$ _____
Off-Site (1)	\$ _____
Total value of new construction—sum of above (2)	\$ _____
Estimate added annual value to existing real estate base (3)	\$ _____

1. See Information Sources paragraph #2.
2. this value* would be used to calculate economic impacts using BEA multipliers at the county or state levels): see Information sources, paragraph #1.
3. this value would be representative of the assessed valuation of the built inventory so would exclude off-site costs incurred by the developer and some soft costs that would not be reflected in an appraisal). Insurance and financing costs and fees would be excluded as these outlays have little or no impact on the local economy; all soft costs that reflect professional services should be included as these outlays clearly represent economic activity generated within the local economy as a consequence of the building industry.

Value Added Impacts (of one or more years of new construction) - the objective of this analysis is to calculate the economic output associated with the work or activity that is enabled due to the new building capacity provided. This work/activity includes both the outlays associated with operating the new inventory of buildings and the work of the jobs housed in the building.

Building Operations and Maintenance and Repair (1)

Building operations outlays (management, utilities, custodial) \$ _____/sf

Annual maintenance and repair outlays \$ _____/sf

Building or inventory square feet _____

Total annual outlays to support building/office inventory (2) \$ _____

Persons working in the office building(s) @ 250 sf/worker (3) _____

Average (mean) salary of office jobs in current year (4) \$ _____

Payroll impact of housed workers(5) \$ _____

1. See Information Sources paragraph # 5.
2. Square feet times cost per square foot summed
3. Use local worker/sf value here
4. See Information Sources paragraph #4; all the local department of economic development or chamber of commerce may be able to provide estimates for average salaries.
5. # of workers times mean salary

To calculate the total value of these outlays on the local economy, the respective spending values should be multiplied by the appropriate total output, personal income and job multipliers from the BEA tables - see Information Sources paragraph #1 regarding multipliers. Different multipliers are available for each county in the US for new construction (commercial maybe distinguished from residential), architectural and engineering services or specialized design services (soft costs), management companies (operating outlays), facilities support services (operating outlays), services to buildings (operating outlays), retail trade, personal services, health and education services and restaurant and entertainment (employee spending impacts).

Retail Economic Impact Work Sheet

The data requirements and analytical approach for retail space will parallel the requirements and processes outlined for office buildings. Assumptions concerning workers per square foot, payroll, and construction and operating costs should reflect industry specifics.

Total Inventory Impact Analysis

Total assessed value (1)	\$ _____
Total real estate tax revenue (2) (Tax rate/\$100 x value)	\$ _____
Total square feet (3)	_____
Total estimated work force (4) (Total sf divided by sf/worker)	_____
Total estimated payroll (5) (Workers times mean salary)	\$ _____
Total building operating outlays (6) (Cost/sf times total sf)	\$ _____
Total repair and maintenance outlays (7) (Cost/sf times total sf)	\$ _____
Total retail sales generated by the inventory (sales/sf times total square feet of stock)	\$ _____

1. See Information Sources paragraph #3.
2. See Information Sources paragraph #3.
3. See Information Sources paragraph #2
4. Multiply the total inventory square footage by the accepted number of workers per gross square feet in the locale (e.g., 450 gross sf per worker)*
5. Multiply the mean annual salary for retail workers (retail sector employment may be used) developed from local sources (Chamber of Commerce, Department of Economic Development) times the number of retail workers being housed.
6. Multiply the annual average per square foot operating costs (excluding utilities) reflecting local prices or use industry standard from appropriate source (e.g., IREM) times the inventory's total number of square feet.
7. Multiply the annual average per square foot repair and maintenance cost for retail uses (from local sources or industry association publications [e.g., IREM]) times the number of gross square feet in the inventory.

The total economic impacts of the dollar values developed for the spending potential of the work force housed in the retail building inventory and the outlays associated with operating and maintaining this inventory as determined in the work sheet above can be calculated by applying the appropriate economic multiplier to each category of impact. As each source of spending has an indirect effect on the local economy as these new

dollars are re-spent locally, the value of this additional spending represents an important contribution to the economy’s overall vitality. The magnitude of these combined economic impacts (direct and indirect) are represented by the “multiplier” for each respective source of new spending; for example, for each new dollar of spending for building operations in Fairfax County, Virginia, the total economic impact in the County is \$1.55. The source of these multipliers (by county) is provided in paragraph #1 under Information Sources.

New Construction Analysis (total current year construction or cumulative years)

Also, the economic impacts associated with one year’s (or the cumulative impact of several year’s) of new construction can be calculated by applying the appropriate construction multipliers as outlined below.

Value of construction in dollars (round to thousands or millions for presentation)

Hard Costs (1)	\$_____
Soft Costs (1)	\$_____
Total Building Costs (sum of hard and soft \$s)	\$_____
Land Costs (1)	\$_____
Associated Infrastructure (value)	
On-site (1)	\$_____
Off-Site (1)	\$_____
Total value of new construction—sum of above (2)	\$_____
Estimate added annual value to existing real estate base (3)	\$_____

1. See Information Sources paragraph #2.
2. This value* would be used to calculate economic impacts using BEA multipliers at the county or state levels): see Information sources, paragraph #1.
3. This value would be representative of the assessed valuation of the built inventory so would exclude off-site costs incurred by the developer and some soft costs that would not be reflected in an appraisal). Insurance and financing costs and fees would be excluded as these outlays have little or no impact on the local economy; all soft costs that reflect professional services should be included as these outlays clearly represent economic activity generated within the local economy as a consequence of the building industry.

Value Added Impacts (of one or more years of new construction) - the objective of this analysis is to calculate the economic output associated with the work or activity that is enabled due to the new building capacity provided. This work/activity includes both the outlays associated with operating the new inventory of buildings and the work of the jobs housed in the building.

Building Operations and Maintenance and Repair (1)

Building operations outlays (management, utilities, custodial)	\$ _____/sf
Annual maintenance and repair outlays	\$ _____/sf
Building or inventory square feet	_____
Total annual outlays to support retail space inventory (2)	\$ _____
Persons working in the retail space @ 450 sf/worker (3)	_____
Average (mean) salary of retail jobs in current year (4)	\$ _____
Payroll impact of housed workers (5)	\$ _____

1. See Information Sources paragraph # 5.
2. Square feet times cost per square foot summed
3. Use local worker/sf value here
4. See Information Sources paragraph #4; all the local department of economic development or chamber of commerce may be able to provide estimates for average salaries.
5. # of workers times mean salary

To calculate the total value of these outlays on the local economy, the respective spending values should be multiplied by the appropriate total output, personal income and job multipliers from the BEA tables - see Information Sources paragraph #1 regarding multipliers. Different multipliers are available for each county in the US for new construction (commercial maybe distinguished from residential), architectural and engineering services or specialized design services (soft costs), management companies (operating outlays), facilities support services (operating outlays), services to buildings (operating outlays), retail trade, personal services, health and education services and restaurant and entertainment (employee spending impacts).

Industrial Building Economic Impact Work Sheet

The data requirements and analytical approach for industrial building space will parallel the requirements and processes outlined for office building and retail centers. Assumptions concerning workers per square foot, payroll, and construction and operating costs should reflect industry specifics.

Total Inventory Impact Analysis

Total assessed value (1)	\$ _____
Total real estate tax revenue (2) (Tax rate/\$100 x value)	\$ _____
Total square feet (3)	_____
Total estimated work force (4) (Total sf divided by sf/worker)	_____
Total estimated payroll (5) (Workers times mean salary)	\$ _____
Total building operating outlays (6) (Cost/sf times total sf)	\$ _____
Total repair and maintenance outlays (7) (Cost/sf times total sf)	\$ _____
Total retail sales generated by the inventory (sales/sf times total square feet of stock)	\$ _____

1. See Information Sources paragraph #3.
2. See Information Sources paragraph #3.
3. See Information Sources paragraph #2
4. Multiply the total inventory square footage by the accepted number of workers per gross square feet in the locale (e.g., 900 gross sf per worker)*
5. Multiply the mean annual salary for industrial workers (manufacturing or wholesale sector employment may be used) developed from local sources (Chamber of Commerce, Department of Economic Development) times the number of retail workers being housed.
6. Multiply the annual average per square foot operating costs (excluding utilities) reflecting local prices or use industry standard from appropriate source (e.g., NAIOP) times the inventory's total number of square feet.
7. Multiply the annual average per square foot repair and maintenance cost for industrial/warehouse uses (from local sources or industry standards [e.g., NAIOP]) times the number of gross square feet in the inventory.

The total economic impacts of the dollar values developed for the spending potential of the work force housed in the industrial building inventory and the outlays associated with operating and maintaining this inventory as determined in the work sheet above can be calculated by applying the appropriate economic multiplier to each category of impact.

As each source of spending has an indirect effect on the local economy as these new dollars are re-spent locally, the value of this additional spending represents an important contribution to the economy's overall vitality. The magnitude of these combined economic impacts (direct and indirect) are represented by the "multiplier" for each respective source of new spending; for example, for each new dollar of spending for building operations in Fairfax County, Virginia, the total economic impact in the County is \$1.55. The source of these multipliers (by county) is provided in paragraph #1 under Information Sources.

New Construction Analysis (total current year construction or cumulative years)

Also, the economic impacts associated with one year's (or the cumulative impact of several year's) of new construction can be calculated by applying the appropriate construction multipliers as outlined below.

Value of construction in dollars (round to thousands or millions for presentation)

Hard Costs (1)	\$ _____
Soft Costs (1)	\$ _____
Total Building Costs (sum of hard and soft \$s)	\$ _____
Land Costs (1)	\$ _____
Associated Infrastructure (value)	
On-site (1)	\$ _____
Off-Site (1)	\$ _____
Total value of new construction—sum of above (2)	\$ _____
Estimate added annual value to existing real estate base (3)	\$ _____

1. See Information Sources paragraph #2.
2. this value* would be used to calculate economic impacts using BEA multipliers at the county or state levels): see Information sources, paragraph #1.
3. this value would be representative of the assessed valuation of the built inventory so would exclude off-site costs incurred by the developer and some soft costs that would not be reflected in an appraisal). insurance and financing costs and fees would be excluded as these outlays have little or no impact on the local economy; all soft costs that reflect professional services should be included as these outlays clearly represent economic activity generated within the local economy as a consequence of the building industry.

Value Added Impacts (of one or more years of new construction) - the objective of this analysis is to calculate the economic output associated with the work or activity that is enabled due to the new building capacity provided. This work/activity includes both the outlays associated with operating the new inventory of buildings and the work of the jobs housed in the building.

Building Operations and Maintenance and Repair (1)

Building operations outlays (management, utilities, custodial) \$ _____/sf

Annual maintenance and repair outlays \$ _____/sf

Building or inventory square feet _____

Total annual outlays to support industrial building inventory (2) \$ _____

Persons working in the industrial building(s) @ 900 sf/worker (3) _____

Average (mean) salary of industrial jobs in current year (4) \$ _____

Payroll impact of housed workers (5) \$ _____

1. See Information Sources paragraph # 5.
2. Square feet times cost per square foot summed
3. Use local worker/sf value here
4. See Information Sources paragraph #4; all the local department of economic development or chamber of commerce may be able to provide estimates for average salaries.
5. # of workers times mean salary

To calculate the total value of these outlays on the local economy, the respective spending values should be multiplied by the appropriate total output, personal income and job multipliers from the BEA tables - see Information Sources paragraph #1 regarding multipliers. Different multipliers are available for each county in the US for new construction (commercial maybe distinguished from residential), architectural and engineering services or specialized design services (soft costs), management companies (operating outlays), facilities support services (operating outlays), services to buildings (operating outlays), retail trade, personal services, health and education services and restaurant and entertainment (employee spending impacts).

RIMS II Multipliers

Table 1.A--Total Multipliers for Output, Earnings, and Employment by State

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	Final-demand multiplier			Direct-effect multiplier	
	Output/1/ (dollars) (1)	Earnings/2/ (dollars) (2)	Employment/3/ (jobs) (3)	Earnings/4/ (dollars) (4)	Employment/5/ (jobs) (5)
1. Alabama.....	2.3431	0.6982	25.2	2.2330	2.3858
2. Alaska.....	1.7473	.5388	14.9	1.7193	2.2246
3. Arizona.....	2.1955	.6901	22.3	2.1161	2.2478
4. Arkansas.....	2.0902	.6016	22.3	1.9769	2.1486
5. California.....	2.3136	.7258	18.7	2.2067	2.4778
6. Colorado.....	2.2171	.7000	20.7	2.1386	2.3627
7. Connecticut.....	2.0190	.6070	14.4	1.9346	2.1138
8. Delaware.....	1.8081	.4727	13.9	1.7417	1.9492
9. District of Columbia.....	1.2786	.0800	2.0	1.5590	1.4622
10. Florida.....	2.1351	.6761	23.1	2.0642	2.1031
11. Georgia.....	2.4096	.7243	22.6	2.3073	2.3608
12. Hawaii.....	1.8884	.6004	16.9	1.8355	2.3357
13. Idaho.....	1.9664	.6028	22.9	1.9187	2.1311
14. Illinois.....	2.4478	.7319	19.1	2.3020	2.6401
15. Indiana.....	2.2673	.6616	21.7	2.1128	2.4329
16. Iowa.....	2.0930	.6158	21.8	1.9925	2.2611
17. Kansas.....	2.1369	.5931	20.3	2.0714	2.3496
18. Kentucky.....	2.1604	.6096	22.2	2.0281	2.1921
19. Louisiana.....	2.0767	.6348	22.7	2.0038	2.1880
20. Maine.....	2.0151	.6257	23.2	1.9507	2.1228
21. Maryland.....	2.1469	.6230	17.9	2.1117	2.3790
22. Massachusetts.....	2.0853	.6275	14.9	2.0364	2.2465
23. Michigan.....	2.1946	.6830	19.3	2.0933	2.4617
24. Minnesota.....	2.2170	.6776	19.4	2.1146	2.5015
25. Mississippi.....	2.1384	.6284	23.5	2.0429	2.2413
26. Missouri.....	2.3211	.6481	20.2	2.1446	2.4832
27. Montana.....	1.8630	.5888	22.8	1.8047	2.0500
28. Nebraska.....	2.0228	.6066	21.3	1.9605	2.2392
29. Nevada.....	1.8972	.5804	16.4	1.8811	2.1728
30. New Hampshire.....	2.1112	.6013	17.5	2.0332	2.2911
31. New Jersey.....	2.1904	.6340	15.5	2.0818	2.3099
32. New Mexico.....	1.9563	.6102	23.0	1.9102	2.1193
33. New York.....	1.8800	.5421	13.8	1.7836	1.8921
34. North Carolina.....	2.3023	.6879	23.3	2.1870	2.3035
35. North Dakota.....	1.8420	.5316	20.4	1.7688	1.9911
36. Ohio.....	2.4190	.7143	22.6	2.2773	2.5750
37. Oklahoma.....	2.2652	.6889	26.1	2.1575	2.3915
38. Oregon.....	2.1612	.6310	19.0	2.0834	2.5983
39. Pennsylvania.....	2.4669	.7215	20.8	2.3221	2.5681
40. Rhode Island.....	1.9022	.5348	15.9	1.8765	2.1935
41. South Carolina.....	2.2207	.6425	22.6	2.1576	2.3744
42. South Dakota.....	1.9204	.5813	22.2	1.8486	2.0645
43. Tennessee.....	2.4009	.6984	22.3	2.2978	2.4996
44. Texas.....	2.5342	.7792	23.7	2.3858	2.4631
45. Utah.....	2.2710	.7030	24.6	2.1827	2.5199
46. Vermont.....	1.9128	.5752	20.9	1.8493	2.0140
47. Virginia.....	2.2131	.6280	19.9	2.1286	2.2624
48. Washington.....	2.1415	.6635	18.8	2.0525	2.4452
49. West Virginia.....	1.7944	.4899	18.6	1.7627	1.9573
50. Wisconsin.....	2.1990	.6708	21.1	2.0749	2.5063
51. Wyoming.....	1.6656	.5001	19.2	1.6487	1.8574
52. United States.....	3.1805	.9585	28.1	2.8879	3.1211

1. Each entry in column 1 measures the total dollar change in output in all row industries that results from a \$1 change in output delivered to final demand by the industry corresponding to the entry.

2. Each entry in column 2 measures the total dollar change in earnings of households employed by all row industries that results from a \$1 change in output delivered to final demand by the industry corresponding to the entry.

3. Each entry in column 3 measures the total change in number of jobs in all row industries that results from a \$1 million change in output delivered to final demand

by the industry corresponding to the entry. Because the employment multipliers are based on 1900 regional data and 1998 national data, the output delivered to final demand should be in 1900 dollars.

4. Each entry in column 4 measures the total dollar change in earnings of households employed by all row industries that results from a \$1 change in earnings paid directly to households employed by the industry corresponding to the entry.

5. Each entry in column 5 measures the total change in number of jobs in all row industries that results from a change of one job in the industry corresponding to the entry.

Source: Bureau of Economic Analysis, U.S. Department of Commerce.