

## **Program Description of Location Economic Information and Forecasting Assistance.**

State Demography Office  
Technical Documentation  
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Local Economic Information & Forecasting Assistance provided by the State Demography Office (SDO) of the Colorado Division of Local Government in support of regional and county economic planning or design projects

The State Demography Office of the Colorado Division of Local Government, as part of its general responsibility for demographic data and information, prepares population forecasts. These forecasts are used by state agencies and local governments as well as by private businesses, non-profit agencies, citizen groups and other governmental agencies. They are used in their preparation of statements or forecasts of different needs, in establishing the expected demands for different programs, in anticipating changes in private markets, and other developments related to population and population change.

Over the years, it has become evident that population change is largely -- though not entirely -- caused by changes in the region and local economy, i.e., changes in the number and type of employment opportunities and their associated earnings and benefits, and changes in the amounts and forms of other sources of income, e.g., social security and other retirement income, savings, Medicare, Medicaid, welfare programs, inter-governmental transfers. Thus, for population forecasts to be reasonable and relatively accurate, they must be prepared in the context of perceptions and/or forecasts of the local economy along with other factors that influence population change.

To achieve the desired set of economic forecasts for use in preparing its population forecasts, the State Demography Office, has prepared top-down economic forecasts for each region and county (except for the counties within the Denver metropolitan area). They have been prepared in two stages.

In the first, a forecast has been prepared by the SDO of the state's economy. This econometric model has been developed by the Center for Business and Economic Forecasting (CBEF), although is currently run and maintained by the SDO. The model is tied to 72 national data series prepared by Moody's Economy.com.

In the second stage, the same econometric model prepares forecasts of total jobs, employed persons, the labor force and personal income by region and county. These forecasts are largely based on recent and historical trends regarding the area's share of the state total. These forecasts are then evaluated and adjusted to reflect consideration of input by other economists, other forecasts, or other knowledge of local economies and/or populations.

However, the basis of these forecasts at the county level has been very general and thus, they alone have not been a completely satisfactory basis for reliably forecasting economic, and consequently population, changes at the region or county level. What has been missing has been detailed information on the industrial composition of the local economies, a sense of which industries and factors are basic to

the economy (and thus responsible for overall growth and change), a sense of the future prospects of these industries in the area, and an economic forecast based on these perceptions. Most of all, what has been missing has been any significant local input in any of these stages, and consequently, any local buy-in or understanding, much less commitment, to the futures implied by the forecasts.

Since 1990, the U. S. Forest Service and several other parties have provided monies and support to enable the Demography Office to work with local governments to overcome these missing elements. As a result, the Office has developed a program of Local Economic Information and Forecasting Assistance. This bottom-up forecasting program itself has three parts: 1.) data preparation, 2.) an analysis of the economic base, and 3.) the use of these findings to work with the counties in forecasting their economy in association with implications for the population. The following is a brief description of each of these parts:

1. Data Preparation. In this stage, the Demography Office obtains detailed data available to it from the Labor Market Information Section of the Colorado Department of Labor and Employment, the U. S. Bureau of Economic Analysis, the U. S. Census Bureau, and the United States Railroad Retirement Board. It then compiles and formats the data for the most recent year by industrial categories in an easy-to-use spreadsheet.[1] | Finally, it works with local governments and other interested parties to insure that the data are complete and properly represented by their industry designation.

2. Economic Base Analysis. Then, the Office prepares a sketch economic base analysis which distinguishes those economic activities or incomes which are: a.) "direct basic" (DB), i.e., produce exports or derive their sales or income from other outside sources including tourists or the Federal government, b.) "indirect basic" (IB), i.e., provide supplies or business services to basic industries, and c.) non-basic worker-related local resident services. The initial assumptions about which industries are direct basic, indirect basic, and non-basic local resident services are then reviewed with people knowledgeable of the activities and markets of local firms. Finally, selective surveys are conducted of firms and financial programs to determine the more important basic activities and/or markets or sources of outside revenue where these have not been satisfactorily estimated by the above general understandings.

3. Economic Forecasts. Finally, the above data and analyses are used to develop general and specific perceptions of the local economy, strategies for economic development, and/or forecasts of the future.

The forecasting process initially focuses on the major basic industries or drivers of the area and their future prospects given the expectations of that industry at the regional or national levels. On the basis of these considerations, a reasonable forecast (and/or set of alternative forecasts) is established and combined with a forecast of their secondary effects to produce a forecast of total jobs.

The jobs forecast is then integrated with existing expectations (or forecasts) regarding the population on a "Forecasting Worksheet". The population expectations may relate to past trends in population change or to population implications of local plans and/or residential zoning. On the "Forecasting Worksheet", the labor force provided by present and future county residents and combined with prospective amounts of commuters from other counties, are matched up with the job demands generated in the

economic forecast. Analytical differences in labor demand and labor supply lead to revisions in either the economic or population forecasts (or both) and / or an understanding of the relationships between them.

The data, analyses, and forecasts as prepared by the SDO in association with local governments are unique in the following respects:

a. They are more detailed in a way that is most significant in understanding the nature and functioning of the local economy and in a way that enables the use of a variety of different data sources. Numbers that could not be disclosed from the administrative record sources have been supplied by local surveys. Finally, because of the local review of the data, they are more complete and accurate, and, most of all, credible and generally accepted by local users and decision-makers.

b. They are presented in a (base industry) analytical framework that serves to identify the economic activities that drive the rest of the local economy, and, In turn, those that are dependent on these “drivers”. The identification of these distinct types of activities provides the understandings that are necessary for regional and local governments to develop appropriate strategies for economic development and provide a substantial basis for forecasting their economic future.

c. The forecasts are not just trends of aggregate data but instead are based on detailed analysis of the area's base industries. Most importantly, local governments review and revise them based on their evaluation of the area's advantages and disadvantages and on local economic development plans and programs. Finally, they are reviewed in the context of expected population growth and change, of patterns of labor force participation and commuting, and issues related to housing and community development.

The following pages are intended to provide a complete documentation of the processes that are used in carrying out this work.

## **1. DATA PREPARATION**

The data that are used by the State Demography Office to lay the groundwork for describing the local economy derive from public agency administrative records on the reported activity of business establishments. The data are compiled via a series of steps that begins with a broad-based inventory of all firms that report under the Unemployment Insurance Program. They are then supplemented at the state and federal levels from additional sources to fill in missing sectors. Finally, they are adjusted in small ways at the national level to fit into overall estimates for the national economy.

Though this system is comprehensive and thoroughly developed, the data for every county also must be reviewed and supplemented by local knowledge. This is mainly to identify activities not reported into the system and to otherwise review the system’s findings for having properly included and assigned all activity. In the last several years the State Demography Office has worked with local governments to understand and overcome these problems. As a result of these experiences, it has learned of some common patterns of under- and over-reporting of the data and has built some standard adjustments

into the system (explained below). However, as many other aspects of these reporting problems are specific to each local and/or type of industrial firm, the local review is still necessary to insure the accuracy as well as credulity of the data.

The data developed under this program consists of two variables, employment and personal income, each of which represents different aspects of the benefits or return of the economy to people or individuals. The first, employment, represents how many people are involved or engaged in the economy. Personal income measures the dollars that people receive.

For the work of this program, which is intended to serve a population forecasting program, we have had to give primacy to describing the economy in terms of employment or jobs. Thus, the first part of our work – and this documentation – has been the development of the employment data.

The data on personal income are also very important. The data on the earnings (of a job) describe how much that job is worth in terms of dollars to the job-holder. Other labor income refers to additional benefits that are associated with a wage and salary job. Proprietor's income similarly measures the income associated with a proprietor's activity which is counted as a job in our employment series.

However, there are also incomes which are not associated with a job. These include dividends, interest and rent which are quite significant, amounting to 20% of all personal income in the state. In addition, there are "transfer benefits" which include all public assistance monies, such as Social Security, Medicare, Medicaid, welfare assistance, and federal grants for housing, education and other social services assistance. All of these dollars are important to their recipients and play a significant role in the economy.

The following text describes in detail how these data are prepared.

### **The Series of Steps Leading to the Data on Employment and Personal Income**

As mentioned before, the primary variable in our analysis of the economy is employment, really jobs, because it gives a sense of how many people are involved in the economy (but not necessarily its relative dollar benefits). In fact, the term employment is very misleading because this same term is used by many unknowingly to refer to two very different measures. The first measure is a job which is a position of employment by a person with a particular firm. The second variable is an employed person which is a person who has one or more jobs. Because of multiple job holdings there are typically more jobs than employed persons in a region.

However, jobs are reported by place of work while employed persons are reported by place of residence. Thus, a person's job or second job could take place in a county different than their place of residence. Estimates of commuters are used to resolve differences in jobs created in each county's economy with the jobs supplied (including second and third jobs of an employed person) by each county's population.

In the first step, data on the number of wage and salary employees and their total earnings are reported to the Labor Market Information section (LMI) of the Colorado Department of Labor and Employment by

all employers (“with one or more employee”) covered under the Unemployment Insurance Program (Quarter Census of Employment and Wages QCEW). These firm-specific data are reported by quarter -- the employment data are listed by month -- and the firm is assigned a North American Industry Classification System (NAICS) code number based on the predominant activity of the establishment. These data are available to the Demography Office and to local governments approximately seven months after the end of the quarter. To prevent the release of firm-specific information, their use is governed by strict rules of disclosure that protect their confidentiality.

In a second step, Labor Market Information (LMI) supplements these data with data or estimates on the wage and salary employment and earnings of firms not covered under unemployment insurance, e.g., railroad workers, non-office insurance sales workers, those of religious organizations. After removing all agricultural workers, because most employees in this sector do not have to be reported, these data, as supplemented, are released by both LMI and the U. S. Bureau of Labor Statistics (BLS) in the U. S. Department of Labor as nonagricultural wage and salary employment. These data are published for 73 (“two and three digit”) industrial categories and for all metropolitan areas as well as the state as a whole.

In the third step, these data are sent to the Bureau of Economic Analysis (BEA) in the U. S. Department of Commerce. The BEA is responsible for a wide range of data and information series including the construction of the national income and product series of which estimates of gross domestic product and personal income are commonly known variables. This latter responsibility requires BEA to maintain a complete and comprehensive view of the national economy. Part of their work is to integrate -- fill-in or delete -- aspects of state-reported data with information perceived at the national level. In this “third” step, therefore, they supplement or edit the state-produced non-agricultural wage and salary data, develop data for agricultural and military sectors, and produce a complete (BEA) wage and salary employment series.

In a fourth step, BEA estimates the activity (employment) and earnings of proprietors and self-employed individuals, primarily on the basis of income tax records (Schedule C). While accounting for the activity and earnings of proprietors (such as store owners, consultants, doctors and dentists) is extremely important, the implied number of “workers” reported here can be significantly overstated. The overstatement is primarily in the extent that the data may be misinterpreted to represent full or nearly full time workers. A significant number of the persons reported here, e.g., people who do sales or consulting or the raising of animals on the side, spend only a small amount of their time in the self-employed activity.

In step five, other sources of income besides those derived from employment, i.e., dividends, interest, and rent, and transfer payments are compiled to complete the picture of total personal income.

The data on wage and salary employment, really jobs, as prepared from the first three sources and released by BEA are regarded as most accurate and most complete (for what it represents). Beyond that, its estimates of proprietors and self-employed persons (Step #4) are usually overstated, especially in the large sectors of trade and services, for reasons stated above. To overcome this

problem, the Demography Office uses the estimates prepared by the U. S. Census Bureau on non employers. A non employer in the Census Bureau's definition is a business with no paid employees. The number of non employers is determined from administrative records including tax returns filed with the IRS and the Census Bureau's Business Register. Non-construction businesses with annual receipts of less than \$1,000 are excluded (are assumed to be more of a hobby job) as are business with more than one million dollars of receipts (which are assumed to be contract or lease employment). In the event these data are suppressed, the State Demography Office supplements the information with specific data on shares of total proprietors' income by industry from BEA.

The data on income (Step #5) as compiled by BEA from all sources of income are most accurate and complete.

These BEA data – both on employment or jobs and personal income -- are currently released over two years after the end of the year for which the variables are reported. (The 2002 data were released in the Spring of 2004.) To make the data more current, they are "projected" forward one year (e.g., from 2002 to 2003) on the basis of the percent increase shown in the Unemployment Insurance data. This helps to update the data as much as possible and enables reviews and users to relate them to the present or recent past.

The following is a list of industries for which there is not sufficient UI coverage to move or "project" the data forward one year. Thus, other data sources and methods are used to accomplish this task:

Production agriculture – We use data from the US Census of Agriculture. Proprietors and wage and salary workers are treated differently. Proprietors are left constant, but trended in between Censuses of Agriculture, which occur every five years. Wage and salary employment is benchmarked to Census of Agriculture employment for agricultural workers who work more than 180 days per year and projected based on QCEW data.

Agricultural services industry – left constant from the previous year

Railroad transportation employment – County level data from the previous year is taken from the United States Railroad Retirement Board. County level data for the current year are not available at the time that the SDO employment estimates are produced, but state level employment estimates are. Counties, then, are advanced by the same percentage to aggregate to the estimated state total and revised in the subsequent year.

Private household services – change in the total population by county is used here to "project" the job change to the latest year.

These "projected" data are presented in a Data Source Matrix which lists the projected (one year) BEA wage and salary employment and the BEA wage and salary earnings in a left-most column of each variables segment of the matrix or table. BEA's estimate of total income is presented in the column to the right of that on earnings and its percent increase (over earnings) is used to calculate an "estimated" (total, including proprietors) employment, shown to the right of that on wage and salary employment. A

third column is included for each variable to allow for a locally-determined adjustment to the estimate. The sum of the estimated amounts and the local adjustments, shown in the second and third columns, equals the “proposed final” estimate. The adjustments are retained in the system from one year to the next so that they are included in each year’s update of the data.

These data as such are then presented to individuals knowledgeable of a particular county’s economy. Their job is to review and evaluate the data compiled in this way, first for its completeness and accuracy, and then, second to understand the nature of the activity for the base analysis in the next step. If a local government professional has signed an agreement not to disclose the data on a particular firm, this person can obtain the listing of firms that have been reported in the first step of the system. Using yellow pages from telephone directories and other local listings, she/he can check and supplement these lists for their completeness. The identification of the firms that make up these sectors helps to clarify the nature of the activities behind the standard definitions for the sectors.

### **Adjusting the Data for Its Under- and Over-estimation**

Though all economic activities are supposed to be reported somewhere in the system and this system includes all places that are reported, the numbers may be inaccurate for several reasons. One is that not every business -- usually those that are small or short-lived -- and every dollar of income are reported to the system. In the metropolitan areas, the numbers not reported are probably not very significant proportionately, though the amounts not reported may be (of some significance). In the non-metropolitan areas, the proportions are higher and in some sectors such as construction reach 20% or more.

In industrial sectors where there are large amounts of wage and salary employees the data on employment, including that on proprietors, is fairly easy to “estimate”, though the presence of some part-time workers may overstate a full-time equivalence. (The BEA annually reports on the ratio of reported employment to a full-time equivalent as part of its national accounts.) However, estimating a near-full time or comparable employment number is more difficult in other sectors, especially those in which a large number of proprietors or self-employed are reported. While these segments include many full-time professionals, such as lawyers, doctors, dentists, and business people, it also includes many who are reporting a small amount of additional or supplemental income received from either selling or consulting “on-the-side” of other major pursuits. Conversely, some businesses employ unpaid family members who under the system are not reported or included as employees.

The State Demography Office has worked with both locally-provided information and national parameters to try to estimate both the underreporting of income (and associated employment) and overestimating of employment to arrive at estimates of total income and nearly-full-time i.e., roughly equivalent to the wage and salary data as reported in most sectors. In general, there is little that can be done to estimate unreported income except in smaller areas where it is evident from windshield, telephone, or face-to-face surveys that there is significantly more activity in a sector than is reported to the system.

As it has turned out, national parameters (ratios) on the number of proprietors to wage and salary workers are successful in estimating the number of proprietors in the metropolitan plus ski areas of the state. In the rest of the state, all non-metropolitan areas except the ski areas, dividing the proprietors' income by the average earnings of the wage and salary employees of the industry seems to produce the most reasonable estimate of the number of the nearly full-time proprietors. Thus, the employment series, referred to as "estimated total jobs" as developed now by the Demography Office before or in absence of local review are prepared in these ways for metropolitan and non-metropolitan areas, respectively.

These data as such are then presented to individuals knowledgeable of a particular county economy. Their job is to review and evaluate the data compiled in this way, first, for its completeness and accuracy, and then second, to understand the nature of the activity for the base analysis in the next step. If a local government professional has signed an agreement not to disclose the data on a particular firm, this person can obtain the listing of firms that have been reported in the first step of the system. Using yellow pages from the telephone directories and other local listings, she/he can check and supplement these lists for their completeness. The identification of the firms that make up these sectors helps to clarify the nature of the activities behind the standard definitions for the sectors.

#### **Data on Employment and Earnings in Agriculture**

Data on employment and earnings in agriculture is unusually difficult to obtain for several reasons. First, agricultural producers -- farmers -- are not required to report their employees under the Employment Security program. While some do, the reporting that does occur covers only a small fraction of the actual employment. Second, the industry includes large numbers of proprietor-operators -- farmers -- and their families, and there are no good estimates on the numbers of these that represent full-time workers. Finally, farm income fluctuates widely with market prices and changes in inventories. Thus, the income data are not necessarily an accurate measure of activity as they are in other industries.

The most complete picture of this industry comes from the Censuses of Agriculture, which are conducted every five years. The most recent Census of Agriculture is from 2007. The data are compiled by the U. S. Bureau of the Census, based on a survey conducted primarily by mail. Because the response is voluntary (the survey results are adjusted for no responses), it is likely that the results are not perfectly accurate. However, the data that are obtained are fairly detailed and include a wide-range of variables, such as the number of farms and land use in addition to that on revenues, government payments, and expenses. These data on the number of farms and land use enable a comparison of their results with those of the county assessor, which presumably regarding these variables are fairly complete.

The most difficult metric to measure is that of farm proprietor employment. The Census of Agriculture gives a precise number in census years, although there is a great deal of uncertainty in the years following a Census. For this reason, proprietors are simply left constant until the next Census comes out. At this point they are trended. For example, at the time of this publication (2011) the 2007 Census of Agriculture is the most recent data available. The most recent Census of Agriculture prior to this was in

2002. Farm proprietors between 2002 and 2007 are trended using a compound annual growth rate between the two years. Farm proprietors from 2007 onward are held constant, but will be trended when 2012 data – the next Census – are available.

Farm labor is also difficult. As already mentioned in this document, only a fraction of farm labor is reported for unemployment insurance purposes and is therefore underreported in the QCEW. Furthermore, we do not want to track all farm labor as much of it is seasonal and not tied to a region's steady population. The Census of Agriculture divides farm labor out in to workers who work less than 180 days (approx. 6 months) and those who are employed more than 180 days.

We benchmark agriculture labor to the Census of Agriculture numbers for workers who are employed more than 180 days per year. This number is adjusted annually based on percent change in QCEW employment, although it is always evaluated because small changes in small employment numbers in the QCEW can generate large percent changes. Any large changes are evaluated by SDO staff.

For the purposes of macro-economic analysis, it is less important to achieve precise estimates of the employment and earnings of any one sector than it is to estimate its size relative to other base industries. In most rural areas, agricultural is the largest base employer, but it shares its importance with transfer payments as a source of outside income. Second, in such economic analysis, it is important to understand current and long-run trends in these industries and sources. In many agricultural areas, the trend for the earnings of this industry are fairly flat. However, a legislated reduction in agricultural subsidies can be expected to lower the overall income of the areas by a small but potentially significant amount. Thus, counties may have to prepare to accept some decline and/or seek out new ways to develop their local economy.

## **2. BASE INDUSTRY ANALYSIS**

After the final estimates of personal income and employment have been developed for each industrial sector, these activities are divided into 1) those that bring in outside dollars to the area and thus are basic to the local economy (directly or indirectly, see later discussion), and 2) those that are the result of the spending of those dollars for local resident services. This is known as economic base analysis.

### **The Theoretical Basis of an Economic Base Analysis**

The reason industries that sell outside the area, and thus bring in outside dollars, are considered basic to a region or local economy (or are considered the base of that economy) is because without them the local economy could not exist. Because nearly all people buy goods in a national market and pay federal (and state) taxes, the area would eventually run out of dollars (as it pays for these outside goods -- imports -- and pays its state and federal taxes) unless these outflows (of dollars) were matched by an inflow. These industries are basic, therefore, because without them in that place, all others could not exist in that place as well. (The exceptions occur where there are those who are receiving outside dollars from other sources, e.g., social security from the federal government, personal savings or pensions, gifts, or where there are people who are able to sustain themselves without purchasing outside goods

and without recorded monetary transactions, e.g., by farming, barter, unreported or underground activities, etc. which could be taxed.)

The spending of the outside dollars for local services or supplies is what generates additional secondary economic activities in the local economy. By separating the economy into basic and non-basic components, it is possible to focus attention on those elements of the economy -- the activities of the base industries -- which are responsible for the growth or decline of the area's overall economy.

The distinction of base versus non-base industries in a local economy is very evident in the experiences of mining towns in Colorado. When a mine was open and active in different places and times in Colorado, the nearby town was teeming, not only with a large number of miners, but also store owners, doctors, school teachers, and others. When the mine closed, the whole economy shut down, not just the mine, and everybody had to move elsewhere to earn a living, leaving a ghost town behind. Today, such drastic effects are delayed by unemployment benefits and savings, and many times are even offset or replaced by gambling or tourist dollars (from the outside) or social security or retirement benefits. Even so, the basic truth still holds. If a town or place does not receive outside dollars in one form or another, it cannot continue to survive.

The base industries generate the additional "secondary" jobs in the local economy in two ways. The first is by their purchasing of local supplies or services for the operation of their business. The jobs or earnings that result in these supplier's firms are referred to as indirect basic employment or earnings. They are indirect in that they do not directly sell to the outside customer. They are basic, however, in that they are involved with the direct basic industry in serving that outside customer rather than serving local residents.

The second, more important way, the base industries generate additional jobs is by their providing earnings (mainly), rent, interest, and possibly profits, to local residents. These residents, in turn, by spending these earnings at the local store or medical facility or by paying taxes to provide schools and enforce laws, create jobs for retailers, doctors, school teachers and police persons. These additional jobs, earnings, and income are referred to as residential services jobs in these analyses.[2]

### **Base Industries**

Direct (DB) - directly sell to outside world, export.

Indirect (IB) - provide supplies and/or services to direct basic industries (secondary, part 1).

Non-Base Industries

Local Resident Services (RS) "Induced" by Base (secondary, part 2).

### **Conducting an Economic Base Analysis**

An economic base analysis is conducted by determining the proportion of each industry's sales that are outside or inside the study area. To the extent -- proportionally -- a firm or an industry [3] sells outside the area, this proportion of their activity is (direct) basic, to the extent it sells to other firms that sell outside the area, it is indirect basic, and to the extent it sells to local residents, this proportion is local resident services. Some industries, like coal mining, aerospace manufacturing, or hotels may sell almost entirely to outside customers. Others like food stores or doctors may sell almost entirely to local customers. And others, like a regional telephone company may service all three: outside customers, local businesses, and local residents. In the end, it is the local businesses (and residents with some form of outside income) that bring in outside dollars that are the basis of the existence of all other activities in the local economy.

The most direct and complete way of determining the base industry of a local economy is to survey all local firms as to the proportion of their sales that are made to each type of customer (those outside the area, local -- direct -- businesses and local residents). A more practical way is to limit the surveys to large firms and a sample of all others. In a number of industrial sectors like hotels (virtually 100% basic) or personal services (almost 100% local resident services) an initial assumption can be made [4]. Then later, these assumptions can be checked to the extent that they affect the end result and that there are resources available to sample a number of firms.

Once the proportions have been determined for each industrial sector, the amounts of earnings, and employees in each of these sectors can be assigned to the three types of activities by multiplying the proportions by the amounts for each variable. This enables separate reviews of the industrial sectors that are direct basic, indirect basic, and local resident services, respectively. Obviously, the most important are those that make up the basic category because these are the industries -- and it is their amounts of income and employment -- that constitute the base of the local economy.

A review of the other types of industries, however, is also important. The most important part about the indirect basic industries is their ties to the direct basic industries. Ultimately, the community may want to understand more completely how certain of these industries are tied to specific direct base industries, not only in terms of sales, but also in terms of location and their use of resources.

There are several aspects to the findings regarding local resident services. They all relate to the fact that this sector, in reality, derives from the expenditure patterns of local consumers. First, in general, consumers spend between thirty (30%) and (50%) of their incomes on local resident services, depending on the size of the (local service sector of the) economy. [5] If this proportion can be estimated -- which it usually can, roughly, on the basis of its size and distance from larger markets -- then the total impact resulting from base industries, i.e., the size of the overall economy can be estimated, using this proportion in a mathematical formula [6]. If this estimated size does not match with the result of the base analysis, then either the estimate (of that proportion) is off, the estimates of the proportions of the industries are wrong, or that something is missed or overstated in the preparation of the data.

Similarly, the composition of the local resident service sector should match the reasonably-expected local service expenditures pattern of the residents. If they do not, then it may be useful to conduct

surveys of the local residents regarding their expenditure patterns so that the nature of this sector can be better understood.

### **Special Industry Studies - Tourism**

A major concern of all areas of the state, but especially those of the Western Slope, is the nature and size of its tourism industry. While the industry is very easy to define in terms of its customers, the identification and measurement of the industrial sectors involved has been much more complex. This is, in part, because it involves a half a dozen different sectors, and, even more, because in some of these sectors, such as retail, it is hard to establish how much of each sector's activities -- sales, earnings, employment -- are related to tourism. Furthermore, some aspects of tourism such as touring, visiting friends, and such activities as hiking, biking, hunting, and fishing add significantly to the day-time populations and/or traffic and/or involve large amounts of land, and yet result in little or hard-to-measure economic activity.

Nonetheless, given the above-mentioned resources of the Demography Section, much can now be done to identify and measure the tourism industry. Given that, by definition, all of the activity of this sector is basic -- is the result of expenditures of people from outside the area -- it is very important to understand its (tourism's) size and composition and its use of the resources of the area.

The most obvious element of the tourism sector are the activities that take place at major destination points such as ski or summer resorts, or at historic or special tourist sites like Mesa Verde or the Durango-Silverton Railroad. The economic measures of these activities can generally be obtained by contacting the operating companies or reviewing public documents of those that take place on public lands. Even more, surveys can be undertaken at each of these places to study the associated expenditures, such as for lodging, eating and drinking, and shopping, of visitors to these destinations.

The second, most obvious element of the tourism sector is the expenditures for hotels and other lodging places. The data on employment and earnings in this industry are readily available from the published QCEW data. Data on sales tax receipts and sales are available from the Colorado Department of Revenue. While there is probably some amount of unreported activity in this sector, e.g., related to bed and breakfast places, it is likely that over 95% of the activity of this industry is accounted for by these public-reporting data sources. The special value of this sector is not only that its establishments almost entirely serve people from outside the area and that its sales are fairly well reported but also that its activity (sales) tends to be commensurate with activities in the other parts of the tourism industry. Thus, once the overall tourism industry -- and its seasonal nature -- has been established, then short-term changes in sales tax receipts at hotels can be used as a surrogate measure for short-term changes in the overall tourism industry.

Tourism also includes a whole series of activities related to second homes, condominiums, and other tourist-related lodging that are not considered in the category of "hotels and other lodging places". (These activities have become very significant in many of the resort areas of Colorado.) The impact of this type of activity shows up in at least two places within a basic economic accounting system.

First, the building and repair of a home or town house units shows up in the construction sector. While the construction of a housing unit is a once-and-done affair, the amount of construction that has recently, and is presently going on, and is likely to continue, at least at some level, makes it a significant part of the resort communities' economy. At present, the construction of a million dollar home (not including land costs) in a resort area requires approximately fifteen (15) workers for a one-year period. Further, once the structure is built, there are numerous continuous construction activities involved in maintaining and/or remodeling the structure.

The second place where tourist activity related to second homes is evident from the economic data is in the real estate sector. The data here result from the management of these units, which is usually conducted by a local real estate and/or property management agency. While some of these (second home) properties are occupied and managed by the owner, most are not. Thus, the marketing, leasing, and management of the units are conducted by these real estate agencies. Accordingly, the employment and earnings by these agencies are reported in the real estate sector. (The earnings per resident in this sector for Colorado are nearly twice that for the rest of the country). This statistic confirms the important role of this sector in tourism and as a base industry.

Other large industrial categories that are involved with providing tourist services (and hence receive the tourist's outside dollars) are those of eating and drinking places (restaurants, bars, etc), other retail establishments (clothing, sporting goods, gift shops, convenience stores, etc), transportation services (airports, car rentals), and gas stations and auto repair services. However, the identification and measurement of the tourist portion of these industries activities (sales, earnings, employment) has been quite difficult for analysis of a local economy, especially given the resources that are generally available to address this issue.

The best measurements of these portions are obtained from surveys of customers at each of the establishments that are frequented by tourists. As the expense of such surveys can be prohibitive, many communities can become discouraged from trying to estimate the tourism industry. When an estimate is made but these sectors are not included, this omission undermines the credibility of the estimate.

Whatever relatively small error that will exist from determining the tourism proportions of these industries in this manner, this error pales against the value of having the estimate, which is tied to good data for the overall sector, and the quickness of getting it. By this approach, the main stumbling block of developing a fairly easy way of estimating of the size of the overall tourist industry has been overcome.

The importance of this overall tourism industry cannot be overstated, especially for counties on the Western Slope, as the dollars obtained from this industry are all out-side dollars. Because of this importance, it is easy to see why areas with major tourism industry components have been so susceptible to changes in the industry, or why declining counties have sought to exploit the possibilities of tourism for their area.

### **Other Sources of Personal Income**

Most people think of their local economy in terms of employment and earnings. In fact, it is the activities of employees and self-employed proprietors that constitute the activities of the economy. However, much of these activities are generated by dollars that come into and/or are circulated in the area that are not derived from any production of service activity (within the area and/or in the current time period). As such, they must be included in the tabulation of personal income. These other sources of personal income are:

**Transfer Payments.** Transfer payments are defined as payments by government and businesses to individuals and nonprofit institutions for which no current services are performed. [8] These consist primarily of retirement and disability insurance benefit payments, medical payments (Medicare and Medicaid), income maintenance benefits, unemployment insurance payments, veterans benefits, and payments to nonprofit institutions. In Colorado, transfer payments constitute 14% of total personal income. In certain counties of the state, they are a much higher percent; in some cases, they constitute more than 50% of the outside (base) income.

**Dividends, Interest, and Rent.** [9] Personal dividends and interest income are received by individuals, nonprofit institutions, and estates and trusts. Dividend income is that paid in cash and in other assets to stockholders who are residents of an area by corporations in the U. S. or abroad. Interest income consists of monies received from money market mutual funds and interest from other sources. It also consists of a certain amount of imputed interest which, for example, includes the value of financial services for which persons are not charged from life insurance companies, pension plans, and other financial intermediaries.

The rental income of persons consists of monetary income of persons from the rental of real property, the imputed net income of owner-occupants of non-farm dwellings, and the royalties received from patents, copyrights, and from the rights to natural resources. The income imputed to homeowners from homes that they occupy and, in effect, rent to themselves, is generally a significant portion of this total. This can distort one's perception of its significance to the economy if rental income is thought of as only monetary rental income paid by renters to landlords.

**Residency Adjustment** [10] Personal income is a measure of income by place of residence. However, more than 60% of personal income, primarily wage and salary disbursements, are reported by place of work. Thus, these data must be adjusted to account for commuting and when a person receives earnings for work performed and paid for from outside their place of residence. The BEA prepares such estimates, which could be positive (for a bedroom suburb) or negative (for an industrial center) based primarily on data available from the previous (1990) Census of Population. This source of income is significant for counties within metropolitan areas and for counties which contain (negative) or serve as bedroom communities (positive) for several of the ski resorts.

**Personal Savings and Gifts.** Personal savings and gifts constitute an important source of income-for-spending in a particular place and time. Personal savings constitute the source of income-for-spending especially for retirees and out-of-state owners and others of second homes. "Gifts", the transfer of monies from one individual to another, are generally not of significance in an area, though may be

interpreted as such in college towns where parents pay a significant portion of the education expenses of the students.

### **3. THE USE OF THESE DATA AND ANALYSES IN THE DESIGN OF ECONOMIC DEVELOPMENT STRATEGIES, AND IN THE PREPARATION OF ECONOMIC PLANS AND FORECASTS**

The data and analyses described above define the economic base of the study area. Further, they determine the general nature of the relationship of these base industries to the rest of the economy. The state forecast for these base industries, along with some assumptions regarding the trend in the area's share of the state totals for each of these base industries, provides a basis for a forecast of the base industries of the area. This (or these) number(s) times a general or industry-specific estimate of the secondary effects will produce a forecast defining the potential for the total growth of the overall economy.

A general multiplier defining the relationship of base employment to total employment results from the base analysis described above, and thus can be used to make the fore-cast of total employment from that of the base industries. However, local surveys defining industry-specific relationships of base industries to local suppliers and their employees (via income groups) to local consumption patterns could be developed to forecast the secondary effects of each industry. Industry-specific multipliers are also available on a regional basis using the RIMS[11] multipliers prepared for the Section by the Bureau of Economic Analysis (BEA).

However, there may be a variety of factors, such as the availability of labor, infrastructure, natural resources (water), or environmental constraints that could limit such projected growth. Conversely, there could be other developments in the area, such as a new attraction, expanded educational resources, improved accessibility (a new airport), and/or an increased availability of resources (water), which could give an area new advantage, and hence, provide the potential for stronger growth. How an area responds to prospective growth (reflected in a forecast based on outside forces and trends) and to potentially limiting or expanding factors depends to a great extent on local policies and efforts to shape the area's economy. Many of these local policies and efforts are typically addressed under the heading of economic development (see next section). They are also addressed by economic design projects when the key base industries are located on public lands, e.g., National Forests,

In sum, therefore, preparing an accurate forecast of an area requires at least three types of information and understanding. They are as follows:

1. An understanding of the current makeup of the economy, and, in particular, its base industries along with a fairly developed sense of the future of these industries and their prospective total impact on the rest of the area's economy. These could include the planned activities on National Forest lands.
2. The identification and quantifying of any change in the area's advantages and disadvantages regarding these or any other industries and the modification of the base industry forecasts accordingly.

3. The development of a community response to local problems and an accounting for a reasonable level of success from these efforts in the forecast.

Once completed, such forecasts can serve as a reliable basis for local government efforts, for state and federal government support and participation in meeting local needs, and as a basis for private and non-profit sectors decision-making.

Endnotes:

[1] These data are not generally available in this detailed form because of additional work that is required to insure their presentation does not violate disclosure requirements protecting the confidentiality of data regarding individual firms.

[2] This effect has been referred to as induced employment or income in many other economic studies.

[3] An industry is a group of firms that perform the same type of economic activity and produce or provide the same type of product or service.

[4] The Demography Section maintains a record of the general findings of the proportions assigned to each analysis category by each industrial sector so that they can be used as starting points for studies in other areas.

[5] The rest goes for the purchase of goods manufactured outside the area, for non-local taxes, or for savings.

[6] Total income = Direct income  $\times (1 / 1 - c)$  where  $c$  = proportion of total personal income spent for local resident services.

[7] In counties at the very low end it is possible that some of the local residents expenditures in these industries are made outside the county. Thus, these lowest amounts are somewhat below an average amount per resident throughout the state. However, by an inspection of the graph, it is evident that by not too much above this lowest amount, there is an amount per person that roughly applies to many counties. This is the amount that could be used to approximate the local resident component of these industries.

[8] Local Area Personal Income, 1969-92, "The Sources and Methods for the Annual Estimates of Local Area Personal Income for 1987-92," Bureau of Economic Analysis, U. S. Department of Commerce, September, 1994, page M-21.

[9] Ibid, pp. M19-21.

[10] Ibid, pp. M28-32.

[11] The Regional Input-Output Modeling System multipliers were prepared by BEA using the interindustry relationships contained in the 1987 national input-output table and 1992 Colorado regional data on employment and earnings.