

## Digging into Construction Data

By Kenneth D. Simonson

*Ken Simonson is Chief Economist for Associated General Contractors of America, the leading national trade association for the non-residential construction industry. Among other writings, he produces a free weekly one-page e-mail summarizing economic news relevant to construction, available by e-mailing him at [simonsonk@agc.org](mailto:simonsonk@agc.org).*

*Construction is a large, diverse, and—lately—fast-growing sector of the U.S. economy, comprising several distinct categories of activity. Construction accounts for roughly five percent of non-farm payroll employment and 12 percent of self-employment. The value of construction put in place totals eight percent of GDP; construction supplies and equipment are important components of manufacturing output. The current outlook for the industry is for a pause in the fast-growing residential market, but we can expect an acceleration in private and public non-residential construction. Data on different aspects of construction are available from a variety of federal and private sources. There are limitations and pitfalls that data users should bear in mind.*

The construction industry is a major contributor to the economy as data from a variety of sources attest. Here is a concise drive down “the construction data highway,” with a glance in the rear-view mirror, a look at the road ahead,

and a few warning signs about potholes in some of the indicators.

### Statistics and Sources

Construction employment in the United States in 2004 averaged 7.0 million, or five percent of non-farm payroll employment, according to the monthly employment situation report ([www.bls.gov/ces](http://www.bls.gov/ces)) from the U.S. Bureau of Labor Statistics (BLS). Moreover, two million of the nation’s 18 million sole proprietors and other non-employer businesses were in construction, according to the U.S. Census Bureau’s non-employer statistics ([www.census.gov/epcd/nonemployer](http://www.census.gov/epcd/nonemployer)). Note that the employed and non-employed workers are not additive since many employees moonlight or turn to self-employment between payroll jobs.

The value of construction put in place ([www.census.gov/construction-spending](http://www.census.gov/construction-spending)), a measure of the amount spent on design, engineering, and construction, was \$1 trillion in 2004, according to the Bureau of Census. This amount is equivalent to roughly eight percent of GDP. Approximately half of that total represented value added by construction firms directly, according to the U.S. Bureau of Economic Analysis (BEA)’s estimate of GDP by industry ([www.bea.gov/nea/pn/GDPbyInd\\_VA\\_NAICS.xls](http://www.bea.gov/nea/pn/GDPbyInd_VA_NAICS.xls)). The other half was for purchases of goods and services.

Bureau of Census figures ([www.census.gov/indicator/www/m3](http://www.census.gov/indicator/www/m3)) show that shipments of construction materials and supplies in 2004 totaled \$471 billion or nearly 11 percent of total manufacturing shipments. Shipments of construction machinery totaled \$29 billion—ten percent of total machinery shipments. Shipments do not equate to construc-

tion industry purchases, since shipments include exports and sales to non-construction customers. Conversely, construction projects use materials and equipment that are imported as well as items that are not construction-specific, such as diesel fuel and pickup trucks.

Costs for construction materials and components jumped ten percent between December 2003 and December 2004, a bit more than the 9.1 percent increase in the U.S. Bureau of Labor Statistics (BLS)’s producer price index (PPI) for all intermediate goods and far ahead of the 4.1 percent gain in the finished-goods PPI ([www.bls.gov/ppi](http://www.bls.gov/ppi)). The PPI for construction machinery and equipment climbed six percent during this period.

Most construction firms are tiny. The Census Bureau’s *County Business Patterns* identified 710,000 construction establishments in 2002, with a total of 6.3 million employees, or nine per establishment ([www.census.gov/epcd/cbp/view/cbpview.html](http://www.census.gov/epcd/cbp/view/cbpview.html)). Of these, 647,000 or 91 percent had fewer than 20 employees, and only 467 or 0.07 percent had 500 or more. Nearly all the construction firms have only one ‘establishment,’ or fixed location, although they may operate at numerous job sites in the course of a year.

There is a large seasonal element to some types of construction work, such as highway construction in Northern states. For example, seasonally adjusted hiring in construction was nearly level in November and December 2004—388,000 and 385,000 respectively—while unadjusted hiring plunged from 299,000 to 236,000, as reported by the BLS in its monthly Job Openings and Labor Turnover release ([www.bls.gov/jlt](http://www.bls.gov/jlt)).

Construction workers earn higher

hourly wages (\$19.21 in January 2005, seasonally adjusted) than private non-supervisory or production workers overall (\$15.88, a 21 percent difference), according to BLS's monthly employment report. But construction work is less continuous than the average job, both because of seasonality and the lack of assurance that once a project is completed another one requiring the same skills will be available. As a result, the gap in average *annual* pay in 2003 between construction (\$39,500) and all private industries (\$37,500) was only five percent, according to BLS's quarterly census of employment and wages ([www.bls.gov/cew/home.htm](http://www.bls.gov/cew/home.htm)).

The industry is ubiquitous and large enough in nearly every state for BLS to present monthly state construction employment counts. (Construction data are combined with the small natural resources and mining sector for Delaware, the District of Columbia, Hawaii, and Maryland.) Unfortunately, these are the only free monthly construction data by state. BLS puts out annual employment counts and wages by industry, occupation, and state. BEA produces quarterly and annual estimates of earnings—employee compensation plus profit-type income—by industry, with a lag of several months. The Bureau of the Census presents annual state and local information, but with an even longer lag, in its *County Business Patterns*. ([www.census.gov/ipcd/cbp/view/cbpview.html](http://www.census.gov/ipcd/cbp/view/cbpview.html)).

The construction industry's work force differs from the overall labor force in a number of ways, as shown in BLS tables from the *Current Population Survey* ([www.bls.gov/cps/home.htm#annual](http://www.bls.gov/cps/home.htm#annual)). In 2004, the industry employed disproportionately more Hispanic or Latino workers (21 percent of total construction employees vs. 13 percent for all industry) but fewer women (10 percent vs. 46 per-

cent overall), blacks (six percent vs. 11 percent) and Asians (one percent vs. four percent). Union membership was nearly twice as high in construction (14.7 percent) as it was in the entire private sector (7.9 percent).

### Private Eyes on the Industry

Besides the usual government suspects, a number of private sources provide information about construction. McGraw-Hill is the leading private source of both free and for-sale information about construction ([www.construction.com](http://www.construction.com)).

McGraw-Hill Construction (formerly F.W. Dodge) produces a monthly release on the value of new construction contracts. This report typically comes out a few days before the Census report on the value of construction put in place. The McGraw-Hill report covers about 55 percent of the total reported by Census and counts the full value of a contract the month it begins, whereas Census counts only the amount spent on goods, services, labor, and overhead in a given month. The overall direction of change in the two series tends to agree most of the time, although subcomponents fluctuate more in the McGraw-Hill series, as the start of a single large stadium, power plant, or bridge project can send the total for that category up long before many dollars are "put in place."

McGraw-Hill's *Engineering News-Record*, or *ENR* ([www.enr.com](http://www.enr.com)), is a weekly magazine that includes two pages of prices for 75 specific construction materials in 20 cities plus a building cost index and a separate construction cost index, both of which use fixed baskets of material and labor to track changes. In addition, the magazine usually runs several articles at the end of each quarter on construction cost trends. The city-level data and highly specific material costs provide levels of detail

not found in the PPI. The greater specificity makes it easier to track costs for a particular location or type of project but provides less of a basis for overall construction cost trends.

A supplement to the December 2004 issue of *ENR* called "Construction Facts" listed a variety of price indexes from both public and private sources. General-purpose cost indexes such as ENR's and the GDP indexes measure direct materials and labor input costs. Selling-price indexes attempt to capture the change in prices of completed buildings, including any change in margins for contractors. Valuation cost indexes measure the replacement cost of buildings and are typically used for insurance purposes.

An impressionistic early-warning system for construction input costs and availability comes out of the monthly reports of the Institute for Supply Management (ISM) ([www.ism.ws](http://www.ism.ws)). The separate surveys of purchasing managers for manufacturing and nonmanufacturing companies yield lists of items that have risen or fallen in price or are in short supply. An unspecified number of construction companies are included in the nonmanufacturing survey; and both reports typically list items that are significant for construction even if they are not unique to the industry, such as steel products or freight surcharges.

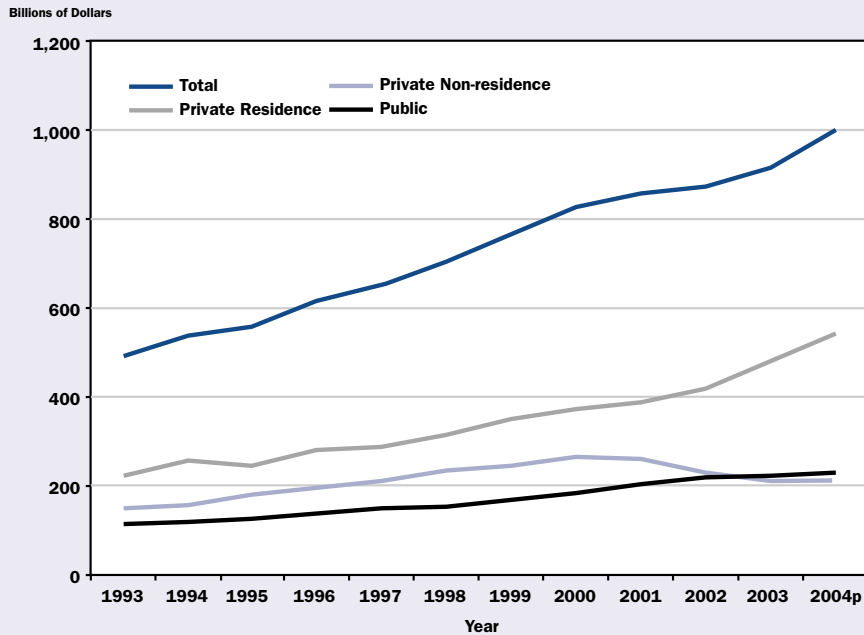
*ENR* publishes an annual list of the largest construction firms, known as the Top 400, as well as lists covering different construction specialties.

### A Look Back at 2004

In many respects, construction is more a collection of separate industries than a single industry. Each responds to different sources of demand. As the figure below shows, each has displayed a different growth pattern over the past decade.

FIGURE 1

CONSTRUCTION PUT IN PLACE, 1993-2004



The Census Bureau’s monthly press release on value put in place data presents subtotals for private and public construction, further divided between residential and 16 types of non-residential construction. The website provides detail on more than 100 finer breakouts.

*Residential Construction*

In 2004, residential construction accounted for \$550 billion (55 percent) of the \$998 billion total put in place, with all but \$7 billion being private. The predominance of residential construction is very recent; from 1995 through 2001, private residential construction annually accounted for about 45 percent of total value put in place.

The private residential total rose 14 percent in 2004, to \$543 billion, the strongest in a nine-year run of increases. (All numbers are in current dollars and reflect the sharp rise in the cost of many construction materials and inputs in 2004.) The

surge has been fueled mostly by new single-family construction, which jumped 19 percent in 2004, to \$370 billion. But multi-family construction also did well, gaining nine percent to \$39 billion despite high rental vacancy rates in many markets. Strong demand for condominiums means that “multi-family” no longer equates to “rental.” The remainder of private residential construction, not shown separately in monthly Census reports, is improvements to existing single- and multi-family units—major repairs, additions, and alterations. This category totaled \$134 billion in 2004, up three percent from 2003. The \$7 billion public residential market comprises mainly subsidized multi-family housing.

*Private Non-residential Construction*

The remaining 45 percent of value put in place in 2004 was split almost equally between private non-residential (\$222 billion, up four percent from 2003) and public non-resi-

dential (\$226 billion, up three percent). Private non-residential construction climbed from 1993 to 2000, slipped for the next three years, then grew again in 2004.

The largest private non-residential category, commercial construction, accounted for \$61 billion in 2004, six percent more than in 2003. The detailed Census tables divide commercial construction into six categories: automotive (further divided into sales, service/parts, and parking), food/beverage (including food, dining/drinking, and fast food), multi-retail (general merchandise, shopping center, and shopping mall), other commercial (drug store, building supply store, and other stores), warehouse (general commercial and mini-storage), and farm (not shown separately in monthly reports). Within these subcategories, there was a wide range of activity in 2004. The first four groups, which together encompass retail construction, rose nine percent, led by a 25 percent surge in general merchandise stores, mainly “big box” discount and warehouse-type stores. At the other extreme, warehouse construction fell six percent, reflecting the continued reduction in inventory-holding by all stages of production.

The next largest private non-residential construction categories in 2004 were: office at \$32 billion, health care and power (mainly electric power plants) at \$26 billion each, manufacturing at \$15 billion, communication and educational at \$13 billion each, and lodging at \$12 billion.

Private non-residential totals and rankings have changed dramatically in the last five years. The total peaked at \$268 billion in 2000 and contracted 20 percent over the next three years before last year’s four percent pickup. The only steady gainer over that period was health care con-

struction, which expanded ten percent last year and 33 percent since 2000. The comeback leader last year was lodging construction, as increased domestic and international business and leisure travel encouraged hotels to renovate and begin expanding. That category shrank 39 percent from 2000 to 2003 but grew 19 percent in 2004. Other turnaround categories included office, down 42 percent from 2000 to 2003 and up six percent in 2004; commercial, down ten percent from 2000 to 2003 and up six percent in 2004; communication, down 37 percent from 2001 to 2003 and up five percent in 2004; and manufacturing, down 65 percent from 1998 to 2003 and up two percent in 2004.

Electric power construction is a special case. That category topped out in 2001 and tumbled 27 percent through 2004, including an 11 percent drop last year. Demand for power plants dropped dramatically in 2000 and 2001, but the long completion time on such construction means the impact on value put in place is still being felt.

#### *Public Construction*

Public construction grew every year from 1993 to 2004 but slowed markedly in the last two years in response to slumping state and local revenues. More than 90 percent of public construction is considered state and local, even though the funding for many projects comes in part from federal grants (highways) or revolving funds for loans (water and wastewater treatment). In 2004, highway and street construction was the largest state and local category, at \$64 billion, just ahead of educational, at \$62 billion. Educational construction is broken down between primary/secondary (\$42 billion in 2004), higher education (\$17 billion) and a small “other” component, mainly library/archive. Other sizable state

and local categories include transportation (\$18 billion), sewage and waste disposal (\$14 billion), office (\$12 billion), amusement and recreation (\$11 billion), and water supply (\$10 billion).

#### **The Outlook**

It appears that 2005 will be a year of trading places. Residential construction is likely to take a breather after leading the parade for the past four years, while private and public non-residential construction pick up speed.

#### *Residential*

The decline in home building should be both slight and short-lived. Strong demand and higher materials costs have pushed land and construction costs up in many markets. Meanwhile, gradually rising interest rates will make monthly payments higher even on unchanged new-house prices. As a result, some moderate-income homebuyers are likely to be priced out of the market in 2005 and 2006.

But the longer-run demographic trends appear favorable for keeping home construction from cratering. As baby boomers become empty nesters, freed of paying for their kids’ tuition, room, and board both at home and away, they increasingly are buying a second home rather than merely downsizing the one they occupy. As their kids move into the workforce in record numbers, they have the potential to buy homes sooner than their parents did, given still-low interest rates and down payments that range down to zero. Also, a rising number of long-established immigrants are likely to become homeowners in large numbers.

#### *Private non-residential*

This sector should strengthen broadly in 2005. The hotel renovation

and construction boom that got under way in 2004 is gaining speed as more chains announce expansion plans. Retail construction will get a short-term boost from a temporary tax break that allows tenant and restaurant improvements to be deducted in 15 years instead of the usual 39 years. In addition, shopping malls are trying to woo back customers by retooling themselves as “lifestyle centers,” with more entertainment and outdoor dining, less monolithic structures, and even mixed-use buildings incorporating offices and lodging. Health care and related construction will continue to benefit from the large dollar sums that employers, consumers, and governments are pumping into research, diagnosis, and treatment. There are likely to be selective increases in manufacturing, distribution, transportation, and warehousing facilities to relieve bottlenecks and add productive capacity. The least promising markets for the short term appear to be offices and power plants, both of which still have excess capacity in many regions.

#### *Public*

Public non-residential construction is heading for a modest revival, with gains in highway, school, and most other categories. Highway construction will rise modestly. Congress approved a two percent increase in federal-aid funds for fiscal 2005 (ending September 30), with small increases likely in future years. State fuel and vehicle tax receipts, which typically fund the state share of highway spending, also are growing slowly.

Educational spending will benefit from the housing boom. Single-family houses appreciated 13 percent nationally in the year ending July-September 2004, according to the Office of Federal Housing Enterprise Oversight ([www.ofheo.gov](http://www.ofheo.gov)). Where property-tax assessments keep pace,

school districts that depend on property taxes can afford more construction. School construction is likely to shift more toward high schools and away from elementary schools. Census estimates that the elementary-school population in 36 states has fallen since 2000 as the “baby boom echo” cohort is becoming older.

State higher-education construction, as well as other categories, will benefit from a pickup in state general-fund revenues. Income and sales tax receipts climbed 7.5 percent in fiscal 2004 (covering July 2003-June 2004 for most states) after much slower growth in 2001 and 2003 and a sharp decline in 2002, according to a February 2005 tally by Nicholas Jenny of the Nelson A. Rockefeller Institute of Government ([www.rockinst.org](http://www.rockinst.org)). That will enable legislatures to reverse some of the construction cuts and freezes imposed in the last several years. However, delays in the design, permit, hearing, and contract phases that follow legislative approval mean the public pickup in construction may not gather steam until 2006. Meanwhile, federal assistance and direct spending for water, wastewater, and building construction is likely to slow by 2006 due to tight budgets for domestic discretionary programs.

Putting the pieces together yields a total for construction put in place in 2005 that will be close to the 2004 level, with growth resuming in all three segments by 2006. Meanwhile, more of the dollar total will represent new projects rather than merely higher materials prices. Materials costs are likely to remain volatile but with less upward tilt than in 2004.

### **A Cautionary Note on Construction Statistics**

Demand for construction arises from so many sources that no leading indicator reliably captures it. The

best signals relate to housing. The National Association of Home Builders ([www.nahb.com](http://www.nahb.com)) puts out a monthly survey of home builders’ expectations for the next six months. For very short lead times, the monthly Census figures on building permits accurately predict housing starts, which become construction put in place over the next several months. About 86 percent of single-family permits and 65 percent of multi-unit permits become starts within one month of issuance ([www.census.gov/const/www/lengthoftimeindex.html](http://www.census.gov/const/www/lengthoftimeindex.html)).

For non-residential construction, some private sources give hints. McGraw-Hill data broadly suggest the direction of spending. But lags between contract signing as reported by McGraw-Hill and construction put in place vary greatly by size and type of project. Construction is one of the industries covered by a quarterly survey of employers’ hiring plans by Manpower Inc. ([www.manpower.com](http://www.manpower.com)). The survey is released two weeks before the start of each quarter. The CIT Group releases an annual survey of construction executives and equipment dealers about their expectations for the coming year ([www.cit.com/main/IndustryFocus.htm](http://www.cit.com/main/IndustryFocus.htm)). The survey is conducted in August and September and released in December.

Misleading indicators result from surveys with small, unrepresentative samples or failure to adjust for the seasonality inherent in construction. Getting a representative sample of such a diverse and unconcentrated industry is difficult but essential. In contrast, the ISM survey of non-manufacturing supply executives includes an unreported, but evidently small, number of construction companies. The entire survey has “more than 370” respondents from 62 industries, or an average of six per industry. As another example, the weekly reports on new unemployment

claims by the Employment and Training Administration of the U.S. Department of Labor often list construction among the industries in which more than 1,000 new claims were reported by some states. But such experiences are to be expected in large states, where many construction projects end in any week, especially as winter approaches. The reports do not correlate at all with seasonally adjusted state employment data.

One other popular but misleading statistic is the widely cited figure from the Federal Highway Administration (FHWA) on the number of jobs “created” per \$1 billion of highway construction spending. FHWA several years ago put out an estimate that \$1 billion of federal aid, matched by \$250 million of state funds (the normal 80/20 ratio) produced 47,500 direct, indirect, and induced jobs. Not only did this figure make no adjustment for other offsetting changes in employment from using resources for construction, but it is invariably cited without reference to increases in labor costs (which each year should shrink the number of jobs per \$1 billion) or the state match.

What’s missing? Constant-dollar estimates of the value of construction put in place have been lacking since 2002, when Census discontinued its estimates because it believed the methodology was flawed. However, BLS anticipates releasing its first completed-building cost index later in 2005, and it is working on designing PPIs for several building types. BEA publishes a constant-dollar figure and price index for private non-residential fixed investment in structures, although this category includes a small amount of wells and mining structures not included in the Census totals. Privately produced price indexes also give an indication of how

costs have changed for some structure types.

Another missing measure is for productivity in construction. That is especially unfortunate in that there is wide disagreement over whether, let alone how much, productivity is changing in the industry. Creation of PPIs for different building types will eventually allow this gap to be narrowed. ■



# Ad Here?