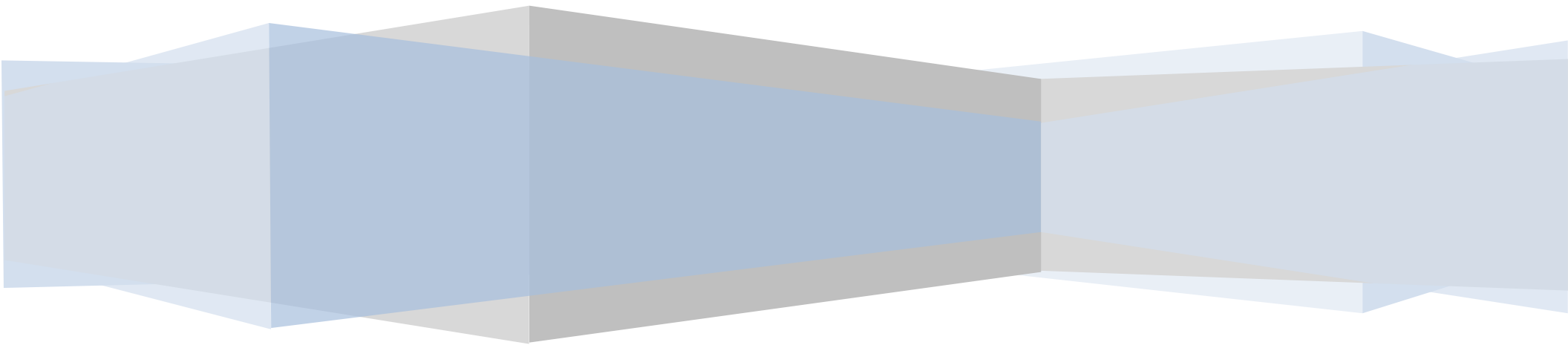


# **Colorado's Construction Industry – Impact Beyond the Hammer and Nails**

## **Analysis of Construction and Related Employment**

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## Purpose

This report presents the impact of the construction and its related industries on employment in the state of Colorado. It shows their size and how they have changed relative to total employment during the 2000s.

As well, this report briefly touches on issues relevant to construction, its related industries, and the overall economy and how those issues might impact employment.

## Overview of Construction

There are three categories of construction activity: residential (new construction and remodeling of homes), non-residential (commercial buildings such as office buildings, churches, and schools) and non-building (infrastructure such as roads and utilities). The most common industry metrics include type of permit, valuation, starts, and employment. Other metrics used to explain and understand industry activity include interest rates, housing prices, and foreclosures. This report focuses on total employment.

Construction employment is measured by the North American Industrial Classification System (NAICS) Construction sector (23), whereas the related industries include workers in select sectors of manufacturing, wholesale and retail trade, utilities, financial activities, and professional and technical services. These sectors are listed in the following sections.

The methodology for this analysis is based on a report prepared by Marshall J. Vest, Director of the Economic and Business Research Center at the University of Arizona in 2008 (<http://ebr.eller.arizona.edu>). In 2007, Vest prepared a report that showed that construction and its related industries accounted for about 20% of Arizona's total employment.

From a NAICS perspective, construction employment is categorized in three subsectors under the sector heading (23). In 2009 there were about 131,000 Colorado construction workers and the percentage of employees by subsector was:

- 67% Specialty Trade Contractors
- 19% Construction of Buildings
- 14% Heavy and Civil Engineering Contractors.

In addition, there are over 40,000 sole proprietors who work in the construction industry. While sole proprietors are admittedly an important part of the industry, this study focuses only on the covered workers, as defined by the Colorado Office of Labor Market Information (LMI). Covered workers are those who work for a company and receive wages.

## Analysis of Construction and Related Employment

### Construction

Over the years, there has been a joke that Colorado has five seasons: winter, spring, summer, and fall; the fifth is cone-zone season. Despite the severe effects of the Great Recession on the latter, Colorado has a significantly higher concentration of construction workers than other parts of the country. In 2009 the state's construction industry had a location quotient of 1.29.

Like most other industries, construction follows the ups and downs of most business cycles. Unlike other industries, it contributes proportionately more to the economy during expansionary times and less during recessionary periods. In

other words, construction is more volatile; the peaks are often more exaggerated and the troughs more severe.

This volatility can be seen in Table I. Construction as a percentage of private sector employment ranges from 7.2% to 8.9% for the period 2001 to 2009.

Note that in 2009, Real GDP was negative, single-family permits posted record lows, and construction employment as a percentage of total employment plummeted to 7.2%.

**Table I – Key Colorado Construction Information**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Colorado Construction Covered Employment	167,440	160,335	149,923	151,429	160,101	167,647	167,718	161,814	131,004
Total Covered Private Employment Colorado	1,872,850	1,814,307	1,776,722	1,800,646	1,843,544	1,890,640	1,934,618	1,943,153	1,828,955
Construction as % of Total Employment	8.9%	8.8%	8.4%	8.4%	8.7%	8.9%	8.7%	8.3%	7.2%
Real GDP (U.S.)	1.1%	1.8%	2.5%	3.6%	3.1%	2.7%	1.9%	0.0%	-2.6%
Colorado Single Family Permits	36,437	34,993	33,837	40,753	40,140	30,365	20,516	11,147	7,261

Sources: Colorado Office of Labor Market Information (LMI), Census Bureau, Bureau of Economic Analysis (BEA).

### Construction Related Manufacturing Employment

There are 11 Colorado manufacturing subsectors, or roughly 15% of all factory workers, with close ties to construction. Simplistically speaking, they produce materials used by builders and contractors. Changes in the construction industry drive the demand for their products and employment for these sectors.

Table II illustrates how construction and its related manufacturing employment increased during 2004, 2005, and 2006. This was a time when overall manufacturing employment declined. Construction and its related industries experienced employment declines from 2006 to 2009.

**Table II – Colorado Construction-Related Manufacturing Employment**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
NAICS 321 Wood product mfg	4,862	4,637	4,548	5,060	5,276	5,595	5,298	4,712	3,258
NAICS 32412 Asphalt paving & roofing materials mfg.	202	217	274	331	379	359	286	284	225
NAICS 3255 Paint, coating, & adhesive mfg	340	348	319	355	374	396	394	393	377
NAICS 32712 Clay building material & refractories mfg.	517	510	538	603	648	561	547	424	268
NAICS 3272 Glass & glass product mfg	957	845	830	865	978	1,098	1,161	1,081	959
NAICS 3273 Cement & concrete product mfg	5,678	5,444	4,805	4,884	5,142	5,174	5,250	4,897	3,824
NAICS 3274 Lime & gypsum product mfg	173	185	179	176	169	167	155	132	116
NAICS 327991 Cut stone & stone product mfg	345	314	288	308	341	498	647	644	478
NAICS 3323 Architectural & structural metals mfg.	4,877	4,567	4,257	4,407	4,092	4,187	4,364	4,417	3,694
NAICS 3334 HVAC & commercial refrigeration equipmt	1,619	1,552	1,495	1,487	1,493	1,513	1,594	1,615	1,437
NAICS 337 Furniture & related product mfg	7,596	7,145	6,955	6,902	7,090	7,110	7,134	6,663	5,312
<b>Total</b>	<b>27,166</b>	<b>25,764</b>	<b>24,488</b>	<b>25,378</b>	<b>25,982</b>	<b>26,658</b>	<b>26,830</b>	<b>25,262</b>	<b>19,948</b>

Source: LMI Covered Employment.

### Construction-Related Trade Employment

Employment patterns for Colorado’s construction-related trade sectors (4 wholesale and 3 retail) followed a pattern similar to the construction sector, although they were less

volatile. Trade employment recorded growth in 2004, 2005, and 2006. There was virtually no growth in 2007 followed by declines in 2008 and 2009.

**Table III – Trade Employment Related to Construction**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
NAICS 4233 Lumber & const. supply merchant whslrs	5,970	5,804	5,676	5,481	5,670	5,844	5,965	6,143	5,205
NAICS 4236 Electric goods merchant whslrs	9,427	8,068	7,190	6,903	6,953	7,139	7,100	7,050	6,273
NAICS 4237 Hardware & plumbing merchant whslrs	5,049	4,781	4,569	4,533	4,765	4,919	5,002	4,945	4,563
NAICS 42381 Construction equipment merchant whslrs	1,837	1,798	1,771	1,860	2,001	2,224	2,378	2,459	2,101
NAICS 442 Furniture & home furnishings stores	11,005	10,776	10,385	10,675	10,905	11,099	10,813	10,168	8,362
NAICS 44311 Appliance, TV, & other electronics stores	5,429	5,466	5,491	5,856	6,484	7,014	7,239	7,479	7,117
NAICS 444 Building material & garden supply stores	21,451	22,326	21,643	22,457	23,059	23,709	23,371	22,578	20,605
<b>Total</b>	<b>60,168</b>	<b>59,019</b>	<b>56,725</b>	<b>57,765</b>	<b>59,837</b>	<b>61,948</b>	<b>61,868</b>	<b>60,822</b>	<b>54,226</b>

Source: LMI Covered Employment.

### Construction-Related Utilities Employment

The two sectors within utilities that are directly related to construction have moved in a pattern different from overall employment and the construction industry, suggesting the utilities have a different business cycle than construction and

overall employment. This seems reasonable, given that utilities employment is based in part on the capacity of the production facilities and changes in population and less by changes in the construction industry.

**Table IV – Colorado Utilities Employment Related to Construction**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
NAICS 2211 Power generation and supply	6,037	6,093	5,879	5,904	5,889	5,928	6,064	6,239	6,361
NAICS 22131 Water supply and irrigation systems	579	590	587	599	601	637	661	670	677
<b>Total</b>	<b>6,616</b>	<b>6,683</b>	<b>6,466</b>	<b>6,503</b>	<b>6,490</b>	<b>6,565</b>	<b>6,725</b>	<b>6,909</b>	<b>7,038</b>

Source: LMI Covered Employment.

*Construction-Related Finance and Real Estate Employment*

There was countercyclical growth in the finance sector throughout the 2001 recession. This was a result of the financial industry developing and selling a variety of creative financial tools. Financial sector growth was counter to construction and total employment trends.

Around 2006, financial employment began to taper off as demand for these innovative, but sometimes problematic, programs began to decline. The total of the nine construction-related financial and real estate subsectors moved similar to the construction industry for 2006 to 2009.

In retrospect, the countercyclical movement of the construction-related financial sector employment during the first part of the decade was a signal of greater problems in years ahead. Most economists either missed these signals, misinterpreted their significance at the time, or spoke about them to audiences who did not hear their message.

(Note that this analysis does not include the 45,000 realtors classified as sole proprietors.)

**Table V – Colorado Financial Employment Related to Construction**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
NAICS 52292 Real Estate Credit	5,214	6,237	7,788	7,701	7,796	7,356	6,689	5,291	5,105
NAICS 52231 Mortgage and nonmortgage loan brokers	3,414	4,206	5,353	4,935	4,726	4,137	3,484	2,408	3,414
NAICS 524126 Direct property and casualty insurers	10,135	10,013	9,966	10,094	10,191	10,144	10,302	10,007	10,135
NAICS 5311 Lessors of real estate	11,380	11,287	11,284	11,473	11,695	11,610	11,568	11,401	11,380
NAICS 531190 Lessors of other real estate property	1,137	1,230	1,149	1,074	1,049	1,048	1,068	1,021	1,137
NAICS 5312 Offices of real estate agents and brokers	7,280	7,325	7,503	7,820	8,384	8,780	8,575	7,831	7,280
NAICS 531311 Residential property managers	7,851	8,135	8,402	8,448	8,529	8,919	9,276	9,348	7,851
NAICS 53132 Offices of real estate appraisers	1,062	1,141	1,301	1,255	1,153	1,095	1,028	988	1,062
NAICS 53139 Other activities related to real estate	614	638	649	638	776	915	999	925	614
Total	48,087	50,212	53,395	53,438	54,299	54,004	52,989	49,220	46,017

Source: LMI Covered Employment.

*Construction-Related Professional and Business Services (PBS) Employment*

The PBS sector has been a major driver of the state economy for the past two decades. As such, changes in PBS employment patterns more closely resembled overall employment than the construction industry.

Of the four sectors with close ties to construction, only the Title Abstract subsector trended similar to the construction

industry. The other 3 PBS sectors trended with the overall economy.

This is ironic because the Architectural and Engineering (AE) Services sector is thought to be a leading indicator of construction activity. Annual AE employment showed signs of strength into 2008 whereas construction employment flattened out in 2007 and fell precipitously in 2008.

**Table VI—Colorado Professional Business Services Employment Related to Construction**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
NAICS 541191 Title abstract and settlement offices	541	579	934	731	1,164	1,126	1,091	971	957
NAICS 5413 Architectural and engineering services	38,019	36,294	35,254	36,705	39,030	41,303	43,271	44,593	41,560
NAICS 54141 Interior design services	1,070	1,021	1,036	1,138	1,179	1,371	1,435	1,355	1,036
NAICS 54142 Industrial design services	79	69	164	162	111	102	132	155	128
Total	39,709	37,963	37,388	38,736	41,484	43,902	45,929	47,074	43,681

Source: LMI Covered Employment.

### Construction and Construction Related Employment

For most of the previous decade, Colorado’s construction and its 33 related industries accounted for 18% to 19% of total private covered employment. In 2009, that percentage fell sharply to 16.5% as permits dropped to record lows, Real GDP turned negative, and sector employment decreased at a faster

rate than other sectors. This data shows that between 2007 and 2009, the state lost approximately 105, 700 net jobs. About 36,700 were construction workers and 22,200 workers were in the related sectors. That total represents about 56% of net jobs lost during these two years.

**Table VI – Colorado Construction and Construction Related Industries**

	2001	2002	2003	2004	2005	2006	2007	2008	2009
Colorado Total Covered Employment (Private)	1,872,850	1,814,307	1,776,722	1,800,646	1,843,544	1,890,640	1,934,618	1,943,153	1,828,955
Change in Employment (Prior Year)		(58,543)	(37,585)	23,924	42,898	47,096	43,978	8,535	(114,198)
Index on 2001	100.0	96.9	94.9	96.1	98.4	100.9	103.3	103.8	97.7
Colorado Covered Construction Employment	167,440	160,335	149,923	151,429	160,101	167,647	167,718	161,814	131,004
Change in Employment (Prior Year)		(7,105)	(10,412)	1,506	8,672	7,546	71	(5,904)	(30,810)
Index on 2001	100.0	95.8	89.5	90.4	95.6	100.1	100.2	96.6	78.2
Location Quotient	1.44	1.42	1.35	1.32	1.32	1.31	1.31	1.32	1.29
Manufacturing Related Sectors	27,166	25,764	24,488	25,378	25,982	26,658	26,830	25,262	19,948
Trade Related Sectors	60,168	59,019	56,725	57,765	59,837	61,948	61,868	60,822	54,226
Utilities Related Sectors	6,616	6,683	6,466	6,503	6,490	6,565	6,725	6,909	7,038
Finance and Related Sectors	48,087	50,212	53,395	53,438	54,299	54,004	52,989	49,220	46,017
Professional Services Related Sectors	39,709	37,963	37,388	38,736	41,484	43,902	45,929	47,074	43,681
Total Construction Related Sectors	181,746	179,641	178,462	181,820	188,092	193,077	194,341	189,287	170,910
Change in Employment (Prior Year)		(2,105)	(1,179)	3,358	6,272	4,985	1,264	(5,054)	(18,377)
Index on 2001	100.0	98.8	98.2	100.0	103.5	106.2	106.9	104.1	94.0
Construction Employment as % of Total	8.9%	8.8%	8.4%	8.4%	8.7%	8.9%	8.7%	8.3%	7.2%
Construction Related Employment as % of Total	9.7%	9.9%	10.0%	10.1%	10.2%	10.2%	10.0%	9.7%	9.3%
Construction & Related Employment as % of Total	18.6%	18.7%	18.5%	18.5%	18.9%	19.1%	18.7%	18.1%	16.5%

Source: LMI Covered Employment.



## Comments About the Role of the Colorado Construction and Related Industries

Colorado's construction and related industries employ one-in-six private-sector covered workers, yet almost 60% of the net jobs lost between 2007 and 2009 were in these sectors.

What type of economic activity is necessary to generate enough construction and construction-related activity to recoup these losses, particularly given the state of Colorado's housing and commercial markets? (Note: this does not suggest that construction is primary or export industry or that is could or should be).

A financial analyst might suggest that the risk or volatility associated with the construction industry could be reduced if Colorado had a larger, more diverse economy. Therein lies the paradox. Because Colorado is a growth state, it is necessary to have a construction industry to support the current base of five million people and build the homes and buildings that would support a larger, more diverse economy. The Colorado State Demography Office projects continued population increases in the range of 1.5% to 2.0% for the extended future. (Population projections can be found at <http://dola.colorado.gov/dlg/demog/>).

Even with the recent reduction in state construction workers, the 2009 location quotient is 1.29, down from 1.44 in 2001. Because the industry is not considered a primary or export

industry, at some point the location quotient will eventually revert to 1.0. At that time Colorado will have a concentration of construction workers comparable to most other parts of the country. Keep in mind that this correction will likely include a comparable adjustment in the related industries identified in this study.

Construction is necessary for the expansion and maintenance of the Colorado economy. It is essential that economic development, public, and private leaders understand the relationship between construction employment, its related sectors and the overall economy. That includes awareness of the volatility of the industry and the likelihood that construction employment will ultimately revert to a location quotient of 1.0.

*Gary Horvath has conducted research in Colorado for over 2 decades. If you have questions about this or other research, contact visit <http://www.cber.co> or contact him at [cber@cber.co](mailto:cber@cber.co).*