Exhibit A


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EXHIBIT A

BY **JOHN CAULFIELD,** SENIOR EDITOR

ERRORS AND OMISSIONS IN CONTRACT DOCUMENTS LEADING CAUSE OF DISPUTES IN NORTH AMERICA: ARCADIS REPORT

For the second consecutive year, the leading cause of construction contract disputes in North America was errors and omissions in contract documents. While the value of disputes fell by nearly 14% in 2014, the time it took to resolve them lengthened substantially, to more than a year.

These are some of the key findings in the "Global Construction Disputes Report 2015," the fifth such annual report produced by Arcadis. Its data are based on contract disputes handled by Arcadis's Construction Claims Consulting teams in North America, Europe, the Middle East, and Asia. (Arcadis could not provide statistics on the total value of disputes. But last year it served as a claims consultant on approximately 40 disputes with values up to $100 million.)

Globally, the report found an increase in the value and length of disputes, with the most common cause being a failure to properly administer the contract.

"This is both a revealing and concerning statistic," said Mike Allen, Arcadis's Global Leader of Contract Solutions. "It raises myriad questions as to how projects and programs are briefed, scoped, and structured," as well as questions about resourcing, training, and the contracting environment itself.

The transportation sector accounted for 31% of global contract disputes. Despite the presumed advantages of joint ventures, one in three JVs still ends up in a contract dispute. That figure dips to less than one in five (19.8%) in North America.

Worldwide, the average value of disputes increased last year to $51 million, from $32.1 million in 2013. The highest average was in Asia, where dispute values more than doubled, to $85.6 million. Arcadis attributed the jump primarily to the region's growth, the complexity of its construction projects, and the rise in joint ventures.

Dispute values in the Middle East rose to $76.7 million, from $40.9 million in 2013. In the U.K., dispute values dipped slightly, to $27 million.

The average time taken to resolve disputes globally rose to 13.2 months, up from just under 12 months in 2013. All areas of the world saw their resolution processes extend, with the exception of Asia, where the average dispute length took two months less than it did the year before.

In North America, the length of disputes last year increased by more than 18%, to

RSMEANS COST COMPARISONS: Schools (elementary, junior high, high, vocational)

	ELEMENTARY SCHOOL			JUNIOR HIGH SCHOOL			HIGH SCHOOL			VOCATIONAL SCHOOL		
	'15	'14	% chg.	'15	'14	% chg.	'15	'14	% chg.	'15	'14	% chg.
Atlanta	153.04	152.69	0.2	153.60	154.82	-0.8	151.34	152.42	-0.7	152.77	151.93	0.6
Baltimore	163.22	161.27	1.2	163.82	163.53	0.2	161.40	160.99	0.3	162.94	160.48	1.5
Boston	206.04	205.24	0.4	206.80	208.11	-0.6	203.75	204.88	-0.6	205.68	204.23	0.7
Chicago	205.34	204.04	0.6	206.10	206.89	-0.4	203.05	203.68	-0.3	204.98	203.03	1.0
Cleveland	175.15	173.12	1.2	175.80	175.54	0.1	173.20	172.82	0.2	174.85	172.27	1.5
Dallas	149.70	147.53	1.5	150.26	149.59	0.4	148.04	147.28	0.5	149.45	146.80	1.8
Denver	161.11	161.62	-0.3	161.71	163.88	-1.3	159.32	161.33	-1.2	160.83	160.82	0.0
Detroit	181.64	178.79	1.6	182.32	181.29	0.6	179.62	178.48	0.6	181.33	177.91	1.9
Houston	151.81	150.80	0.7	152.37	152.90	-0.3	150.12	150.53	-0.3	151.55	150.05	1.0
Kansas City, Mo.	179.36	180.51	-0.6	180.03	183.03	-1.6	177.37	180.19	-1.6	179.05	179.62	-0.3
Los Angeles	188.31	186.01	1.2	189.01	188.60	0.2	186.22	185.68	0.3	187.99	185.08	1.6
Miami	152.33	153.37	-0.7	152.90	155.52	-1.7	150.64	153.10	-1.6	152.07	152.61	-0.4
Minneapolis	190.42	189.44	0.5	191.12	192.09	-0.5	188.30	189.11	-0.4	190.09	188.50	0.8
New Orleans	151.28	152.17	-0.6	151.84	154.30	-1.6	149.60	151.90	-1.5	151.02	151.42	-0.3
New York City	230.43	229.80	0.3	231.28	233.01	-0.7	227.87	229.40	-0.7	230.04	228.66	0.6
Philadelphia	202.00	198.89	1.6	202.75	201.67	0.5	199.76	198.54	0.6	201.66	197.90	1.9
Phoenix	154.97	154.06	0.6	155.54	156.21	-0.4	153.24	153.79	-0.4	154.70	153.30	0.9
Pittsburgh	180.06	178.10	1.1	180.73	180.59	0.1	178.06	177.79	0.2	179.76	177.22	1.4
Portland, Ore.	176.38	172.95	2.0	177.03	175.37	0.9	174.42	172.65	1.0	176.08	172.10	2.3
St. Louis	180.41	178.79	0.9	181.08	181.29	-0.1	178.41	178.48	0.0	180.11	177.91	1.2
San Diego	183.22	181.20	1.1	183.90	183.73	0.1	181.19	180.88	0.2	182.91	180.30	1.4
San Francisco	215.16	212.11	1.4	215.96	215.08	0.4	212.77	211.74	0.5	214.80	211.06	1.8
Seattle	180.94	178.96	1.1	181.61	181.46	0.1	178.93	178.65	0.2	180.63	178.08	1.4
Washington, D.C.	170.24	169.00	0.7	170.87	171.36	-0.3	168.34	168.71	-0.2	169.94	168.17	1.1
Winston-Salem, N.C.	146.02	135.85	7.5	146.56	137.75	6.4	144.39	135.62	6.5	145.77	135.18	7.8

COSTS IN DOLLARS PER SQUARE FOOT

FOR MORE DATA, VISIT RSMEANS AT WWW.RSMEANS.COM, OR CALL (800) 448-8182.

Exhibit B

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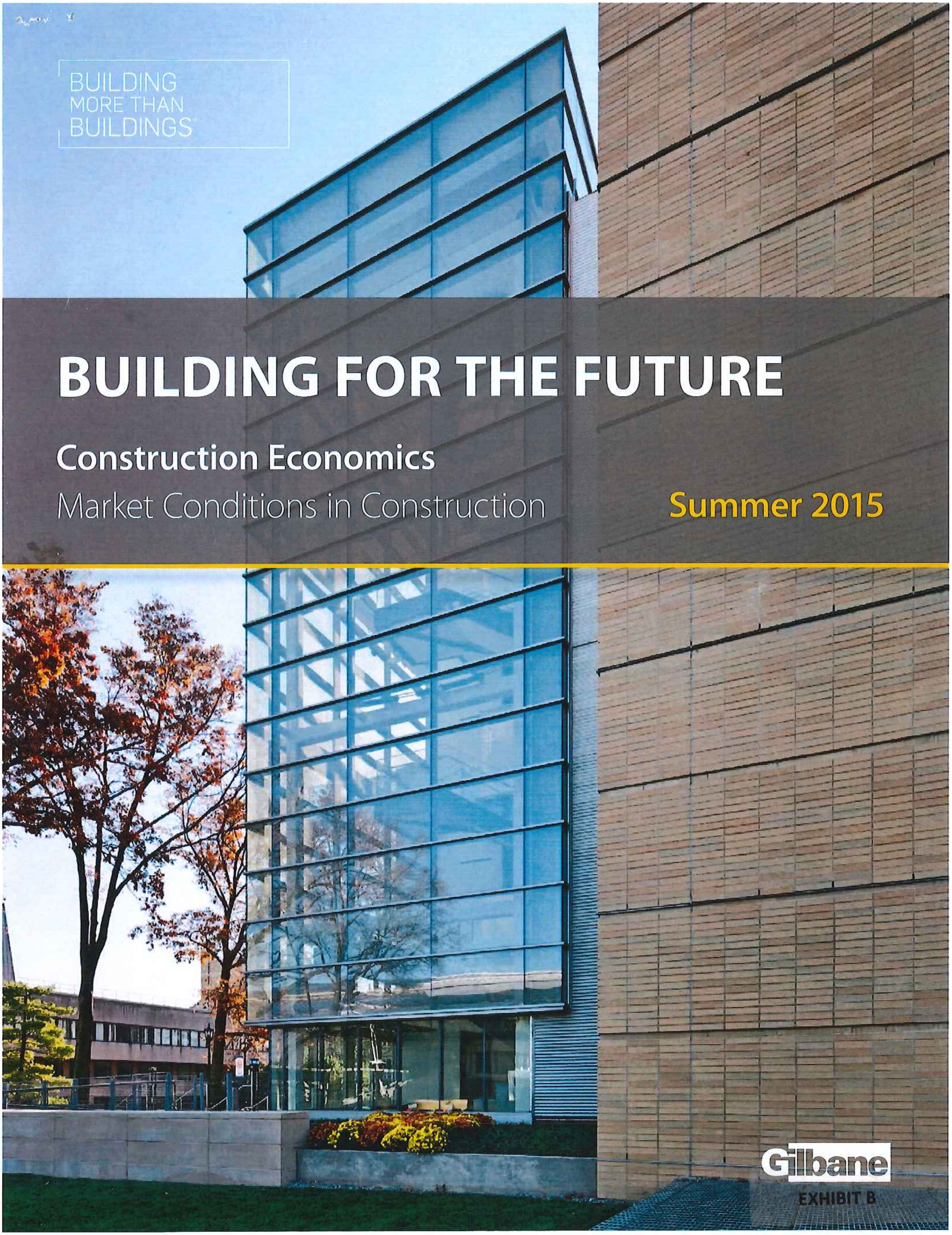
Construction Economics

Market Conditions in Construction

Summer 2015

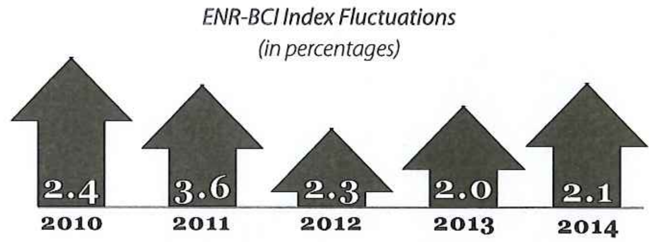


Gilbane

EXHIBIT B

ENR Building Cost Index

The August 2015 Engineering News-Record 20 Cities Average Building Cost Index (ENR-BCI) is 5515, up 2.3% year over year. New York City is at 9.1%. Cincinnati, St. Louis, Boston and Chicago show a higher than average inflation rate. Atlanta, Cleveland, Dallas, Denver, Kansas City, and Los Angeles are below the ENR average inflation rate. Baltimore and Birmingham are showing deflation.



The ENR-BCI is one of the most well-known and most widely-used building cost indices. However, its long-term strengths can also be weaknesses, particularly in times of fluctuating selling prices because:

- It is made up of a small shopping basket of labor and materials. Therefore, it is not always the best representation of all building types, which can vary considerably in composition.
- That shopping basket includes no representation for any mechanical, electrical or plumbing items, which can comprise 30%-50% of the cost of the building. In many cases, the shopping basket comprises less than 20% of the building cost.
- Building materials differ widely in rate and timing of cost growth and can dramatically affect the cost of projects. In 2009, while structural steel products declined in price by 10% to 15%, copper products increased in price by 40%.

The annual average ENR Index has gone up every year for 70 years.

ENR-BCI does not take into consideration bid prices, so it often does not represent the final cost of buildings. Bid prices are referred to as Selling Price, and this is not included in the ENR-BCI. Selling prices show increased or reduced margin bids due to market activity.

There were several monthly declines in the ENR index from late 2008 through early 2010, but the annual average has gone up every year for 70 years. More importantly, from Q2 2008 through Q2 2011, during the only recent period in which true deflation occurred, the ENR-BCI would indicate a 10% cost increase! The actual final cost of buildings, documented by several reliable measures, from Q2 2008 through Q4 2010 went down by 8% to 13%.

Whenever there are very active periods or very depressed periods of construction activity, contractor selling prices rise or fall accordingly, and since the ENR-BCI does not track selling price, it cannot reflect accurately what effect selling price had on the cost of buildings during those periods. Nonetheless, the ENR-BCI is often relied upon as an indicator of cost movement over time.

You must take into consideration the selling price of buildings, past and present, if you want to accurately index the cost of buildings over time.

Exhibit C

Kamath, Sundaresh K

Subject: Using ENR Indexes

Using ENR Indexes

Readers of ENR direct a steady stream of questions about the magazine's indexes and how to accurately apply them to various construction projects. To help clarify the nature and uses of the cost indexes, here are answers to the most frequently asked questions and suggestions on how to avoid costly mistakes.

What is the difference between ENR's Construction Cost Index and its Building Cost Index?

The difference is in their labor component. The CCI uses 200 hours of common labor, multiplied by the 20-city average rate for wages and fringe benefits. The BCI uses 68.38 hours of skilled labor, multiplied by the 20-city wage- fringe average for three trades– bricklayers, carpenters and structural ironworkers. For their materials component, both indexes use 25 cwt of fabricated standard structural steel at the 20-city average price, 1.128 tons of bulk portland cement priced locally and 1,088 board ft of 2x4 lumber priced locally. The ENR indexes measure how much it costs to purchase this hypothetical package of goods compared to what it was in the base year.

What kinds of construction do the ENR indexes represent?

The two indexes apply to general construction costs. The CCI can be used where labor costs are a high proportion of total costs. The BCI is more applicable for structures.

Where does ENR get its data?

ENR has price reporters covering 20 U.S. cities who check prices locally. The prices are quoted from the same suppliers each month. ENR computes its latest indexes from these figures and local union wage rates.

Does ENR have cost indexes for cities outside the U.S.?

ENR publishes indexes for two Canadian cities, Montreal and Toronto, each month. ENR's Fourth Quarterly Cost Report includes the most comprehensive listing of international costs.

Are material prices averaged?

No. ENR reporters collect "spot prices" from a single source for all of the materials tracked, including those in the index. The reporters survey the same suppliers each month for materials that affect the index. Actual prices within a city may vary depending on the competitiveness of the market and local discounting practices. This method allows for a quick indicator of price movement, which is its primary objective.

Do the city indexes have different weightings?

No. Each city uses the same weight for the labor and materials components as the U.S. average index.

Do the indexes measure cost differentials between cities?

No. This is one of the more common errors in the application of ENR's indexes, which only measure the trend in an individual city and in the U.S. as a whole. Differentials between cities may reflect differences in labor productivity and building codes. Moreover, quoting bases for lumber and cement vary from one city to another. One city may report list prices while in another prices for the same material may include discounts.

Are indexes seasonally adjusted?

No. This is an important point for users of the indexes to keep in mind. Wages, the most important component, usually affect the indexes once or twice a year. Cement prices tend to be more active in the spring while fabricated structural steel pricing tends to have monthly adjustments. Lumber prices, more dependent on local pricing and production conditions, are the most volatile and can change appreciably from month to month. Declines in indexes are most often the result of falling lumber prices.

The study of an index movement for a period of less than 12 months can sometimes miss these important developments. Users of an index for individual cities should also watch the timing of wage settlements. Stalled labor negotiations may keep the old wage rate in effect longer than a 12-month period, giving the appearance of a low inflation rate.

Is it more accurate to use an index that is closest to my home city?

No. The 20-city average index is generally more appropriate. Because it has more elements, it has a smoother trend. Indexes for individual cities are more susceptible to price spikes.

Are annual averages weighted?

No. They are straight mathematical averages.

EXHIBIT C

Are the indexes verifiable?

Yes. ENR's national indexes are updated in the first week of each month on the Construction Economics pages of the magazine while indexes for individual cities appear in the second issue of the month. Prices for the indexes' materials component are published in the preceding month on the Construction Economics pages.

Cement prices are in the first issue of the month, lumber prices in the third and steel in the fourth issue. Wage rates for all 20 cities are published in the second and third Quarterly Cost Reports. The reader can compute ENR's indexes by multiplying the published prices and wages by the appropriate weights, shown in the tables below, and summing the results.

Does ENR forecast its indexes?

Yes. ENR projects its BCI and CCI for the next 12 months once a year in the Fourth Quarterly Cost Report. To reach its forecast, ENR incorporates the new wage rates called for in multiyear, collective-bargaining agreements and estimates for areas where new contract terms will be negotiated. ENR estimates the materials component by studying consumption forecasts and price trends.

Does ENR ever change the weighting of the index components?

No. The components are always multiplied by the same factors. However, a component's share of an index's total will shift with its relative escalation rate.

Has ENR ever changed the makeup of the index components?

Yes. Only once, in 1996. ENR was forced to switch from the mill price for structural steel to the 20-city average fabricated price for channel beams, I-beams and wide-flanges when ENR's sources for mill prices left the structural market.

Does ENR revise the indexes?

Yes. On some occasions, ENR must revise the indexes. For example, ENR revised its March 2004 indexes shortly after their initial publication to reflect the huge surcharges being placed on structural steel. Revisions to national indexes are published below. Revisions to indexes for individual cities are published in the tables on the following pages.

Do ENR's cost indexes capture all the factors influencing construction costs?

No. ENR's two primary cost indexes, the Construction Cost Index and the Building Cost Index, each have only four components (inputs) -- cement, lumber, structural steel, and labor. They do not capture all the factors influencing project costs. They merely offer a snapshot of general cost trends.

Why doesn't ENR publish data on construction costs in Florida or Arizona?

When we first began collecting cost data in the 1930's Florida and Arizona were very lightly populated. We have decided not to revise our list of 20 cities, in order to preserve the continuity of our data sets.

Where can I obtain data on construction costs in Florida or Arizona, or other states that ENR does not collect cost data from?

There are three major firms that collect construction cost data -- R.S. Means, Marshall and Swift/Boeckh, and BNI Books -- all of which have data for most regions of the U.S., including Florida and Arizona.

What data does ENR publish on building material prices?

ENR has been collecting, compiling and publishing price data on 75 different building materials, in 20 major U.S. cities, plus Montreal and Toronto, on a monthly basis for over 50 years. We publish a table of cement and concrete and aggregate prices in our first weekly issue every month, pipe prices the second week, lumber, drywall and insulation prices the third week, and steel prices the fourth week.

How can I get any of this building material price data going back in time?

If you only need this data for a few specific months in the past, the best way to get it is to get those tables off our website. The monthly tables since February 2005 are posted on our website. To find them, go to our home page, and on the right-hand side of the screen, click on the link that says "magazine archive." Then scroll down to the weekly issue containing the table you need, and click on the link that says " This week ENR (date) online index." That will bring you to the table of contents page for that issue. Then, under the Departments heading, click on the Construction Economics link.

Exhibit D

KILEYADVISORS
Leadership & Strategy

October 15, 2015

Mr. Leo Bobadilla
Chief Operating Officer
Houston Independent School District
Hattie Mae White Educational Support Center
4400 West 18th Street
Houston, Texas 77092

Dear Mr. Bobadilla,

This letter follows up your inquiry to us about the validity of using the R.S Means Construction Cost Data and the Engineering News Record's (ENR) Cost Indexes as an accurate reflection of construction cost escalation or deflation in the greater Houston area. Our answer is that neither measurement is accurate nor relevant to Houston based for the following reasons:

- First, neither index is specific to Houston. R.S Means uses a national average as its base, and then figures a per city percentage of that average. ENR typically uses an average of 20 cities, and a basket of specific materials or trades for their material and wage index calculations. In these calculations, there are cities with much less dynamic construction markets than Houston has had during the period 2012 through 2014 and continuing into 2015.
- During the period 2012-2014, Houston had unprecedented growth in New Non – Residential Construction Contract Awards, which includes both commercial and industrial projects. Houston was the national leader in New General Purpose Office Space construction and several of the large petro-chemical projects got underway. This created labor shortages, material shortages, talent wars and the use of per diem allowances. The cost escalations required to cope with these real market conditions in Houston would be discounted in both the R.S Means and ENR cost indexes by being averaged with cities that were stagnant or decreasing in construction volume.
- Additionally, even a comparison to Houston's own past cost escalation percentages, would have missed the dynamics of the 2012-2015 period because of the impact of the number and size of the industrial projects.

Sincerely,

Pat Kiley
Kiley Advisors

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Fax: 713-840-1776
Web: www.kileyadvisors.com

EXHIBIT D

Supporting Documentation

McGraw-Hill/Dodge Analytics Houston MSA Contracts Awarded
(9-12 month leading indicator for construction)

		Non-Residential	% chg	Residential	% chg	Total	% chg
2010		3,224,431,000	-15.0%	4,843,575,000	3.6%	8,068,006,000	-4.7%
2011		3,647,348,000	13.1%	5,323,790,000	9.9%	8,971,138,000	11.2%
2012		4,072,056,000	11.6%	7,171,424,000	34.7%	11,243,480,000	25.3%
2013		3,832,964,000	-5.9%	8,541,300,000	19.1%	12,374,264,000	10.1%
2014	unadjusted	20,637,206,000	438.4%	9,841,557,000	15.2%	30,478,763,000	146.3%
2015	run rate	6,737,631,000	-67.4%	10,275,583,000	4.4%	17,013,214,500	-44.2%

Notes: 2010 was the lowest point for non-residential construction since 2003; 2014 began the inclusion of large industrial projects in the non-residential numbers.

Houston Construction Employment via BLS (000's)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2010	172.2	171.5	172.4	173.2	173.9	173.9	174.5	175.0	174.9	175.2	172.4	171.0
2011	165.9	169.6	170.8	170.9	170.7	173.3	174.5	175.9	178.0	177.7	176.1	174.5
2012	171.7	175.3	178.2	178.0	180.6	181.8	179.5	183.8	184.9	190.2	188.1	186.7
2013	183.6	190.8	191.6	192.0	192.3	193.9	192.0	193.4	192.5	194.2	192.5	192.1
2014	191.5	196.9	198.3	201.5	203.6	202.8	203.4	206.7	208.6	210.4	209.1	208.8
2015	204.9	206.1	207.0	206.4	204.4	205.4	203.4	203.0(P)				

P : Preliminary

Houston Total Non-Farm Payroll Employment via BLS (000's)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	2591.9	2592.4	2588.4	2572.2	2572.8	2566.7	2536.8	2529.6	2533.2	2536.7	2541.0	2546.9
2010	2501.1	2515.7	2533.5	2546.5	2565.6	2566.0	2550.5	2553.9	2561.5	2576.0	2587.1	2596.6
2011	2553.9	2569.7	2593.4	2612.5	2618.1	2630.6	2618.5	2625.6	2642.5	2648.2	2664.2	2679.5
2012	2637.7	2662.8	2689.0	2699.9	2720.7	2735.1	2720.6	2736.3	2751.5	2767.8	2788.0	2798.0
2013	2747.7	2785.0	2802.8	2811.5	2824.5	2834.6	2824.1	2829.7	2842.0	2861.2	2879.3	2887.9
2014	2839.9	2869.7	2888.7	2903.6	2923.0	2931.3	2921.6	2932.0	2947.2	2967.5	2982.7	2992.6
2015	2945.6	2965.7	2973.1	2971.6	2982.7	2991.1	2982.2	2970.4(P)				
P : Preliminary												

Houston Job growth:
2010: 49,700
2011: 82,900
2012: 118,500
2013: 89,900
2014: 104,700
2015 (YTD): -22,200

City of Houston Permits

		Non-Residential	% chg	Residential	% chg	Total	% chg
2010		2,212,942,871	-22.0%	962,493,768	9.4%	3,175,436,639	-14.5%
2011		2,385,946,356	7.8%	1,227,040,628	27.5%	3,612,986,984	13.8%
2012		3,084,289,115	29.3%	1,772,393,816	44.4%	4,856,682,931	34.4%
2013		3,506,459,082	13.7%	2,156,159,128	21.7%	5,663,618,210	16.6%
2014	unadjusted	5,127,846,454	46.2%	2,793,763,239	29.6%	7,921,609,693	39.9%
2015	YTD August	3,481,194,433		1,978,057,869		5,459,252,302	

Note: 2014 higher than previous 12 years (all categories); 2015 slightly lagging 2014 YoY numbers but the run rate would put 2015 at a faster pace than 2014 if the momentum remained (unlikely)

KILEYADVISORS

Exhibit E

Escalation – What Should We Carry?

Escalation – What Should You Carry?

Escalation is typically thought of as one simple value. An estimator typically prepares a budget in today's dollars, but then must escalate the total estimate to the midpoint of the project construction schedule. As explained in prior sections, when determining escalation, the value must account for several factors.

Escalation must account for all anticipated differences from today's cost to expected future cost.

TO MOVE COSTS FROM TODAY'S DOLLARS TO FUTURE DOLLARS, WE MUST ACCOUNT FOR THE CUMULATIVE EFFECT OF:

- Market activity
- Labor wage rate changes
- Productivity changes
- Materials cost changes
- Equipment cost changes
- Margins fluctuations

The following escalation recommendations are based on the previous analysis of anticipated market activity, labor and material cost movement, productivity expectations and anticipated margin movement.

- Looking back at Q4 2014, it is expected construction activity growth in most major sectors. Healthcare and infrastructure heavy engineering declined, but manufacturing buildings began to expand rapidly.
- For both 2015 and 2016, the general consensus across several construction economic reports is growth in spending of 8% to 11%.
- Residential construction expanded, although at a somewhat slower rate than 2012-2013.
- Nonresidential buildings activity in 2015 will post the largest percentage gains ever recorded.
- Spending could reach 20%+ growth above 2014. Two-thirds of that will come from starts recorded in 2014.
- In 2015, office construction is expected to register 20%+ growth for the second year in a row.
- Manufacturing will post a 50%+ gain in 2015, a percent gain never before seen in any market.
- The Architectural Billings Index for Institutional building hit an all-time high in June. The institutional sector is the last to recover after a downturn. The institutional ABI has been positive for 13 consecutive months and just reached a new high. This is an indicator that the rate of spending activity will increase 9 to 12 months from now.
- Inflationary pressures may push the rate of material cost increases higher. All material cost increases from the manufacturer through the supplier may be passed along to the owner.

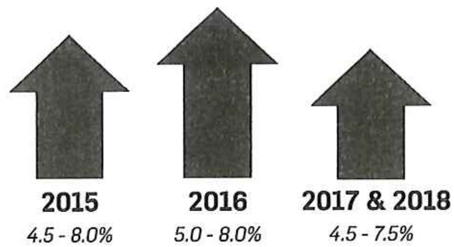
- Labor shortages may be significant resulting in higher labor retention costs.
- Growing work volume will have the effect of reducing productivity, driving up labor cost.
- Contractors may increase margins 1% to 2% per year.
- Any assumption of low escalation (3%-3.5%) requires that market activity does not experience strong growth. All signs indicate otherwise.

Historical labor and material index growth is 75% in 20 years. That is 3.75% simple index growth per year or 2.85% compounded inflation cost growth for 20 years.

Historical as-sold building cost growth is 89% for 20 years. That is 4.45% simple index growth per year or 3.25% compounded inflation cost growth for the last 20 years.

Historical average spending growth is 7% per year (not including 2008 to 2011 when spending declined 35%).

TOTAL ESCALATION



Since the U.S. Census began keeping construction spending records in 1993, it has recorded a rate of spending growth over 10% per year only twice and only three other years have exceeded 9% per year growth. In 2015, we will have 10%+ growth.

FOR NONRESIDENTIAL BUILDINGS

In years when nonresidential spending growth exceeded 10%, as-sold cost escalation was 9% to 11%.

Potentially, there may be escalation similar to the growth years of 2004 through 2008 when (for nonresidential buildings) spending grew 53%, and escalation averaged 8% per year for five years. All leading indicators point to continued growth for the next few years.

For each year above, consider your market. If you are in a market area or sector that has expectations of a huge volume of work that may start within a narrow window of time, then market pricing can turn rapidly for you.

Exhibit F

Experts Take on Construction Pricing, Schedules and Trends in Houston

Cushman & Wakefield recently sat down with some of the top construction executives in Houston for their take on the market, pricing, schedules, trends and the future of construction. Joining the Q&A were Joe Cleary from Harvey Builders, Dan Gilbane from Gilbane Building Company, Trey Snider from O'Donnell/Snider Construction, and Bobby Surles from Trademark Construction.

Q: What drives construction pricing?

Cleary: The simple components of construction pricing are labor, materials, supervision/management and fees. These components begin to get complicated when the demand for contracts and services is high or low. When demand is high, labor increases due to competition for skilled and unskilled labor. Materials (including rental equipment), management and fees follow the economic theory/law of supply and demand. As contractors' and subcontractors' backlogs get healthier in a busy market, overhead and profit margins increase to whatever the current market will bear. As the market begins to cool off, labor, materials, rental prices, and overhead and profit margins begin to recede, albeit at a much slower rate than when they increased. We refer to this phenomenon as "sticky pricing."

Gilbane: There is no consistent formula for determining construction pricing as the market is driven by multiple variable inputs with two of the more consistently significant contributors being labor and commodity inputs. "In the trenches" construction is a local business with each market reflecting micro-economic trends, particularly the labor market. Conversely, commodity inputs can significantly impact market pricing as it is driven more by macro-economic trends and is more of a reflection of global demand.

Snider: Construction pricing is driven by demand. Cost of materials is a factor, but demand for labor and increasing trade costs are more significant.

Surles: Construction pricing is driven by volume of work in the market, as well as available resources in people and materials.

Q: Expand on the role labor plays in pricing.

Gilbane: Labor is consistently a substantial driver of pricing, and the current labor market is a particularly significant driver in the commercial construction environment. As evidenced by almost every economic indicator (unemployment, building permits, population growth, etc.), the economic expansion in our current market cycle has been significant, not only in Houston, but across Texas and the Gulf Coast region, which has meaningfully impacted labor capacity and price escalation.

EXHIBIT F

Snider: Availability of qualified labor, cost and demand are the most critical factors in construction pricing.

Surles: As a general contractor, and especially in this market, our people are our resources, and they become the limiting factor as to if we can/should pick up additional work at any given time.

Cleary: For most contractors, the labor component of a contract can range from 30% to 70% of the contract amount. As the demand for labor increases in the Houston Metro area and the entire Gulf Coast region, costs will continue to increase. For example:

> Construction Laborer Average Wage 2013 = $14.50/hr
> Construction Laborer Average Wage 2014 = $16.50/hr

If a contractor or subcontractor's labor component is 50% of the contract amount, the 14% increase in labor increases the overall cost by 7%. When OH&P is then added, an effective increase of 8.5% is felt in the marketplace.

Q: What is the impact of the petrochemical industry on construction pricing?

Snider: The petrochemical industry is affecting pricing in Houston in many ways. Obviously the volume of construction for energy-related businesses has never been greater, which has increased the demand for qualified contractors and construction personnel, putting upward pressure on pricing. In addition, many "construction" professionals, project managers, superintendents and tradesmen are being actively recruited for petrochemical work, further increasing the value (and therefore, cost) of qualified people in the construction industries.

Surles: The more volume of all types of work in the City puts more pressure on the skilled and qualified labor force. This increased pressure on the limited labor force will cause it to become more scarce and drive up pricing within the corporate interior markets.

Cleary: As the petrochemical facilities commence their announced projects, demand for labor in the Houston and entire Gulf Coast region will continue to escalate. The petrochemical projects are multi-year endeavors, which is preferable for most career construction workers with skilled trades being paid very well. The effect on the commercial construction industry will be higher labor costs because the mix of workers will most likely have higher unskilled/apprentices to skilled/journeyman ratios, and schedules will protract due to lower productivity. When schedules protract, costs of operations (general conditions) will also increase.

Gilbane: The petrochemical industry has had, and will continue to have a substantial influence on pricing not only locally but also regionally and nationally. From a commercial construction perspective in the Houston market, the impact has been multifaceted with significant drivers, including the demand for labor and commodities in petrochemical production and construction, the growth in demand for office and industrial space for the oil/gas and service firms, and the expansion in the manufacturing and exports driven by lower priced inputs, particularly natural gas.

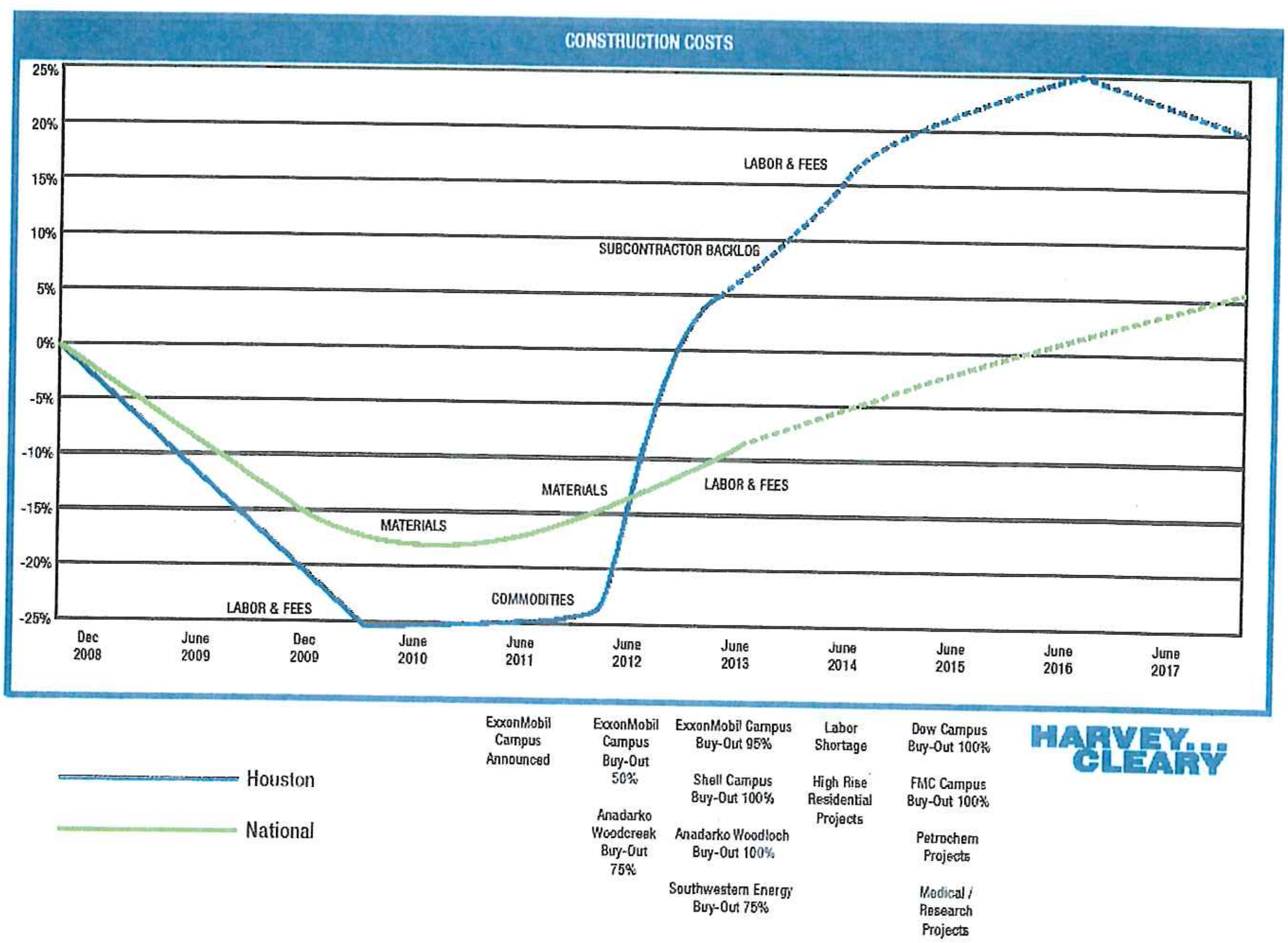
Q: How does pricing in Houston compare with other parts of the country?

Snider: Our "non-union" workforce, geographical location (port and rail access) and entrepreneurial spirit have all contributed to our competitive pricing when compared to other parts of the country. In addition, Houston is fortunate to have a number of very good firms that actively compete for the best projects, which keeps prices in check.

Surles: We do not have offices in any other city, so it is difficult to say with any certainty.

Gilbane: On a relative basis, Houston's pricing has typically lagged the national index, and that disparity is more pronounced when viewed in contrast to the markets in other comparably sized cities. Historically, New York City has had the highest dollar-per-square-foot construction costs in the country followed by San Francisco, Boston, Chicago and Philadelphia. Houston has traditionally been in a relatively low-cost peer set with comparable cities, mainly in the southeast and south-central such as Miami, Atlanta, Phoenix and Dallas. Price escalation is perhaps a more meaningful metric for measurement in the current environment, and in that regard, Houston significantly outpaces almost all major markets in the United States.

Cleary: We have offices in Houston (headquarters), Austin, San Antonio and Washington, D.C. Houston is going through a "white hot" boom that has caused construction pricing to increase 38% between mid-2011 and now (mid-2014). In the same period of time, other areas of the country have averaged a 12% increase. Below is a graph that tracks costs from late 2008 through today and with a projection through 2017. As you can see, even with a 12% increase on the national cost average, the curve has not fully recovered from 2008. Houston had a meteoric rise in 2012 and fully recovered 3rd Quarter 2012. With that said, the cost of a 150,000 GSF class 'A' office building in Houston is the same cost today as one in Washington, D.C. Ten years ago, a Houston project would have been 20% less than a D.C. project.



Q: What is impacting construction schedules today?

Surles: City permitting and how quickly we can get materials affect construction schedules.

Cleary: Subcontractors are very busy. The busier they get (compounded by the shortage of skilled and unskilled labor), the crew mix of inexperienced vs. experienced increases to a ratio that makes the production rates fall, while increasing the time it takes to properly put construction in place. We are also experiencing slow or late deliveries of materials. A good example is ready mix concrete. The number of concrete truck drivers in Houston is limited, and the drivers are limited in the number of hours they can safely drive. The demand for truck drivers in South Texas due to the Eagle Ford Formation/Shale has impacted all trucking operations in the rest of the state.

Gilbane: The competitive market environment for commercial construction, as well as increased activity in associated industries such as petrochemical, infrastructure and manufacturing construction, affects construction schedules.

Snider: There are a number of scheduling challenges on almost every construction project. Delays in lease execution, completion of architectural and engineering plans as intended, and availability of long lead items (i.e., light fixtures) can all impact schedules. In addition, city permits are taking significantly longer to obtain than a year ago. Therefore, early engagement of a qualified General Contractor to work with the architect, engineer and tenant in planning, material selection, early procurement of materials and value engineering can significantly improve project delivery.

Q: What is your greatest concern regarding construction a year from now?

Cleary: I am very concerned that due to a severe labor shortage in both on-site and off-site workers, especially skilled workers, costs and schedule will burgeon to the point that real estate deals will not work financially. If projects are put on hold to wait for better pricing and schedules, it could be two to three years before prices and schedules normalize to a point of being palatable again. For instance, most general contractors and subcontractors have backlogs between 12 and 24 months. If we take 18 months of backlog from when new project groundbreakings begin to decline, and we add the "sticky pricing" theory, construction pricing may take as long as two to three years to normalize.

Gilbane: While labor, price escalation and schedule constraints have a substantial impact on the construction market, Gilbane has a 141-year track record of successfully managing through challenging market environments. With that said, safety is always the most important concern on any of our projects. We want everyone involved with our projects to go home in exactly the same condition that they arrived; therefore, our focus on safety will remain consistent regardless of market conditions.

Snider: Our greatest concern regarding construction is that office leasing would constrict and demand for construction would diminish! Houston is an incredibly resourceful community, and the construction industry has responded well to the growth in demand over the last few years. The top firms have built strong teams capable of delivering exceptional projects even in this period of high demand. Other challenges to consider include a continuing decline in availability of qualified personnel, continuing impact of municipal governments, and increasing personnel and insurance costs.

Surles: A great concern regarding construction a year from now is the availability of manpower and materials.

Q: What new construction trends will we start to see?

Gilbane: Technology is playing an increasingly important role in all aspects of construction. Our teams have implemented a wide variety of technology solutions to enhance our effectiveness and to deliver a higher-quality product in a shorter time frame for better value. Examples range from uses that now seem somewhat pedestrian like using tablets and handheld devices in the field to review and update plans in real-time to more cutting-edge uses. This includes working with virtual reality software programs to immerse team members in building information modeling ("BIM") to better understand design intent and plan logistics and execution, and using "drones" to view, inspect and photograph work more safely.

Snider: I believe we will see an increase of early engagement of general contractors on the premier Houston projects. More and more real estate professionals recognize the tremendous benefit to our customers of building their team early and enjoying the contribution of the general contractor in the early stages of leasing, cost analysis, planning and scheduling. The value added through cost savings, stress reduction, increased quality and improved schedule delivery validates this approach.

Surles: Technology is playing a big role in all office space projects. In addition, we will continue to see LEED projects.

Cleary: On the positive side, the use of BIM modeling for coordination and prefabrication of materials is becoming commonplace. With less-skilled workers, the need for an engineering crew to lay out and check subcontractors' work has become a necessity for quality control. Our crews are able to use the BIM model to help in this regard. Subcontractors are also using the BIM model to coordinate and prefabricate large systems such as ductwork, piping, plumbing batteries, exterior wall panels, etc. in their shops, instead of relying on field labor. The prefabrication is being done in a controlled environment by skilled and trained shop labor, thus enhancing quality assurance and control.

On the negative side, due to the significant labor shortage, a number of subcontractors and general contractors are using temporary labor companies to fulfill their labor requirements. We see this as a true impediment to working safely and productively and producing a quality product. We do not allow temporary labor on our job sites and would prefer to have permanent employees being trained both offsite and onsite. Although temporarily painful, we believe this promotes a more sustainable and stable workforce for the future.

Q: What is the most unique construction element you've seen?

Snider: It is amazing how creative architects can be! We have seen and built some incredible space with glass, stone, wood veneers, etc. But perhaps one of the most unique elements I have seen is a wall made of sections of pipe encased in glass. It was very cool.

Cleary: While I have seen a lot in the past 37 years of my career, the most unique and effective element I have experienced is unitized curtainwall panels. Prefabricated in a shop and installed from inside of the structure, the installation is safe. In addition, since the curtainwall elements are assembled in a shop with a controlled environment, quality control is excellent and creates a very leak proof product.

Gilbane: The Energy Center at the ExxonMobil campus has a 10,000-ton floating cube that appears to hover over a plaza below. It is probably the most unique element our team has had a chance to work on. From a program perspective, we have built "net-zero" projects where the total amount of energy used by the building on an annual basis is roughly equal to the amount of renewable energy created on the site.

Q: Where do you see the market going as it relates to construction over the next 1-2 years? 3-5 years?

Surles: I would expect the market to level off a bit in the next 1-2 years. As far as the 3-5 year horizon, it will depend on government and the oil and gas industry's ability to continue to grow and be strong in Houston.

Cleary: I believe over the next 1-2 years (2015-2016) in Houston, as job growth continues to increase and then stabilize, we will continue to see office building starts, build-to-suits or major tenant deals, numerous health care and research project starts, and more high-rise residential and petrochemical work. Public and private school work will also continue to trend upward as more people move into the area. The following years (2017-2020) will be very difficult to predict. As cyclical as our business is, we will prepare for a downturn in the number of commercial construction starts predicated on area job growth returning to more historical averages.

Gilbane: Based on the leading indicators our industry typically follows, we expect market trends to continue and perhaps accelerate. In addition to the continued expansion in the corporate/commercial market, demographically we anticipate additional growth coming from the public sector "institutional" marketplace with considerable demand for increased construction for schools (both K-12 and higher education), healthcare facilities and government facilities.

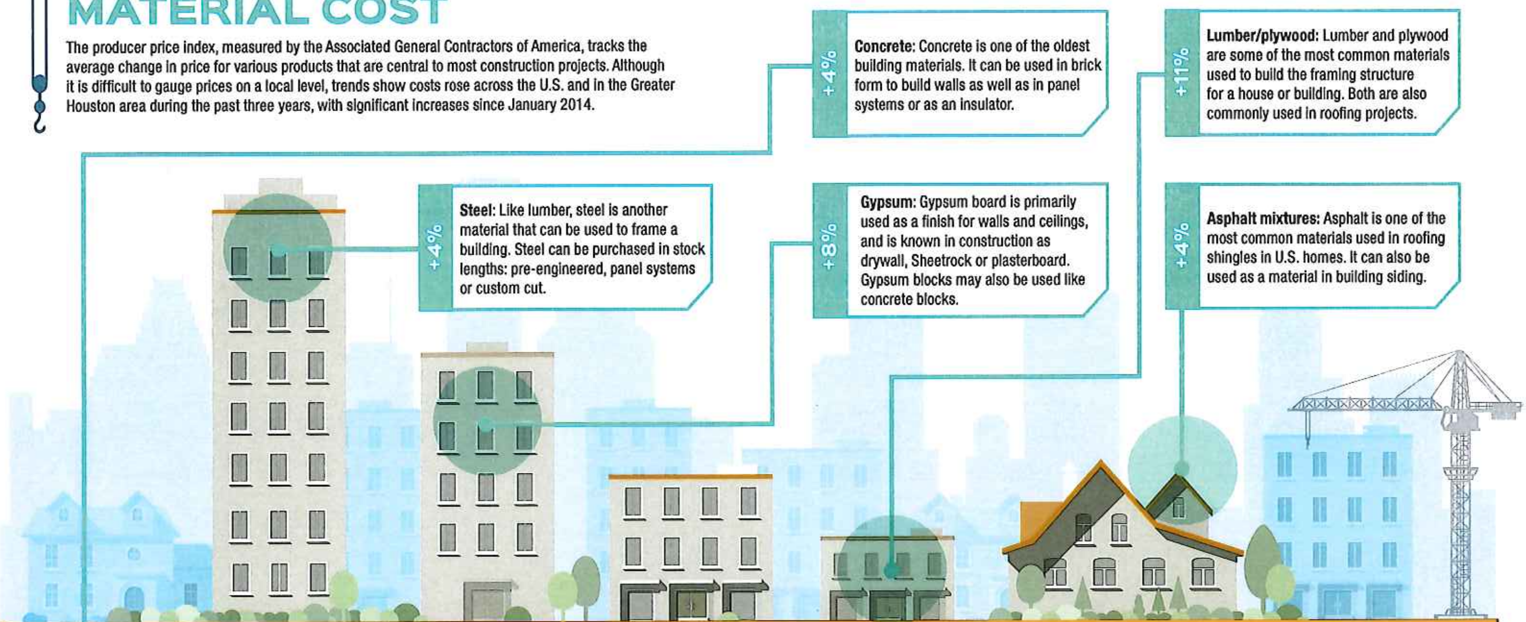
Snider: Construction in Houston trails leasing, and with the growth forecast for the Houston area, I believe leasing activity and construction activity will remain strong over the next 3-5 years barring any unexpected change in circumstances. We are fortunate to be the energy capital of the world, home to a fantastic medical center and home to the Port of Houston, which all will contribute to our continued growth.

Exhibit G

RISE IN THE COST OF CONSTRUCTION

MATERIAL COST

The producer price index, measured by the Associated General Contractors of America, tracks the average change in price for various products that are central to most construction projects. Although it is difficult to gauge prices on a local level, trends show costs rose across the U.S. and in the Greater Houston area during the past three years, with significant increases since January 2014.



	High-rise office building	Mid-rise office building	Two-to-three-story building	One-story flex office building	Single-family residence
2013	\$98–\$135/sf	\$87–\$97/sf	\$77–\$84/sf	\$60–\$70/sf	\$95–\$103/sf
2014	\$105–\$142/sf	\$92–\$102/sf	\$84–\$94/sf	\$73–\$78/sf	\$117–\$125/sf

Sources: Kirksey Architecture, National Association of Home Builders

Labor, materials

Continued from | 1

"We are much more diversified now in the types of projects that are ongoing," Steubing said. "They are not all related to the energy market or gas and oil. Contractors are much more diverse in what they are doing."

This boom has paired Sugar Land up against major projects, such as the construction of the Grand Parkway and Phase 2 of the Fort Bend Parkway, which has created an increased demand for contractors and subcontractors. As a result of this demand, local projects are receiving fewer bids at an increased cost.

Although the city maintains lines of communication with local contractors and developers, Steubing said determining interest and projecting the amount of bidders on each project has become a guessing game.

"There is no rhyme or reason to it," he said. "You throw a dart at the wall and you hit a number, and you have just as much luck guessing as you do hitting the right number with the dart."

Most recently, Sugar Land City Council moved forward with Phase 2 of the \$12.37 million Brazos River Park recreational development and an adjacent festival site as a part of the \$31.5 million parks bond, which was approved by voters in 2013. Only two contractors—Harper Brothers Construction and Millis Construction—made bids on the project, both of which came in above the city's \$10.15 million budget.

Harper Brothers filed the lowest bid at \$12.37 million while Millis Construction filed its bid at \$13.55 million. To move forward with construction, City Council awarded the projects to Harper Brothers and voted to reallocate \$3.4 million of Proposition 2 funds, intended for use in 2016, to account for the \$2.22 million increase.

Voters approved Proposition 2, worth \$21.3 million, as part of the city's parks bond package in November 2013, and it outlines Phase 2 of the Brazos River Park project and the festival site. Doug Adolph, assistant director of communications for Sugar Land, said the city accounted for inflated construction costs when determining the total cost of Proposition 2.

City Council's decision to reallocate funds slated for 2016 to 2015 helps maintain project timelines and keeps them in line with what voters approved, Adolph said.

FBISD officials said additional construction costs have resulted in district projects coming in higher when compared to projects from five years ago. Between 2007 and 2014, construction costs for schools rose from approximately \$118 per square foot to \$200 per square foot, according to the Texas Comptroller's office.

With four new additional schools planned alongside elementary schools No. 46 and No. 47 and Middle School No. 15, FBISD Chief Financial Officer Steve Bassett said the district accounted for the rise in construction costs in the \$484 million bond initiative that was passed in 2014.

Despite the increase in construction costs, FBISD Chief Operations Officer Max Cleaver said FBISD projects have not been delayed as the district looks to decrease spending by reducing the need for additional facilities.

Cost of materials

Turner Construction Company, which has offices around Houston, developed its own cost index to track nonresidential building construction. The company's methodology—which considers labor rates and productivity, material prices and the competitive condition of the marketplace—shows steady increases every quarter since 2011. Overall, costs have risen about 11.7 percent since that time.

"Growth in nonresidential construction was steady in the fourth quarter in virtually all domestic markets," Turner Vice President Attilio Rivetti said. "Higher construction cost escalations in urban centers with increased construction activity are driving the average domestic construction cost increases."

The rising cost of materials has wide-ranging effects. Steubing said the city's biggest concern is having the ability to deliver projects addressing infrastructure and reconstruction needs without increasing the tax rate.

"That is the biggest issue," he said. "You have a city that is growing, aging infrastructure and everything else while being able to deliver the services that are expected by residents."

Fewer skilled hands

One persistent contributing factor to the rising construction costs is the shortage of skilled workers across various fields.

Houston added more construction jobs than any U.S. metro market, according to a report from the American General Contractors of America. The jobs boom means the labor shortage will continue through 2015. The declining unemployment rate has made it more difficult to find qualified workers, officials said.

A 2014 survey conducted by the National Association of Home Builders found that about 46 percent of Houston building companies are struggling with the skilled labor shortage. The shortage is also expected to intensify as millions of baby boomers prepare for retirement.

Skilled laborers in the construction field include industrial electricians, commercial plumbers, heavy equipment operators and concrete finishers.

The shortage has been so widespread in the Houston market that the demand for projects is starting to outweigh the supply of labor, Steubing said.

"I do not think it is there yet because we are still able to get bids on certain things, but I think labor is starting to be one of the biggest issues," he said.

For more information visit impactnews.com

EXHIBIT G

Exhibit H

Kamath, Sundaresh K

From: HISD Business Assistance
Sent: Friday, October 09, 2015 8:05 AM
To: Kamath, Sundaresh K
Subject: Gilbane Building Company as Construction Manager-at-Risk

Gilbane Building Company as Construction Manager-at-Risk

When:

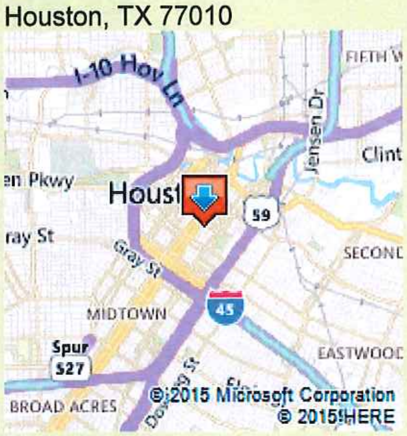
Bids or Proposals are due on Thursday, October 22, 2015 at 2:00 p.m., CST

Site Visits can be arranged by emailing Jimmy Upshaw at swropurchasing@gilbaneco.com

Add to Calendar

Where:

Gilbane Building Company, Attn: Jimmy Upshaw
1331 Lamar Street
Suite 1170
Houston, TX 77010



Driving Directions

Hello Sundaresh,

Gilbane Building Company, as Construction Manager-at-Risk for HISD, in accordance with Texas Government Code 2269, will receive bids or proposals from all qualified subcontractors for:

Lamar High School Additions & Renovations

(Click above for details)

Gilbane Building Company

(Click above for a map)

located at
1331 Lamar St., Suite 1170
Houston, TX 77010

Bids or proposals are due on
Thursday, October 22, 2015 at 2:00 p.m.,
and should be emailed to
swropurchasing@gilbaneco.com,
faxed to 713-690-2299
or mailed/delivered to:

Gilbane Building Company,
Attn: Jimmy Upshaw
1331 Lamar St., Suite 1170
Houston Texas 77010

Late bids will not be accepted.

EXHIBIT H

Contact Jimmy Upshaw at
swropurchasing@gilbaneco.com
or Wm. Earl Finley, C.P.M., A.P.P. at
wfinley@houstonisd.org for additional information on this project.

THANK YOU.

HISD Supplier Diversity Team

Email Us

Phone: 713-556-7273

HISD

Business Assistance

SERVICE EXCELLENCE

Kamath, Sundaresh K

From: HISD Business Assistance
Sent: Wednesday, September 30, 2015 12:08 PM
To: Kamath, Sundaresh K
Subject: Satterfield & Pontikes Construction, Inc., as CMAR for HISD

Satterfield & Pontikes Construction, Inc., as Construction Manager-At-Risk for HISD

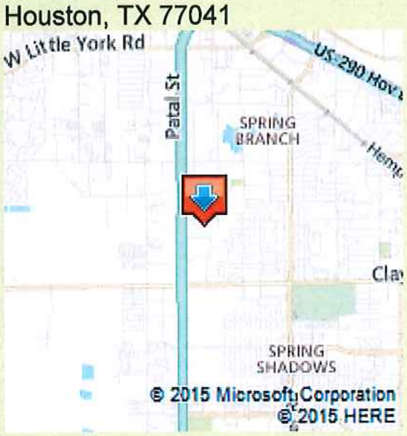
When:

Bids or Proposals are due on Thursday, October 8, 2015 at 2:00 p.m., CST

Add to Calendar

Where:

Satterfield & Pontikes Construction, Inc.
11000 Equity Drive
Suite 100
Houston, TX 77041



Driving Directions

Hello Sundaresh,

Satterfield & Pontikes Construction, Inc., as Construction Manager-at-Risk for HISD, in accordance with Texas Government Code 2269, will receive bids or proposals from all qualified subcontractors for the Westbury High School Ballfield MEP & Restroom Package.

Westbury High School Ballfield MEP & Restroom Package

(Click above for details)

Satterfield & Pontikes Construction

(Click above for a map)

located at
11000 Equity Drive, Suite 100
Houston, TX 77041

Bids or proposals for **Westbury High School** are due on **Thursday, October 8, 2015 at 2:00 p.m., and** should be emailed to houstonbids@satpon.com, faxed to 713-690-2299 or mailed/delivered to:

Satterfield & Pontikes Construction, Inc.
11000 Equity Drive, Suite 100
Houston Texas 77041

Late bids will not be accepted.

Contact Charles Reagan at creagan@satpon.com

or Wm. Earl Finley, C.P.M., A.P.P. at wfinley@houstonisd.org for additional information on this project.

THANK YOU.

HISD Supplier Diversity Team

Email Us

Phone: 713-556-7273

HISD Business Assistance Supplier Diversity

Opening Doors, Creating Opportunities, Building Success

Forward email

Exhibit I

Kamath, Sundaresh K

From: HISD Business Assistance
Sent: Monday, October 12, 2015 8:02 AM
To: Kamath, Sundaresh K
Subject: HISD Weekly Bid Opportunities 101215

Read More About the HISD 2012 Bond in their

NEWSLETTER
(select above link to view)

to subscribe send an email to
bondnewsletter@houstonisd.org

Dear Sundaresh,

The Houston Independent School District

Publishes business opportunities on their website weekly and the information can change daily. You may view, download and check for updates on current bid requests by clicking on the following link for the week of:

October 12, 2015

If you have any question or would like additional information please don't hesitate to contact our office.

Please Note:

Downloads of any project bids do not necessarily allow for notices of addendum, changes and/or revision to the project. You must periodically check the Bid Opportunities page for any and all updates.

THANK YOU

HISD Supplier Diversity Team

Click Here to Email Us

Phone: 713-556-7273

HISD
Business Assistance
SERVICE EXCELLENCE

Forward email

EXHIBIT I

Inflation Analysis

INFLATION CALCULATIONS FOR PROPOSED SUPPLEMENTAL FUNDING
HISD 2012 BOND PROGRAM

September 30, 2015

Following is a brief outline of the process used to determine the impact of inflation on the 2012 Bond Program. The results indicated a need for supplemental funding in the amount of $211.2 million.

Original construction budgets for the 2012 Bond Program were established in July 2012 and were stated in terms of 2012 dollars. Based primarily on data from previous and current HISD projects, a base amount of $160 per square foot was used for new construction calculations. HISD projects opened in 2011 and 2012 were in a cost range of $121 - $151 per square foot. Square foot estimates for specialty schools such as Debakey High School, HSPVA, and Jordan High School were calculated at a higher cost per square foot due to the cost of specialized facilities. Renovation cost estimates, where applicable, were calculated on a project-by-project basis with major renovations calculated at $100 per square foot. The original construction budgets, in 2012 dollars, are in column "B" of the Proposed Supplemental Funding spreadsheet. The total program original construction budget estimates are $988,430,963.

Additional considerations:

- 2012 Bond Program budgets included separate line items for Inflation and Project Reserves. Inflation was anticipated at an annual rate of 5%. Project Reserves (Owners Contingency) were included at 5% of the construction budget as a potential source of funding to address unforeseen market conditions. The total amount of Inflation and Project Reserve funds available for each project are listed in column "C" of the Proposed Supplemental Funding spreadsheet. The Bond Program total allocation for Inflation and Project Reserves is $197,870,715.
- Inflation and Project Reserves funding included in the original project budgets allow for an average increase in the Construction Budget of 20% (Column "C"/Column "B" = 20.0186%). This means we have funds in the original Total Project Budgets to increase the Construction Budget by an <u>average</u> of $32 per square foot for a total of $192 per square foot (20% of $160 = $32 increase for a total of $192).

Actual and projected inflation impact:

- In early 2014 some of the first Bond Project to be bid were coming in below $192 per square foot. However, by the end of 2014 HISD was seeing design estimates and bids in the range of $210 per square foot. At this point in time industry analysists were reporting higher than anticipated costs in construction materials and labor as well as higher markups by contractors. As further confirmation of the $210 per square foot number for new construction, the Annual School Construction Report from School Planning & Management magazine, published in February 2015, listed the 2014 Median cost for high school construction in Region 9 (AR, LA, OK, and TX) as $209.84 per square foot. (Page 32 of the report) This represented an increase of $18 per square foot above the amount available in the 2012 Bond Program. ($210 - $192 = $18)
- By mid-2015, commercial construction in the Houston area was reported to be increasing at a rate of 5.69% for labor and 5.71% for materials (As a general rule labor is 45% of the total cost and materials are 55% of the total). This was based on a survey of Houston area contractors conducted and reported by AGC Houston. Based on this information we used 5.7% as the inflation rate for 2015. Therefore if you increase the 2014 cost of $210 per square foot by 5.7% the 2015 cost would be $222 per square foot. ($210 X 5.7% = an increase of $11.97 per square foot) $210 + $12 = $222.

- For 2016 cost projections we again used 5.7% as the inflation rate. This was based on market conditions that indicate the rate going forward will be about the same as for 2015. Therefore if you increase the 2015 rate of $222 per square foot by 5.7% the 2016 projection would be $235 per square foot. ($222 X 5.7% = an increase of $12.65 per square foot) $222 + $13 = $235 per square foot.
- The next step was to calculate the total inflation impact on each project. For this exercise it was assumed that all Group 1 and Group 2 projects would fall within the 2015 square foot average cost of $222 and that all Group 3 and Group 4 projects would fall within the 2016 projected cost of $235 per square foot. The 2015 cost of $222 per square foot represents an increase of 38.75% over the original Construction Budget of $160 per square foot. (38.75% X $160 = an increase of $62) The projected 2016 cost of $235 per square foot represents an increase of 46.88% over the original Construction Budget. (46.88% X $160 = an increase of $75 per square foot) Therefore the total inflation impact from 2012 to 2015 for projects in Group 1 and Group 2 was calculated at 38.75%. The total inflation impact from 2012 to 2016 for projects in Group 3 and Group 4 was 46.88%. That means the total inflation impact for projects in Groups 1 & 2 is $261,116,000 and for projects in Groups 3 & 4 the total is $147,460,885. Therefor the total inflation impact for the 2012 Bond Program from 2012 to 2016 will be $408,576,885.
- To determine the difference between the actual inflation projection ($408,576,885) and the budgeted amount for Inflation and Project Reserves ($197,870,715) we deducted the budgeted amount from the projected amount on each project. This gave us the Delta between actual inflation and budgeted Inflation/Reserves. The total Delta calculation is $408,576,885 - $197,870,715 = $210,706,170. However, when making the calculation on each individual project, one project (Eastwood Academy) showed a negative difference of ($463,350) when we deducted the budgeted Inflation/Reserves from the projected inflation amount. This would indicate that enough money had already been budgeted in this project to cover the projected inflation with a reserve of $463,350. Since it would not be prudent to take this amount away from the Eastwood project to distribute among other projects we adjusted the calculation to a Delta of $0 meaning we needed to add this amount back to the total Delta of $210,706,170. Therefore $210,706,170 + $463,350 = $211,169,520. We rounded this amount to **$211,200,000.**
- If the Supplemental Funding is approved, the distribution among all projects is proposed to be on a proportional basis calculated on the Original Construction Budget. For example: If the Original Construction Budget is 5% of the total of all Construction Budgets then the project would receive 5% of the total Supplemental Funding. Actual example: Debakey High School Original Construction Budget of $41,483,501/$988,430,963 (total of all const. budgets) = 4.19690424% X $211,200,000 = $8,863,862. The proposed Proportional Funding Distribution, based on this calculation, is shown in Column “D” of the Proposed Supplemental Funding – 2012 Bond Program spreadsheet.
- The Proposed Revised Construction Budget is shown in Column “E” and is the Sum of amounts in Columns “B”, “C”, and “D”.
- The Proposed Revised Total Project Budget is shown in Column “F” and is the Sum of amounts in Columns “A” and “D”.

BASIC BUDGET PROCESS

Determine Scope

- Proposed Capacity
- Square Feet per Student Allocation (i.e.: 116 for Elementary; 140 for MS & HS)
- Proposed Square Feet of New Construction
- Proposed Square Feet of Renovated Area

Example:
Elementary School: 750 student capacity x 116 sq. ft. = 87,000 gross sq. ft.
High School: 2,000 student capacity x 140 sq. ft. = 280,000 gross sq. ft.

Determine Construction Cost for New and Renovated Space

- Establish cost per square foot for new construction based on market conditions
- Establish cost per square foot for renovation based on condition of space to be renovated

Example:
Elementary School: 87,000 square feet x $160 per sq. ft. = $13,920,000
High School: 280,000 square feet x $160 per sq. ft. = $44,800,000
Renovated Areas: 50,000 sq. ft. x $100 per sq. ft. = $5,000,000

Establish Construction Contingency Allowance (Basically for Unforeseen Conditions)

- Based on HISD and industry experience, contingency for new construction is typically 4% of construction cost.
- Based on HISD and industry experience, contingency for renovation is typically 10% of construction cost.

Example:
Elementary School: $13,920,000 x 4% = $556,800
High School: $44,800,000 x 4% = $1,792,000
Renovation: $5,000,000 x 10% = $500,000

Design and Engineering Costs

- Total cost for Design and Engineering on new construction is typically 8% of construction cost.
- Total cost for Design and Engineering on renovation is typically 10% of construction cost.

Example:
Elementary School: $13,920,000 x 8% = $1,113,600
High School: $44,800,000 x 8% = $3,584,000
Renovation: $5,000,000 x 10% = $500,000

Project Management Costs

- Salary and Overhead for all HISD employees involved in the program

- Cost of contracted services such as Project Managers
- Based on HISD experience and industry standards, management costs will typically be 8% of construction cost.

Example:
Elementary School: $13,920,000 x 8% = $1,113,600
High School: $44,800,000 x 8% = $3,584,000
Renovation: $5,000,000 x 8% = $400,000

Owners Miscellaneous Project Costs/Soft Costs

- Costs incurred by the Owner for site surveys, materials testing, environmental surveys and other miscellaneous costs.
- Based on HISD experience and industry standards, Soft Costs will typically be approximately 10% of construction costs.

Example:
Elementary School: $13,920,000 x 10% = $1,392,000
High School: $44,800,000 x 10% = $4,480,000
Renovation: $5,000,000 x 10% = $500,000

Logistics and Swing Space Expenses

- Costs typically incurred when building on an existing school site or renovating an existing building
- Costs can include temporary housing for students either onsite or offsite
- Replacement of site components that are impacted by construction such as playing fields and parking areas
- Cost is estimated on a per-site basis taking into consideration specific issues related to that site.

Project Reserves/Owners Contingency

- A fund set aside in each project to address unanticipated scope issues that may arise during design.
- A source of funding to address unanticipated market conditions affecting project costs
- Based on HISD experience, Project Reserves are established at 5% of construction costs

Example:
Elementary School: $13,920,000 x 5% = $696,000
High School: $44,800,000 x 5% = $2,240,000
Renovation: $5,000,000 x 5% = $250,000

Furniture, Furnishings and Equipment

- Cost to provide furniture, furnishings and equipment for all new construction
- Cost to provide for partial replacement of FF&E in renovated areas
- Based on HISD experience, an allocation of 9% - 10% of construction/renovation cost is included for FF&E

Example:
Elementary School: $13,920,000 x 10% = $1,392,000
High School: $44,800,000 x 10% = $4,480,000
Renovated Area: $5,000,000 x 10% = $500,000

Media Center Books and Materials

- Cost for providing Media Center books and materials to meet current accreditation standards
- Cost of providing additional Media Center books and materials when the capacity of a school is increased
- Cost of providing Media Center books and materials is currently calculated at $200 per student for new schools and increased capacity in existing schools.
- Renovated schools would receive funding for partial replacement of existing books and materials

Example:
Elementary School: 750 students x $200 = $150,000
High School: 2,000 students x $200 = $400,000

Technology Equipment

- Cost for providing a technology network including file servers, network switches, data terminals, wireless hubs, etc.
- Budget cost for basic system components is calculated at $600,000 per new school
- Budget cost for classroom data terminals, remote data closets, wireless hubs, etc. is calculated at $5 per square foot of building area.

Example:
Elementary School: $600,000 + $5 x 87,000 = $600,000 + $435,000 = $1,035,000
High School: $600,000 + $5 x 280,000 = $600,000 + $1,400,000 = $2,000,000

Inflation

- The base budget is calculated using current market conditions and costs
- Anticipated inflation costs are established using historical trends and market forecasts
- Inflation is calculated on the estimated inflation percentage rate multiplied by the estimated number of months from start of design to award of construction contracts.
- The number of inflation months will vary depending on the size of the project and the anticipated schedule
- The 2012 Bond Program used .42% per inflation month (5% annual rate)

Example:
Elementary School: $13,920,000 x .42% x 20 months = $1,169,280
High School: $44,800,000 x .42% x 24 months = $4,515,840

DRAFT FOR DISCUSSION ONLY

	A	B	C	D	E	F	G	H
2012 Bond Program Inflation Analysis	New Construction & Renovation Cost	Total Project Budget	Inflation and Reserves Included in Original Budget	Delta Between Projected Inflation & Budgeted Inflation + Reserves	Construction Inflation From 2012 To 2015	% Inflation From 2012 to 2015	% Inflation From 2012 to 2016	Construction Inflation From 2012 To 2016
Group 1 Bond Projects								
Group 1 Bond Project Totals	425,744,251	723,979,000	87,941,540	77,034,358	164,975,897	38.75%		
Group 2 Bond Projects								
Group 2 Bond Project Totals	248,103,490	420,428,000	48,833,538	47,306,564	96,140,103	38.75%		
Group 3 Bond Projects								
Group 3 Bond Project Totals	115,285,723	191,912,000	21,245,944	32,794,238			46.88%	54,040,182
Group 4 Bond Projects								
Group 4 Bond Project Totals	199,297,499	345,621,000	39,386,343	54,034,360			46.88%	93,420,702
Column Totals	988,430,963	1,681,940,000	197,407,365	211,169,520	261,116,000			147,460,885
			463,350	Eastwood Academy Adjustment (Group 2)*				
			197,870,715	Total Budgeted Inflation and Project Reserves				

2012 Bond Sq. Ft. Cost Estimate	$ 160.00		
2014 Const. Cost Per Sq. Ft.	$ 210.00	31.25%	Increase from 2012
2015 Const. Cost Per Sq. Ft.	$ 222.00	38.75%	Increase from 2012
2016 Estimated Cost PSF	$ 235.00	46.88%	Increase from 2012

*The Eastwood Academy adjustment was made to avoid a negative Delta between actual inflation and budgeted inflation plus project reserves

RS Means Historical Cost Indexes

Historical Cost Indexes

The table below lists both the RSMeans® historical cost index based on Jan. 1, 1993 = 100 as well as the computed value of an index based on Jan. 1, 2015 costs. Since the Jan. 1, 2015 figure is estimated, space is left to write in the actual index figures as they become available through either the quarterly *RSMeans Construction Cost Indexes* or as printed in the *Engineering News-Record*. To compute the actual index based on Jan. 1, 2015 = 100, divide the historical cost index for a particular year by the actual Jan. 1, 2015 construction cost index. Space has been left to advance the index figures as the year progresses.

Year	Historical Cost Index Jan. 1, 1993 = 100		Current Index Based on Jan. 1, 2015 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100	Current Index Based on Jan. 1, 2015 = 100		Year	Historical Cost Index Jan. 1, 1993 = 100	Current Index Based on Jan. 1, 2015 = 100	
	Est.	Actual	Est.	Actual		Actual	Est.	Actual		Actual	Est.	Actual
Oct 2015*					July 2000	120.9	58.5		July 1982	76.1	36.8	
July 2015*					1999	117.6	56.9		1981	70.0	33.9	
April 2015*					1998	115.1	55.7		1980	62.9	30.4	
Jan 2015*	206.7		100.0	100.0	1997	112.8	54.6		1979	57.8	28.0	
July 2014		204.9	99.1		1996	110.2	53.3		1978	53.5	25.9	
2013		201.2	97.3		1995	107.6	52.1		1977	49.5	23.9	
2012		194.6	94.1		1994	104.4	50.5		1976	46.9	22.7	
2011		191.2	92.5		1993	101.7	49.2		1975	44.8	21.7	
2010		183.5	88.8		1992	99.4	48.1		1974	41.4	20.0	
2009		180.1	87.1		1991	96.8	46.8		1973	37.7	18.2	
2008		180.4	87.3		1990	94.3	45.6		1972	34.8	16.8	
2007		169.4	82.0		1989	92.1	44.6		1971	32.1	15.5	
2006		162.0	78.4		1988	89.9	43.5		1970	28.7	13.9	
2005		151.6	73.3		1987	87.7	42.4		1969	26.9	13.0	
2004		143.7	69.5		1986	84.2	40.7		1968	24.9	12.0	
2003		132.0	63.9		1985	82.6	40.0		1967	23.5	11.4	
2002		128.7	62.3		1984	82.0	39.7		1966	22.7	11.0	
2001		125.1	60.5		1983	80.2	38.8		1965	21.7	10.5	

Adjustments to Costs

The "Historical Cost Index" can be used to convert national average building costs at a particular time to the approximate building costs for some other time.

Time Adjustment Using the Historical Cost Indexes:

$$\frac{\text{Index for Year A}}{\text{Index for Year B}} \times \text{Cost in Year B} = \text{Cost in Year A}$$

Example:

Estimate and compare construction costs for different years in the same city.

To estimate the national average construction cost of a building in 1970, knowing that it cost $900,000 in 2015:

INDEX in 1970 = 28.7

INDEX in 2015 = 206.7

$$\frac{\text{INDEX 1970}}{\text{INDEX 2015}} \times \text{Cost 2015} = \text{Cost 1970}$$

$$\frac{28.7}{206.7} \times \$900{,}000 = .139 \times \$900{,}000 = \$125{,}100$$

The construction cost of the building in 1970 is $125,100.

Note: The city cost indexes for Canada can be used to convert U.S. national averages to local costs in Canadian dollars.

Example:

To estimate and compare the cost of a building in Toronto, ON in 2015 with the known cost of $600,000 (US$) in New York, NY in 2015:

INDEX Toronto = 110.9

INDEX New York = 131.8

$$\frac{\text{INDEX Toronto}}{\text{INDEX New York}} \times \text{Cost New York} = \text{Cost Toronto}$$

$$\frac{110.9}{131.8} \times \$600{,}000 = .841 \times \$600{,}000 = \$504{,}600$$

The construction cost of the building in Toronto is $504,600 (CN$).

*Historical Cost Index updates and other resources are provided on the following website.
http://info.thegordiangroup.com/RSMeans.html

ENR Historical Cost Indexes

Building Cost Index History - As of October 2015

View all Historical Indices »

Text size: A A

HOW ENR BUILDS THE INDEX: 68.38 hours of skilled labor at the 20-city average of bricklayers, carpenters and structural ironworkers rates, plus 25 cwt of standard structural steel shapes at the mill price prior to 1996 and the fabricated 20-city price from 1996, plus 1.128 tons of portland cement at the 20-city price, plus 1,088 board ft of 2 x 4 lumber at the 20-city price.

ENR'S BUILDING COST INDEX HISTORY (1915-2015)

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	AVG.
2015	5497	5488	5487	5501	5494	5507	5510						
2014	5324	5321	5336	5357	5370	5375	5383	5390	5409	5442	5468	5480	5387
2013	5226	5246	5249	5257	5272	5286	5281	5277	5285	5308	5317	5326	5278
2012	5120	5122	5144	5150	5167	5170	5184	5204	5195	5204	5213	5210	5174
2011	4969	5007	5010	5028	5035	5059	5074	5091	5098	5104	5113	5115	5058
2010	4800	4812	4811	4817	4858	4888	4910	4905	4910	4947	4968	4970	4883
2009	4782	4765	4767	4761	4773	4771	4762	4768	4764	4762	4757	4795	4769
2008	4557	4556	4571	4574	4599	4640	4723	4733	4827	4867	4847	4797	4691
2007	4432	4432	4411	4416	4475	4471	4493	4512	4533	4535	4558	4556	4485
2006	4335	4337	4330	4335	4331	4340	4356	4359	4375	4431	4462	4441	4369
2005	4112	4116	4127	4168	4189	4195	4197	4210	4242	4265	4312	4329	4205
2004	3767	3802	3859	3908	3956	3996	4013	4027	4102	4129	4128	4123	3984
2003	3648	3655	3649	3652	3660	3677	3683	3712	3717	3745	3765	3757	3693
2002	3581	3581	3597	3583	3612	3624	3652	3648	3655	3651	3654	3640	3623
2001	3545	3536	3541	3541	3547	3572	3625	3605	3597	3602	3596	3577	3574
2000	3503	3523	3536	3534	3558	3553	3545	3546	3539	3547	3541	3548	3539
1999	3425	3417	3411	3421	3422	3433	3460	3474	3504	3505	3498	3497	3456
1998	3363	3372	3368	3375	3374	3379	3382	3391	3414	3423	3424	3419	3391
1997	3332	3333	3323	3364	3377	3396	3392	3385	3378	3372	3350	3370	3364
1996	3127	3131	3135	3148	3161	3178	3190	3223	3246	3284	3304	3311	3203
1995	3112	3111	3103	3100	3096	3095	3114	3121	3109	3117	3131	3128	3112
1994	3071	3106	3116	3127	3125	3115	3107	3109	3116	3116	3109	3110	3111
1993	2886	2886	2915	2976	3071	3066	3038	3014	3009	3016	3029	3046	2996
1992	2784	2775	2799	2809	2828	2838	2845	2854	2857	2867	2873	2875	2834
1991	2720	2716	2715	2709	2723	2733	2757	2792	2785	2786	2791	2784	2751
1990	2664	2668	2673	2676	2691	2715	2716	2716	2730	2728	2730	2720	2702

SOURCE FOR THE DATA HERE

ANNUAL AVERAGE

YEAR	AVG	YEAR	AVG	YEAR	AVG	YEAR	AVG
1989	2634	**1988**	2598	**1987**	2541	**1986**	2483
1985	2428	**1984**	2417	**1983**	2384	**1982**	2234
1981	2097	**1980**	1941	**1979**	1919	**1978**	1654

1977	1545	**1976**	1425	**1975**	1306	**1974**	1205
1973	1138	**1972**	1048	**1971**	948	**1970**	836
1969	790	**1968**	721	**1967**	676	**1966**	650
1965	627	**1964**	612	**1963**	594	**1962**	580
1961	568	**1960**	559	**1959**	548	**1958**	525
1957	509	**1956**	491	**1955**	469	**1954**	446
1953	431	**1952**	416	**1951**	401	**1950**	375
1949	352	**1948**	341	**1947**	313	**1946**	262
1945	239	**1944**	235	**1943**	229	**1942**	222
1941	211	**1940**	203	**1939**	197	**1938**	197
1937	196	**1936**	172	**1935**	166	**1934**	167
1933	148	**1932**	131	**1931**	168	**1930**	185
1929	191	**1928**	188	**1927**	186	**1926**	185
1925	183	**1924**	186	**1923**	186	**1922**	155
1921	166	**1920**	207	**1919**	159	**1918**	159
1917	167	**1916**	131	**1915**	95		

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What is the bases for these monthly number ie.. May 2015 "5494" what is the detail behind this

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In trying to establish the % increase or decrease in cost for a particular area should you both the BCI and CCI for that area and and use the average of the two?
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Information is provided on construction projects in following stages in each issue of ENR: **Planning**, **Contracts/Bids/Proposals** and **Bid/Proposal Dates**.

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Texas Comptroller Report on Public School Construction Costs

Susan Combs
Texas Comptroller
of Public Accounts

Public School Construction Costs

Examining what building schools costs the Texas taxpayers

www.texastransparency.org/Special_Features/Reports/School_Construction/

WHY FAST MATTERS

Since 2010, the Comptroller's Financial Allocation Study for Texas (FAST) has produced ratings of one to five stars for Texas school districts and campuses. Created in response to 2009 legislation, we base these ratings on operational expenditures (the input) and academic progress (the output).

For its spending component, FAST uses operational expenditures — funded in large part by a district's maintenance and operations (M&O) tax — which is spending directly related to teaching students.

Many school districts also levy an interest and sinking (I&S) tax to pay off debt issued for capital purchases (primarily school facilities). This construction survey is an effort to provide Texas school districts and their taxpayers an opportunity to compare side-by-side new school construction costs over a multi-year sample.

www.FASTexas.org

Each district and charter operator reported new school construction data in response to a public information request from the Comptroller's office. For comparison purposes, the Comptroller's office adjusted the reported construction costs for inflation and for regional differences in the price of materials and labor. Each source district and charter operator was given the opportunity to verify or correct its reported data prior to publication. Reported campus data were not independently verified by the Comptroller's office.

Ladies and Gentlemen:

We have a lot of young minds to educate and an economy that relies upon skilled and educated workers. We need some school construction. Buildings wear down. Enrollment grows. Needs change. Technology improves. That's understandable. But in this era of ballooning public spending, it is important to shine a light on such spending. In this report on public school construction costs, we take a look at new schools built since **2007** — some **873 campuses** opened in **369 districts** and **charter operators**. We found construction costs that ranged from **$76 per square foot** for an elementary school in the Laredo (United ISD) community to **$260 per square foot** for an elementary school in Port Arthur.

Unfortunately, we also encountered plenty of obstacles in our efforts to collect consistent, comparable school construction data. We sent **thousands of emails, mailed thousands of letters and made hundreds of phone calls**. And though some districts replied promptly, 111 days passed before we had responses from every district in Texas. Imagine trying to track this information down on your own. Instead, we decided to share our results. This report accompanies an online toolkit that allows you to make an array of in-depth cost comparisons (adjusted to account for inflation and regional cost variation). We also make policy recommendations that would allow us to **better monitor construction efficiency, build a more robust inventory of existing facilities and let you, the local taxpayer, easily compare construction costs across districts**.

We hope you find this report and the accompanying web tools useful.

Susan Combs
Texas Comptroller

INTRODUCTION

This report is an effort to provide Texas school districts and the property taxpayers who fund them an opportunity to see and analyze, side-by-side, construction costs for newly built campuses that opened between 2007 and 2013.

A classroom in Cibolo Green Elementary School, North East ISD.

The Comptroller's office collected these cost data by sending open records requests to all public school districts and charter school operators in Texas — more than **1,200 entities**.

It wasn't easy to collect and analyze these data. In fact, **several districts put up significant resistance** toward our efforts. The entire process took seven months, thousands of emails and hundreds of phone calls.

We took on this challenge for two primary reasons:

- School districts hold **more than half** of all the **tax-supported debt** local Texas governments issue. Many districts levy property taxes to repay debt for school construction and renovations.
- These **data were not previously compiled in a single, publicly available** database. The online school construction cost data tool is sortable and searchable, making it easy for districts and taxpayers to see where schools stand.

GO> **www.texastransparency.org/Special_Features/Reports/School_Construction/**

EXPLANATION OF CAMPUS TYPES

The data in this report are compared by campus type.

ELEMENTARY: Generally serves students at 6th grade or below.

MIDDLE: Generally serves post-elementary students no higher than 8th grade. This category also may include schools called intermediate or junior high.

SECONDARY: Generally serves post-elementary students up to 12th grade. More than 80 percent of secondary campuses in this dataset are high schools with students in 9th through 12th grade.

PRE-K: Generally serves students pre-K age or younger. Some campuses in this survey may also serve students in kindergarten or early education.

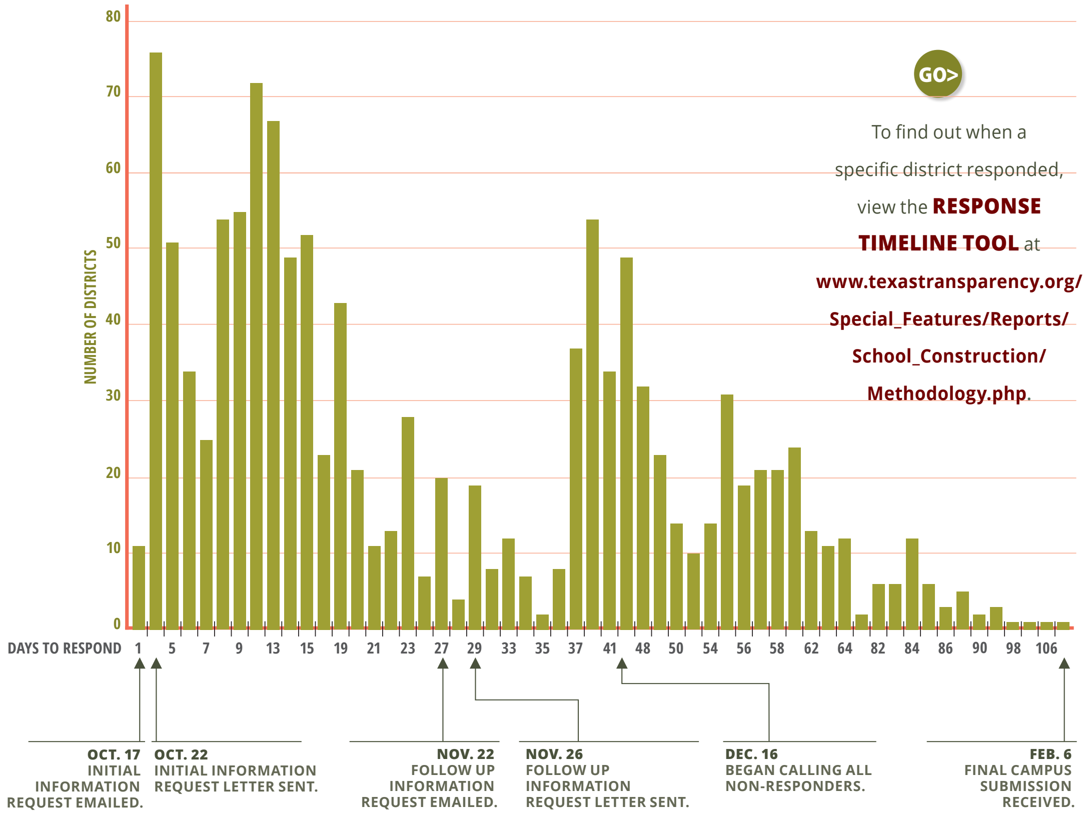
MIXED: Generally serves two or more of the elementary, middle or secondary grade spans.

SCHOOL CONSTRUCTION DATA REQUESTS: RESPONSE TIMES

- **October 2013:** We sent our initial email request and followed up with a letter.
- **November 2013:** We had received information from **62 percent** of the districts and sent follow-up emails to those that had not responded.
- **Mid-December 2013 - January 2014:** Another **31 percent** had responded, and Comptroller staff called the remaining **89 districts**.
- **February 2014:** Every district had responded, and we began contacting districts to verify their data met the requirements.

KEY FINDING

The lack of uniform data collection and reporting requirements for school districts makes it **extremely difficult to gather data taxpayers should have** to understand whether their school districts' facilities costs and sizes are reasonable. Our data collection and verification process was extensive, but the resulting data set remains dependent on the accuracy of data reported to us by school districts, reflecting **the importance of implementing standardized, centralized reporting requirements for school construction costs across the state**.



Source: Texas Comptroller of Public Accounts

VERIFICATION PROCESS

Our verification process was a multi-faceted effort involving emails and phone calls.

- **February 2014:** We asked respondents to confirm their submitted information covered only new campuses (not building renovations or extensions). We provided average cost information so school officials could compare their data to those submitted by their peers.
- **April 2014**: We published the data for **877** campuses on our website and invited districts to review them alongside statewide averages.
- **May 15, 2014**: We asked districts to submit any changes by this deadline.

Districts did not make it easy for us to acquire these data. During the verification process and after the data were made public, **some districts changed their previously submitted data**.

For example:

- At least **10 school districts** did not acknowledge that their projects were for additions until the Comptroller's office questioned the data.
- During the pre-publication verification process in **February,** districts submitted **128 campus changes**; they reported **58 more changes** during the **May 2014** review period.
- Over the course of the Comptroller's 2012 and 2013 school construction surveys, **one school district changed its reported data on one campus five times**.
- **Staff turnover at school districts** often meant those submitting the data were not in place when new campuses were built and **they could not locate building records, making it difficult to accurately verify costs**.

WHAT ARE THE KEY RESULTS OF OUR SURVEY?

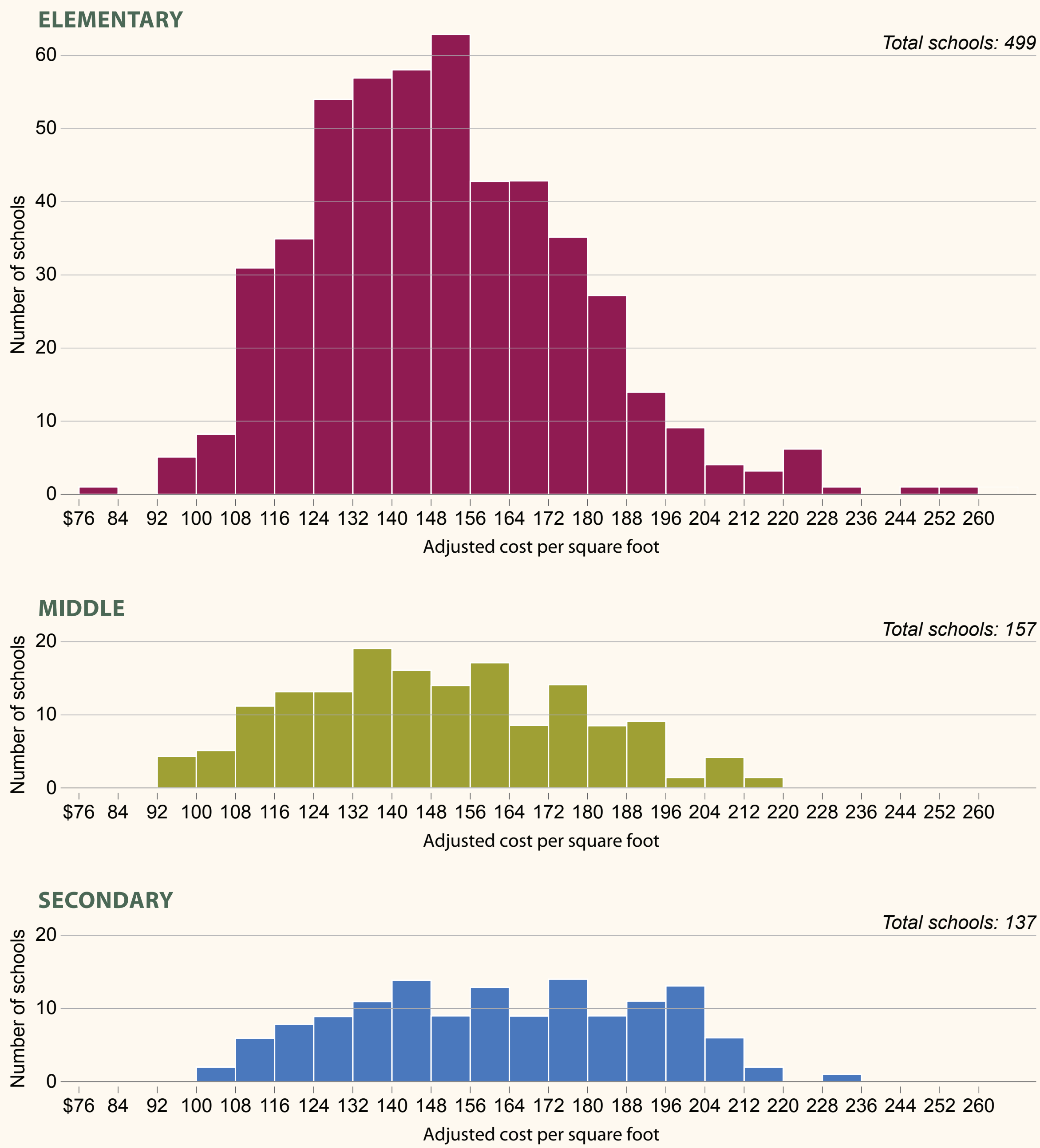
Once the adjusted data had been verified, we had detailed information on **834 new campuses** (excluding charter operators) — **$15.4 billion** in combined adjusted construction costs. **Cost per square foot was our key comparison metric, but we also looked at cost per student at capacity and square feet per student for additional context**. We also grouped facilities using categories like metro areas and school types, and calculated comparison statistics for each group.

After Comptroller staff **adjusted for inflation and for local labor and materials price variations** within Texas, we analyzed the results to gauge the cost of constructing a new campus in Texas.

This process is detailed on our website: **www.texastransparency.org/Special_Features/Reports/School_Construction/Methodology.php**.

COST DIFFERENCES AMONG CAMPUS TYPES

The construction costs adjusted for inflation and regional cost variations show a range of $76 to $260 per square foot.



Sources: Texas Comptroller of Public Accounts, RS Means, data reported by school districts.

WHAT ARE THE KEY RESULTS OF OUR SURVEY?

School districts reported construction costs for schools opened between 2007 and 2013. To compare construction project costs across time, Comptroller staff:

- **converted all costs to 2013 dollars** by applying the monthly All Urban Consumers CPI for the month in which each campus opened;
- **adjusted for local labor and materials price variations** within Texas by applying the RS Means Texas Cost Index; and
- **analyzed the resulting data** to gauge the cost of building a new campus in Texas.

Cost per square foot was our key metric, but we also examined cost per student at capacity for additional context.

- Of the reported schools (excluding charters) built between 2007 and 2013, **60 percent** were elementary schools, **19 percent** middle schools, **16 percent** secondary schools, **3 percent** mixed grade and **2 percent** pre-K.
- **Middle** and **elementary schools** were the **least expensive** to build at **$149 per square foot**. **Secondary campuses** and **pre-K** schools were the **most expensive**, averaging **$163 per square foot**.*
- **Secondary schools had the highest cost**, at more than **$26,500 per student** at capacity. **Middle schools** averaged almost **$21,500 per student at capacity** and **elementary schools** almost **$17,500**. (See note on p. 7 explaining cost per student at capacity.)

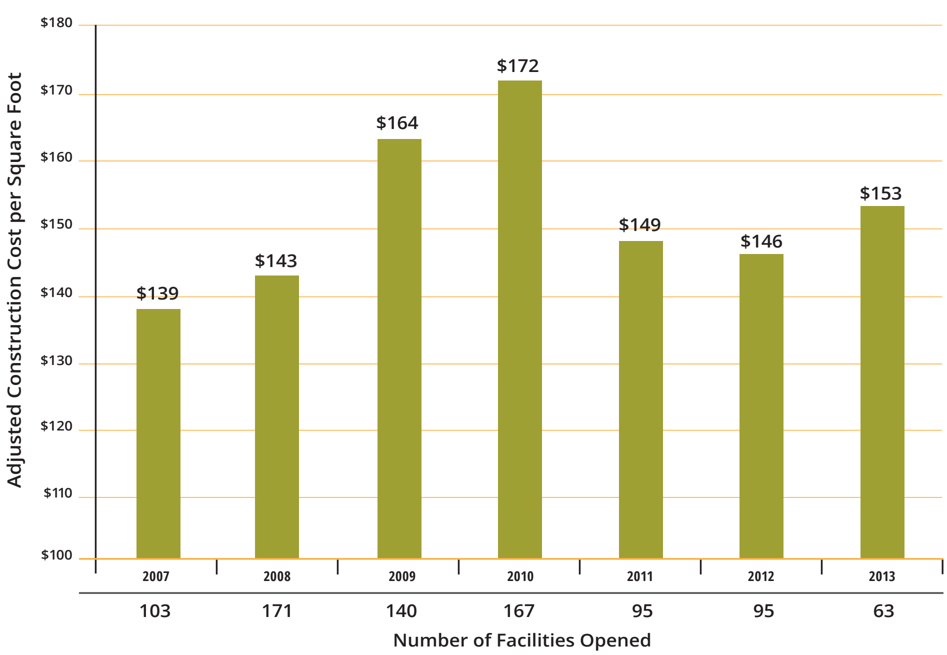
Construction Cost Averages by Campus Type

Campus Type	New Campuses Opened 2007-2013	Share of Campuses Built	Adjusted* Cost Per Foot	Adjusted* Cost Per Student at Capacity	Square Footage Per Student at Capacity
Pre-K	17	2%	$163	$17,993	111
Elementary	499	60%	$149	$17,461	117
Middle	157	19%	$149	$21,473	145
Secondary	137	16%	$163	$26,711	164
Mixed	24	3%	$162	$23,214	143
Overall	**834**	**100%**	**$154**	**$20,769**	**135**

Sources: Texas Comptroller of Public Accounts, RS Means, data reported by school districts.
Note: Charter school data are not included in these averages.
*Costs are adjusted for inflation and regional price differences.

* Due to the small sample size of pre-K schools (17 campuses), we cannot draw firm conclusions about their costs.

CONSTRUCTION COSTS FLUCTUATE FROM YEAR TO YEAR



Sources: Texas Comptroller of Public Accounts, RS Means, data reported by school districts.

The most expensive schools were opened in 2009 and 2010, meaning they likely were **initiated** during the building boom prior to the recession. School districts reported project bids obtained during the recession were more favorable than immediately prior.

KEY FINDING

The information in this report provides a clearer picture of what kinds of schools were built during our survey period and the adjusted cost to build them.

ROLE OF ENROLLMENT

Enrollment growth is a key driver for additional school facilities. **Texas' under-18 population is expanding 6.5 times faster than the U.S. average**. Our data show newly built schools (both new campuses in growing districts and replacement facilities) house almost **740,000 students** — about **15 percent** of Texas public school enrollment (this percentage is based on Texas Education Agency enrollment figures).

McFee Elementary School, Cypress-Fairbanks ISD, opened in 2007.

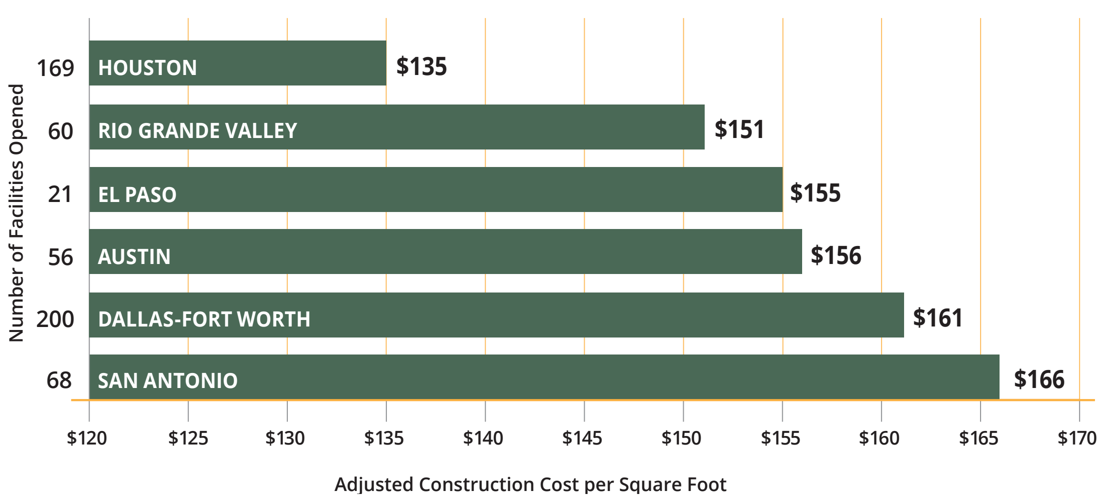
KEY FINDING

Since fast-growing districts are building schools at a rapid pace, they need to build them efficiently to minimize the burden on taxpayers. Districts could use comparable data to find efficiencies for their new projects.

Cost per student at capacity shows how much each district paid to provide student space if enrollment is at maximum capacity. Note that these data do not attempt to quantify the cost of that space over the building's life or estimate the cost per student if a school is not at full enrollment.

Assuming each student requires a certain amount of educational square footage, campus construction and square footage should roughly, though not perfectly, correspond with enrollment trends.

NEW SCHOOL ADJUSTED AVERAGE CONSTRUCTION COST PER SQUARE FOOT IN LARGE METRO AREAS



Sources: Texas Comptroller of Public Accounts, RS Means, data reported by school districts.

Over the six-year period, the Houston area's **169** campuses were by far the least expensive in adjusted average cost per square foot at **$135**. The Dallas-Fort Worth metro area had the most campuses (200) averaging **$161 per square foot**, behind the San Antonio area's **$166 per square foot** for 68 campuses.

ROLE OF ENROLLMENT

A. W. Brown Academy, Dallas

Why did we exclude charter schools from the analysis?

Although charter schools are public schools, their operators have no local property taxing authority and do not issue debt for construction that is supported by local property taxes.

Charter schools often lease commercial building space or renovate other existing structures. Just **39 new purpose-built charter school campuses**, less than **5 percent** of all new schools reported to us, opened between 2007 and 2013.

Between two and 11 newly built charter campuses were opened each year of the survey, and charter school construction costs varied significantly from year to year. This small number of new builds means that charter schools have very little effect on overall construction averages. Because of these factors, charters were excluded from all analysis in this report.

Individual charter school submissions are included in the Comptroller's online school construction cost data tool available at **www.texastransparency.org/Special_Features/Reports/School_Construction/Lookup_Tool.php**.

Growth is often the driving force in new school construction, but it doesn't have to result in a higher cost per square foot or with high square footage per student. Schools can be built efficiently and less expensively, but districts do not always choose to do so. And it is important to note that new facilities are sometimes constructed for reasons other than enrollment growth. Districts may choose to build **new facilities to replace older ones**.

Districts also may build facilities to address rising enrollment in one part of a district **instead of redrawing school attendance zones**, sometimes leaving enrollment in campuses in another part of the district **below capacity**.

- New school construction is consistent with enrollment growth in the El Paso area, the Rio Grande Valley and the San Antonio area.
- School districts in the Houston area had **30 percent** of statewide enrollment growth, but only **20 percent** of the campuses built from 2007 through 2013.
- In the areas outside the six largest metropolitan statistical areas, **35 percent** of districts experienced a net student loss. Despite this, the group accounts for **9 percent** of enrollment growth, nearly a **quarter of all new capacity** and **31 percent** of all new campuses.
- The average metro school has **127,000 square feet** and holds **948 students**, compared with **77,000 square feet** and **546 students** in rural schools.

KEY FINDING

The state does not require districts to report the capacity of existing facilities; interested taxpayers must acquire such information directly from school districts.

A CLOSER LOOK

Take a closer look at school districts with the highest and lowest average construction costs, by adjusted cost per square foot, for five campus types. More than just a listing, this section highlights specific campuses and a few of the factors that school district officials report affect costs.

HIGH COST – ELEMENTARY CAMPUSES

Port Arthur ISD – Adams Elementary School and Washington Elementary School Site improvements helped make these two schools the most expensive in Texas on a cost per square foot basis. Adams was designed with a raised floor and windows seven feet above the ground to reduce hurricane damage potential, according to district officials. The school also required an expensive sanitary sewer lift station. Washington Elementary School has similar needs, requiring floodplain protection. The district also indicates location-based security concerns prompted school officials to construct eight-foot steel palisade fences around the structure for protection.

North East ISD – Cibolo Green Elementary School At almost 123,000 square feet, Cibolo Green is the biggest elementary school in its district. District officials attribute its high costs to its design as an energy-efficient "green school" and its "21st century learning environments." District officials say the school consumed almost a third less energy per square foot than the average elementary school (in the 12-month period ending in February 2014), saving electricity, natural gas and water due to its design.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
PORT ARTHUR ISD	ADAMS ELEMENTARY SCHOOL	7/2010	$20,954,693	85,000	582	146	$22,102,750	**$260**	$37,977
PORT ARTHUR ISD	WASHINGTON ELEMENTARY SCHOOL	7/2010	$21,049,353	88,000	600	147	$22,202,594	**$252**	$37,004
NORTH EAST ISD	CIBOLO GREEN ELEMENTARY SCHOOL	8/2010	$27,252,943	122,756	1,036	118	$28,110,236	**$229**	$27,133
JUDSON ISD	CONVERSE ELEMENTARY SCHOOL	5/2009	$24,038,381	113,000	858	132	$25,339,488	**$224**	$29,533
HIDALGO ISD	HIDALGO ELEMENTARY SCHOOL	7/2007	$17,491,032	91,552	625	146	$20,472,750	**$224**	$32,756
CROCKETT CO. CISD	OZONA ELEMENTARY SCHOOL	9/2010	$13,803,906	69,000	600	115	$15,365,022	**$223**	$25,608
ROBSTOWN ISD	SAN PEDRO ELEMENTARY SCHOOL	3/2010	$7,750,000	37,400	500	75	$8,343,459	**$223**	$16,687
ROBSTOWN ISD	LOTSPEICH ELEMENTARY SCHOOL	3/2010	$7,750,000	37,400	500	75	$8,343,459	**$223**	$16,687

LOW COST – ELEMENTARY CAMPUSES

United ISD – Killam Elementary School At an adjusted cost of **$76 per square foot**, Killam is the least expensive school in the Comptroller's 2007-13 survey by a significant amount. Opened in 2008, the district got a 2003 price for the school because it was the last to open as part of a **six-school guaranteed price contract** with the construction company. The six campuses **shared an architectural prototype**. Change orders for sidewalks and sprinkler systems actually reduced the cost because the district used its own staff during summer lulls instead of the contractor, officials said.

Cypress-Fairbanks ISD – McFee Elementary School The district achieved efficiencies in this elementary project, one of three Cy-Fair schools opened in fall 2007, in several ways, including employing an existing **architectural prototype** and receiving favorable prices by giving a few contractors **repeat business**. School officials say changes in the construction market mean schools being built for less than **$100 per square foot** are a thing of the past, but the district still expects to build future schools as efficiently as possible.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
UNITED ISD	KILLAM ELEMENTARY SCHOOL	8/2008	$6,500,294	92,880	1,168	80	$7,052,141	**$76**	$6,038
CY-FAIR ISD	MCFEE ELEMENTARY SCHOOL	8/2007	$9,361,596	102,924	1,144	90	$9,684,207	**$94**	$8,465
CY-FAIR ISD	WARNER ELEMENTARY SCHOOL	8/2007	$9,024,742	98,169	1,144	86	$9,335,745	**$95**	$8,161
CY-FAIR ISD	RENNELL ELEMENTARY SCHOOL	8/2010	$11,025,292	114,579	1,144	100	$11,033,326	**$96**	$9,645
LAREDO ISD	HEIGHTS ELEMENTARY SCHOOL	6/2007	$5,845,155	68,500	418	164	$6,697,641	**$98**	$16,023
EAGLE PASS ISD	ARMANDO CERNA ELEMENTARY SCHOOL	8/2010	$5,602,000	62,734	725	87	$6,298,849	**$100**	$8,688
LAREDO ISD	DON GALLEGO ELEMENTARY SCHOOL	8/2007	$8,151,549	92,305	638	145	$9,340,411	**$101**	$14,640
KILLEEN ISD	HAYNES ELEMENTARY SCHOOL	8/2011	$11,456,851	121,531	974	125	$12,303,941	**$101**	$12,632

*Adjusted for inflation and regional price differences.

HIGH COST – MIDDLE SCHOOL CAMPUSES

RICE CISD – RICE JUNIOR HIGH SCHOOL Rurally located in Rice CISD, the junior high school was built next to the existing 40-year-old Rice High School and 15 miles from each of the district's three elementary schools. The school initially housed seventh and eighth grade students, and could potentially add sixth grade students. The district already owned the land. All construction workers, however, had to travel significant distances, which district officials say raised the construction costs.

PLANO ISD – OTTO MIDDLE SCHOOL This project was initiated at the height of the construction boom, which is one reason for the school's high cost. Based on its design capacity (calculated by the district using Texas Education Agency's minimum design standards), Otto Middle School's 100 square feet per student is significantly lower than the state average of 144. The district says the compact footprint could explain why the cost per square foot is higher than the state average. District policy determines a higher functional capacity, however, so Plano students are unlikely to encounter such tight facilities as this average square footage at capacity suggests.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
RICE CISD	RICE JUNIOR HIGH SCHOOL	8/2009	$16,787,783	85,500	320	267	$18,449,098	**$216**	$57,653
PLANO ISD	OTTO MIDDLE SCHOOL	10/2010	$28,669,324	154,121	1,538	100	$32,638,192	**$212**	$21,221
NORTHSIDE ISD	DOLPH BRISCOE MIDDLE SCHOOL	8/2010	$38,516,732	190,175	1,342	142	$39,728,348	**$209**	$29,604
PAMPA ISD	PAMPA JUNIOR HIGH SCHOOL	6/2010	$25,260,189	128,822	900	143	$26,549,314	**$206**	$29,499
NORTHSIDE ISD	DR. HECTOR P. GARCIA MIDDLE SCHOOL	8/2009	$37,854,139	192,725	1,483	130	$39,469,312	**$205**	$26,615
VALLEY VIEW ISD	EARLY COLLEGE CAMPUS	8/2010	$23,648,849	133,229	968	138	$26,489,746	**$199**	$27,365
LINDALE ISD	LINDALE JUNIOR HIGH SCHOOL	11/2010	$26,000,000	138,400	750	185	$26,836,690	**$194**	$35,782
FRISCO ISD	COBB MIDDLE SCHOOL	7/2010	$25,580,471	143,160	1,000	143	$27,505,883	**$192**	$27,506

LOW COST – MIDDLE SCHOOL CAMPUSES

JOSHUA ISD - R.C. LOFLIN MIDDLE SCHOOL At the time the school was built, the district had its own construction department of skilled professionals who handled some aspects of this project's construction. According to district officials, this strategy helped reduce construction costs. Additionally, the district used funds from a bond to **buy building materials in bulk**, which helped keep the costs low. The materials purchased were used for several other projects, including renovations at other campuses and buildings.

RIO GRANDE CITY ISD – VETERANS MIDDLE SCHOOL School officials say their approach to building projects is to **be as conservative as possible** when deciding what to build and what they can afford. There was a degree of **good timing when the middle school went out for bid** — officials report there was not a lot of comparable construction going on in the area, enabling the district to build the school at a very favorable price.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
JOSHUA ISD	R.C. LOFLIN MIDDLE SCHOOL	3/2010	$15,710,000	170,447	1,000	170	$16,129,082	**$95**	$16,129
RIO GRANDE CITY CISD	VETERANS MIDDLE SCHOOL	8/2007	$13,547,306	166,000	1,000	166	$15,856,731	**$96**	$15,857
CY-FAIR ISD	HOPPER MIDDLE SCHOOL	8/2007	$21,637,770	229,698	1,475	156	$22,637,790	**$99**	$15,348
CHANNELVIEW ISD	ANTHONY AGUIRRE JR. HIGH	8/2012	$19,342,230	181,000	1,520	119	$18,171,244	**$100**	$11,955
ALVIN ISD	MANVEL JUNIOR HIGH SCHOOL AT RODEO PALMS	8/2012	$18,552,295	172,163	1,000	172	$17,807,160	**$103**	$17,807
HEARNE ISD	HEARNE JUNIOR HIGH SCHOOL	7/2008	$2,500,000	24,898	225	111	$2,634,002	**$106**	$11,707
SOCORRO ISD	SPC. RAFAEL HERNANDO III MIDDLE SCHOOL	7/2007	$10,898,577	118,553	900	132	$12,692,286	**$107**	$14,103
PASADENA ISD	CARTER LOMAX MIDDLE SCHOOL	1/2008	$12,908,782	120,450	1,000	120	$12,938,578	**$107**	$12,939

*Adjusted for inflation and regional price differences.

HIGH COST – SECONDARY CAMPUSES

PARIS ISD – PARIS HIGH SCHOOL Problems with the architect at the start of the project and weather delays at the end resulted in a compressed timeline and additional costs for Paris' replacement high school project, according to school officials. In fact, the 2010-11 **school year was actually delayed by two weeks** because of these issues.

School officials say the district changed architects because the first architect's fees were deemed excessive. Late in the construction phase, wet weather made it difficult for contractors to access and work on the site, according to the district. The resulting compressed timeline meant higher labor costs due to overtime.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
PARIS ISD	PARIS HIGH SCHOOL	9/2010	$38,094,202	187,925	1,000	188	$43,834,136	**$233**	$43,834
JUDSON ISD	JUDSON HIGH SCHOOL	10/2010	$95,180,824	441,632	3,150	140	$97,130,504	**$220**	$30,835
PORT ARTHUR ISD	MEMORIAL HIGH SCHOOL	7/2009	$69,882,932	339,230	2,930	116	$74,512,856	**$220**	$25,431
CELESTE ISD	CELESTE HIGH SCHOOL	8/2009	$9,804,803	53,816	350	154	$11,404,796	**$212**	$32,585
ROUND ROCK ISD	CEDAR RIDGE HIGH SCHOOL	8/2010	$74,908,188	374,221	2,400	156	$78,918,272	**$211**	$32,883
SUNNYVALE ISD	SUNNYVALE HIGH SCHOOL	7/2009	$22,229,528	107,630	550	196	$22,624,914	**$210**	$41,136
BRADY ISD	BRADY HIGH SCHOOL	1/2010	$19,174,949	102,721	500	205	$21,424,234	**$209**	$42,848
LA JOYA ISD	BENITO JUAREZ-ABRAHAM LINCOLN HIGH SCHOOL	11/2010	$62,021,978	330,204	2,200	150	$68,733,504	**$208**	$31,243

LOW COST – SECONDARY CAMPUSES

CYPRESS-FAIRBANKS ISD – CYPRESS RANCH HIGH SCHOOL **Using an existing high school's plans** and modifying it to comply with updated Texas Education Agency space requirements, Cypress Ranch is co-located with another campus on a 130-acre site. The school came in **$162,000** less than the original budget.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
CY-FAIR ISD	CYPRESS RANCH HIGH SCHOOL	8/2008	$54,525,495	523,330	3,325	157	$53,404,264	**$102**	$16,061
CHANNELVIEW ISD	L.W. KOLARIK 9TH GRADE CENTER	1/2008	$14,896,700	146,000	950	154	$15,071,375	**$103**	$15,865
MANSFIELD ISD	LAKE RIDGE HIGH SCHOOL	5/2012	$47,260,546	422,425	2,500	169	$46,045,700	**$109**	$18,418
CY-FAIR ISD	CYPRESS LAKES HIGH SCHOOL	8/2008	$57,164,296	508,390	3,225	158	$55,988,804	**$110**	$17,361
ROSCOE COLLEGIATE ISD	ROSCOE COLLEGIATE HIGH SCHOOL	12/2010	$2,273,350	22,073	350	63	$2,445,165	**$111**	$6,986
DALHART ISD	DALHART HIGH SCHOOL	9/2008	$13,125,961	120,559	850	142	$13,649,065	**$113**	$16,058
FLORESVILLE ISD	FLORESVILLE HIGH SCHOOL	1/2010	$44,560,085	389,013	1,500	259	$44,567,336	**$115**	$29,712
MANSFIELD ISD	LEGACY HIGH SCHOOL	6/2007	$45,287,387	422,420	2,500	169	$48,585,164	**$115**	$19,434

*Adjusted for inflation and regional price differences.

PRE-K CAMPUSES

A small number of pre-K schools (17 campuses) were built for a wide range of construction costs during the survey period, making it difficult to draw firm conclusions about pre-K campus costs. Adjusted for inflation and labor and materials price variations, the **average cost per square foot was $163**; however, **eight of these campuses came in at less than $140** and **six** at **$190 or higher**. Looking at the cost per square foot metric is inconclusive in this small sample — the **adjusted cost per student at capacity ranged from about $9,000** at Houston-area districts **Klein and Channelview**, **to almost $39,000 per student at Austin ISD's Anita Uphaus Early Childhood Center** and almost **$45,000 at Ysleta ISD's Pre-K Center**.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
DENTON ISD	GONZALEZ SCHOOL FOR YOUNG CHILDREN	8/2010	$12,881,170	60,391	616	98	$14,284,096	**$237**	$23,188
ENNIS ISD	CARVER EARLY CHILDHOOD CENTER	8/2009	$13,322,779	65,222	400	163	$14,463,728	**$222**	$36,159
YSLETA ISD	YSLETA PRE-K CENTER	8/2010	$12,068,450	68,300	300	228	$13,450,196	**$197**	$44,834
PLANO ISD	ISAACS EARLY CHILDHOOD SCHOOL	10/2009	$10,613,312	62,236	553	113	$12,212,497	**$196**	$22,084
AUSTIN ISD	UPHAUS EARLY CHILDHOOD CENTER	8/2012	$14,315,470	73,690	367	201	$14,312,343	**$194**	$38,998
FRISCO ISD	EARLY CHILDHOOD SCHOOL	7/2009	$17,764,691	101,784	1,100	93	$19,309,446	**$190**	$17,554
MCKINNEY ISD	LAWSON EARLY CHILDHOOD CENTER	8/2009	$13,607,476	90,225	850	106	$15,828,008	**$175**	$18,621
ROYAL ISD	ROYAL EARLY CHILDHOOD CENTER	5/2009	$12,465,158	85,618	682	126	$13,714,619	**$160**	$20,109
HENDERSON ISD	MONNIE MEYER WYLIE PRIMARY	8/2009	$8,879,715	71,238	448	159	$10,464,653	**$147**	$23,359
ALDINE ISD	GARCIA-LEZA EARLY CHILDHOOD/ PRE-K CENTER	8/2009	$9,485,195	68,242	645	106	$9,492,106	**$139**	$14,716
LEVELLAND ISD	LEVELLAND ABC	1/2007	$7,097,744	58,399	572	102	$8,031,614	**$138**	$14,041
KELLER ISD	KELLER EARLY LEARNING CENTER AND ANNEX FACILITY	8/2010	$11,496,332	95,000	600	158	$13,008,936	**$137**	$21,682
KLEIN ISD	GRACE ENGLAND EARLY CHILDHOOD/ PRE-K CENTER	8/2012	$9,511,000	66,500	1,000	67	$8,935,200	**$134**	$8,935
ALDINE ISD	JONES EARLY CHILDHOOD/PRE-K CENTER	8/2008	$8,451,708	64,243	707	91	$8,277,913	**$129**	$11,709
ALDINE ISD	KUJAWA EARLY CHILDHOOD/PRE-K CENTER	8/2008	$8,448,348	64,243	711	90	$8,274,621	**$129**	$11,638
CHANNELVIEW ISD	BARRETT-LEE EARLY CHILDHOOD CENTER	3/2012	$8,385,290	61,754	860	72	$7,877,641	**$128**	$9,160
LA FERIA ISD	SAM HOUSTON ELEMENTARY SCHOOL	8/2010	$7,530,000	75,000	725	103	$8,434,566	**$112**	$11,634

HIGH COST – MIXED CAMPUSES

Del Valle ISD – Opportunity Center The Opportunity Center campus at Del Valle has the science labs, classrooms and library needed by students focused solely on graduating rather than the traditional high school experience. However, the school does not have many of the other core facilities such as a gym or even a full kitchen for the cafeteria. District officials said that unlike the other Del Valle schools built in recent years, co-locating the Opportunity Center with existing middle and elementary schools meant installing costly 35-foot concrete piers so the two-story building's foundation could withstand the shifts in the expansive red clay beneath it.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
DEL VALLE ISD	DEL VALLE OPPORTUNITY CENTER	8/2009	$12,075,834	61,318	500	123	$12,860,579	**$210**	$25,721
OVERTON ISD	OVERTON HIGH SCHOOL	10/2007	$3,260,400	19,653	400	49	$3,971,865	**$202**	$9,930
WACO ISD	UNIVERSITY HIGH SCHOOL	7/2011	$68,146,774	350,000	2,000	175	$68,749,086	**$196**	$34,375

LOW COST – MIXED CAMPUSES

Hermleigh ISD – Hermleigh School Good timing played a significant role in Hermleigh School's construction project in 2010 to replace three 60- to 75-year-old buildings with the brand-new campus. School officials say the bonds were sold when interest rates were low. When the bids for the pre-K-12th grade campus went out, the lull in the construction sector at that time meant bids were very favorable for the school district, even with contractors traveling a long way.

DISTRICT	CAMPUS	OPENING DATE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
HERMLEIGH ISD	HERMLEIGH SCHOOL	8/2011	$8,021,972	80,627	300	269	$8,361,400	**$104**	$27,871
ABBOTT ISD	ABBOTT SCHOOL	8/2008	$3,316,484	33,657	400	84	$3,523,898	**$105**	$8,810
LORAINE ISD	LORAINE SCHOOL	8/2013	$8,100,000	70,538	450	157	$8,189,448	**$116**	$18,199

*Adjusted for inflation and regional price differences.

BIG PICTURE ISSUES FACING CAMPUS CONSTRUCTION

KEY FINDING

Site-specific factors can vary significantly from one construction site to another. Districts and taxpayers must determine whether costs are justified.

Nearly every Texas school construction project faces site-specific challenges. There is no one-size fits-all solution when it comes to building schools, but districts have several options to choose from when planning new campuses.

Prototypes

Architectural prototypes (using a consistent design) for multiple campuses can mean savings in the design phase, on architectural fees and on purchasing (because the same design and materials are used, less time is needed to plan subsequent projects). Local zoning restrictions or building regulations, however, could result in changes to prototypes, reducing potential savings.

- **Round Rock ISD** uses architectural prototypes for elementary facilities and can build an elementary school in an average of **14 months**, compared to the average build time of **18 months**.
- **Cypress-Fairbanks ISD** extends savings by using architectural prototypes and the same builders and contracts on multiple projects. The district has implemented different prototypes based on site variations.

Austin ISD's Jaime Padron Elementary School is being built in the shell of a former 143,000-square-foot warehouse and will cost significantly less per square foot than a nearby school opened in 2013.

Renovate or Build?

According to the Texas Association of School Boards, **renovations cost 50-70 percent** of a new building's cost and can often meet the goals of a new structure. School districts with older facilities or slower student growth can couple historic and civic considerations with the economic benefits of renovating existing schools or other facilities.

- For **Austin ISD's Jaime Padron Elementary School**, scheduled to open in August 2014, school leaders bought and refitted an **existing 143,000-square-foot warehouse**, projected to save about **20 percent** compared to another Austin ISD elementary school that opened in 2013. The school will accommodate more than **1,000 students** and is being retrofitted to achieve a three-star rating from Austin Energy's Green Building program.

Building on an empty site offers an opportunity to build a durable, energy-efficient school that suits the district's educational needs. Conversely, it could result in potentially expensive infrastructure costs.

- Fast-growth district **Frisco ISD built more than 20 new schools** in the Comptroller's survey period and projects **30 to 50 percent** savings over conventional HVAC systems by implementing geothermal pumps that use renewable energy both to heat and cool buildings, installing energy recovery ventilation systems to improve air quality and adding spray foam insulation.

CY-FAIR ARCHITECTURAL PROTOTYPES SAVE TIME, MONEY

How do school districts meet the challenges involved in building a new school? The case studies in this report provide an in-depth look at how some districts are facing these challenges such as:

- how the construction market affects costs;
- how districts juggle issues associated with rapid growth; and
- how local goals and government regulations can contribute to building decisions.

School district officials provided the information reported in these case studies.

Fast-growing suburban Houston school district **Cypress-Fairbanks ISD** is the state's third largest. Since 2007, **18,000** additional students filled spots in **14 new campuses**.

With average building costs of **$107 per square foot** (adjusted for inflation and regional variations in the cost of labor and materials), the district ties for the least expensive construction costs among districts that built and opened at least two new campuses between 2007 and 2013. Paying **30 percent** less than the average adjusted cost per square foot, the biggest question is, what is Cy-Fair's secret?

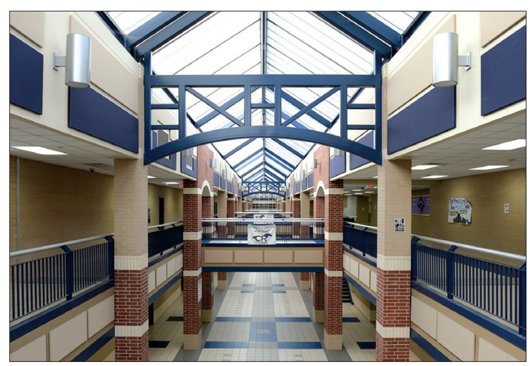
Construction Practice Saves Money on New Schools

- Cy-Fair officials say the district can build and open a high school in 32 months from start to finish, compared with the industry average of four years.
- **Multiple architectural prototypes** suit elementary, middle or high schools, saving months of construction time and hundreds of thousands of dollars.
- Key decisions, such as materials and building layout, are already made.
- Different prototypes speed adjustments to site variables, such as soil, drainage, utilities and access to roads.
- Time is saved by **using the same architects, builders and contractors** in both the bidding process and design phases of multiple projects.

The Future: Educational Village and 2014 Bond

In May 2014, Cy-Fair voters approved **$1.2 billion** in new bond debt, including **$197 million** for new construction and **$666 million** for renovation. Cy-Fair is moving forward with new concepts that district officials say will provide "21st century learning" flexibility for teaching in smaller groups, even on a campus for thousands of students.

- An **educational village concept** with a shared site and economies of scale will offer savings. The district's 11th high school will be co-located with an elementary and middle school, so operational infrastructure, such as a single cooling plant for the entire site, can be shared. Events like concerts will benefit from proximity to large parking lots and an auditorium.
- Cy-Fair's demographer projects enrollment will increase by **25,000 students** in the next six years, requiring more schools. District officials predict new campuses will cost more as the construction industry has recovered from recession and labor and material costs are increasing. Cy-Fair's most recently completed elementary school will cost an estimated **$123 per square foot**, but they expect the next one — initiated in 2014 — could cost **$155-$160 per square foot**.



Cypress Ranch High School opened in 2008.

CYPRESS-FAIRBANKS ISD NEW CAMPUSES	NUMBER OF CAMPUSES	AVERAGE SQUARE FEET	AVERAGE STUDENT CAPACITY	SQUARE FEET PER STUDENT	AVERAGE ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT
ELEMENTARY SCHOOLS	8	103,830	1,144	91	$10,882,362	$105	$9,513
MIDDLE SCHOOLS	3	234,072	1,475	159	$25,452,447	$109	$17,256
SECONDARY SCHOOLS	2	515,860	3,275	158	$54,696,534	$106	$16,711
MIXED SCHOOL	1	53,170	200	266	$7,741,989	$146	$38,710

*Adjusted for inflation and regional price differences.

LEANDER ISD JUGGLES FAST GROWTH, MULTIPLE NEW SCHOOLS, COMPLICATED FINANCING

Fast-growing school districts face the ongoing challenge of predicting how many students they'll need space for each year. **Leander ISD**, northwest of Austin, has grown by **41 percent**, from **24,000 to 34,000 students,** since 2007 and opened nine schools in that period.

Bringing new schools online so rapidly comes with challenges. Leonard Reed Elementary School was built in 2011, but was not opened to students for three years. The first classes are scheduled to begin in fall 2014 with an anticipated enrollment of **700**. District officials cite state funding cuts as the reason for keeping the school closed, a decision that saved **$600,000** in annual operating costs, but required students to be placed at other campuses, some in portable buildings.

Westside Elementary School opened in 2008.

Efficient, Flexible Design

- All nine Leander schools in the Comptroller's 2007-2013 new school construction survey come in at a **well below-average cost per square foot**.
- **Efficient building techniques**, such as tilt-up concrete walls and well-thought design standards, contribute to low costs.
- LISD elementary **schools share science labs among classrooms**, minimizing preparation and transit time for hands-on lessons and saving on square footage.

Interior of Westside Elementary School.

Capital Appreciation Bonds

Below-average construction costs may be more expensive in the long run due to the district's use of Capital Appreciation Bonds (CABs). CABs are structured so that interest is not repaid until the loans mature. Leander defends this approach as necessary to build the schools it needs now by limiting its current debt repayments to a level it can afford within the state's **$0.50 per $100** value cap on the tax rate levied for debt service. However, due to interest compounding throughout the life of bond — regardless of interest rates — the final cost is more than a loan where principal and interest are paid throughout.

LEANDER ISD NEW CAMPUSES	OPENING DATE	GRADE LEVEL	SQUARE FEET	STUDENT PER CAPACITY	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT
WESTSIDE ELEMENTARY SCHOOL	8/2008	ELEMENTARY	112,270	821	$13,110,001	$117	$15,968
RIVER PLACE ELEMENTARY SCHOOL	8/2007	ELEMENTARY	95,425	848	$11,469,642	$120	$13,526
REAGAN ELEMENTARY SCHOOL	6/2009	ELEMENTARY	112,270	871	$14,155,803	$126	$16,252
PARKSIDE ELEMENTARY SCHOOL	8/2008	ELEMENTARY	108,852	871	$14,558,904	$134	$16,715
RIVER RIDGE ELEMENTARY SCHOOL	7/2009	ELEMENTARY	110,965	871	$16,184,675	$146	$18,582
STILES MIDDLE SCHOOL	6/2012	MIDDLE	177,767	1,358	$19,725,352	$111	$14,525
FOUR POINTS MIDDLE SCHOOL	6/2009	MIDDLE	175,276	1,358	$22,310,684	$127	$16,429
VANDEGRIFT HIGH SCHOOL	6/2010	SECONDARY	399,220	1,800	$50,784,048	$127	$28,213
ROUSE HIGH SCHOOL	7/2008	SECONDARY	410,372	2,400	$54,185,568	$132	$22,577

*Adjusted for inflation and regional price differences.

ENVIRONMENTAL ISSUES PROMPT SOME CONSTRUCTION DECISIONS

With **23 campuses** opened between 2007 and 2013, only one Texas school district built more campuses than **Northside Independent School District** in San Antonio. Northside's adjusted cost per square foot for new campuses ranged from average to expensive in the Comptroller's survey. Each school is **designed to accommodate site variables** related to the district's location on the Balcones Escarpment and the Edwards Aquifer recharge zone, according to district officials. Some sites are flat and easy to build on, while others have required substantial ground preparation to remediate **elevation changes of up to 60 feet,** officials say.

Recharge Zone and Endangered Species

- Retention and water quality ponds were built to facilitate construction over the Edwards Aquifer recharge zone — one school required both for a total cost of approximately **$425,000**.
- To comply with local tree and landscape ordinances, Northside had to buy larger sites for recent projects: 16-acre lots used to be sufficient for an elementary campus, but **newer schools are built on 18- to 20-acre lots**.
- **Federal endangered species regulations** have resulted in **higher building costs** in the district's western portion, where **nine endangered species** have been identified. (To date, no species have been found on a building site and stopped a project.)
- Karst features (caves that may be habitat for some of these species) were discovered during recent projects, **adding costs for exploration and investigation**.

Building for the Long Term

- Schools are being built to the school board's goal of a **50- to 100-year life expectancy.** The initial structural design uses suspended slabs, which are more expensive up front than some other options, but offer **long-term accessibility to all sides of the building**.
- Walls are built with concrete blocks and brick veneers, rather than the faster-to-build tilt-up concrete walls and pre-engineered metal **construction**.
- According to the district, other design decisions requiring **higher up-front** costs include **energy conservation** choices and **high efficiency cooling systems**.

Local tree preservation rules required Northside ISD to move trees during construction at the Los Reyes Elementary School.

NORTHSIDE ISD NEW CAMPUSES	NUMBER OF CAMPUSES	AVERAGE SQUARE FEET	AVERAGE STUDENT CAPACITY	SQUARE FEET PER STUDENT	AVERAGE ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT
ELEMENTARY SCHOOLS	16	100,923	802	127	$17,588,361	$174	$22,116
MIDDLE SCHOOLS	5	191,921	1,433	134	$35,134,334	$184	$24,644
SECONDARY SCHOOLS	2	447,334	2,768	162	$79,584,468	$178	$28,688

*Adjusted for inflation and regional price differences.

RURAL CONTRASTS: TIMING, SCOPE AND LOCATION AFFECT COSTS

KEY FINDING

For rural districts like Hermleigh and Blackwell, building a new school is unlikely to happen for another couple of generations, so building a solid facility that will serve their rural communities now and in the future is imperative. With few local residents to pay for it, getting the right design for an acceptable price is essential.

Separated by **50 miles**, **Blackwell CISD** and **Hermleigh ISD** both built schools for lower-than-average adjusted cost per square foot to serve their small K-12 student bodies in rural West Texas. But on another measure, adjusted cost per student at capacity, both schools were above average — in fact, Blackwell was more than twice the average.

Hermleigh School

- Opening in 2011 on a new site, Hermleigh School replaced three buildings built in 1936, 1942 and 1950.
- The school was built for an adjusted **$104 per square foot**, one of the least expensive schools in the state, thanks to the timing of the district's bond sale when interest rates had declined and the timing of seeking construction bids, according to school officials.
- All aspects, such as concrete, electrical and air conditioning, were **bid separately**, and even though the closest pool of likely contractors was at least 70 miles away, the **scarcity of new construction work** at that time **resulted in favorable bids**.
- The district built for the long term, **focusing spending on durable construction**.
- Some 100 of Hermleigh's **240 students** (capacity 300) are transfers from other districts. Transfer places can be reduced if more spaces are needed for in-district students.

Blackwell School

- The new Blackwell School opened in 2009 next to the old school, most of which was subsequently demolished.
- Dirt was brought in to level the site for the new building, adding to construction costs.
- The Texas construction market was strong and interest rates were higher when the project was bid. Although building costs seem low at an adjusted **$135 per square foot**, Blackwell's small capacity — and enrollment — spread over **13 grade levels** equates to an expensive cost per student at capacity compared to the average.

Blackwell School opened in 2009.


Hermleigh School opened in 2011.

BLACKWELL CISD & HERMLEIGH ISD DISTRICT	CAMPUS	COUNTY	OPENING DATE	CAMPUS TYPE	CONSTRUCTION COST	SQUARE FEET	STUDENT CAPACITY	SQUARE FEET PER STUDENT	ADJUSTED* CONSTRUCTION COST	ADJUSTED* COST PER SQUARE FOOT	ADJUSTED* COST PER STUDENT AT CAPACITY
BLACKWELL CISD	BLACKWELL SCHOOL	NOLAN	8/2009	MIXED	$9,200,000	74,777	200	374	$10,110,429	$135	$50,552
HERMLEIGH ISD	HERMLEIGH SCHOOL	SCURRY	8/2011	MIXED	$8,021,972	80,627	300	269	$8,361,400	$104	$27,871

*Adjusted for inflation and regional price differences.

HOW CAN THIS SCHOOL CONSTRUCTION COST REPORT HELP SCHOOLS AND DECISION MAKERS?

We believe this single source of data will help school districts and decision makers monitor construction efficiency and keep an eye on costs. But it is important that, in the future, data on school facilities be reported in a standard, comparable manner so that taxpayers can see if their money is being wisely spent.

Texas law gives **operational control and authority to local public school districts**. Subject to statewide standards for academic performance, they have the authority and responsibility to fund and manage suitable facilities. Decisions about the design, builders, architects and budget lie with local school officials and their associated communities.

For the campuses included in this report, school districts and communities can **see how their construction costs match up** to projects in the same region, with similar enrollment, by campus type or by campus size. Using the Comptroller's school construction data to create these comparisons makes it easy for school districts and stakeholders to see **what they are doing well and how they can make improvements in the future**.

Those same comparisons can also help school districts planning new construction projects. But beyond that, this report offers case studies that look at the choices specific school districts made — information from which new projects can benefit.

For example:

- Building on an empty site offers an opportunity to implement energy-efficient systems, but may also require new infrastructure.
- Districts need to weigh the benefits of retrofitting an existing building versus using an architectural prototype.

Cypress Ranch High School, Cypress-Fairbanks ISD, opened in 2008.

KEY FINDING

We hope this report will help school decision makers — whether they have recently built a new campus or have school construction projects on the horizon.

BUT THIS IS JUST THE FIRST STEP

We collected this information simply because **people need to know it**. It should be available in a **standardized way** and presented in **context**. This kind of **transparency** can help ensure taxpayer dollars are **spent efficiently** and bring about **greater accountability** by school districts.

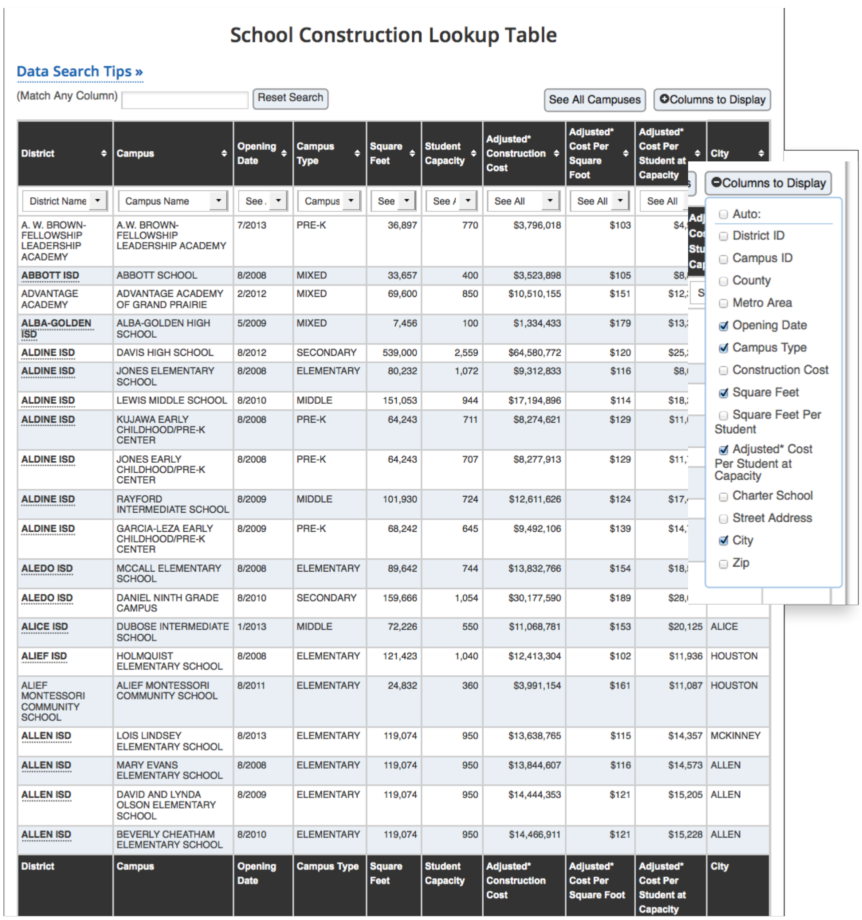
Based on what we have learned in collecting and analyzing these data, we have developed **several policy recommendations**. While it is our understanding that the Texas Education Agency (TEA) has authority to collect data, it may need additional resources to implement these recommendations.

1. The **commissioner of education** should establish data collection and reporting standards concerning school construction costs to be reported through the Texas Student Data System or a successor data management system managed by TEA. These measures should include total construction cost, cost per square foot and per student, total square footage and total student capacity.

2. The **commissioner of education** should direct each Texas school district and charter school operator to prepare an inventory of all of its existing facilities for inclusion in TEA's data system. This inventory should include age, purpose, capacity, current enrollment (for instructional facilities) and anticipated replacement date.

3. When **TEA's data system is complete**, the agency should report regional cost averages so that districts and their taxpayers can compare projected construction projects with other districts.

4. The **Texas Legislature** should require all public and charter school districts and campuses to provide a direct, readily accessible link to TEA's school facilities data on their websites.



School Construction Lookup Table

Data Search Tips »

(Match Any Column) Reset Search See All Campuses Columns to Display

District	Campus	Opening Date	Campus Type	Square Feet	Student Capacity	Adjusted* Construction Cost	Adjusted* Cost Per Square Foot	Adjusted* Cost Per Student at Capacity	City
District Name	Campus Name	See	Campus	See	See	See All	See All	See All	
A. W. BROWN-FELLOWSHIP LEADERSHIP ACADEMY	A.W. BROWN-FELLOWSHIP LEADERSHIP ACADEMY	7/2013	PRE-K	36,897	770	$3,796,018	$103	$4,	
ABBOTT ISD	ABBOTT SCHOOL	8/2008	MIXED	33,657	400	$3,523,898	$105	$8,	
ADVANTAGE ACADEMY	ADVANTAGE ACADEMY OF GRAND PRAIRIE	2/2012	MIXED	69,600	850	$10,510,155	$151	$12,	
ALBA-GOLDEN ISD	ALBA-GOLDEN HIGH SCHOOL	5/2009	MIXED	7,456	100	$1,334,433	$179	$13,	
ALDINE ISD	DAVIS HIGH SCHOOL	8/2012	SECONDARY	539,000	2,559	$64,580,772	$120	$25,	
ALDINE ISD	JONES ELEMENTARY SCHOOL	8/2008	ELEMENTARY	80,232	1,072	$9,312,833	$116	$8,	
ALDINE ISD	LEWIS MIDDLE SCHOOL	8/2010	MIDDLE	151,053	944	$17,194,896	$114	$18,	
ALDINE ISD	KUJAWA EARLY CHILDHOOD/PRE-K CENTER	8/2008	PRE-K	64,243	711	$8,274,621	$129	$11,	
ALDINE ISD	JONES EARLY CHILDHOOD/PRE-K CENTER	8/2008	PRE-K	64,243	707	$8,277,913	$129	$11,	
ALDINE ISD	RAYFORD INTERMEDIATE SCHOOL	8/2009	MIDDLE	101,930	724	$12,611,626	$124	$17,	
ALDINE ISD	GARCIA-LEZA EARLY CHILDHOOD/PRE-K CENTER	8/2009	PRE-K	68,242	645	$9,492,106	$139	$14,	
ALEDO ISD	MCCALL ELEMENTARY SCHOOL	8/2008	ELEMENTARY	89,642	744	$13,832,766	$154	$18,	
ALEDO ISD	DANIEL NINTH GRADE CAMPUS	8/2010	SECONDARY	159,666	1,054	$30,177,590	$189	$28,	
ALICE ISD	DUBOSE INTERMEDIATE SCHOOL	1/2013	MIDDLE	72,226	550	$11,068,781	$153	$20,125	ALICE
ALIEF ISD	HOLMQUIST ELEMENTARY SCHOOL	8/2008	ELEMENTARY	121,423	1,040	$12,413,304	$102	$11,936	HOUSTON
ALIEF MONTESSORI COMMUNITY SCHOOL	ALIEF MONTESSORI COMMUNITY SCHOOL	8/2011	ELEMENTARY	24,832	360	$3,991,154	$161	$11,087	HOUSTON
ALLEN ISD	LOIS LINDSEY ELEMENTARY SCHOOL	8/2013	ELEMENTARY	119,074	950	$13,638,765	$115	$14,357	MCKINNEY
ALLEN ISD	MARY EVANS ELEMENTARY SCHOOL	8/2008	ELEMENTARY	119,074	950	$13,844,607	$116	$14,573	ALLEN
ALLEN ISD	DAVID AND LYNDA OLSON ELEMENTARY SCHOOL	8/2009	ELEMENTARY	119,074	950	$14,444,353	$121	$15,205	ALLEN
ALLEN ISD	BEVERLY CHEATHAM ELEMENTARY SCHOOL	8/2010	ELEMENTARY	119,074	950	$14,466,911	$121	$15,228	ALLEN
District	Campus	Opening Date	Campus Type	Square Feet	Student Capacity	Adjusted* Construction Cost	Adjusted* Cost Per Square Foot	Adjusted* Cost Per Student at Capacity	City

Texas Comptroller of Public Accounts, Bureau of Labor Statistics, RS Means and data reported by school districts and charter operators.
Sample image taken from the School Construction lookup tool.

Where can I get more detailed information?

The full school construction lookup table is **searchable and sortable** by district, campus name, total cost, square footage and more.

The school construction campus map features multiple layers, so you can **view data by school type, location and population change**.

We encourage Texas taxpayers and school leaders to find out how their district compares.

GO> **www.texastransparency.org/Special_Features/Reports/School_Construction/Lookup_Tool.php.**

This document can be found on the Web:

**www.texastransparency.org/
Special_Features/Reports/School_Construction/**

Texas Comptroller of Public Accounts
Data Services Division
P.O. Box 13528
Austin, Texas 78711-3528

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Construction Economics Fall 2014/Winter 2015

Fall 2014 /
Winter 2015

BUILDING FOR THE FUTURE

CONSTRUCTION ECONOMICS

Market Conditions in Construction

Gilbane


Gilbane
Khal El-Ali

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DATA INCLUDED IN THIS REPORT:

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Construction Spending (Put-In-Place) through November, released January 2, 2015

Construction Jobs through mid-December, released January 9, 2015

Producer Price Index Materials through November, released December 12, 2014

Producer Price Index Markets through November, released December 12, 2014

Architectural Billings Index through November, released December 17, 2014

Dodge Momentum Index through November, released December 4, 2014

Consumer Inflation Index through October, released November 20, 2014

Summary

CONSTRUCTION GROWTH LOOKING UP:

Construction spending for 2014 is expected to finish the year 5.4% higher than 2013. All sectors will contribute to the growth. See Table 2, Page 15.

Cash flow of new starts for nonresidential buildings indicates a 15% increase in the monthly rate of spending over the next 10 months. See Figure 4, Page 12.

A correlation between the Architectural Billings Index (ABI), Dodge Momentum Index (DMI) and new starts cash flows has twice predicted the direction of nonresidential buildings spending over the last two years. Current forward look shows a flat period in Q4 2014 then a rapid rise in 2015. See Figure B, Page 6; , Figure 3, Page 11; and Figure 4, Page 12.

The U.S. gained 290,000 construction jobs over the last 12 months. Construction jobs are up 13% from the low point. Jobs plus hours worked show that total labor effort is up 18% from its lowpoint. More than forty percent of the total increased labor effort in the last four years is due to added hours.

FIGURE A:

All Construction Spending Rate of Growth 2013-2015

Total spending of ALL types of construction will grow 5.4% year over year from 2013 to 2014. We started 2014 at an annual rate of spending near $950 billion and finished at a rate of $990 billion.

As expected, non-residential buildings contributed to the dips in March and June in 2014, but helped lead the expansion for the second half of 2014.

SOME ECONOMIC FACTORS ARE STILL NEGATIVE:

- Real inflation adjusted constant construction volume is still 22% below peak and has not yet returned to the level of volume in 1993. At the historical rate of volume growth, it will take seven to eight more years to regain previous peak volume levels.
- Currently there are 6.1 million jobs and the total workforce is near 6.7 million, still near a 15-year low, about 1.5 million (18%) lower than the 2006-2007 peak. Since January 2010, between 400,000 and 700,000 workers have left the workforce.
- As workload expands in the next few years, a shortage of available skilled workers will continue to drive up labor cost and have a detrimental effect on schedule.
- In a recent Associated General Contractors (AGC) survey of contractors, 80% indicated some difficulty in acquiring trained workers.

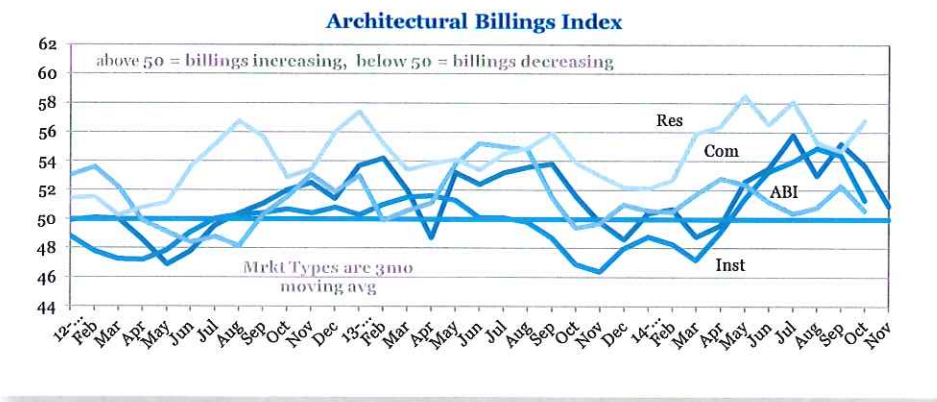
THE EFFECTS OF GROWTH:

- Contractors gain more ability to pass along costs and increase margins as spending continues to increase. Selling price indices for 2013 and 2014 show contractors' as built price both years is above labor and material cost inflation. Margins are increasing.
- Since the low point in January 2011, spending has increased 25%. Construction labor effort has increased by 18%. However, spending corrected for inflation shows construction volume has increased by only 10%. Productivity is declining.
- Growth in nonresidential buildings and residential construction in 2014 and 2015 will lead to more significant labor demand. This may lead to labor shortages and productivity losses.
- Margins regained a positive footing in 2012 and extended those gains in 2013. Margins increased in 2014 and margins are expected to grow even stronger in 2015.
- When activity picks up in all sectors, escalation will begin to advance rapidly.

> ***"In 2014, the U.S. showed a productive increase of 290,000 construction jobs!"***

FIGURE B:

Architectural Billings Index 2012-2014



The most favorable forward-looking conditions I've seen in years support my expectations for strong growth and profits in 2015. Very active markets will drive escalation to climb more rapidly than we have seen in six years.

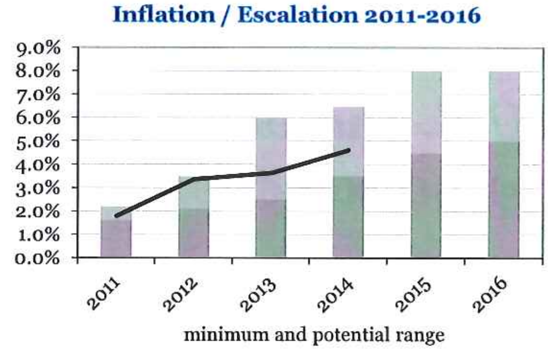
IMPACT OF RECENT EVENTS:

There are several reasons why spending is not rapidly increasing:

- public sector construction remains depressed
- public educational spending is the single largest contributor to the drop in public spending
- lenders are just beginning to loosen lending criteria for project financing but are not providing equal terms to lend working capital to subcontractors
- consumers are still cautious about increasing debt load, including the consumers' share of public debt
- we may be constrained by a skilled labor shortage

FIGURE C:

Inflation / Escalation 2011-2016

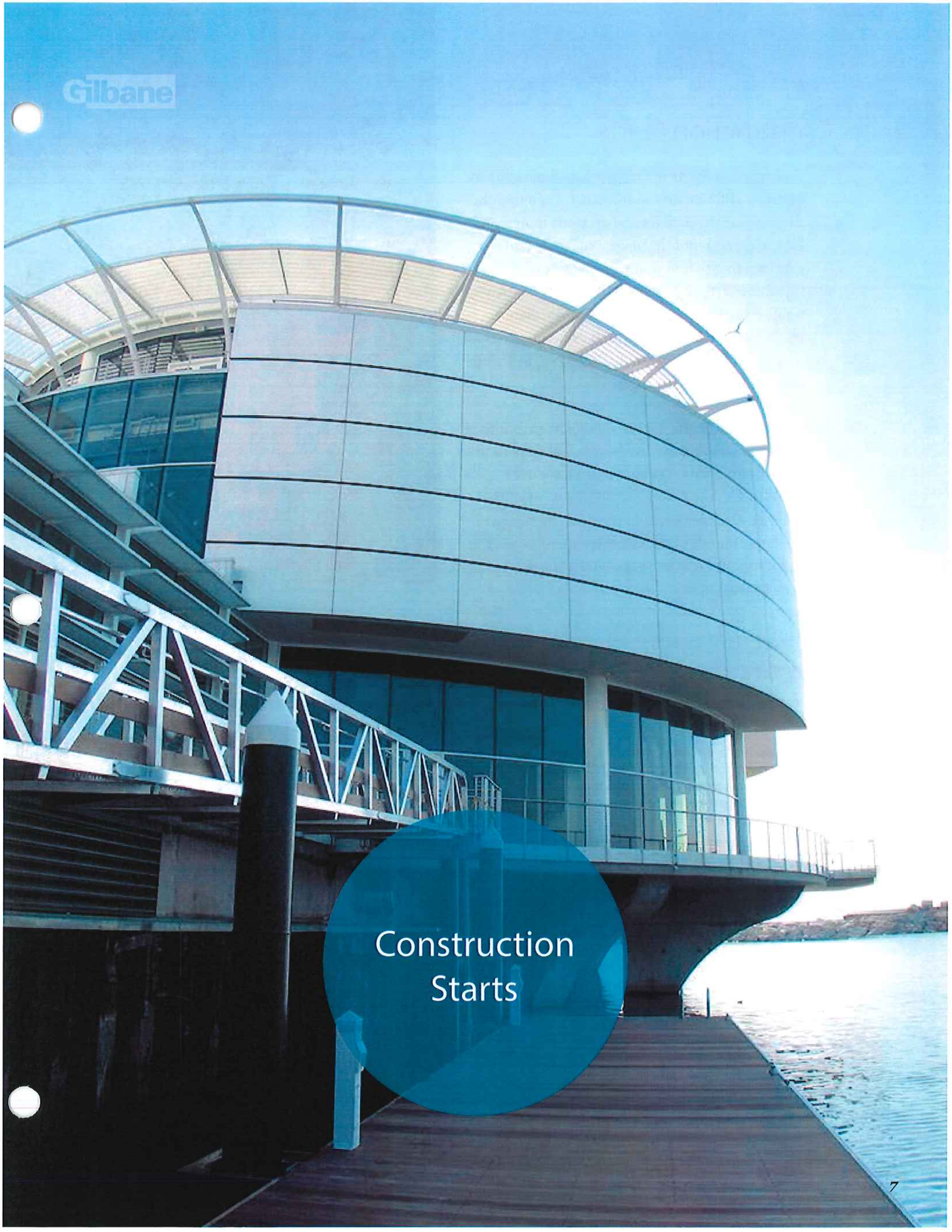


In order to capture increasing margins, future escalation will be higher than normal labor and material cost growth. Lagging regions will take longer to experience high escalation. Residential escalation is currently near, or even above, the upper end of the range.

For escalation back to year 2000, see Figure 25, Page 71.

We advise a range of

- 3.5% to 6.5% for 2014
- 4.5% to 8% for 2015
- 5.0% to 8% for 2016



Construction Starts

Construction Starts

Construction Starts data is published monthly by McGraw Hill Construction (MHC). Each month, they update the data for the previous month and for the data 12 months prior. We incorporate the previous month and year prior update to data into our charts and tables. Although MHC may publish further updates to its data, we do not track any data beyond the 12 month update. This may result in values here that differ slightly from other published MHC data.

Construction Starts data is volatile from month to month and this may cause unusual peaks and valleys in the data. For that reason, we use a three-month moving average (3mma) of starts data. To observe trends in the data, we compare the latest month to the last three months and the last six months of the Seasonally Adjusted Annual Rate (SAAR) data.

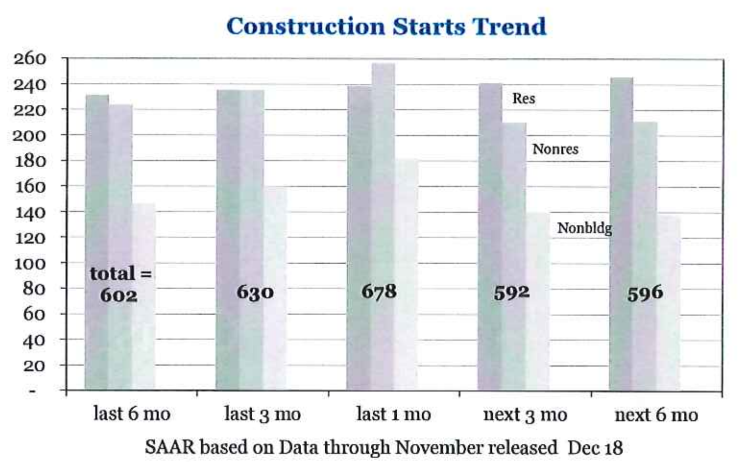
FIGURE 1:

Construction Starts Trends 2013-2014

Residential (Res) starts prior to Q2 2013 showed consistent slow growth for three years, but then had no growth until Q3 2014. Expect 2015 growth to resume at a slower rate.

Nonresidential buildings (Nonres) starts hit a 12-month low in February 2014 but reached a six-year high in the last three months. Expect growth to moderate over the next three to six months.

Nonbuilding (Nonbldg) starts have been declining since a 2012 peak. The Jan-Jun six-month average is the lowest going back to Jan 2008. Starts recovered in Sept. Oct. and Nov. Expect very little growth in 2015.



EXPECTATIONS FOR 2014 NEW CONSTRUCTION STARTS:

- **We predicted total growth in new starts of 6.3% for 2014. This latest report compared to the prior shows a 6% increase each in nonresidential buildings and non-building infrastructure, but a 1% decline in new residential starts.**
- **Nonresidential buildings starts in February dropped to a 12-month low. However, for the April through November period, starts reached the best three-month average and best six-month average since July 2008, both more than a six-year high. Our prediction of nonresidential building starts has increased twice since the start of 2014.**
- **Residential starts grew from $120 billion to $200 billion, or 67%, from Q1 2011 to Q1 2013. Residential starts have been just above $200 billion for 21 of the last 22 months. But for the 12 months from July 2013 through June 2014, growth stalled. For the first six months of 2014, there was no growth at all from the previous six months. Residential starts have been increasing slowly since July 2014.**
- **Nonbuilding infrastructure starts reached a 16-month high in December 2013, but the average of the first six months of 2014 is the lowest on record back to January 2008. Finally, the last three months improved and is the best in a year. Expect a 8% decline in infrastructure starts in 2014 compared to 2013. Expect an 8% decline in infrastructure starts in 2014 compared with 2013.**

TABLE 1:

U.S. Construction Market Outlook New Starts 2009-2015

Total Construction Starts					MHC	Gilbane	Gilbane
						Forecast	Forecast
	2009	2010	2011	2012	2013	2014	2015
Nonresidential Buildings	167,955	161,194	165,048	158,222	177,783	205,174	214,281
		-4.0%	2.4%	-4.1%	12.4%	15.4%	4.4%
Residential Buildings	111,851	121,155	126,299	166,159	210,104	227,535	256,423
		8.3%	4.2%	31.6%	26.4%	8.3%	12.7%
Nonbuilding Construction	141,899	148,088	147,851	162,823	148,686	137,413	137,547
		4.4%	-0.2%	10.1%	-8.7%	-7.6%	0.1%
Total Construction	421,705	430,437	439,198	487,204	536,573	570,122	608,251
percent change yr. after yr.		2.1%	2.0%	10.9%	10.1%	6.3%	6.7%

dollars in millions
includes McGraw Hill data for November 2014 released December 18, 2014
MHC Data includes updates to 12 months ago data through November 2013
all data after November 2014 is predicted

FIGURES 2 A, B, C:

Note: All MHC Starts seasonally adjusted (SAAR) data is revised one month later and not seasonally adjusted (NSA) data is revised 12 months later. These plots include both 12-month and one-month adjustments. The vertical lines show the revision month.

FIGURE 2A: Construction Starts Nonresidential Buildings 2011- 2014

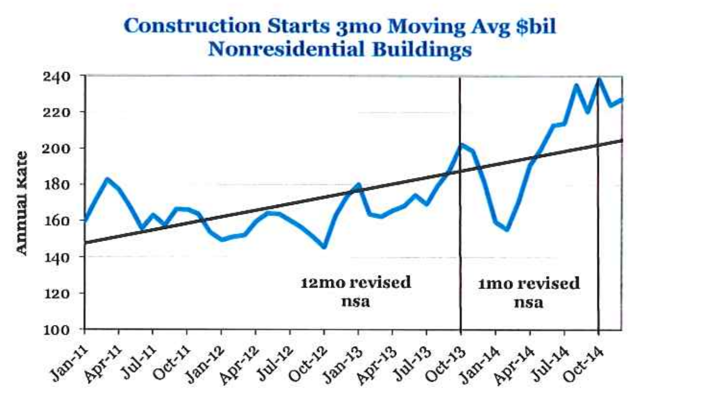


FIGURE 2B: Construction Starts Nonbuilding Infrastructure 2011-2014

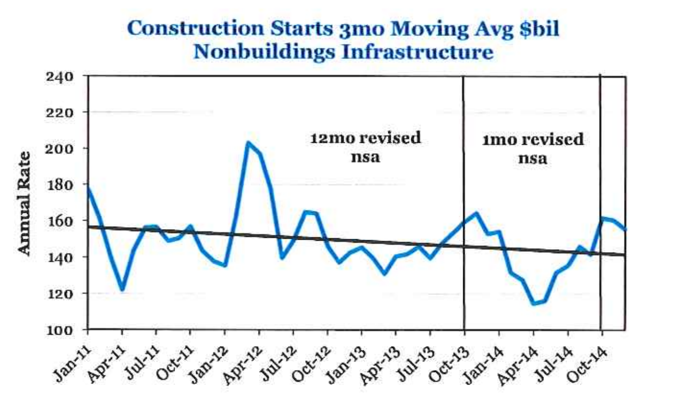


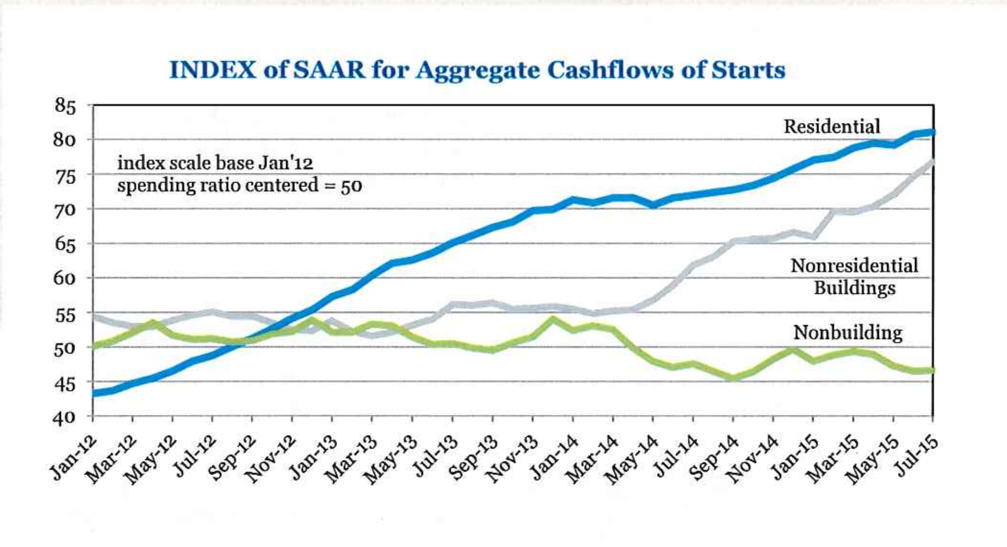
FIGURE 2C: Construction Starts Residential Buildings 2011- 2014

NEW CONSTRUCTION STARTS AS A LEADING INDICATOR:

MHC Construction Starts can act as a leading indicator to spending. Even though not all construction projects are captured in the starts data (only about 50% is captured), we have more than enough data to develop cash flows over time that will show the expected direction in construction spending activity. Starting with the three-month moving average of actual starts, a cash flow spreads out the value of the new project starts over the expected project duration from start to finish. Generally, project durations can range from six to nine months for small projects and up to 24 to 36 months for very large projects. Project duration and cash flow begins in the month the data is posted. The cumulative cash flow total in the current month from all monthly starts over the last two years shows the relative change in spending caused by fluctuation in starts.

FIGURE 3:

Construction Starts – Cumulative Cash Flow of Starts 2012-2015



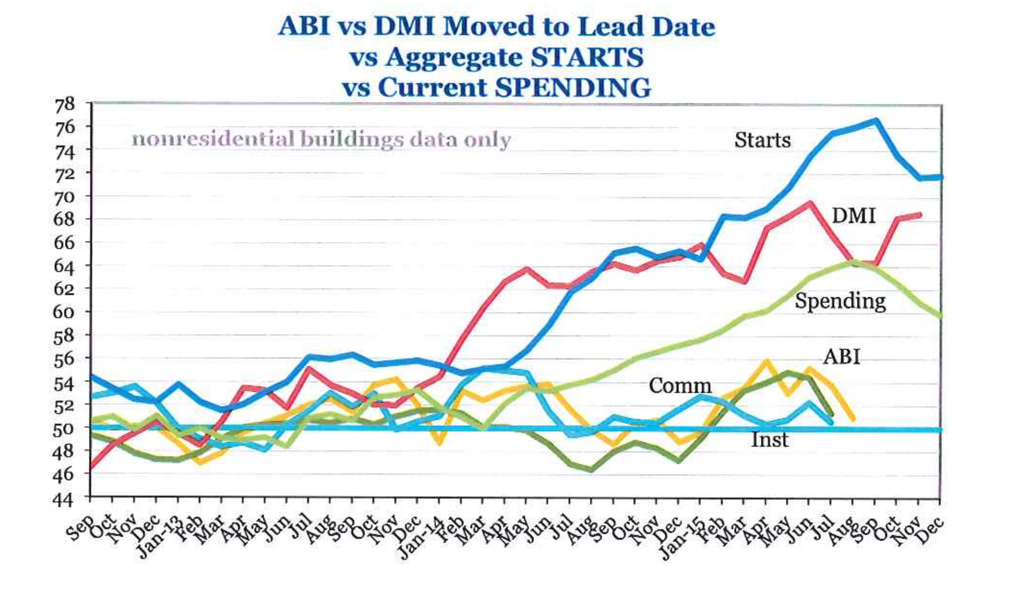
The cash flow plot in Figure 3 shows the slowdown that occurred in residential spending over the last few quarters. A decline in nonbuilding infrastructure projects is very clear. For nonresidential buildings work, we saw rapid growth through most of 2014 with a flat period in Q4 2014 before rapid growth resumes in Q1 2015.

The following index chart shows the correlation among nonresidential starts cash flow, the Architectural Billings Index (ABI), the Dodge Momentum Index (DMI) and actual Construction Spending. Starts data is from the aggregate cash flow explained on Page 11. ABI and DMI data are moved out to their respective lead times; date and spending is real time. The ABI indicates growth if above 50 and a decline if it drops below 50. The Commercial (Comm) and Institutional (Inst) components of the ABI are shown for reference. Although there may be a one to three month differential, there appears to be a correlation between the ABI and Starts, and they provide an indication of the strength and the direction that spending will move.

Both ABI and Starts cash flows indicate a mild slowdown in nonresidential buildings construction spending at the end of 2014 before a strong upturn in spending in 2015. Expect another drop in spending late in 2015.

FIGURE 4:

Overlay of ABI – DMI – Starts – Spending by Lead Time



Construction Spending

Construction Spending

Total spending for ALL types of construction in 2014 will reach 5.4% year over year from 2013 spending.

- *In Q1 2013, the monthly rate of spending was $870 billion.*
- *In Q1 2014, the monthly rate of spending averaged $950 billion.*
- *In Q4 2014, the monthly rate of spending will reached $960 billion.*

FIGURE 5:

All Construction Spending Rate of Growth 2013-2015

For 2014 year-to-date, nonresidential infrastructure spending is down 5% from the beginning of the year, and nonresidential buildings spending declined from December to March then rebounded very strongly. For eight months, residential buildings spending has been range bound lower than the second half of 2013.

For the remainder of 2014, nonresidential buildings and residential contributed equally to growth while nonbuilding infrastructure remained flat.

TABLE 2:
Total Construction Spending Summary 2007- 2015

U.S. Total Construction Spending Summary									
	totals in billions current U.S. dollars							Gilbane Forecast	Gilbane Forecast
	Actual								
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Nonresidential Bldgs	403.9	438.6	377.5	291.9	284.3	300.7	298.5	318.8	363.5
% change year over year	18.9%	8.6%	-13.9%	-22.7%	-2.6%	5.7%	-0.7%	6.8%	14.0%
Nonbuilding Hvy Engr	248.1	272.1	273.5	265.0	251.3	273.7	270.1	284.6	270.8
	19.4%	9.7%	0.5%	-3.1%	-5.2%	8.9%	-1.3%	5.4%	-4.9%
Residential	500.5	357.7	253.9	249.1	252.7	286.8	342.2	356.6	405.0
	-19.3%	-28.5%	-29.0%	-1.9%	1.4%	13.5%	19.3%	4.2%	13.6%
Total	1152.5	1068.4	904.9	806.0	788.3	861.2	910.8	960.1	1039.3
	-1.3%	-7.3%	-15.3%	-10.9%	-2.2%	9.2%	5.7%	5.4%	8.3%

Residential includes new, remodeling, renovation and replacement work
Source: U.S. Census Bureau, Department of Commerce.
Actual Spending data through June 2014 revised back to 2008

A comparison of most recent projections is shown in Table 3 below. Gilbane projections are compared to CMD Construction Data (CMD) and FMI.

CMD Forecast   FMI Forecast

TABLE 3:
Total Spending Predictions Comparisons 2014-2015

2014 - 2015 Spending Predictions Comparisons						
data updated 1-6-15	2014 Gilbane	2014 CMD	2014 FMI	2015 Gilbane	2015 CMD	2015 FMI
Residential	357	365	379	405	413	419
Nonresidential	319	317	310	364	342	327
Nonbuilding	284	291	282	271	313	295
TOTAL Nonres	603	608	592	634	655	622
TOTAL ALL	960	973	971	1039	1068	1041

Values are billions of dollars
Gilbane data 2014 and 2015 – December 2014 report
CMD data 2014 and 2015 = 12-05-2014 report
FMI data 2014 and 2015 – 3rd Quarter Outlook report
FMI Transportation and Communication moved from Buildings to Nonbuilding

NONRESIDENTIAL CONSTRUCTION SPENDING

Total spending for all nonresidential construction in 2014 will reach $603 billion, up 6.1% year over year from 2013.

Nonresidential construction consists of two main categories:

1. Nonbuilding infrastructure projects

2. Nonresidential buildings

Nonbuilding Infrastructure Spending

Nonbuilding projects are composed of heavy engineering, heavy industrial and infrastructure projects. They include transportation, communication, power, highway and street, sewage and waste disposal, water supply and conservation and development. Almost 60% of non-building work is public work.

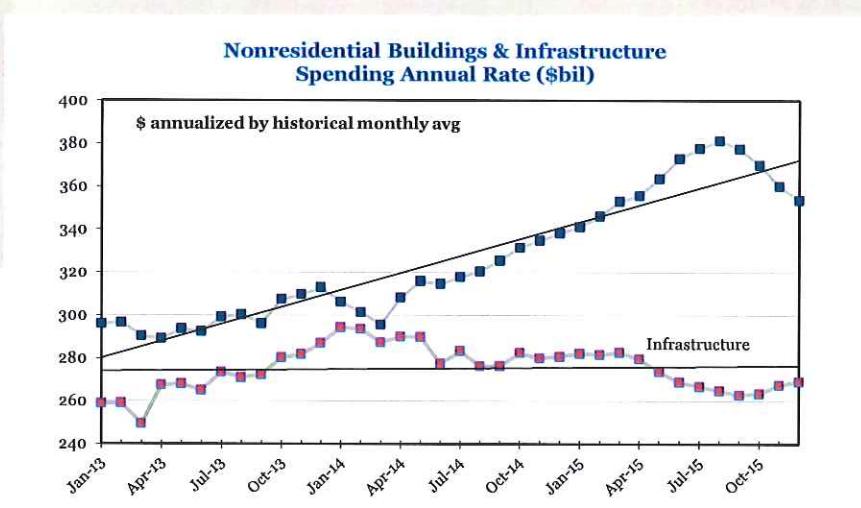
Total spending for nonbuilding infrastructure in 2014 will reach $284 billion, a 5.4% increase from 2013.

- *In Q1 2013, the monthly rate of spending was $256 billion.*
- *In Q1 2014, the monthly rate of spending increased to an average $292 billion.*
- *In Q3 2014, the monthly rate of spending dropped to $278 billion.*
- *For 2015, I expect the decline to continue.*

The largest components of nonbuilding infrastructure work are power and highway/street. Erratic movement in new starts in the power industry causes unusual fluctuations in nonbuilding infrastructure spending. A 55% decline in new power starts in 2013 may cause fluctuations in spending for the next two years. The period from July 2012 through August 2013 had the lowest average new starts for infrastructure work of any period in the last six years, until the first six months of 2014 went even lower. The effect of all of those declines in new starts will result in constrained spending continuing through 2015.

FIGURE 6:

Nonresidential Buildings and Infrastructure Spending Growth 2013-2015



Nonresidential Buildings Spending

The ABI marked a decline in design work up to April 2013 that is reflected in lower new nonresidential buildings starts and spending that bottomed at a nine-month low in March. Both the ABI and new starts cash flows indicate nonresidential buildings spending will slow slightly in the next few months before resuming rapid growth through Q3 2015.

Total spending for nonresidential buildings construction in 2014 reached $318 billion, a 5.4% increase from 2013.

- ***In Q1 2013, the monthly rate of spending was $294 billion.***
- ***In Q1 2014, the monthly rate of spending was $301 billion.***
- ***In Q4 2014, the monthly rate of spending increased to $335 billion.***
- ***By Q3 2015, the monthly rate of spending may reach $375 billion.***

TABLE 4:

Spending Predictions Comparisons – Nonresidential Buildings 2014

2014 Spending Prediction Comparisons - Nonresidential Buildings

	Early Estimate		Mid-year Estimate		Last Estimate	
data updated 12-10-14	2014		2014		2014	
Gilbane Building Company	325	1	314	2	319	3
CMD Construction Data	320	4	308	5	317	6
FMI	314	7	309	8	310	9
Associated Builders & Contractors	324	10	299	11	315	12
McGraw Hill Construction	312	10	299	11	na	
IHS Global Insight	320	10	305	11	na	
Moody's Economy.com	316	10	298	11	na	
Wells Fargo	312	10	299	11	na	
		see notes		see notes		see notes

Values are billions of dollars

Gilbane data 1= Apr'14 report 2=Aug'14 report 3=Dec'14 report
CMD data 4=Feb'14 report 5=Jul'14 report 6=Dec'14 report
FMI data 7= Mar'14 1st Qtr Outlook 8=Jun'14 2nd Qtr Outlook 9=3rd Qtr Outlook
ABC data 12= December Forecast 12-09-14 extrapolated
10 = AIA Jan 2014 Consensus report
11 = AIA July 2014 mid-year Consensus report

The major institutional sectors, healthcare and education, represent 23% of all nonresidential construction and ±40% of nonresidential buildings spending. Both peaked in 2008, with education at an annual rate of $105 billion and healthcare at $47 billion. Education is 80% public while healthcare is 80% private.

Commercial and office sectors represent 15% of all nonresidential construction and ±30% of nonresidential buildings spending. Commercial peaked in 2007, while office peaked in 2008. Both declined 50% from their peaks. Commercial is 95% private and office is 70% private.

The manufacturing sector represents 10% of all nonresidential construction and ±17% of nonresidential buildings spending. Manufacturing peaked in early 2009 but dropped 50% to hit a five-year low in Jan 2011. I predict spending on new manufacturing buildings will reach a new high in 2015. Manufacturing is 100% private.

These five market sectors represent 84% of all nonresidential buildings spending. See Table 5.

TABLE 5:

Construction Spending Major Nonresidential Markets 2007-2015

U.S. Total Construction Spending
totals in billions current U.S. dollars

	Actual							Gilbane Forecast	Gilbane Forecast
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Education	96.8	104.9	103.2	88.4	85.0	84.6	78.0	78.7	83.4
% change year over year	14.0%	8.4%	-1.6%	-14.3%	-3.9%	-0.4%	-7.8%	0.9%	6.0%
Healthcare	43.8	46.9	44.8	39.3	39.7	42.5	41.5	38.8	41.9
	13.8%	7.1%	-4.4%	-12.3%	0.9%	7.2%	-2.5%	-6.5%	8.0%
Commercial retail	89.7	86.2	54.7	40.1	42.8	47.3	50.9	56.0	62.7
	16.9%	-3.9%	-36.5%	-26.7%	6.8%	10.6%	7.6%	10.0%	12.0%
Office	65.3	68.6	51.9	37.9	36.0	37.8	37.6	44.0	50.6
	20.4%	5.1%	-24.3%	-27.1%	-4.9%	5.0%	-0.5%	17.0%	15.0%
Manufacturing	40.6	54.1	57.9	41.2	40.6	47.7	47.9	54.5	62.1
	24.4%	33.2%	7.0%	-28.9%	-1.5%	17.7%	0.4%	13.7%	14.0%
Total	336.2	360.7	312.6	246.9	244.1	260.0	256.0	272.0	300.8
	32.2%	7.3%	-13.3%	-21.0%	-1.1%	6.5%	-1.6%	6.3%	10.6%

Source: U.S. Census Bureau, Department of Commerce
includes public and private
Actual Spending data through June 2014 revised back to 2008

Total spending for Educational buildings in 2014 reached $78.7 billion, a 0.9% increase from 2013. This is the first time since 2008 that spending for Educational buildings has not declined. I expect 2015 spending to increase 6%.

Public educational projects are funded by tax dollars. Therefore, we may expect a delayed rebound in public educational spending due to future economic reactions. Since Q1 2009, public educational spending has declined 30% from $90 billion to $62 billion. Private educational spending has declined 11% from $19 billion to $17 billion. In the last two years, private educational spending declined 3% but public spending has returned to positive.

Total spending for Healthcare buildings in 2014 reached only $38.8 billion, a 6.5% decline from 2013. I expect 2015 spending to increase 8%.

Total spending for Commercial buildings in 2014 reached $56 billion, up 10% from 2013. I expect 2015 spending to increase 12%.

Total spending for Office buildings in 2014 reached $44 billion, up 17% from 2013. This is the first substantial increase in spending for office buildings since 2007. I expect 2015 spending to increase another 15%.

Total spending for Manufacturing buildings in 2014 reached $54 billion, up 13.7% from 2013. I expect 2015 spending to increase 14%.

TABLE 6:

Spending Predictions Comparisons – Major Nonresidential Markets 2014-2015

2014 - 2015 Spending Prediction Comparisons
Selected Nonresidential Buildings

Growth Change 2014 versus 2013 *data updated 12-10-14*	Education 2014	Healthcare 2014	Commercial 2014	Office 2014	Manufacturing 2014
Gilbane	0.9%	-6.5%	10.0%	17.0%	13.7%
CMD Construction Data	0.2%	-7.1%	10.2%	18.2%	12.6%
FMI	0.0%	-1.7%	6.5%	8.2%	6.5%
ABC	-1.0%	-6.7%	9.6%	18.4%	11.0%
McGraw Hill Construction	-1.9%	-4.6%	9.0%	15.2%	7.0%
Growth Change 2015 versus 2014 *data updated 12-10-14*	Education 2015	Healthcare 2015	Commercial 2015	Office 2015	Manufacturing 2015
Gilbane	6.0%	8.0%	12.0%	15.0%	14.0%
CMD Construction Data	5.0%	6.5%	9.0%	8.5%	10.5%
FMI	2.9%	3.6%	5.9%	7.0%	7.8%
ABC	-0.3%	2.2%	10.1%	15.7%	12.9%
McGraw Hill Construction	4.8%	4.1%	15.3%	21.8%	10.4%

Gilbane data 2014 and 2015 - December 2014 report
CMD data 2014 and 2015 = 12-05-2014 report
FMI data 2014 and 2015 - 3rd Quarter Outlook report
ABC data 2014 and 2015 - December Forecast 12-09-14
McGraw Hill data 2014 & 2015 - AIA Consensus report July 2014=

PUBLIC/PRIVATE SPENDING

Total spending for public construction in 2014 reached \$272 billion, an increase of only 0.9% from 2013. This ends a four-year decline in public spending.

The largest public construction markets are highway and education. Those two markets alone represent more than half of all public construction, followed by transportation, a distant third, and waste disposal fourth. Together, those four markets account for nearly 75% of all public construction, and they are all up year-to-date.

Private spending volume is almost two and a half times that of public spending. If we take out residential construction, private spending would be only 25% greater than public spending.

Private construction is predominantly residential. Ninety-six percent of all residential work is private and constitutes just over half of all private work. (A historical note: in 2005-2006, residential work constituted 70% of all private work and more than half of all construction spending). Power (15%), commercial (8%), manufacturing (7%) and office (5%) make up the next largest private building sectors.

Private construction is predominantly residential. 96% of all residential work is private and constitutes just over half of all private work. (A historical note: in 2005-2006, residential work constituted 70% of all private work and more than half of all construction spending). Power (15%), commercial (8%), manufacturing (7%) and office (5%) make up the next largest private buildings sectors.

Total spending for Private construction in 2014 reached \$687 billion, an increase of 7.2% from 2013, although still 25% below the peak of \$912 billion in 2006.

The growth in private spending for the last two years has been driven by residential, up 13% in 2012 and 19% in 2013. In 2014, we started to see a shift in that nonresidential building was picking up pace and residential was slowing. By 2016, they will contribute almost equally to growth in private spending.

TABLE 7:

Total Construction Spending Public vs. Private 2007-2015

U.S. Total Construction Spending
totals in billions current U.S. dollars

	Actual							Gilbane Forecast	Gilbane Forecast
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Private	863.4	759.7	590.0	502.1	501.9	581.9	641.1	687.1	769.0
% change year over year	-5.3%	-12.0%	-22.3%	-14.9%	0.0%	15.9%	10.2%	7.2%	11.9%
Private Residential	493.2	350.3	245.9	238.8	244.1	280.6	336.2	350.4	397.9
Private Nonresidential	370.2	409.4	344.1	263.3	257.8	301.4	304.9	336.7	371.1
Public	288.9	308.7	314.9	304.0	286.4	279.3	269.6	273.0	270.3
	13.1%	6.9%	2.0%	-3.5%	-5.8%	-2.5%	-3.5%	1.3%	-1.0%
Total	1152.3	1068.4	904.9	806.0	788.3	861.2	910.8	960.1	1039.3
	-1.3%	-7.3%	-15.3%	-10.9%	-2.2%	9.2%	5.7%	5.4%	8.3%

Source: U.S. Census Bureau, Department of Commerce
includes public and private
Actual Spending data through June 2014 revised back to 2008

RESIDENTIAL CONSTRUCTION SPENDING

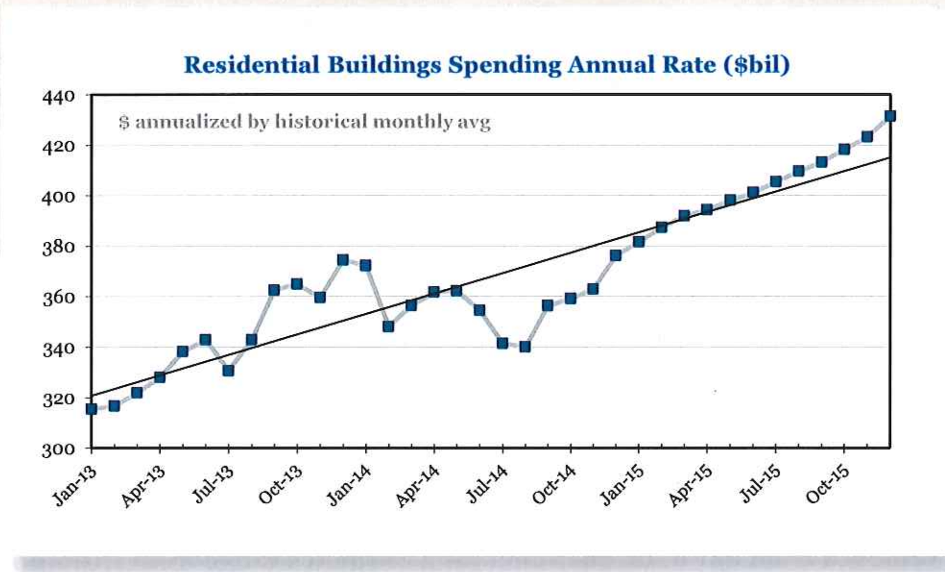
Total spending for residential construction in 2014 reached $358 billion, a 4.7% increase from 2013.

- ***In Q1 2012, the monthly rate of spending was $252 billion.***
- ***By Q1 2013, the monthly rate of spending climbed to $318 billion, up 26% year over year.***
- ***In Q1 2014, the monthly rate of spending was $359 billion, up only 13% from Q1 2013.***
- ***From Q2 and Q3 2014, the monthly rate of spending slowed to $353 billion.***
- ***By Q4 and for 2015, I expect the monthly rate of spending will reach $424 billion.***

The rate of growth in residential spending has been slowing since Q4 2013. From Dec 2013 to Oct 2014, there has been no growth. The next few months show a promise for return to growth. The average spending rate will grow less than 2% from Q4 2013 to Q4 2014, but should grow 15% from Q4 2014 to Q4 2015.

FIGURE 7:

Residential Buildings Spending Rate of Growth 2013-2015



In January 2014, I predicted 1,050,000 new housing starts for 2014. That estimate at the time was only in the 20th percentile of all estimates. All estimates have been repeatedly revised lower several times this year.

In January, there were 14 estimates available for new housing starts in 2014 ranging from 1,045,000 to 1,390,000. Only six estimates were 1,100,000 or lower. The 1,390,000 outlier estimate was so unrealistic that it should have been thrown out. The average of all the others was 1,110,000 or expected growth of 185,000 new units over 2013. We have never before in history achieved such a high growth rate.

We actually started 610,000 new residential units in 2011, 780,000 new units in 2012 and 925,000 new units in 2013. The fastest rate of growth for new housing starts was from 1991 to 2005 with 170,000 additional new units in 1994. In the boom years from 2002 to 2005, growth only increased about 100,000 new units per year. We duplicated the fastest annual growth of 170,000 new units in 2012. Growth in 2013 added 145,000 new units over 2012.

For nine quarters through mid-2013, permits growth averaged over 6% per quarter. For the last five quarters since the middle of 2013, permits growth has averaged less than 1% per quarter. Based on the low growth in permits, I anticipated starts and spending growth would slow dramatically in 2014. Both new starts and spending did slow considerably.

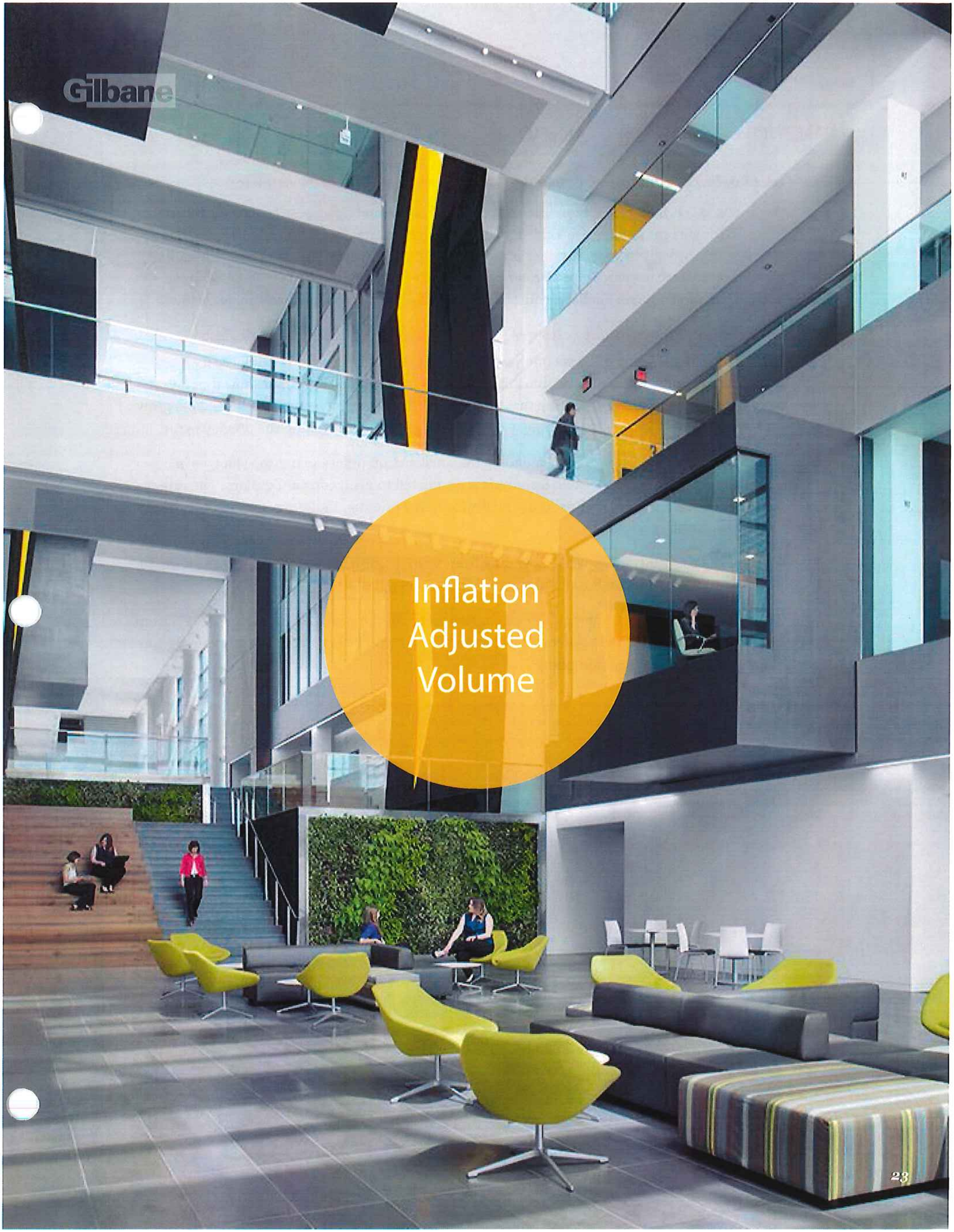
My original estimate for 2014 was 1,050,000 total new units. For the first half of 2014, actual starts averaged an annual rate of only 955,000 new units. To achieve my original estimate, starts for the last six months would need to increase by 20% from the first half, an unrealistic rate of growth. Based on slow performance through August, I've lowered my prediction to 996,000 new housing starts for 2014, growth of only 71,000 new units or 7.5% from 2013.

Revised estimates available for New Housing Starts in 2014 ranged from 958,000 to 1,100,000, with all but one of those estimates within 1% of 1,000,000.

The lower prediction of new housing starts in 2014 also supports my revision to a lower spending forecast. My original estimate for 2014 residential spending was $379 billion, now lowered to $358 billion.

Early estimates available for New Housing Starts in 2015 include three estimates that are 1.3 million or higher, which implies a growth rate of 2 to 3 times the historical maximum growth rate. Those three were considered unachievable and removed from our data. The remaining estimates range from 1,100,000 to 1,170,000, with an average of 1,143,000.

I expect a growth of 140,000 new housing starts in 2015 for a total of 1,136,000.



Inflation Adjusted Volume

Inflation Adjusted Volume

Real volume can only be tracked by analyzing spending after inflation.

Spending is typically reported in unadjusted dollars, and total revenue is reported in current dollars (for current dollars, see Table 2 on Page 15). It is a true indication of current dollars spent within any given year, but does not give quite as clear a comparison of constant dollar volume from year to year. To see a clear comparison of volume from year to year, we must look at inflation adjusted dollars, constant dollars (for constant dollars see Table 8 below).

2014 volume has not yet returned to the level of 1993 in constant dollars.

If spending increases by 2% from one year to the next, but inflation drives up the cost of products by 5% during that same time, then inflation adjusted dollars would show that net volume actually declined 3% during that time period. Dollars spent would have needed to grow by 5% just to keep pace with inflation at zero volume growth compared to the previous year.

Table 8 adjusts total construction spending for construction inflation and the changes in margin costs. All dollars in Table 8 analysis are adjusted to 2014 constant dollars. The rate of inflation each year is determined individually for nonresidential buildings, nonbuilding heavy engineering and residential.

Current dollars total construction spending from 1999 to 2006 increased from $745 billion to the peak of $1.167 trillion for a total spending growth of 57%.

Constant dollars volume shows that real construction volume varied by no more than 2% from 1999 to 2006 and finished 2006 exactly the same as in 1999. Peak constant dollar volume was reached in 2000 and again in 2005.

TABLE 8:

Total Construction Spending Summary 2007-2015 (constant 2014$)

U.S. Total Construction Spending
totals in billions U.S. dollars ADJUSTED to June 2014 $

	Actual							Forecast	Forecast
	2007	2008	2009	2010	2011	2012	2013	2014	2015
Nonresidential Bldgs	416.7	431.8	393.3	328.0	312.9	322.7	308.6	318.8	346.2
% change year over year	10.9%	3.6%	-8.9%	-16.6%	-4.6%	3.1%	-4.4%	3.3%	8.6%
Nonbuilding Hvy Engr	282.2	290.8	305.7	301.7	275.6	295.2	280.5	284.6	259.1
	8.4%	3.0%	5.1%	-1.3%	-8.6%	7.1%	-5.0%	1.5%	-9.0%
Residential	468.0	376.4	294.2	286.9	298.0	331.0	360.3	356.6	382.1
	-17.5%	-19.6%	-21.8%	-2.5%	3.8%	11.1%	8.8%	-1.0%	7.1%
Total	1166.9	1099.0	993.2	916.6	886.6	948.9	949.4	960.1	987.4
	-3.0%	-5.8%	-9.6%	-7.7%	-3.3%	7.0%	0.1%	1.1%	2.8%

Residential includes new, remodeling, renovation and replacement work.
Source $ Data: U.S. Census Bureau, Department of Commerce.
Indices references: Gilbane Margin Index, Selling Price indices, NAHB New Home Price Index, BLS PPI inputs
see Escalation Growth vs. Margin Cost for inflation/deflation adjusted margin cost

Construction inflation during the period of 1999 to 2006 was 40% for nonresidential buildings and more than 75% for residential buildings, accounting for all of the growth in spending.

Residential spending increased 200% from 1993 to 2005, an average of 10% per year. However, in constant after-inflation dollars, real volume increased by only 36% during that time.

2013 revenue increased by 5.7% compared to 2012, but 2013 volume increased by only 0.1% after inflation. I expected 5.3% revenue growth in 2014, but due to rapidly increasing escalation, 2014 volume growth was only slightly more than 1%.

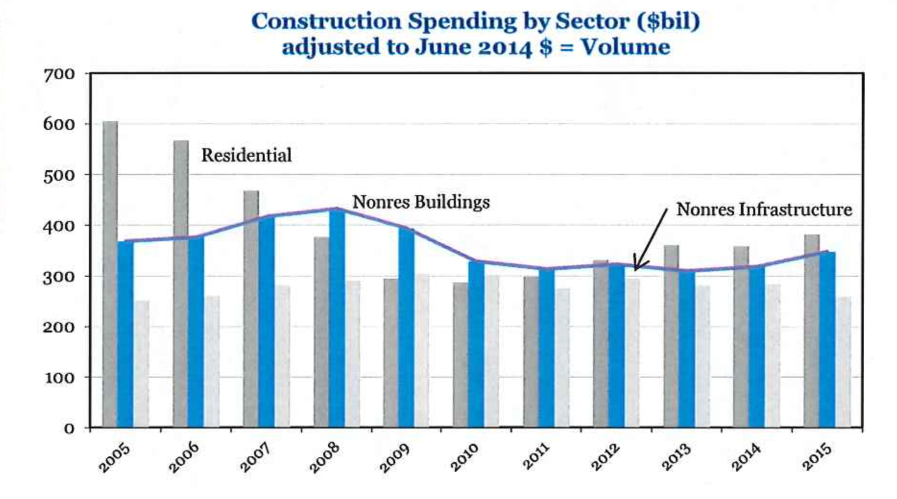
We will return to peak spending in 2016 or at latest early in 2017, but we are still 22% below peak volume. At the historical highest rate of volume growth (average over any 3 years equals +4% per year) it would take six more years to return to the historical level of peak volume. Realistically, we would not expect to maintain the historical highest rate of growth for six consecutive years. Therefore, it is likely we will not return to peak volume until after 2020.

WHY IS IT SIGNIFICANT TO ANALYZE BOTH REVENUE AND VOLUME?

Contractor fees are generally determined as a percentage of revenue. However, workload volume determines the size of the workforce needed to accommodate the annual workload. It is valuable to know how many employees were required to accomplish the workload volume based on the past several years of data. From the standpoint of workforce planning, we are not so much concerned with the value of the revenue as we are with the volume of the work. There is a bit more to this analysis, so we will investigate this further in the Jobs/Productivity section of this report.

FIGURE 8:

Construction Spending by Sector 2005-2015 in constant 2014$



Jobs and Unemployment

Jobs and Unemployment

We track the number of jobs as the measure of how many people are currently working to accomplish the construction spending put-in-place. The unemployment rate shows how many more people are available to go to work. Both added together shows us the size of the workforce. The size of the workforce is important because it tells us how many workers are available to draw from for future volume growth.

Table 9 on Page 28 includes both residential and nonresidential construction employment, as well as all trades and management personnel. The BLS suggests not using any single month but look at long term trends in the data.

We gained 290,000 jobs over the last 12 months. For 2014, jobs growth averaged 24,000 per month, the fastest rate of growth since 2005. From March to October 2014, we averaged only 18,000 jobs per month. Over the last three months, jobs growth averaged 28,000 per month.

The unemployment rate in construction is now at 8.3% after hitting a seven-year low of 6.4% in October 2014. The historical long-term average is between 6% and 7%. In February 2010, the construction unemployment rate hit 27%.

Individually, neither jobs nor unemployment provides us the full picture about the condition of the workforce. If the unemployment rate goes down, but there are few gains in the number of new jobs, that can only mean one thing–the number of people reported still in the workforce has gone down. The workforce declined because workers have either retired, been discouraged from seeking work and no longer qualify for benefits, or moved on to another profession.

As can be seen from the last several years' data, the unemployment rate can be headed downward without equally increasing jobs. The drop in the construction unemployment rate was almost entirely due to workers dropping out of the construction workforce.

The reduction in available workers in the workforce will continue to have a detrimental effect on cost and schedule.

The construction industry had been losing employees for more than five years. We reached a low point of jobs in January 2011, but we didn't fall to the low point of workforce until mid-2013.

The total construction workforce hit a 15-year low in 2013 at about 6.4 million. Currently the workforce is growing and is near 6.7 million, still near a 15-year low, about 1.5 million (~18%) lower than the 2006-2007 peak.

TABLE 9:

Table 9 - Construction Employees ALL 2004 through December 2014

Industry:	Construction												
Data Type:	ALL EMPLOYEES, THOUSANDS												
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Yr Avg
2004	6848	6838	6887	6901	6948	6962	6977	7003	7029	7077	7091	7117	6973
2005	7095	7153	7181	7266	7294	7333	7353	7394	7415	7460	7524	7533	7333
2006	7601	7664	7689	7726	7713	7699	7712	7720	7718	7682	7666	7685	7690
2007	7725	7626	7706	7686	7673	7687	7660	7610	7577	7565	7523	7490	7627
2008	7476	7453	7406	7327	7274	7213	7160	7114	7044	6967	6813	6701	7162
2009	6567	6446	6291	6154	6100	6010	5932	5855	5787	5716	5696	5654	6017
2010	5587	5508	5536	5555	5524	5512	5502	5525	5503	5507	5504	5462	5519
2011	5432	5464	5475	5496	5520	5524	5551	5553	5590	5584	5585	5606	5532
2012	5627	5622	5627	5630	5613	5620	5635	5647	5648	5666	5687	5720	5645
2013	5743	5789	5813	5811	5816	5829	5830	5836	5849	5864	5896	5876	5829
2014	**5927**	**5951**	**5964**	**6000**	**6009**	**6017**	**6047**	**6064**	**6082**	**6098**	**6118**	**6166**	**6037**

From January 2010 to October 2014, the total workforce dropped from 7.3 million to 6.8 million, or 500,000 workers. The workforce is still down 1.5 million from the 2006-2007 peak of 8.3 million workers.

During that same period we gained 600,000 new construction jobs.

During the same period, the total nonworking pool dropped by 1,000,000 workers from 1.7 million to 700,000.

If all of the 600,000 new jobs were rehires of workers that were in the non-working pool, then the pool would have dropped from 1.7 million by 600,000, down to 1.1 million left in reserve, but the current pool has only 700,000 in reserve. Therefore the difference of 400,000 is workers lost from the workforce.

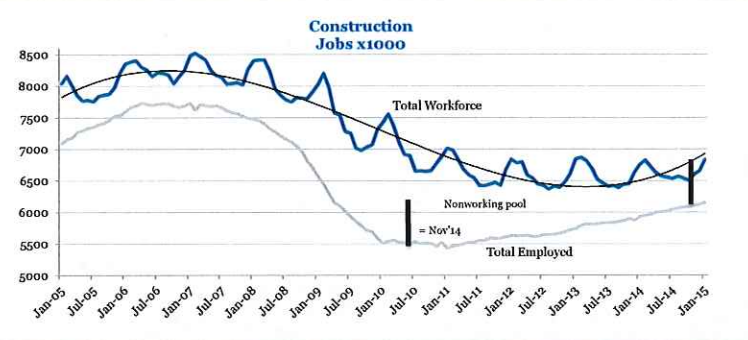
Of course, it is very likely far less than 600,000 new jobs were rehires. If only half were rehires and the remainder of new jobs were people previously outside the workforce, then the current reserve may have lost as many as 700,000 workers since January 2010.

Long term, if we are to see construction volume grow back even close to previous levels, we need the workforce to expand in tandem. Historically, it takes between 6,000 and 6,500 workers to put in place $1 billion worth of construction.

The unemployment rate is not seasonally adjusted. This adds to the short-term fluctuation. The seasonal fluctuation can be seen in Figure 8 on Page 25 where the upper (blue) line shows a repeated annual rise and fall in the unemployment rate. This analysis counts the available workforce or the non-working pool using the statistical trend line of the unemployment rate.

FIGURE 9:

Construction Jobs vs. Construction Workforce 2005 -2014



EXPECT WORKFORCE SHORTAGES

Some of the workers that were let go, moved on or dropped out of the workforce had many years of experience and were highly trained. Unfortunately, some will never return. As a result, over the next few years the construction industry is going to be faced with a shortage of skilled, experienced workers. This will have the tendency to DRIVE COSTS UP and QUALITY DOWN due to the need to pay a premium for skilled workers and the necessity of training new workers in their job and company procedures.

- *During periods of high volume and workforce expansion, productivity declines.*
- *Workforce shortages may force extended work schedules.*

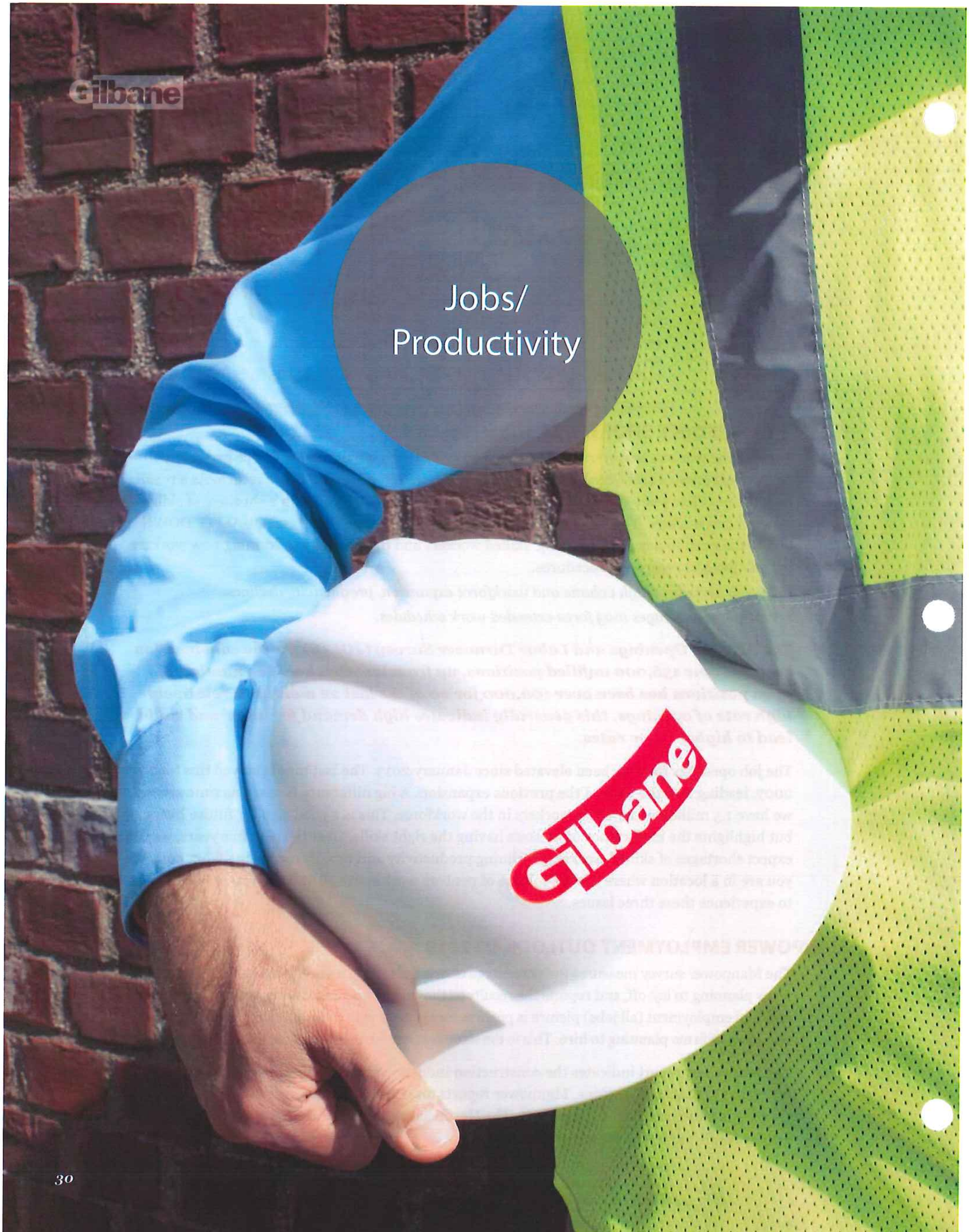
The BLS Job Openings and Labor Turnover Survey (JOLTS) for the construction sector is now 136,000 unfilled positions, up from last October. The number of open positions has been over 100,000 for 20 of the last 22 months. A relatively high rate of openings, this generally indicates high demand for labor and could lead to higher wage rates.

The job openings rate has been elevated since January 2013. The last time it stayed this high was 2007, leading into the peak of the previous expansion. A big difference is that this time around, we have 1.5 million or 20% less workers in the workforce. This is a good sign for future hiring, but highlights the importance of workers having the right skills. Over the next five years, we can expect shortages of skilled workers, declining productivity and rapidly increasing labor cost. If you are in a location where a large volume of pent-up work starts all at once, you may be the first to experience these three issues.

MANPOWER EMPLOYMENT OUTLOOK Q1 2015

The Manpower survey measures the percentage of firms planning to hire, minus the percentage of firms planning to lay-off, and reports the results as the "net" percentage hiring outlook. The overall national employment (all jobs) picture is positive for Q1 2015 with a projected net +16% (seasonally adjusted) of firms planning to hire. This is the strongest employment outlook since Q1 2008.

The Manpower report indicates the construction industry sector should experience increased hiring in Q1 2015 in all regions. Manpower reports total hiring in the construction industry for Q1 2015 is anticipated to be a net +15%. The Northeast expects a net increase of +14%; Midwest +20%; South +14% and West +15%.



Jobs/ Productivity

Jobs/Productivity

A long-term trend in productivity can be found by comparing the annual inflation adjusted volume to the annual average workforce. We developed volume in a previous section by adjusting spending for inflation. Productivity is a measure of unit volume per worker, not dollars put-in-place per worker. The following productivity analysis is based on put-in-place revenues, inflation adjusted to constant 2014 dollars, and compared to actual manpower at average hours worked.

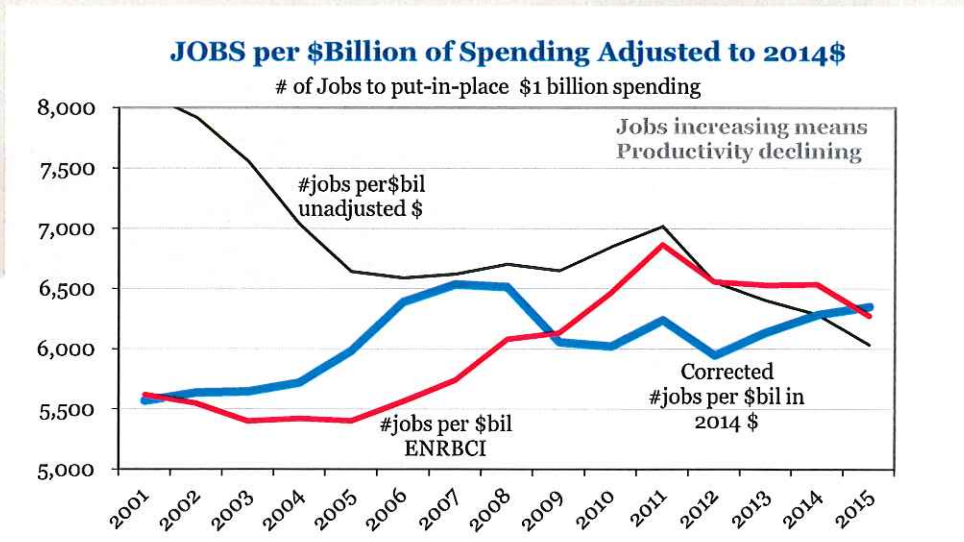
In Figure 10 below, a line is plotted for the number of jobs per $1 billion spending "unadjusted." That is a result obtained by using unadjusted spending dollars without considering inflation. The unadjusted analysis does not represent constant dollar volume of units put-in-place.

Figure 10 also shows a line plotting the number of jobs if spending were indexed solely using the ENR-BCI, the most common construction cost index. Since that index does not account for actual selling prices including margins, it does not represent true construction cost inflation and therefore it also produces an inaccurate result.

The thick blue line in Figure 10 below plotting #jobs per $bil 2014$ shows the only accurate result. Since 2012, the number of workers to complete $1 billion of constant volume has increased from about 6.0 million to 6.3 million. That's a 7% loss in productivity in three years.

FIGURE 10:

Jobs per $billion 2001-2015 in constant 2014$

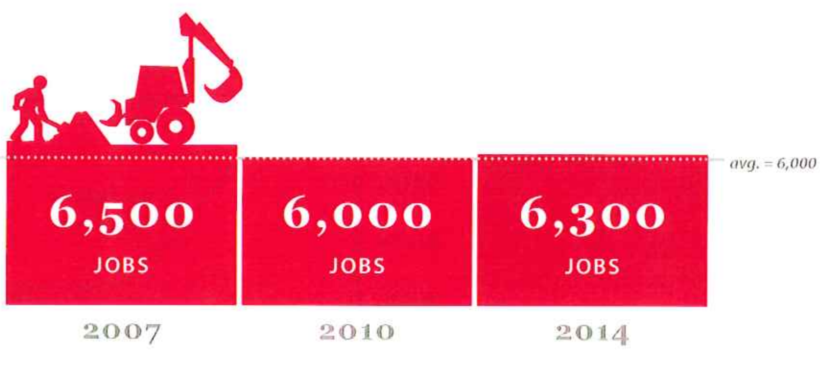


Revenue has a strong influence on hiring, but revenue can sometimes be influenced by rising inflation without regard to real change in volume. If spending is increasing rapidly, but mostly due to inflation, volume may not be increasing and the need to add rapidly to the workforce may not be entirely warranted.

On average, $1 billion of spending supports approximately 6,000 to 6,500 construction jobs. At the peak activity in 2006-2007, it required nearly 6,500 jobs to put in place $1 billion in spending (less volume per employee). Productivity declined to its lowest point in 2007. But growth in new work volume reversed and by 2010 productivity increases were so significant that $1 billion of spending supported only 6,000 jobs. Today, $1 billion in spending supports about 6,300 jobs.

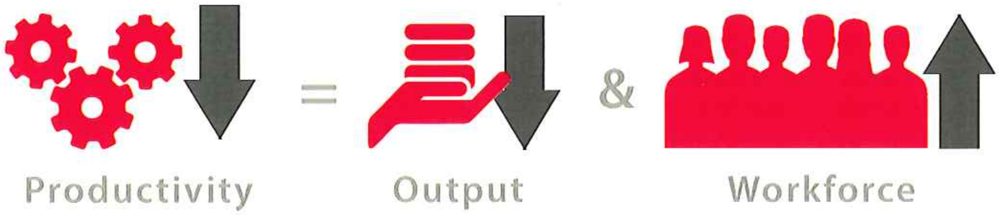
All data in Figure 10 on Page 31 shows national averages. In a location where the city cost index is 1.2, it would take $1.2 billion in spending to support 6,000 jobs and in a location where the city cost index is 0.85, only $850 million in spending would support 6,000 jobs. That means that an average revenue put-in-place of $166,000 supports one job, but it can range from $140,000 to $200,000 per job due to variations in location.

OF JOBS SUPPORTED BY $1 BILLION OF SPENDING



When spending and jobs are on the decline and with diminished workload providing no other options, workers and management find ways to improve out of necessity. But at some point, longer hours and additional work burden causes productivity to decline. Also, a return to volume growth results in an easing of performance. It appears the trend began to reverse in 2010. After two years of work output increases, the work output reversed and finally declined in 2011.

As workload begins to increase in coming years, net productivity gains will decline somewhat. This net effect cannot go unaddressed. The results of productivity declines are either decreased total output (if workforce remains constant) or increased workforce needed (if total workload remains constant).



JOBS EXPANSION MUST BE BASED ON VOLUME, NOT REVENUE

Contractor fees are often determined as a percentage of revenue. However, workload volume is used for planning the size of the workforce. It is valuable to know, from the past several years of data, how many employees were required to accomplish the workload volume. From the viewpoint of workforce size, we should not be concerned with the value of the revenue only the volume of the work. It is not uncommon to see early estimates of staff requirements based on a percentage of revenue. That is a false representation and cannot be accurately relied upon to project staff, unless revenue is first converted to volume.

As an example, at the 2008 peak of construction cost, a building cost $12 million and took 100 men per year to build. In 2010, that same building potentially cost as little as $10 million to build, 20% less. Did it take 20% fewer men per year to build it? No, certainly not. That would be the fallacy of trying to determine jobs needed based on unadjusted revenue.

The building has not changed, only its cost has changed. It still has the same amount of steel and concrete, brick, windows, pipe and wire. Using revenue as a basis, we might be led to think we need 20% fewer workers. However, there is a need to base workers on inflation adjusted volume and productivity, not simply on direct annual revenue.

WORKFORCE EXPANSION

During the most rapid sustained period of jobs expansion in the last 30 years, the workforce grew by 1,000,000 jobs over 36 months, only 15% over three years, resulting in an average of 28,000 jobs per month. Construction spending during that 36-month span increased 12%; however, inflation-adjusted constant dollar volume increased by less than 6%. This was during a period when construction volume reached the all-time peak. Such a rapid workforce expansion during a period of a high level of spending led to measurably significant lost productivity.

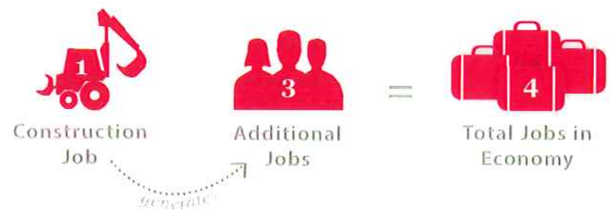
If we experience uninterrupted economic expansion at a rapid level for the next five years, it will produce an extremely active market, there will be worker shortages, and productivity will decline–potentially erasing most or all of the gains realized in the last few years. When that occurs, it leads to rapidly increasing prices.

> ***"Workload volume is the foremost defining factor for determining the size of the workforce."***

HOW MANY JOBS GET CREATED BY CONSTRUCTION?

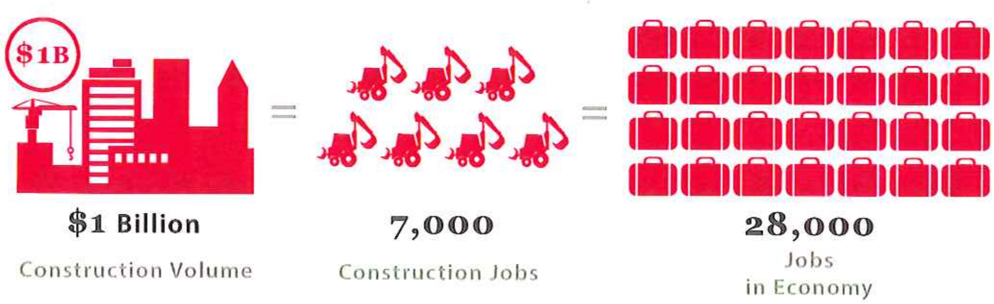
Here are some details regarding how many jobs get created for every dollar spent on construction. For further reference, see Jobs and Unemployment section beginnng on Page 26.

- Historical averages (adjusted for inflation) since year 2000 show the number of direct construction jobs supported by $1 billion in construction spending varies +/- from 6,000 jobs. That calculates to one job for every $165,000 (in 2014 dollars) spent on construction, or 6.0 to 7.0 jobs per $1,000,000 spent. Direct construction jobs include all Architecture/Engineering/Construction (AEC), but not, for instance, lumber or steel mill product manufacturing.
- The importance of correcting for inflation cannot be understated. A rate of $140,000 to $160,000 (in 2013 dollars) per job, at 3.5% inflation, five years ago was $120,000 to $135,000 Five years from now, one job will require $166,000 to $190,000. The long-term historical average for construction inflation is 3.5%, but in the last 10 years has ranged from -8% to +10%.
- In part, the wide variation in the number of jobs created is a result of productivity. In times of increasing work volume activity, productivity declines. In times of decreasing activity, productivity climbs. In 2009, the worst decline in construction activity in my historical records, productivity increased by an average 8%. Because productivity increased, it took fewer workers to put in place the same volume of work. The net result is that $1 billion in spending supported far less jobs than previous years.



- As work volume starts to increase over the next few years, expect productivity to decline. There are many reasons why this will occur, among them: working longer hours until new workers are brought on; working more days; crowding the work area; hiring less qualified workers; and acclimating new workers to the crew.
- The type of work also affects the number of jobs supported, with higher cost buildings supporting fewer jobs than lower cost buildings. For example, $1 billion of life sciences or hospital projects supports fewer workers than $1 billion of residential or general commercial projects because the materials costs are considerably higher and therefore a greater percentage of the total cost is allocated to materials.

There are several studies available, including one by the federal government and one by the Associated General Contractors of America (AGC), that state for every construction job, there are three additional jobs created in the economy. So while $1 billion of building construction may create as many as 7,000 direct construction jobs, overall it generates approximately 28,000 jobs in the economy.




Behind the
Headlines

Behind the Headlines

Total 2014 Construction Spending Expected Up 5.5%. 2015 Expected Up 7%

Growth in spending doesn't provide a clear picture of the growth in real volume. In constant inflation adjusted dollars, total 2014 spending did not reach the level of 1993 spending. Inflation adjusted construction spending reached a peak in 2000. It remained nearly level from 1999 through 2006. From 2006 to 2011, volume declined by 28%. **Current volume is still 22% below the peak level of spending.** We would need to equal the volume growth rate of the four best years in the last 20 years to return to peak level before 2019. In 2014, construction volume increased by only 1.1%. In 2015, spending should grow 8% but volume will grow only 3%. We will probably not reach previous construction volume levels until 2021 or 2022.

Construction Volume is #1 Driver of Construction Cost

I agree 100%. But then the analysis continues to state residential volume is now 50% above its recent bottom and nonresidential volume is up 20%. However, the analysis fails to differentiate between spending and volume. Once we take out inflation and look at spending in constant 2014$, we see residential volume is up by 30% and nonresidential buildings volume is up by only 7% off the bottom. All the rest of the growth in spending is inflation.

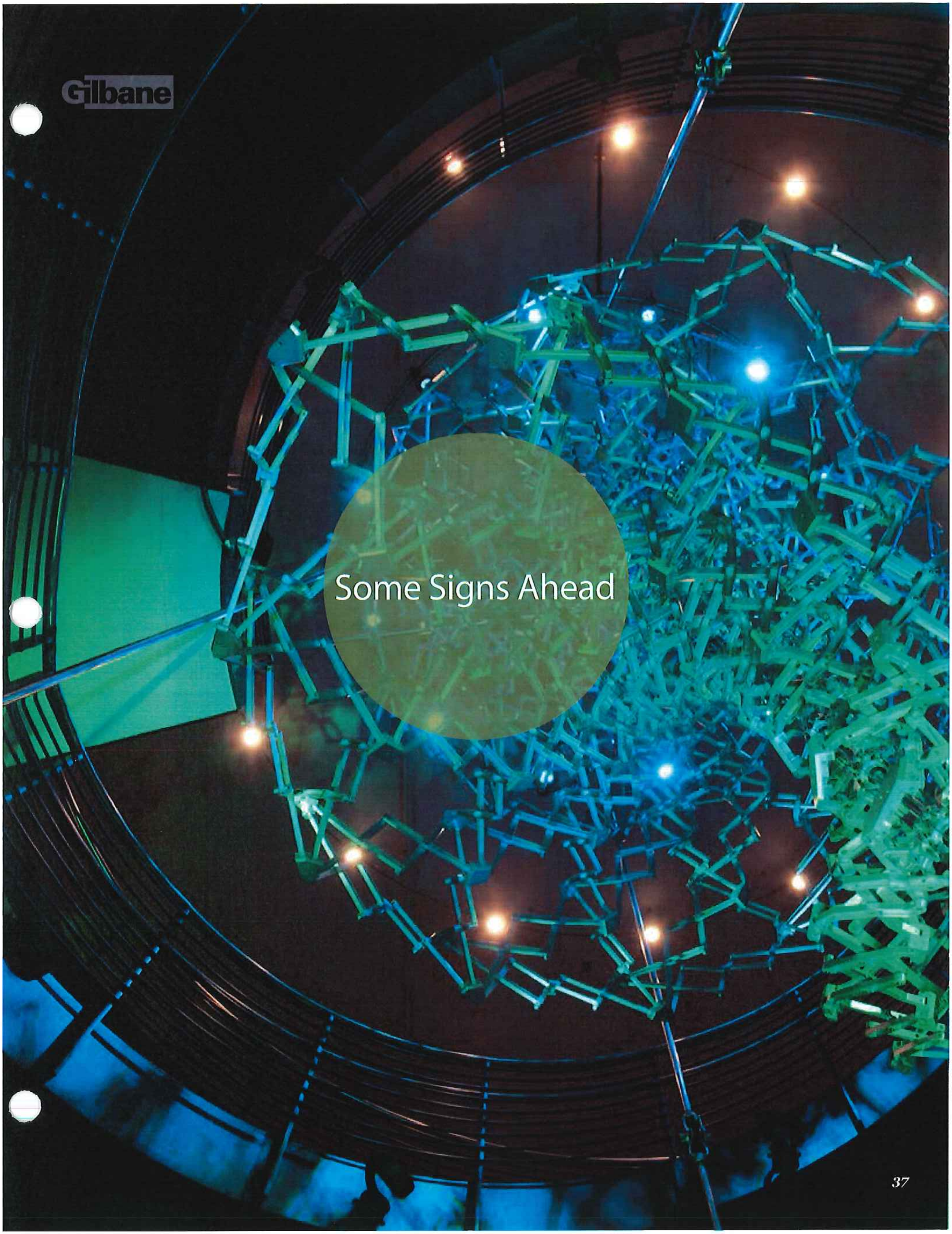
Unemployment Reaches 7-year low in October

Don't be alarmed when it climbs back up a few points between November 2014 and March 2015. The unemployment rate is not seasonally adjusted and after going down every summer, it goes up every year between those months, usually by about 4 or 5 points, reaching a high in January – March period, whether jobs go up or down.

Construction Jobs Up 13% from January 2011 Low

Yes, that's true. However, what is left unstated here is that hours worked, which gets applied to the entire workforce, is also up. Since January 2011, jobs are up 13%. Total new jobs plus hours worked results in total labor effort, which is UP 18% since January 2011. **So if you are only tracking new jobs, you are missing more than 40% of the total labor effort growth.**

> ***"We're hopeful that construction volume levels reached in 2000 will return by 2021 or 2022."***



Some Signs Ahead

Some Signs Ahead

The following reports can be accessed by clicking on the hyperlinks provided.

Architectural Billings Index (ABI) measures monthly work on the boards in architectural firms. It is a 9 to 12 month leading indicator to construction. Index values above 50 show increasing billing revenues and below 50 indicates declining revenues. After 13 consecutive months being positive, the ABI Institutional Index went negative for 10 months. The Commercial Index has dipped into negative territory only three times in the last 21 months.

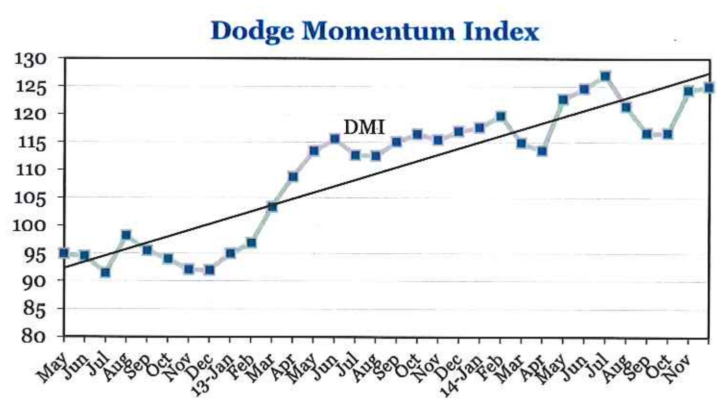
Associated Builders and Contractors (ABC) Construction Backlog Indicator (CBI) is a quarterly forward-looking economic indicator reflecting the amount of work that will be performed by commercial and industrial contractors in the months ahead. The CBI is measured in months of backlog and reflects the amount of construction work under contract, but not yet completed.

ABC Charts and Graphs for Q3 2014 show all of 2013 strongly above 2012. The first quarter 2014 CBI at 8.1 months is the fourth consecutive quarter above 8.1. Heavy industrial CBI dropped to all-time lows in Q3-Q4 2013 and, although up slightly in Q1 2014, is still at third lowest in history. Infrastructure CBI dropped for four consecutive quarters and has only rebounded slightly in Q1 2014. Commercial and institutional backlog increased every quarter from Q1 2012 to an all-time high of 8.9 months in Q4 2013. It went down slightly for Q1 2014 to 8.4 months. The index was created in Q1 2009 so there is no comparison to pre-recession workload

Dodge Momentum Index (DMI) is a monthly measure of nonresidential projects in planning, excluding manufacturing and infrastructure. It is a leading indicator of specific nonresidential construction spending by approximately 12 months. It bumped up and down, peaking in January 2014 but then dipped in March. It peaked again in June but continues to move up and down. The trend is up.

FIGURE 11:

Dodge Momentum Index



The DMI had strong upward movement in early 2013 but then settled into a more narrow range for 10 months. After three strong months again we had a decline. The statistical trend is still UP.

The index shows the strongest correlation in the commercial sector at a nine-month lag and the institutional sector, with a strong correlation at a 15-month lag.

AIA Consensus Midyear 2014 Construction Forecast is a semi-annual survey of construction economists' projections for future spending. Posted on the AIA economics page, the mid-year 2014 report of average expectations for nonresidential construction showed expected growth of 4.90% for 2014 and 8.0% for 2015. The greatest expected growth is for the commercial and office construction sectors.

AGC 2014 Construction Hiring and Business Outlook published in January indicates contractors are more optimistic than they have been since the recession began. It highlights that contractors expect markets to grow but also expect it will be more difficult to hire qualified workers. See survey results here.

Engineering News-Record 2014 Third Quarterly Cost Report shows general purpose cost indices up on average about 2.5% year over year. However, special purpose building indices for nonresidential buildings are up on average 3.3% and selling price indices are up 4.3%. The difference between these indices is increased margins. *(Subscription required).*

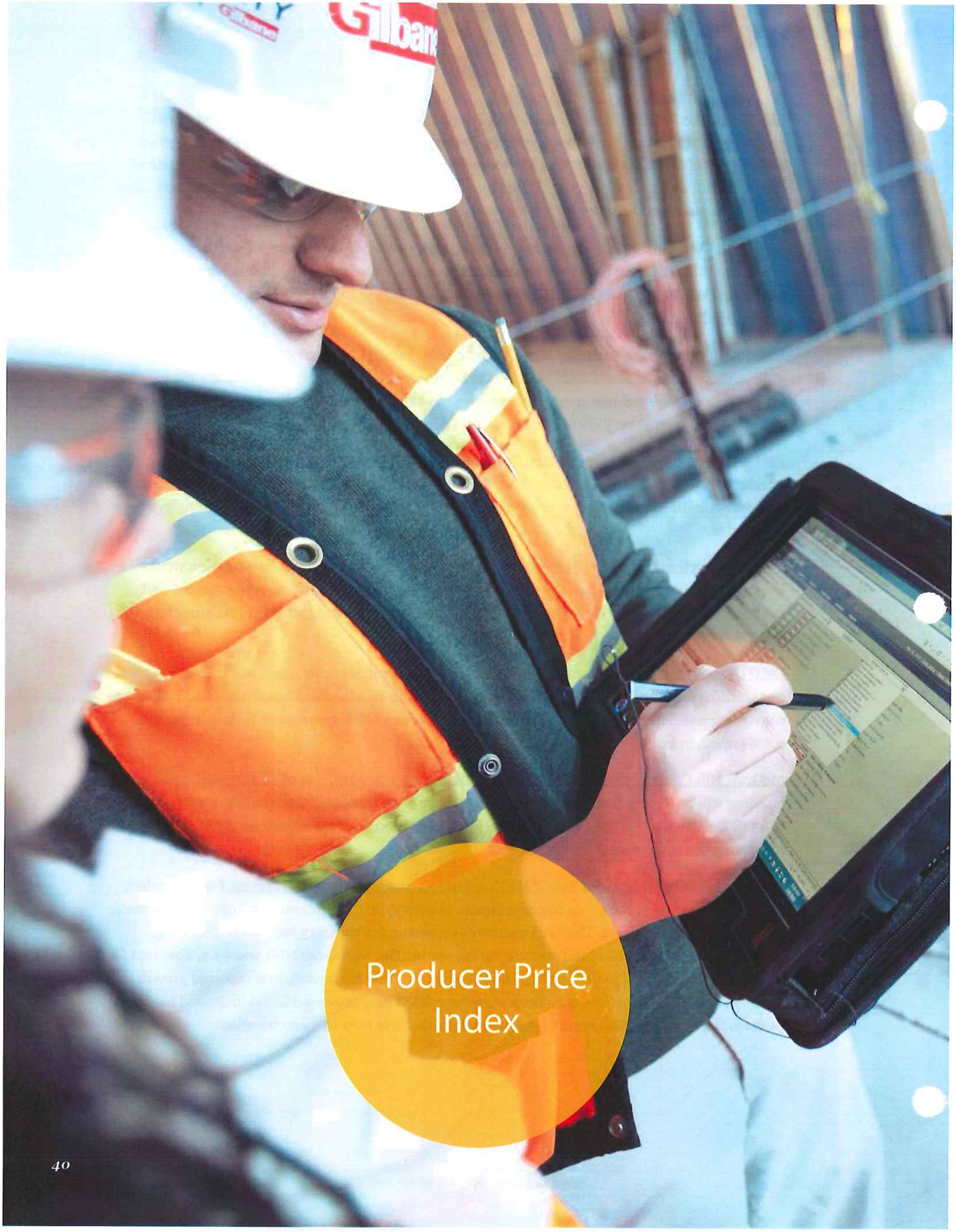
FMI 3rd Quarter 2014 Nonresidential Construction Index (NRCI) is now 65.8, up from last quarter and well up from all of 2013. The NCRI is a report based on a survey of opinions submitted by nonresidential construction executives. The NCRI declined in Q4 2013 but has strongly rebounded.

FMI Construction Outlook 3rd Quarter 2014 Report predicted residential construction would increase 11% in 2014, office construction 8%, commercial construction 6%, education 0% and healthcare construction will decrease 2%. FMI is currently predicting 7% spending growth in 2014 and 7% growth in 2015.

CMD Construction Data December report predicted residential construction will increase 6.7% in 2014, office construction 18.2%, commercial construction 10.2%, educational 0.2% and healthcare construction will decrease 7.1%. CMD currently predicting 6.8% spending growth in 2014 and 9.8% growth in 2015.

McGraw Hill Construction report on Green Building says by 2015, half of all nonresidential building will be Green. From 2008 to 2011, the share of educational Green building went from 15% to 45%. Only 10% of building cost and function is operational. Green investment is also social–improving the environment for employees.

Institute for Supply Management (ISM) Non-Manufacturing Index (NMI) report for November, released December 3, 2014, is a better indicator of activity in the construction industry than the ISM manufacturing report. The NMI measures economic activity in 13 industries (including construction) not covered in the manufacturing sector. The November NMI was 59.3, above 52 for 59 consecutive months, indicating continued economic growth. Construction reported growth in business activity, new orders, employment, slower deliveries, prices paid, and increased backlog, perhaps the strongest NMI report for construction that I've seen in many months.



Producer Price Index

Producer Price Index

The U. S. Census Bureau Producer Price Index (PPI) data for June indicates the PPI for construction materials decreased 0.8% in the month and is up only 0.6% year over year. The largest increases of the year almost always occur early in the year with the fourth quarter often negative.

The November 2014 PPI for Material Inputs to All Construction

- *decreased 0.8% in the month, decreased 1.9% over three months, but is up 0.6% in 12 months*

The November 2014 PPI for Material Inputs to Nonresidential Construction

- *decreased 1.1% in the month, decreased 2.3% over three months and is flat for 12 months*

TABLE 10:

BLS PPI Materials November 2014

US Construction Producer Price Indexes - Nov 2014

Materials PPI	Percent Change Versus to Nov 2014 from Oct-14 1 month	Aug-14 3 months	Nov-13 12 month	annual for 12 months 2013 last yr	12 months 2012	12 months 2011
Summary						
Inputs to ALL Construction	-0.8	-1.9	0.6	1.3	1.4	5.2
Inputs to Nonresidential	-1.1	-2.3	0.0	0.9	0.9	5.7
Commodities						
Cement	0.0	0.4	5.9	4.7	2.9	-1.8
Iron & Steel Scrap	-7.4	-10.8	-11.3	7.5	-15.6	8.7
Manufactured Materials						
Diesel Fuel	-4.2	-11.0	-11.0	-0.9	2.1	20.0
Asphalt Paving	0.0	0.3	2.3	1.0	4.5	8.4
Asphalt Roofing/Coatings	-1.2	5.0	2.4	-0.8	-0.3	4.2
Ready Mix Concrete	1.2	1.0	5.4	2.9	2.6	0.5
Concrete Block & Brick	-0.1	-0.1	2.9	2.1	1.2	1.1
Precast Conc Products	-0.1	0.1	2.1	1.6	2.4	2.9
Building Brick	0.2	0.1	1.4	1.4	-2.6	-2.6
Copper & Brass Mill Shapes	0.0	-2.4	-3.0	-6.6	1.5	-9.3
Aluminum Mill Shapes	0.5	0.5	9.3	-4.6	-1.9	0.6
HR Bars Plt & Strct Shapes	0.0	0.0	7.5	-5.3	-8.5	8.9
Steel Pipe and Tube	-0.3	0.2	-0.6	-5.1	-6.1	13.7
Fab. Structural Steel	-1.5	-1.7	0.2	-0.6	1.6	3.8
Fab. Bar, Joists and Rebar	-0.1	-0.2	3.5	0.4	2.6	1.6
Gypsum Products	0.3	1.3	11.1	16.2	14.1	-1.6
Insulation Materials	-0.2	-2.9	1.5	6.7	5.4	5.4
Lumber and Plywood	-1.0	-2.4	4.3	10.0	11.1	-0.7
Sheet Metal Products	-0.3	-0.5	2.4	-2.2	-1.3	3.7

All data not seasonally adjusted
Source: Producer Price Index. Bureau of Labor Statistics

PPI Items UP the most in price year over year:

- Gypsum products, aluminum shapes, HR bars plates and shapes and ready-mix concrete

PPI Items DOWN the most in price year over year:

- Diesel fuel and copper

The relative impact of cost changes for several materials is a function of how much the material is used within a typical building. For example, for a typical nonresidential building:

- *10% increase in gypsum wallboard material increases typical project cost by 0.05% to 0.08%.*
- *10% increase in copper material increases typical project cost by 0.20% to 0.60%.*
- *10% increase in concrete material increases typical project cost by 0.20% to 0.60%.*
- *10% increase in structural steel material increases typical project cost by 0.50% to 1.00%.*

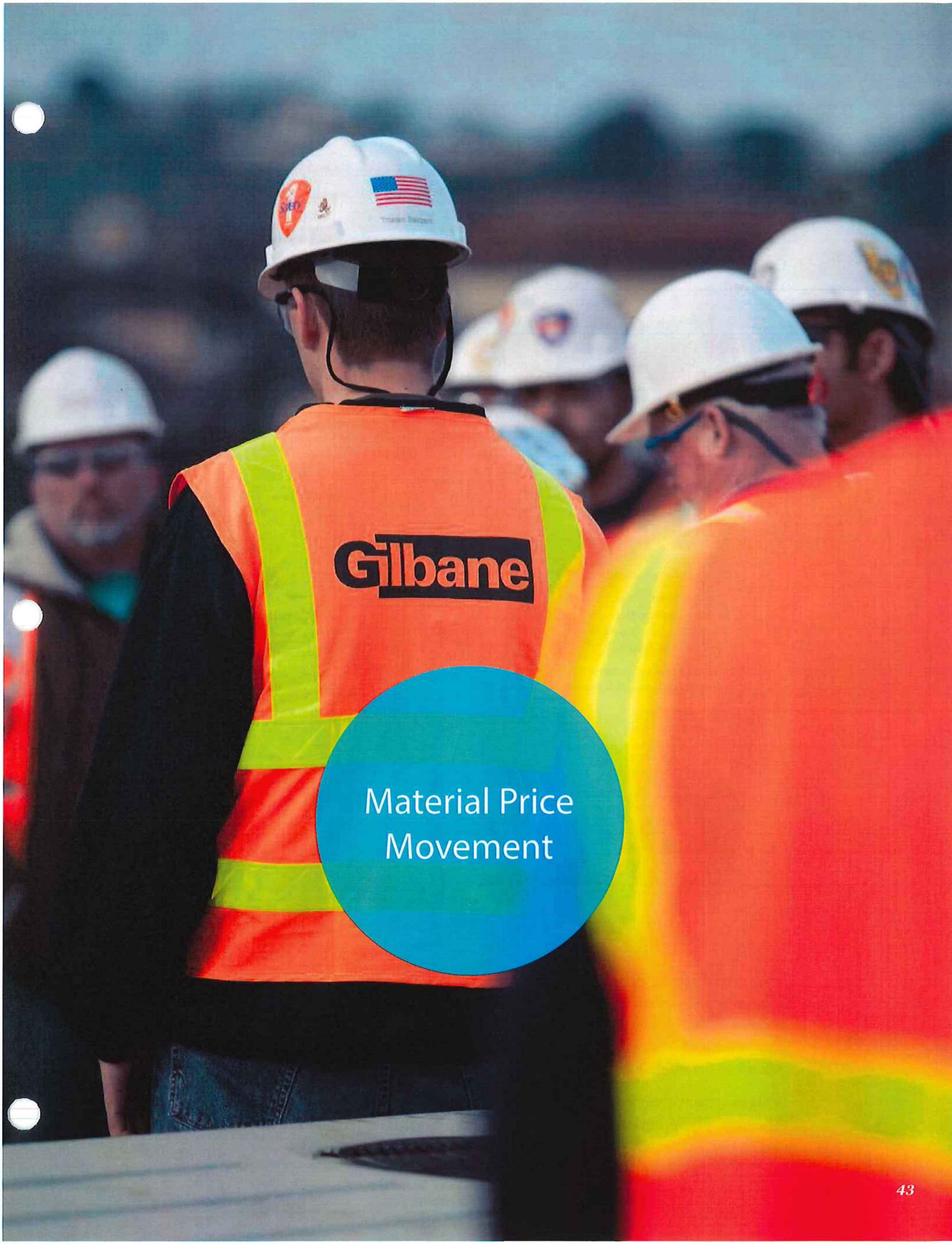
The PPI for construction materials gives us an indication whether costs for material inputs are going up or down. The PPI tracks producers' cost to supply finished products. This tells us if contractors are paying more or less for materials and generally indicates what to expect in the trend for inflation.

Understand PPI trends to help interpret the data.

- 60% of the time, the highest increase of the year in the PPI is in the first quarter
- 90% of the time, the highest increase of the year is in the first six months.
- 75% of the time, two-thirds of the annual increase occurs in the first six months.
- **In 20 years, the highest increase for the year has never been in Q4**
- 60% of the time, the lowest increase of the year is in Q4
- **50% of the time, Q4 is negative, yet in 22 years the PPI was negative only twice**

So when we see monthly news reports from the industry exclaiming "PPI is up strong for Q1" or "PPI dropped in the 4th Qtr.", it helps to have an understanding that this may not be unusual at all and instead may be the norm.

> ***"Producer Price Index (PPI) tracks cost to supplies on construction materials – providing a strong indicator for inflation trends."***



Material Price Movement

Material Price Movement

When the cost to the supplier goes up, it almost always gets immediately passed along in full to the consumer. When the cost to the supplier goes down, the savings trickle down to the consumer very slowly.

Cost for material inputs to all construction increased 1.0% in the last 12 months.

Cost for material inputs to nonresidential construction increased 0.5% in the last 12 months.

TABLE 11:

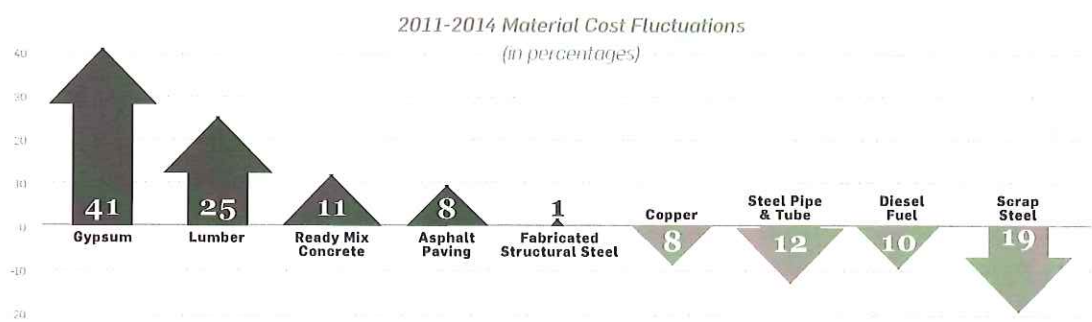
BLS PPI Markets November 2014

US Construction Producer Price Indexes - Nov 2014

Materials PPI	Percent Change Versus to Nov 2014 from			annual for		
	Oct-14 1 month	Aug-14 3 months	Nov-13 12 month	12 months 2013 last yr	12 months 2012	12 months 2011
Summary						
Inputs to ALL Construction	-0.8	-1.9	0.6	1.3	1.4	5.2
Inputs to Nonresidential	-1.1	-2.3	0.0	0.9	0.9	5.7
Inputs to Commercial	-0.7	-1.5	0.7	0.9	1.2	4.9
Inputs to Industrial	-0.8	-1.9	-0.1	0.8	0.8	5.2
Inputs to Hghwy/Hvy Engr	-1.3	-2.8	-0.5	0.9	0.8	6.1
Inputs to Residential	-0.6	-1.4	1.2	1.7	2.0	4.8

All data not seasonally adjusted

Source: Producer Price Index, Bureau of Labor Statistics

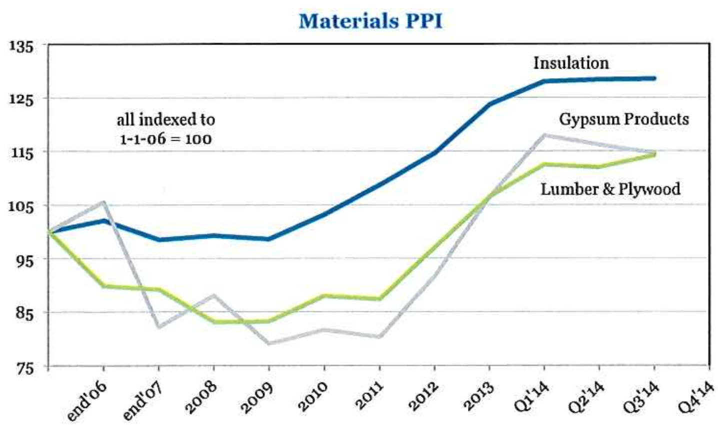


Since 2011, costs for gypsum products increased 41%; lumber increased 25%; ready-mix concrete increased 11%; asphalt paving increased 8%; fabricated structural steel increased 1% and copper decreased 8%. Steel pipe and tube cost increased only 12% and diesel fuel decreased 10% and scrap steel decreased 19%. This extreme variability means individual trades assessment requires individual material index data.

Costs of gypsum, lumber and plywood and insulation are driven primarily by residential markets. Structural steel products are driven more by nonresidential markets.

FIGURE 12:

Materials PPI Index Gypsum Lumber Insulation 2006-2014



Random Lengths, a lumber industry newsletter, recently reported the composite price index for 15 key framing lumber prices at $366, down 11% from the 2014 high of $414 and down 20% from an eight-year high in April 2013. Year-to-date low was $362 set in April.

70% of lumber demand is driven by residential housing.

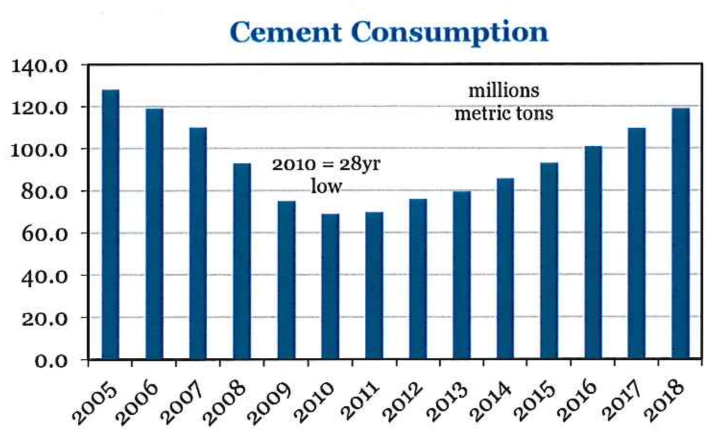
Cement / Concrete / Asphalt

Portland Cement Association (PCA) reports the volume of cement demand as an indicator of economic activity. It is a reliable coincident indicator. PCA reported an 8.9% rise in consumption in 2012 and consumption grew 4.5% in 2013. 2014 was projected to grow by 8.1%.

Nearly two-thirds of U.S. cement consumption occurs in the six months between May and October. Rising consumption and prices leading into summer can lead to large shifts in demand and seasonal pricing and is not an indicator of long-term growth but only reflects periodic seasonal fluctuating consumption rates. Look at total annual volumes for trends.

FIGURE 13:

Cement Consumption 2005-2018

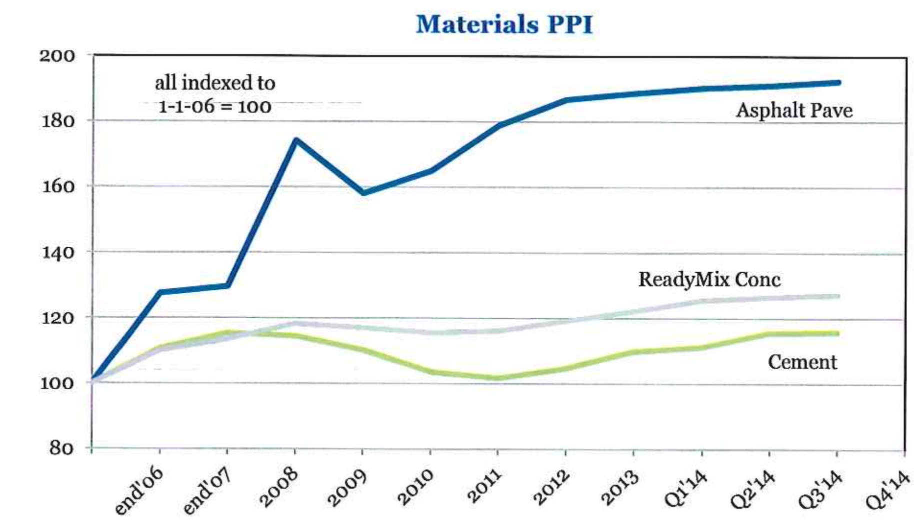


For 2010 and 2011, cement consumption decreased 46% from peak 2008. At the start of 2013, PCA predicted consumption for 2013 would grow 8%. PCA revised data shows 2013 was only 4.5% growth over 2012. 2014 growth is projected at 8.1%. PCA projects consumption by 2018 will be 119mmt. That will require five years of minimum 8.5% growth.

Cement prices increased 3.4% in 2012, after dropping four years in a row. Cement prices increased 4.7% in 2013. Year-to-date Portland cement prices are up 5%. IHS Global predicts cement prices will rise 4.6% in 2015.

FIGURE 14:

Materials PPI Index Cement Concrete Asphalt 2006-2014

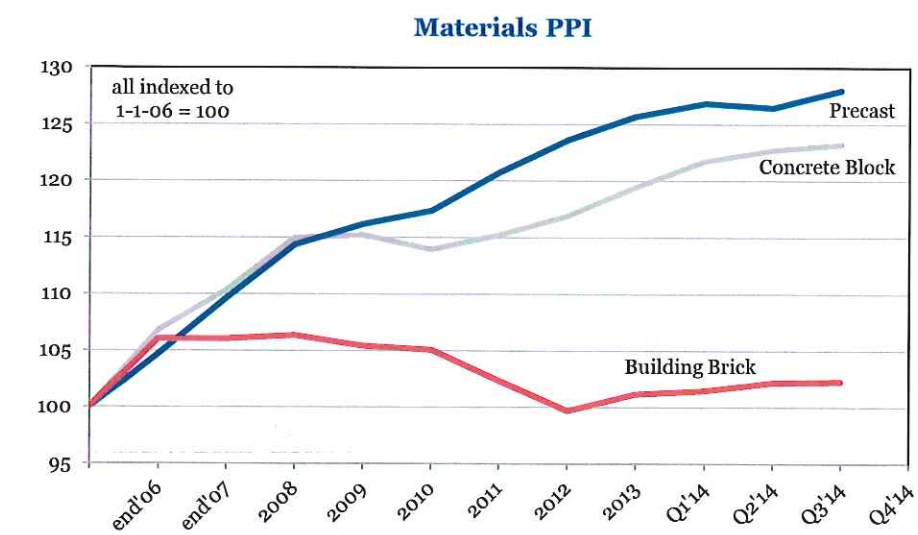


Ready Mix Concrete price increased 2.9% for 2013. For the last 12 months PPI shows another +4.5% ENR has +4 year-to-date 2014. That's a 7% increase in two years.

Global Insight predicts cement prices will rise only 4.6% in 2015.

FIGURE 15:

Materials PPI Index Brick Block Precast 2006-2014



Concrete block and brick increased only 2.1% in 2013. Through the 3rd quarter 2014 cost was up another 4%.

Precast product prices have moved up only 3.5% since December 2012.

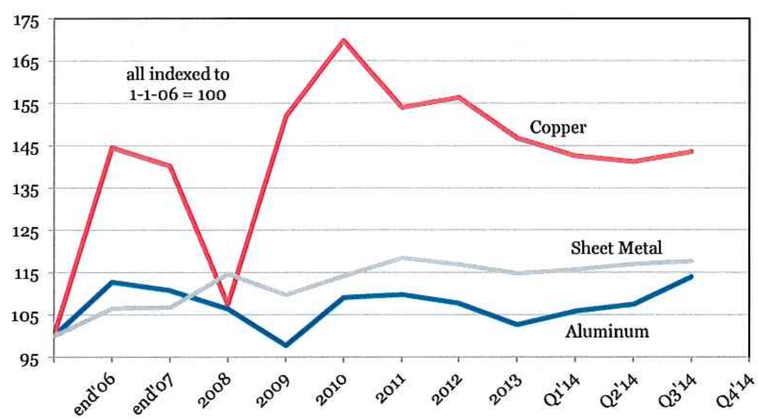
Structural Steel

The construction industry is the largest consumer of steel products worldwide. Approximately 100 million tons of steel is produced annually in the United States. More than 40 million tons of that is delivered to the construction industry. The next largest industries combined (automotive, equipment and machinery) do not consume as much steel as construction.

Structural steel is the most used structural framing material in the United States, with a 58% of market share for nonresidential and multi-story residential buildings, based on square footage built. The next closest framing material, concrete, holds only 21% market share.

FIGURE 16:

Materials PPI Index Iron and Steel Products 2006-2014



The rapid rise in 2008 mirrors the rapid acceleration in bid pricing to the peak in Q3-Q4 2008, and the precipitous fall from that peak. By mid-2009, the mill price of steel products had experienced a 40% decline, retreating to a 2004 low. Today the PPI for pipe, tube, bars and plates has recovered all of those losses, but not fabricated structural, joists or rebar.

Steelworks.org reports adjusted year-to-date steel mill capacity utilization currently at 77% as of December 6, 2014. Capacity utilization is below the post-recession high of 79% in March 2012.

Steel demand in 2013 was flat from 2012. Early in 2013, economic analysis indicated that there was over-capacity in steel production. This did prove to be true, and it helped cause steel prices to fall or remain flat in 2013. This year demand is up.

Steel manufacturer Gerdau Corporation reports that year-to-date demand is up approximately 10% for structural shapes, bars and reinforcing. Demand for structural pipe and tube is up 72%.

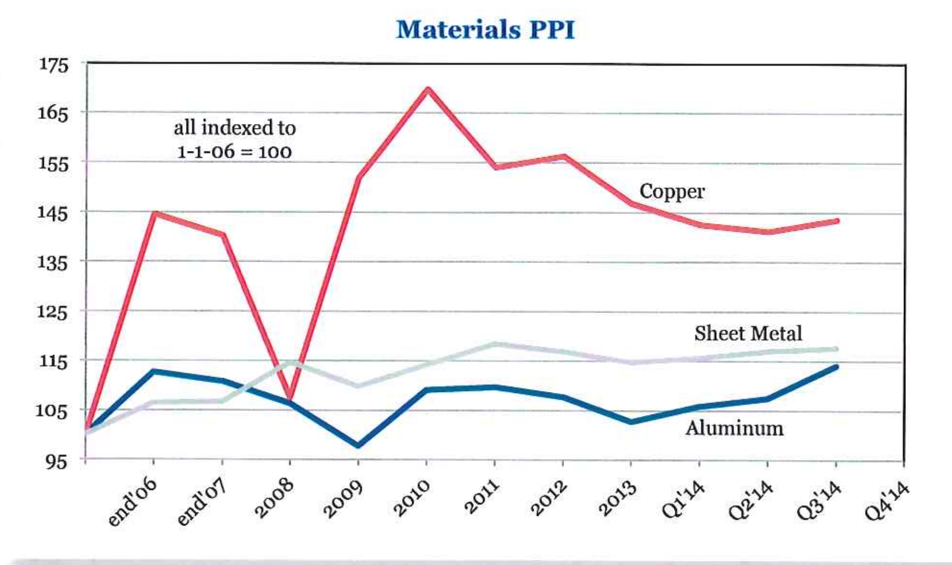
ENR's latest data indicates that wide flange steel prices increased 1.5% since February bringing prices level with a year ago.

The PPI indicates fabricated structural steel cost is up only 0.2% in the last 12 months.

Structural steel is very much dependent on recycled steel. Structural steel is made 90% from scrap steel. Scrap prices are down 11% in the last year.

FIGURE 17:

Materials PPI Index Aluminum Copper Sheet Metal 2006-2014



Copper/Aluminum

What makes copper so important to watch?

Copper is a leading economic indicator that has rarely (if ever) failed to indicate the direction of world economies. When copper rises in price, world economies are leading into expansion. When copper drops in price, a decline in world economies quickly follows. Copper prices and the U.S. workforce move almost perfectly together. Also, because copper is so widely used in buildings and manufacturing facilities must be built to see a big increase in production, copper demand is an excellent predictor of industrial production 12 months out.

Click here to view copper price charts on metalprices.com

What drives copper prices up or down? Unlike some other metals, it is not speculation. Quite often it is demand. Increasing demand equals increasing prices. When demand wanes, prices drop.

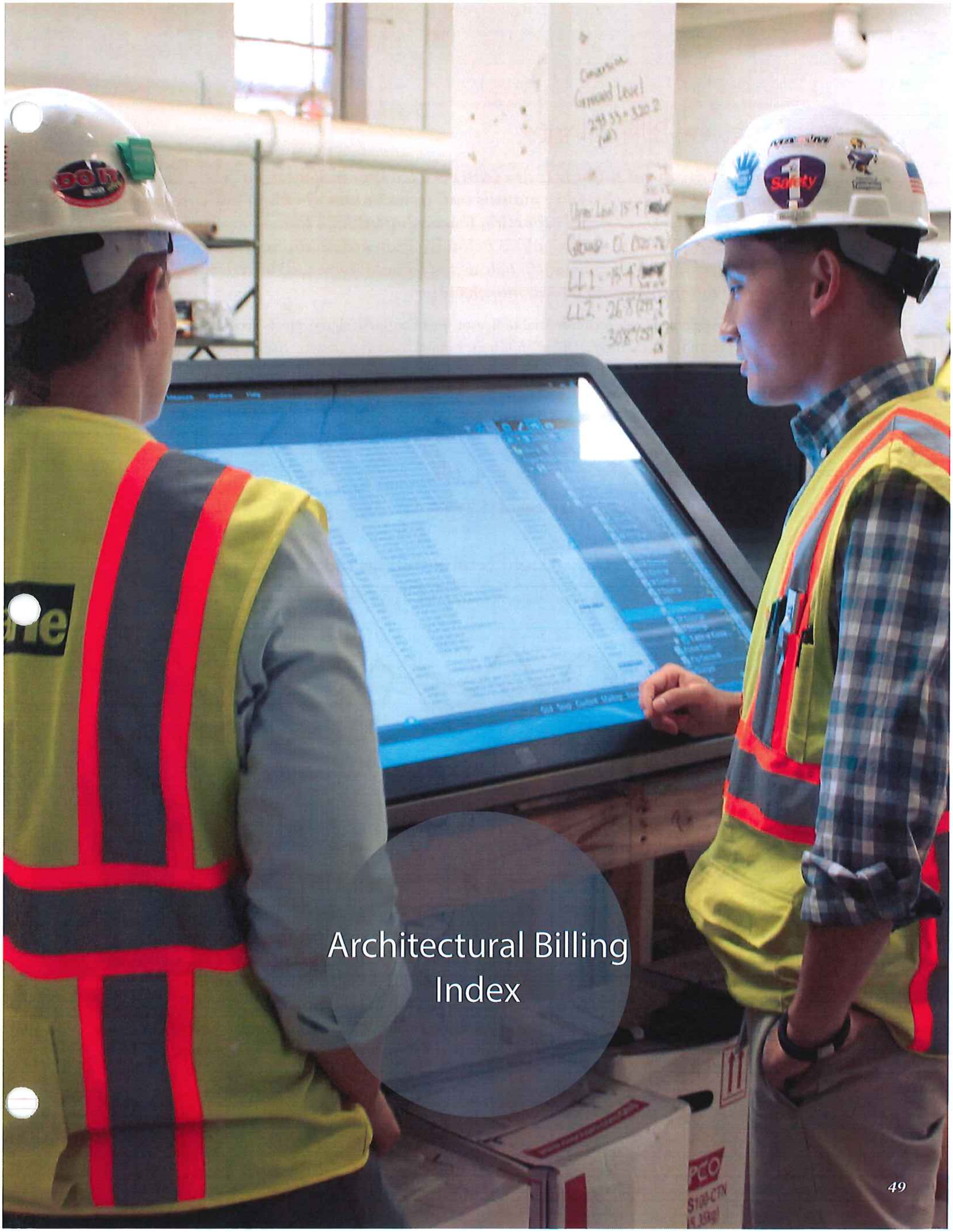
What effects do copper price changes have on the cost of our projects?

Roughly speaking, copper material is about:

- *10% electrical contract or 1% of cost of project*
- *5% of an HVAC contract or 0.6% of cost of project*
- *10% of a plumbing contract or 0.3% of cost of project*

For an average project, copper material can represent approximately 2% of the total cost of the project. Therefore, a 10% increase in the cost of copper will increase the cost of a project by 0.2%.

There are exceptions. For example, if copper is 2% of the total cost of the typical project, it is probably 4% to 5% of total cost on a heavy mechanical/electrical project, such as a data center. So a 10% increase in the cost of copper increases the total cost of a data center by 0.4% to 0.5%. For a copper roof, material is 65% of total cost and can represent ~1% of typical project cost.



Architectural Billing Index

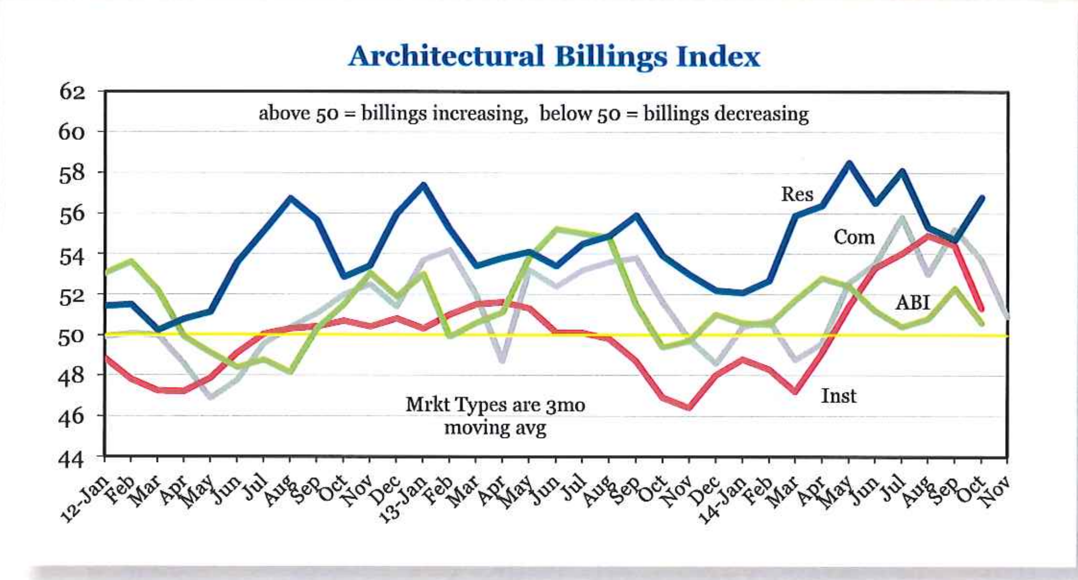
Architectural Billing Index

The Architectural Billings Index (ABI) is a leading indicator for nonresidential work 9 to 12 months out. Index values above 50 indicate more architectural firms reporting increasing billings than firms reporting decreasing billings. Index values below 50 indicate declining workload. Index values remaining consistently below 50 indicate there will be a decrease in construction spending 9 to 12 months later.

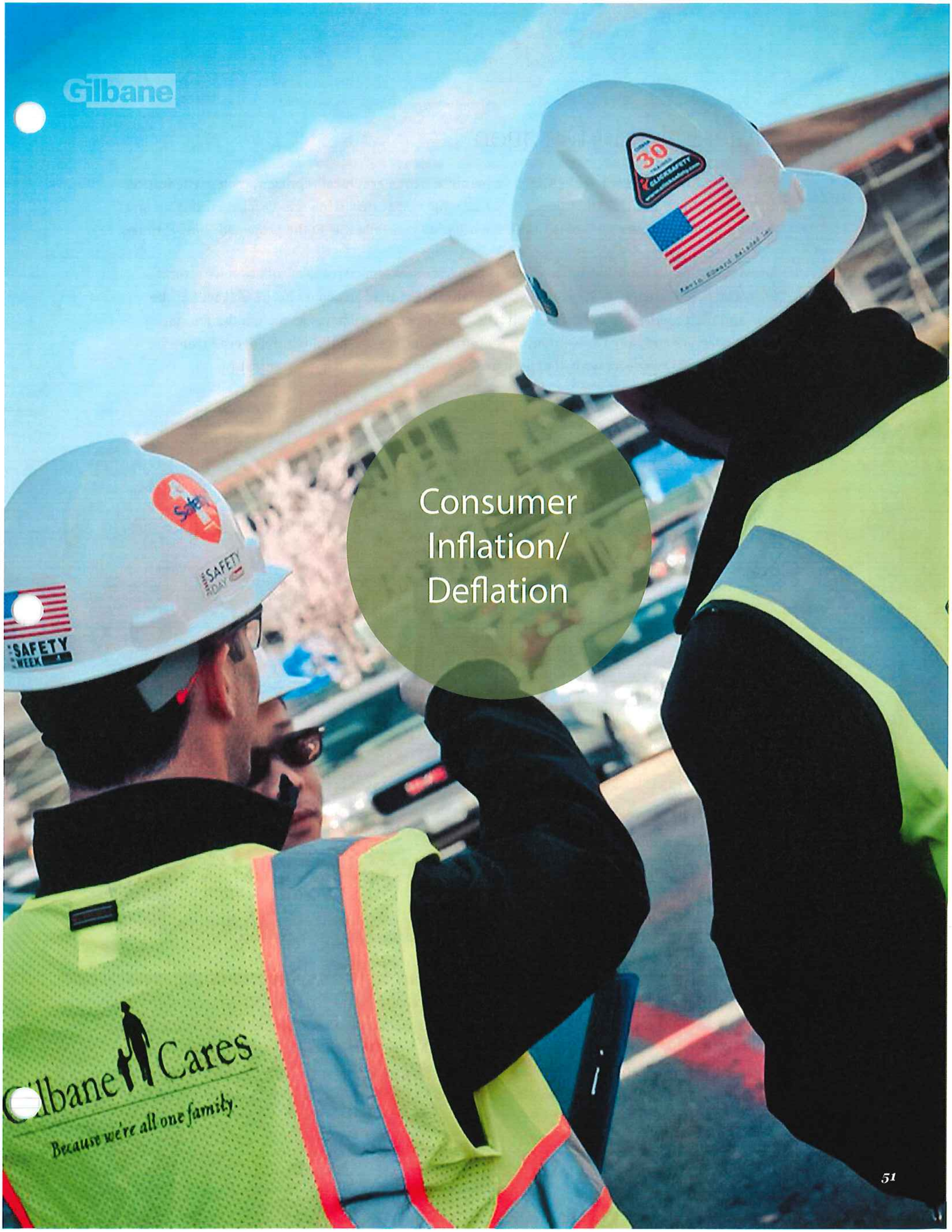
The ABI is primarily a nonresidential indicator. Residential design projects account for only about 15% of the total index. Office buildings, hotels, shopping centers, banks, warehouses, manufacturing plants and other commercial properties represent 35-40% of the index. Institutional buildings account for 45-50% of the index. Typically, institutional facilities are the last nonresidential building sector to recover from a downturn.

FIGURE 18:

Architectural Billings Index ABI 2012-2014



The 2012 drop in the ABI from March through June predicted nonresidential work would be down through Q4 2012 into Q1 2013 with recovery starting in Q2 2013. Institutional billings were declining from January 2011 to June 2012 and commercial work declined from April to August 2012. We expected spending in Q1 and Q2 2013 to be down and it was down. The March-April 2013 ABI indicated a decline in spending for Q1 2014, which did occur. The November 2013 to April 2014 ABI indicates we may see another brief slowdown in nonresidential spending during Q1 2015.



Consumer Inflation/Deflation

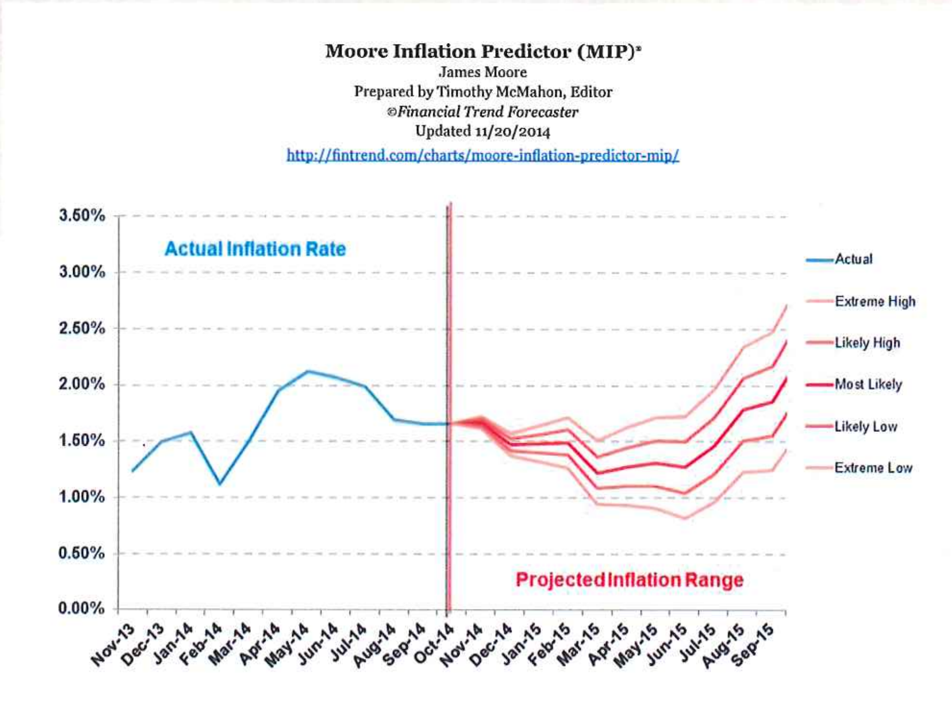
Consumer Inflation/Deflation

The Moore Inflation Predictor© (MIP) is a highly accurate graphical representation of the future direction of the inflation rate. It has a 97%+ accuracy rate forecasting inflation rate direction and turning points and over 90% of the time the inflation rate falls within the projected "likely" range.

A review of long-term inflation data shows there are seasonal aspects of inflation with some fairly consistent trends. It appears that the majority of inflation occurs in the first half of the year and then moderates for the second half. Since 2001, there have been eight deflationary fourth quarters and only three inflationary fourth quarters, even though the overall trend is inflationary. MIP expects we will experience deflation in the fourth quarter 2014.

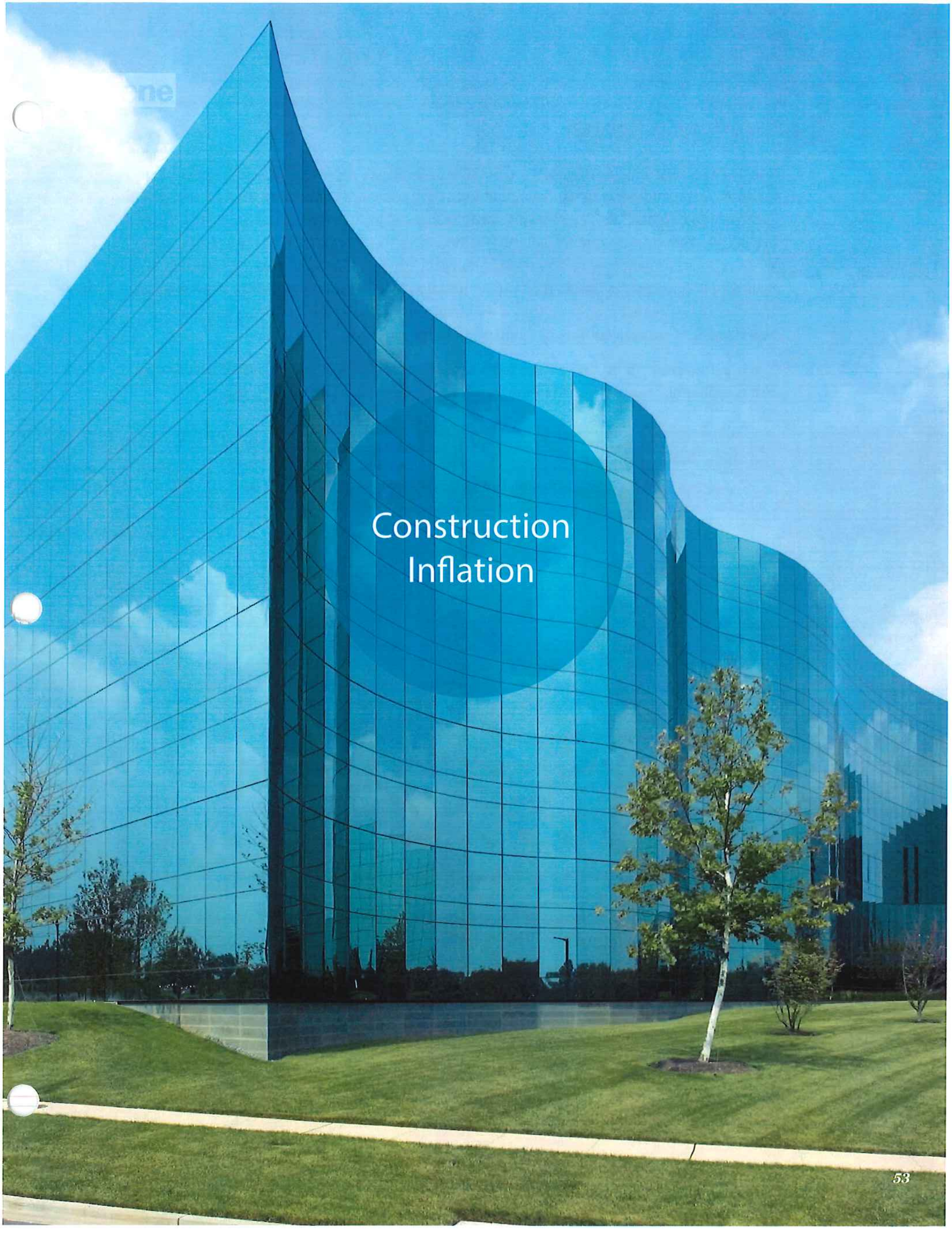
FIGURE 19:

Moore Inflation Predictor Consumer Inflation 2013-2015



(MIP chart used by permission, Tim McMahon, Editor, Financial Trend Forecaster www.fintrend.com)

It is possible that several years of stimulus and easy money policy may eventually lead to strong inflation. However, to date that has not occurred. In fact, some analysts question if that will occur. In 2013, MIP predicted peak inflation most likely at 2.4% and year end inflation at 1.7%. Actual results in 2013 were peak inflation at 2.0% and year end inflation at 1.5%. In the worst case scenario, a year from now we could potentially see inflation range between 3% and 4%. The MIP does not project 3% to 4% inflation at any time within the next 12 months but predicts 12 months from now we will be near 2%.


Construction
Inflation

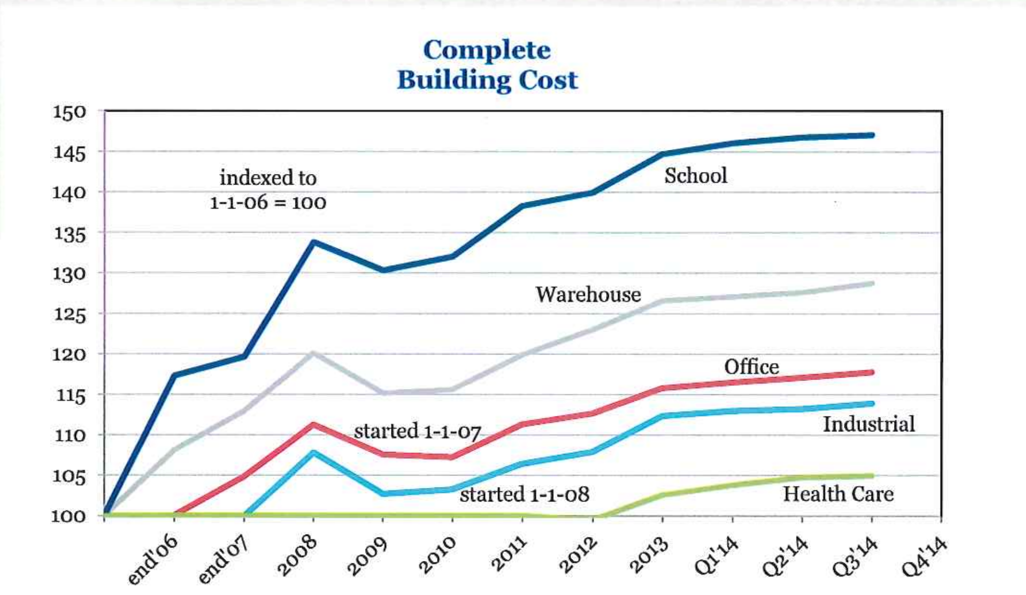
Construction Inflation

Construction inflation, based on several decades of trends, is approximately double consumer inflation. From mid-2009 to late 2011, that long-term trend did not hold up. During that period, construction inflation/deflation was primarily influenced by depressed bid margins that had been driven lower due to diminished work volume. Over the last 24 months that has changed. Work volume has increased and short-term construction inflation has increased now to more than double consumer inflation. If consumer inflation reacts to money policies by accelerating and if it holds true that long-term trends eventually return to the norm, we may soon be experiencing rapid acceleration in construction inflation.

The U.S. Construction Producer Price Index tables for Buildings Complete, which includes the cost complete as charged by the builder, represents true inflation cost of buildings.

FIGURE 20:

Complete Building Cost Index by Building Type 2006-2014



Nonresidential buildings inflation, as depicted by PPI completed buildings data, shows 2013 building cost inflation ranged from 2.8% to 4.1%.

Through November, PPI building cost for 2014 annual inflation ranged from 1.8% to 2.2%.

Through November, PPI Trades cost for 2014 annual inflation ranged from 1.0% to 4.8%.

Industry indices show nonresidential building cost for 2014 average inflation ranging from 2.9% without margins to 4.3% final cost.

New housing price indices show 2014 residential annual inflation ranges 5 to 7%.

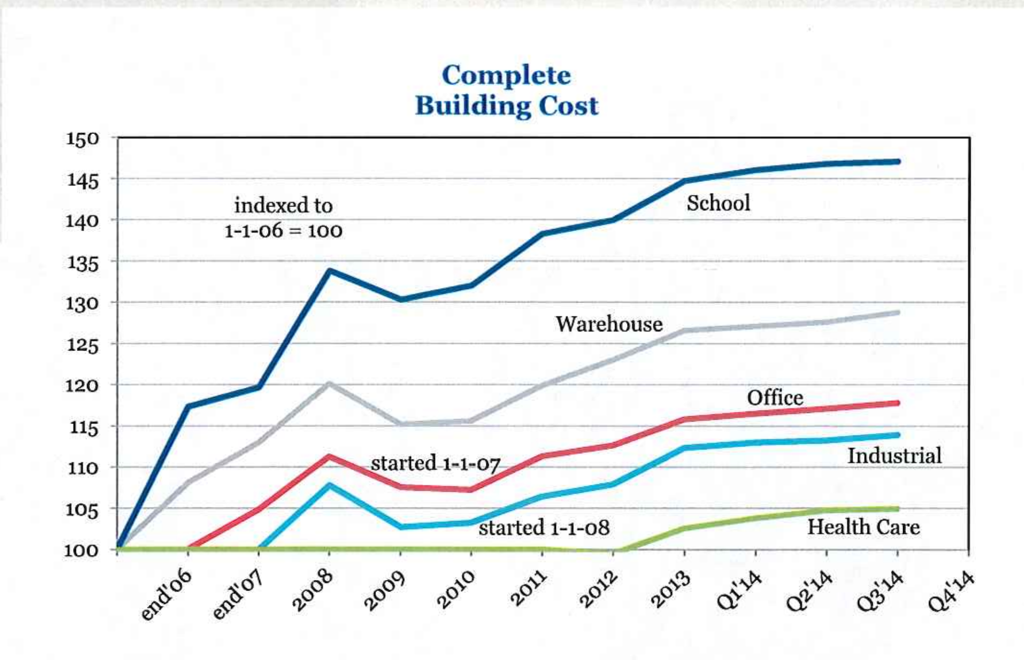
Construction volume will continue to increase in coming months and that will continue to support increasing margins. Therefore buildings' total construction (final cost) inflation will outpace construction labor and materials inflation.

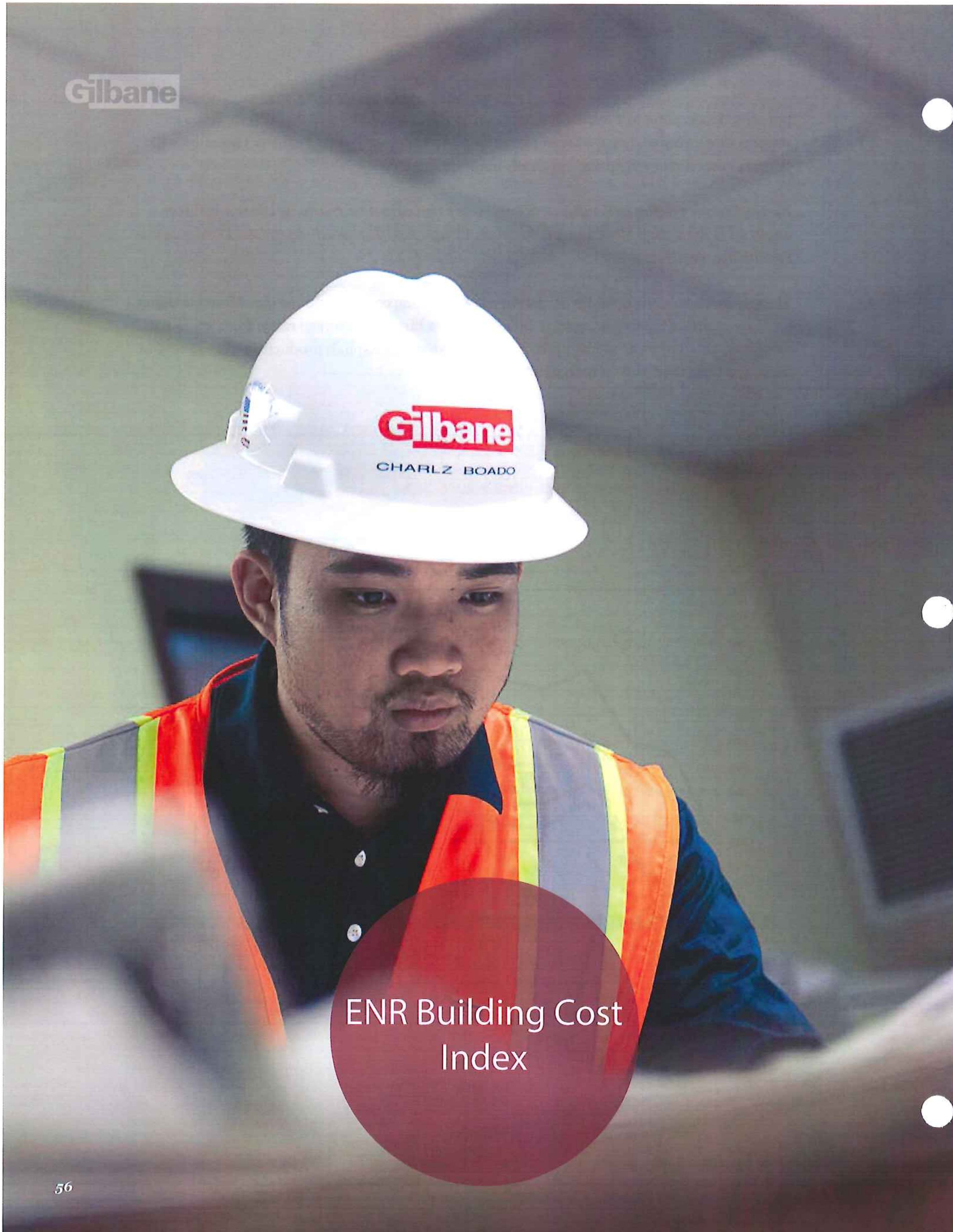
Expect nonresidential construction cost inflation to remain above 4% for several years. See Escalation section (Page 69) for near-term and long-term recommendations.

These average values, useful for adjusting whole building costs, cannot be considered to adjust a unique contract type. Construction inflation with a historical average range from 3% to 8% would not be accurate to adjust asphalt paving or shingles. Asphalt products increased 10% in 2005 and 2006 and 20% in both 2008 and 2009.

FIGURE 21:

Complete Trades Cost Index by Trade 2006-2014





ENR Building Cost Index

ENR Building Cost Index

The December 2014 *Engineering News-Record's* 20 Cities Average Building Cost Index (ENR-BCI) is 5480, up 2.9% year over year. Cleveland and St. Louis show a much higher than average inflation rate. Atlanta, Baltimore, Boston and Dallas are all below the ENR average inflation rate.

The ENR-BCI index increased 3.7% in 2010, 2.8% in 2011, 1.9% in 2012 and 2.2% in 2013.

The ENR-BCI is one of the most well-known and most widely used building cost indices. However, its long-term strengths can also be weaknesses, particularly in times of fluctuating selling prices because:

- It is made up of a small shopping basket of labor and materials. Therefore, it is not always the best representation of all building types, which can vary considerably in composition.
- That shopping basket includes no representation for any mechanical, electrical or plumbing items, which can comprise 30%-50% of the cost of the building. In many cases, the shopping basket comprises less than 20% of the building cost.
- Building materials differ widely in rate and timing of cost growth and can dramatically affect the cost of projects. In 2009, while structural steel products declined in price by 10% to 15%, copper products increased in price by 40%.
- ENR-BCI does not take into consideration bid prices, so it often does not represent the final cost of buildings. Bid prices are referred to as Selling Price, and this is not included in the ENR-BCI. Selling prices show increased or reduced margin bids due to market activity.

TABLE 12:

ENR Building Cost Index History

ENR's Building Cost Index History (2000-2014)													
Base = 1913=100	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVERAGE
2000	3503	3523	3536	3534	3558	3553	3545	3546	3539	3547	3541	3548	3539
2001	3545	3536	3541	3541	3547	3572	3625	3605	3597	3602	3596	3577	3574
2002	3581	3581	3597	3583	3612	3624	3652	3648	3655	3651	3654	3640	3623
2003	3648	3655	3649	3652	3660	3677	3683	3712	3717	3745	3765	3757	3693
2004	3767	3802	3859	3908	3956	3996	4013	4027	4102	4129	4128	4123	3984
2005	4112	4116	4127	4168	4189	4195	4197	4210	4242	4265	4312	4329	4205
2006	4335	4337	4330	4335	4331	4340	4356	4359	4375	4431	4462	4441	4369
2007	4432	4432	4411	4416	4475	4471	4493	4512	4533	4535	4558	4556	4485
2008	4557	4556	4571	4574*	4599	4640	4723	4733	4827	4867	4847	4797	4691
2009	4782	4765	4767	4761	4773	4771	4762	4768	4764	4762	4757	4795	4769
2010	4800	4812	4811	4816	4858	4888	4910	4905	4910	4947	4968	4974	4884
2011	4969	5007	5010	5028	5035	5059	5074	5091	5098	5104	5113	5115	5059
2012	5115	5122	5144	5150	5167	5170	5184	5204	5195	5203	5213	5210	5174
2013	5226	5246	5249	5257	5272	5286	5281	5277	5285	5308	5317	5326	5278
2014	5324	5321	5336	5357	5370	5375	5383	5390	5409	5439	5469	5480	5387

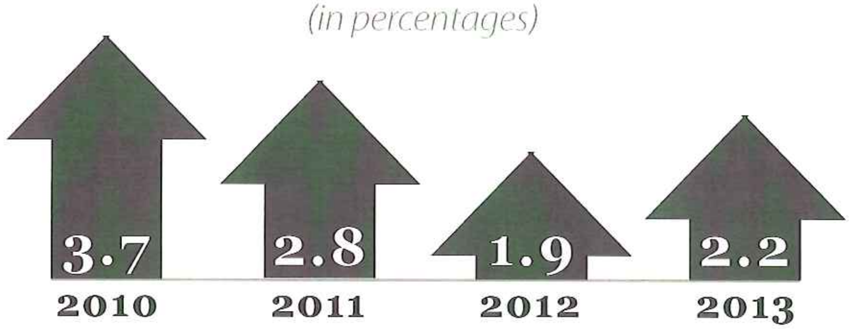
Data reprinted by permission *Engineering News-Record* – ENR.com

There were several monthly declines in the ENR index from late 2008 through early 2010, but the annual average has gone up every year for 70 years. More importantly, from Q2 2008 through much of 2011, during the only recent period of true deflation, the ENR-BCI would indicate a 10% cost increase! The actual final cost of buildings, documented by several reliable measures, from Q2 2008 through Q4 2010 went down by 8% to 13%.

Whenever we have very active periods or very depressed periods of construction activity, contractor selling prices rise or fall accordingly, and since it does not track selling price, the ENR-BCI cannot reflect accurately what effect selling price had on the cost of buildings during those periods. Nonetheless, the ENR-BCI is often relied upon as an indicator of cost movement over time.

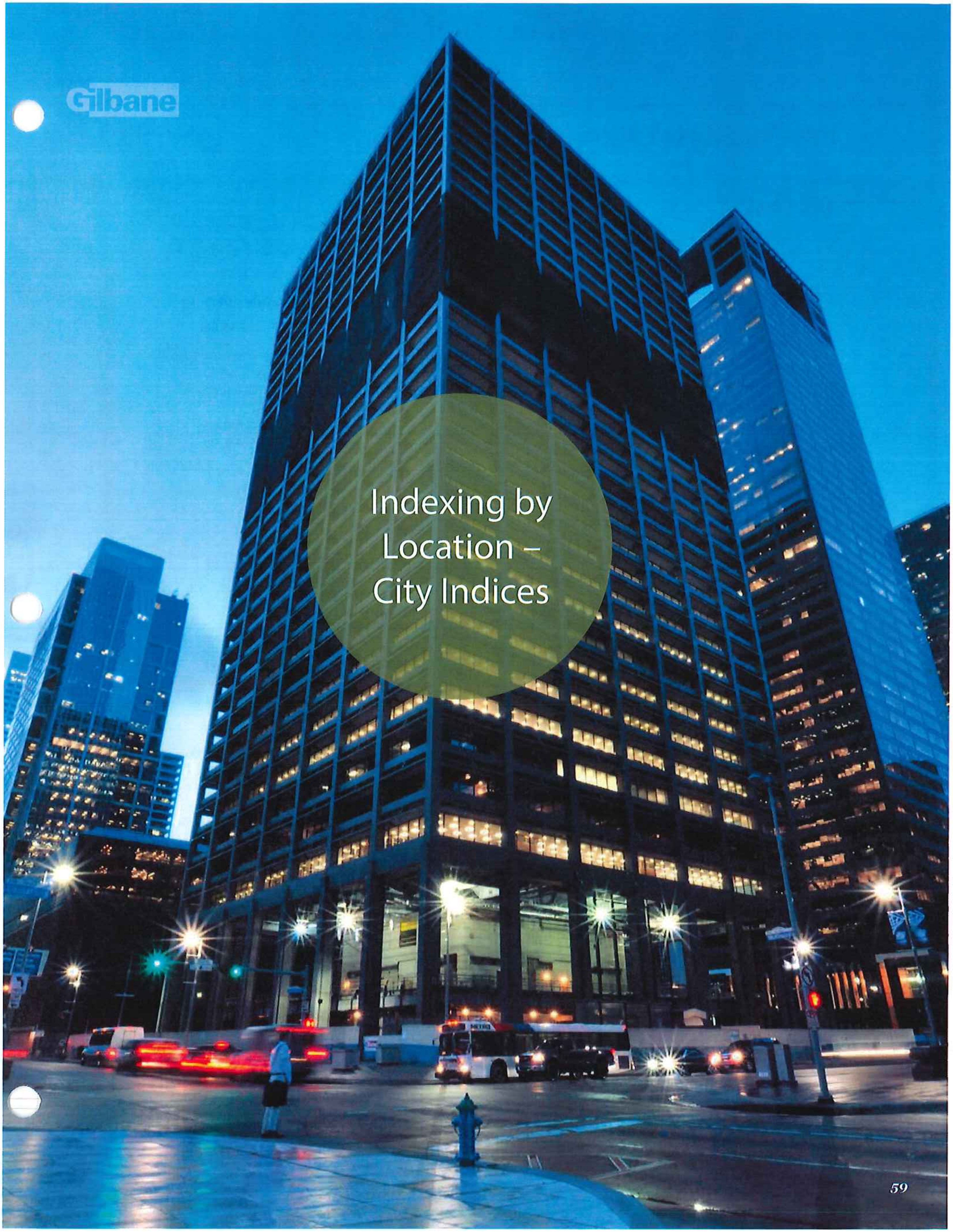
You must take into consideration the selling price of buildings, past and present, if you hope to accurately index the cost of buildings over time.

ENR-BCI Index Fluctuations
(in percentages)



Selling prices are not captured in the ENR Index. For a procedure to adjust for actual selling prices see the "Indexing – Addressing the Fluctuation in Margins" section of this report, and refer to Figure 24 on Page 68: Escalation Growth vs. Margin Cost. This is particularly important for those of you using conceptual cost modeling tools such as the Gilbane CostAdvisor.

Indexing by Location – City Indices



Indexing By Location – City Indices

FIGURE 22:

City Location Cost Index 2013

Equally important as indexing for time is the process of indexing for location. The practice of using historical projects, regardless of location, to get an idea of cost of future projects is quite common. Not only must we move project costs over time, but also we must move location. City indices provide the means to move project costs from one location to another.

Suppose our historical project was built in Phoenix and we wish to determine the cost of a similar project built in Boston.

Assume

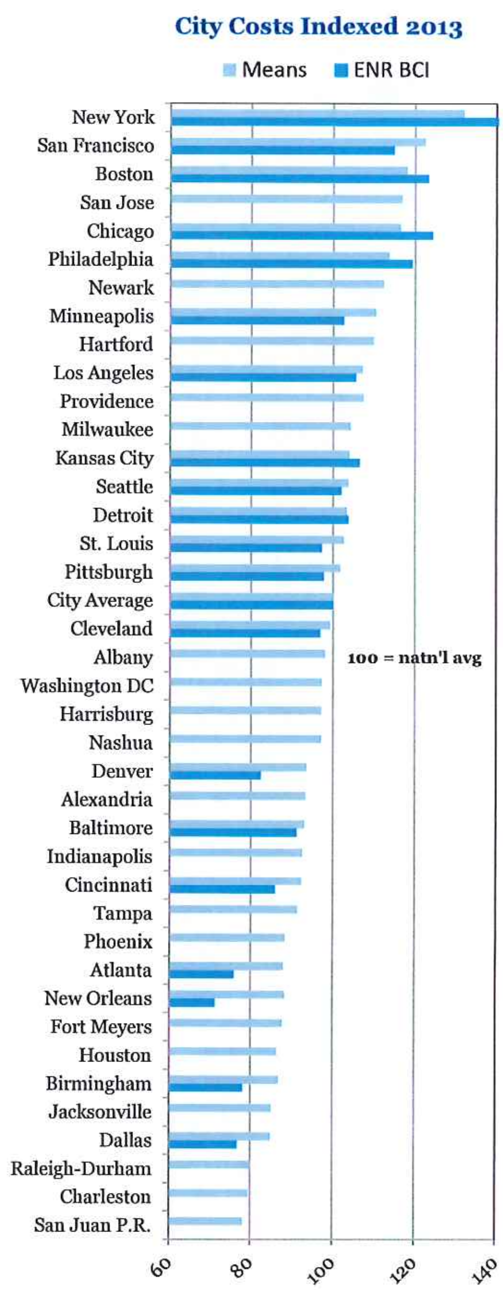
- Project cost as built = $10,000,000
- Boston index = 120
- Phoenix index = 90

Move costs to Boston from Phoenix;
Divide "To" city by "From" city
Multiply original cost by factor.

- Boston / Phoenix = 120/90 = 1.33x
- $10,000,000 x 1.33 = $13,300,000.

Through this example you can see the danger of simply using unadjusted project costs from one location to determine costs in another location. Without adjusting for differences in cost due to location, it is possible to over or under state project costs by substantial amounts.

ENR provides city indices for 20 major metropolitan cities. RS Means annually updates tables for hundreds of cities. The chart here lists 40 major cities from highest to lowest RS Means index. The ENR index is shown for those available.



Selling Price

Selling Price

Selling price is the total price at which a contractor is willing to bid to win a project, even if that selling price eliminates all profit from the bid.

Few inflation or material/labor cost predictors address the issue of bidders raising or lowering margins in bids and hence affecting what is known as selling price. Selling price is dramatically affected by economic conditions such as market volume and contractor booked revenue. When market volume is low, contractor's margin or selling price comes down. As business volume picks up and once contractors secure more work, even if material prices stay low, contractors begin to increase their margins and selling price increases.

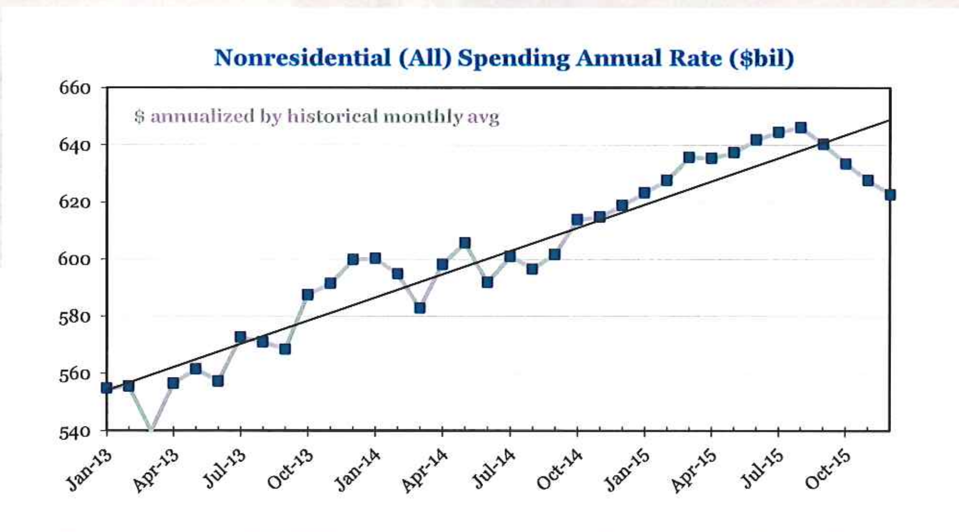
In many areas selling prices are still depressed, and it will take time before workload volumes increase to a point that contractors see a return to normal margins. Nearly 75% of contractors lowered margins in 2010 bids. More than 75% kept margins the same in 2011 or lowered them even more. In 2012 and 2013 we saw margins increasing. The AGC Business Outlook survey for 2014 indicates optimism at a post-recession high. That will lead to increased margins.

We are currently in a growth period as reflected in monthly construction spending. Although the monthly rate of spending took a significant drop in Q1 2013, it returned right back to the normal trend line in Q4 2013. Construction spending is projected to grow by 6% to 10% for the next several years. Although it may be several years before building market activity returns to pre-recession levels, there is clear and strong evidence that the rate of activity is increasing.

Increasing activity leads to higher selling price.

FIGURE 23:

Nonresidential (All) Spending Rate of Growth 2013-2015



Contractors need to recover the cost for all expenses that affect their cost to build. Any cost not recovered is taken as a reduction to margin or reduced selling price. Cost recovered over and above expenses raises selling price and is a growth to margins.

- *On average labor cost represents approximately 35% - 40% of building cost*
- *On average materials cost represents approximately 50% -55% of building cost*
- *Equipment and contractor services represent 10% of building cost*
- *Margins are applied on all 100% of building costs*

Labor wage cost growth is generally 2% to 3% per year. The labor wage cost long-term average is 3%. Labor demand and changes in labor productivity either increases or decreases total labor cost. In growth periods, labor demand tends to increase wages and productivity generally declines increasing overall labor cost.

Materials cost growth is tracked by several reports such as the PPI. Materials costs fluctuate widely, but in general and in times of higher demand material prices go up.

Equipment and services have the least effect on overall project cost. Contractor efficiencies or unusual project conditions may vary this cost.

Margins represent contractor overhead and profit. Selling price includes contractor margins and is market activity dependent. Competition will cause project bid margins to move lower. Increasing volume will allow margins to move higher.

- **If labor wage costs go up by 3%, cost to project = +1.2%**
- **If productivity decreases by 2%, cost to project = +0.8%**
- **If material costs go up by 5%, cost to project = +2.5%**
- **If services costs go up by 5%, cost to project = +0.5%**
- **If margin increases by 1%, cost to project = +1%**

During a period of low volume and competitive pricing (assuming no room for margins to move lower) margins are not increasing. During a period of margin recovery, anticipate a 1% to 1.5% annual increase to margins until margins fully recover.

When we see substantial growth in the volume of projects coming to bid, the need to keep margins reduced will diminish and margins will return to normal. There is no room left for depressed market activity to move margins lower. Expect margins to increase slowly over time.

Margins vary considerably by market and activity within individual markets.

Are Margins Increasing or Decreasing?

Indices like the PPI MTRLS deal only with materials costs or prices charged at the producer level. They do not include delivery, equipment, installation or markups, nor do they reflect the cost of services provided by the general contractor or construction manager.

Total project cost encompasses all of these other costs. Whole Buildings Completed PPI doesn't give us any details about the retail price of the materials used, but it does include all of the contractors costs incurred for delivery, labor for installation and markups on the final product delivered to the consumer, the building owner.

The PPI for construction materials IS NOT an indicator of construction inflation. It is missing the selling price. In 2010, the PPI for construction inputs was up 5.3% but the selling price was flat. In 2009, PPI for inputs was flat but construction inflation as measured by cost of buildings decreased 8% to 10%.

For several years, we have had many construction firms competing for a very low volume of new work. In 2011 and 2012 construction spending, adjusted for inflation to get real volume, reached a 20-year low. There was little work available for bidders, forcing contractors to remain extremely competitive. As a result, contractors had been unable to pass on all cost increases to the owner. This had the effect of keeping selling price low, reducing both contractors and producers margins. In some cases margins may be reduced to a loss just to get work.

I expect whole building costs to rise and remain above material/labor inflation as long as work volume continues to increase.

TABLE 13:

BLS PPI Buildings Completed 2011-2014

US Construction Producer Price Indexes - Nov 2014

Buildings Completed whole building cost	annual for 2014	 2013	 2012	 2011
Inputs to Nonresidential	0.0	.9	.9	5.7
New Nonrsdntl Bldgs	2.2	3.3	1.5	4.0
New Industrial Bldg	2.1	4.1	1.4	3.1
New Warehouse Bldg	2.2	2.9	2.6	3.7
New School Bldg	2.2	3.4	1.2	4.8
New Office Bldg	2.1	2.8	1.2	3.8
New Health Care Bldg	1.8	4.1	-0.5	NA

except inputs, includes labor, material overhead and profit
Source: Producer Price Index. Bureau of Labor Statistics

To analyze the trend in margin movement, we need to combine data from several inputs. Spending data and jobs data provides what we need to determine productivity. Producer Price Index (PPI) gives the cost of materials from the producer but not the cost the contractor charges for the material. Whole building cost gives us the price charged by the contractor to the client, the total cost for all labor, materials, equipment, overhead and profit. Compare all these and we can determine the difference between the costs to the contractor and what the contractor charges. That difference is the margin added to get the selling price.

TABLE 14:

Margins Completed 2011-2014

US Construction Producer Price Indexes - Nov 2014

	annual for			
	2014	**2013**	**2012**	**2011**
MARGINS				
Completed whole building cost	2.4	1.5	2.8	-2.7
Independent Index Avg				
New Nonrsdntl Bldgs	0.2	0.6	2.2	-0.3
New Industrial Bldg	0.2	1.5	2.2	-0.9
New Warehouse Bldg	0.3	0.3	3.4	-0.3
New School Bldg	0.2	0.8	1.9	0.5
New Office Bldg	-0.2	0.1	1.8	-0.1
New Health Care Bldg	-0.2	1.5	0.2	na

(-) margins decreasing (+) margins increasing
All data adjusted for inflation
Source: Producer Price Index. Bureau of Labor Statistics

Margin growth resumed in 2012. Margins moved up and down in 2013 but finished the year positive. The PPI data showed 2014 growth in margins as slowing or even down, but an analysis of independent selling prices shows margins still increasing by over 2%.

The flow of projects coming to bid during the coming months will strongly influence the cost movement of the bids. If the volume of projects coming to bid decreases, overall construction business will remain depressed and bids will remain low, strongly influenced by depressed margins. When we see a continued increase in the volume of projects coming to bid, the need to keep margins reduced will diminish and margins will continue a return to normal.

Indicators are pointing to growth signs, and that will eventually lead to a more normal bidding environment and higher margins.

Indexing – Addressing the Fluctuation in Margins

Indexing – Addressing The Fluctuation in Margins

We often look at the cost of previously built buildings as a historical guide for what to expect in the future. Escalation indices allow us to move the cost of buildings over time. City indices allow us to move for location. To index accurately we need to review margin and productivity movement to determine what effect they might have on current cost compared to current index.

Average costs of buildings from Q2 2008 through Q4 2010 fell by 13% to 15%. However, normal labor/material indices increased by 4% during that time. Normal indices will not account for all changes in individual material costs, wages, productivity changes and margin fluctuations.

Standard labor and material index tables will not address the inflection points in this unusual time period nor will standard labor and material inflation factors address productivity or margin fluctuation. Figure 24 on Page 68, "Escalation Growth vs. Actual Margin Cost", illustrates this unusual period and provides a means to properly account for these unusual occurrences.

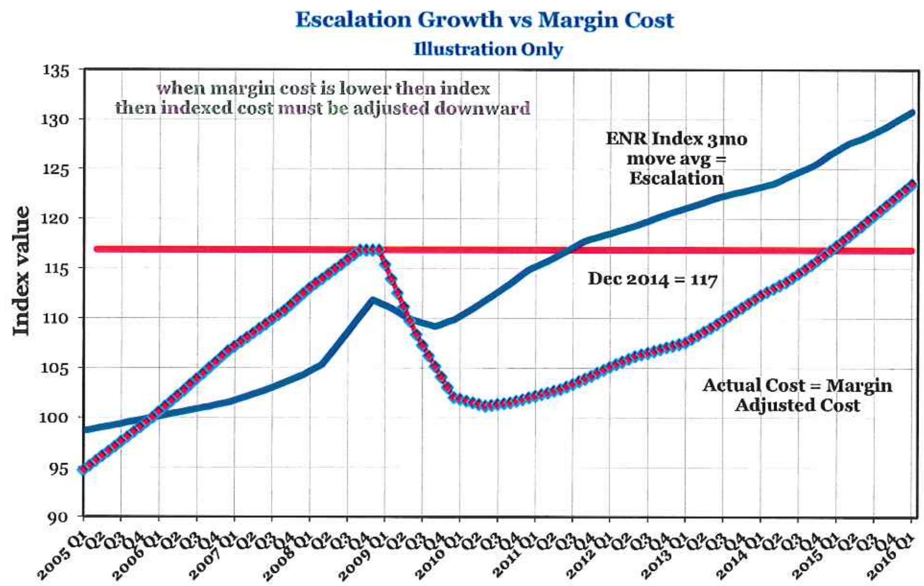
In Figure 24, the blue line indicates ENR-BCI actual values through April 2014 and predicted escalation near 3% over the next two years. The plotted values are three-month moving averages to smooth out the line. The red (thicker) line indicates Contractor Bid Price Movement or Adjusted Margin Cost representative of bids received.

Very low margin cost in mid-2010 reflects contractor bids at low cost to secure a portion of a dramatically reduced amount of available work. Predicted future cost shows long-term cost growth that accounts for both normal labor/material escalation equal to the escalation outlined above and a very slow but steady 0.5% per quarter recovery of margins over the next few years.

> ***"For index accuracy, the careful review of margin and productivity movement is needed to best determine what effect they may have on the current cost."***

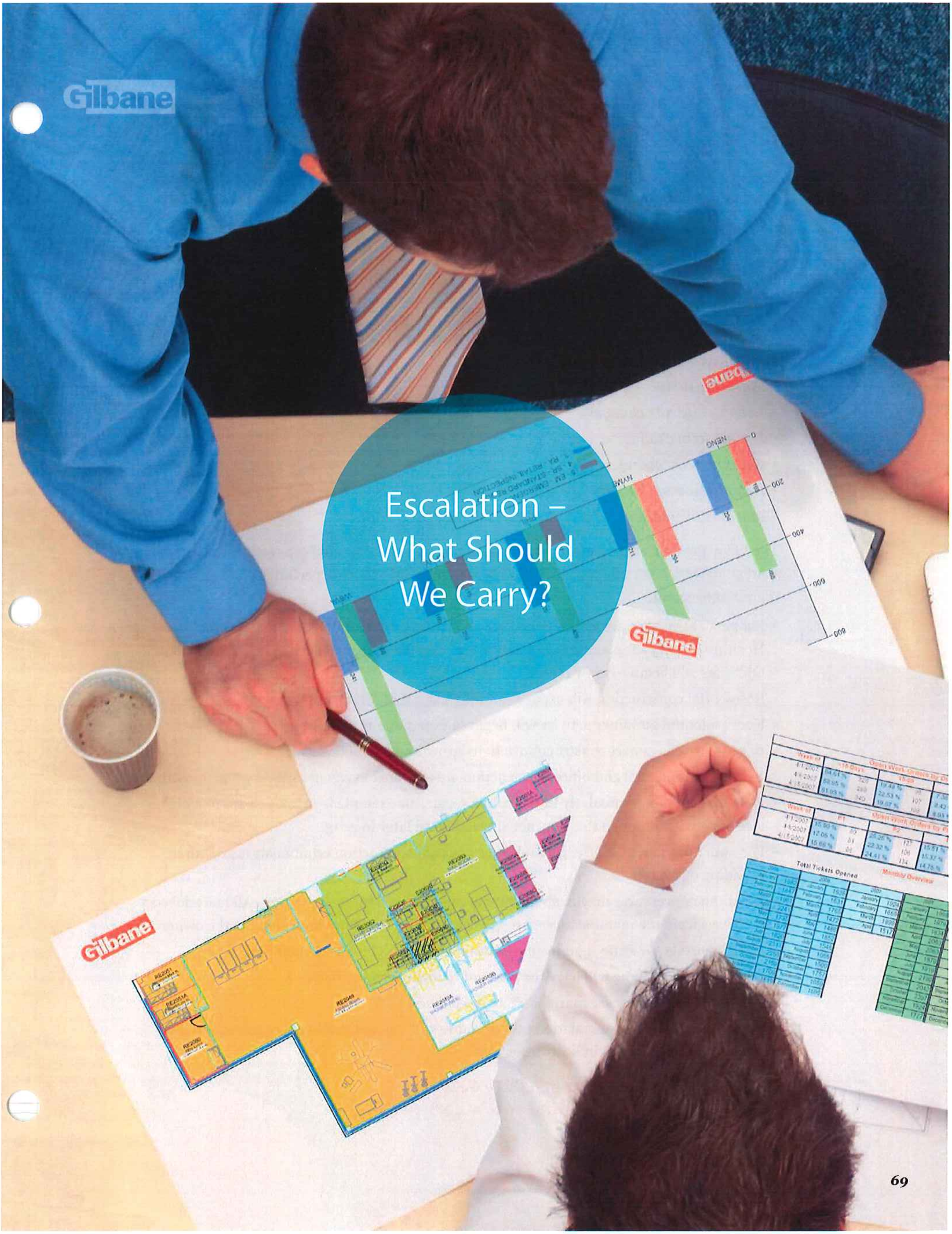
FIGURE 24:

Escalation Growth vs. Actual Margin Cost 2005-2015



How to Use the Above Graph:

- If your project is not previously indexed using ENR-BCI, reference only the Margin index (red line)
- Pick the date for midpoint of the historical reference project
- At that date, draw a vertical line so it passes through both curves
- Now pick today's date
- At that date, draw a vertical line so it passes through both curves
- Record the ENR Index at the historical reference date and today.
- Record the Margin Cost Index at the historical reference date and today.
- Subtract historical ENR index from today's ENR index. Label that value A.
- Subtract historical Margin index from today's Margin index. Label that value B.
- Pay attention to sign (+ or -).
- The difference between the movement due to the ENR index and the Margin Cost Index is the needed correction factor. Use the differences from the ENR Index (A) and the Margin Index (B) to develop an adjustment factor for your project. Since baseline is 100, all factors are the same as percentages.
- B minus A = Margin Adjustment factor. Pay attention to signs (+ or -).
- CostAdvisor users can record the Margin Adjustment value determined here into the Similarity Adjustment factor field. Treat all system indexing and future escalation as you would normally.



Escalation – What Should We Carry?

Escalation – What Should We Carry?

We tend to think of escalation as one simple value. An estimator typically prepares a budget in today's dollars, but then must escalate the total estimate to the midpoint of the project construction schedule. As explained in prior sections, when determining escalation, the value must account for several factors.

Escalation must account for all anticipated differences from today's cost to expected future cost.

To move costs from today's dollars to future dollars, we must account for the cumulative effect of:

- *Market activity*
- *Labor wage rate changes*
- *Productivity changes*
- *Materials cost changes*
- *Equipment cost changes*
- *Margins fluctuations*

The following escalation recommendations are based on the previous analysis of anticipated market activity, labor and material cost movement, productivity expectations and anticipated margin movement.

- Looking at Q4 2014, we expect construction activity growth in most major sectors. Healthcare, education and infrastructure heavy engineering will decline but nonresidential buildings will begin to grow rapidly.
- Residential construction will expand, although at a somewhat slower rate than 2012-2013.
- Nonresidential buildings activity will begin to expand more rapidly.
- In 2015, we can expect construction activity growth in all major sectors.
- In 2015, commercial and office construction are expected to experience very high growth.
- Pent-up demand, particularly in the public sector, for example k-12, may result in a higher rate of activity although this may not show up until later in 2015.
- For both 2015 and 2016, the general consensus of construction economists is growth in spending of 8% to 11%.
- Inflationary pressures may push the rate of material cost increases higher. All material cost increases from the manufacturer through the supplier may be passed along to the owner.
- Labor shortages may be significant resulting in much higher labor retention costs.
- Growing work volume will have the effect of reducing productivity.
- Contractors may increase margins 1% to 2% per year.
- Any assumption of low escalation (3%) requires that market activity does not experience strong growth. All signs indicate otherwise.

Total Escalation for 2014 = 3.5% to 6.5%
Total Escalation for 2015 and 2016 = 4.5% to 8%

Historical labor and material index growth is 75% in 20 years. That is 3.75% simple index growth per year or 2.85% compounded inflation cost growth for 20 years.

Historical as-sold building cost growth is 89% for 20 years. That is 4.45% simple index growth per year or 3.25% compounded inflation cost growth for the last 20 years.

Historical average spending growth is 7% per year (not including 2008 to 2011 when spending declined 35%).

Since the U.S. Census began keeping construction spending records in 1993, we have reached a rate of spending growth over 10% per year only twice and only three other years have exceeded 9% per year growth.

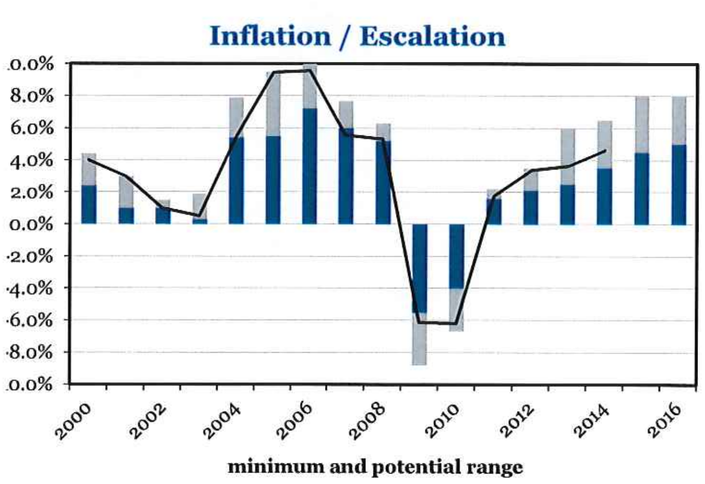
For nonresidential buildings

- In years when spending growth exceeded 10%, as-sold cost escalation was 9% to 11%.
- We may potentially see escalation similar to the growth years of 2005 through 2007 when (for nonresidential buildings) spending grew 43% and escalation averaged 9% per year for three years. All leading indicators point to continued growth for the next few years.

For each year above, consider your market. If you are in a market area or sector that has expectations of a huge volume of work that may start within a narrow window of time, then market pricing can turn rapidly for you.

FIGURE 25:

Inflation / Escalation Minimum and Potential 2000-2016



Prior to economic expansion and then downturn, long-term escalation averaged 3.5% for 20 years. I do not see any scenario which has us return to escalation as low as that long-term average at least for several years beyond the above noted predictions.

Potential inflationary periods, declining productivity and even slight continued margin growth for several years lead me to recommend a minimum long-term escalation beyond 2016 of no less than 4%.

Gilbane Inc. is a full service construction and real estate development company composed of Gilbane Building Company and Gilbane Development Company. The company (www.gilbaneco.com) is one of the nation's largest construction managers providing a full slate of facilities related services for clients in education, healthcare, life sciences, mission critical, corporate, sports and recreation, criminal justice, public and aviation markets. Gilbane has more than 50 offices worldwide with its corporate office located in Providence, Rhode Island.

The information in this report is not specific to any one region. The information is limited to the United States and does not address international economic conditions.

Author Ed Zarenski, a 42-year construction veteran and a member of the Gilbane team for 35 years, managed multi-million dollar project budgeting, owner capital plan cost control, value engineering and life cycle cost analysis. As a construction economics analyst, he compiles economic information and provides data analysis and opinion for this quarterly report.

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This report and the materials contained therein are provided as estimates and projections for what may happen in the future. Information herein is believed to be reliable but Gilbane does not warrant its completeness or accuracy. Gilbane, its related business entities and the author make no guarantee that the projections and expectations will reflect actual future market and industry behavior and the information is used at the reader's own risk.

Data Sources

Along with countless news articles, these sources are used for data in this report:

- American Institute of Architects – www.AIA.org
- American Iron and Steel Institute - Steel.org
- American Recycler - AmericanRecycler.com
- Associated Builders and Contractors - ABC.org
- Associated General Contractors of America - AGC.org
- Bloomberg L.P. Financial News - Bloomberg.com
- Bureau of Labor Statistics - Stats.BLS.gov
- Construction Industry Round Table – CIRT.org
- Data Digest – DataDigest
- Economic Cycle Research Institute - BusinessCycle.com
- Engineering News Record - ENR.com
- Financial Trend Forecaster - Fintrend.com
- FMI Management Consulting - FMINET.com
- IHS Global Insight - IHS.com
- Institute for Supply Management - ISM.ws
- McGraw Hill – Dodge – Construction.com
- Metal Prices – MetalPrices.com
- Producer Price Indexes - BLS.gov
- CMD (formerly Reed Construction Data) - CMDgroup.com
- RS Means - RSmeans.com
- U.S. Census Bureau - Census.gov

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Construction Economics Spring 2015

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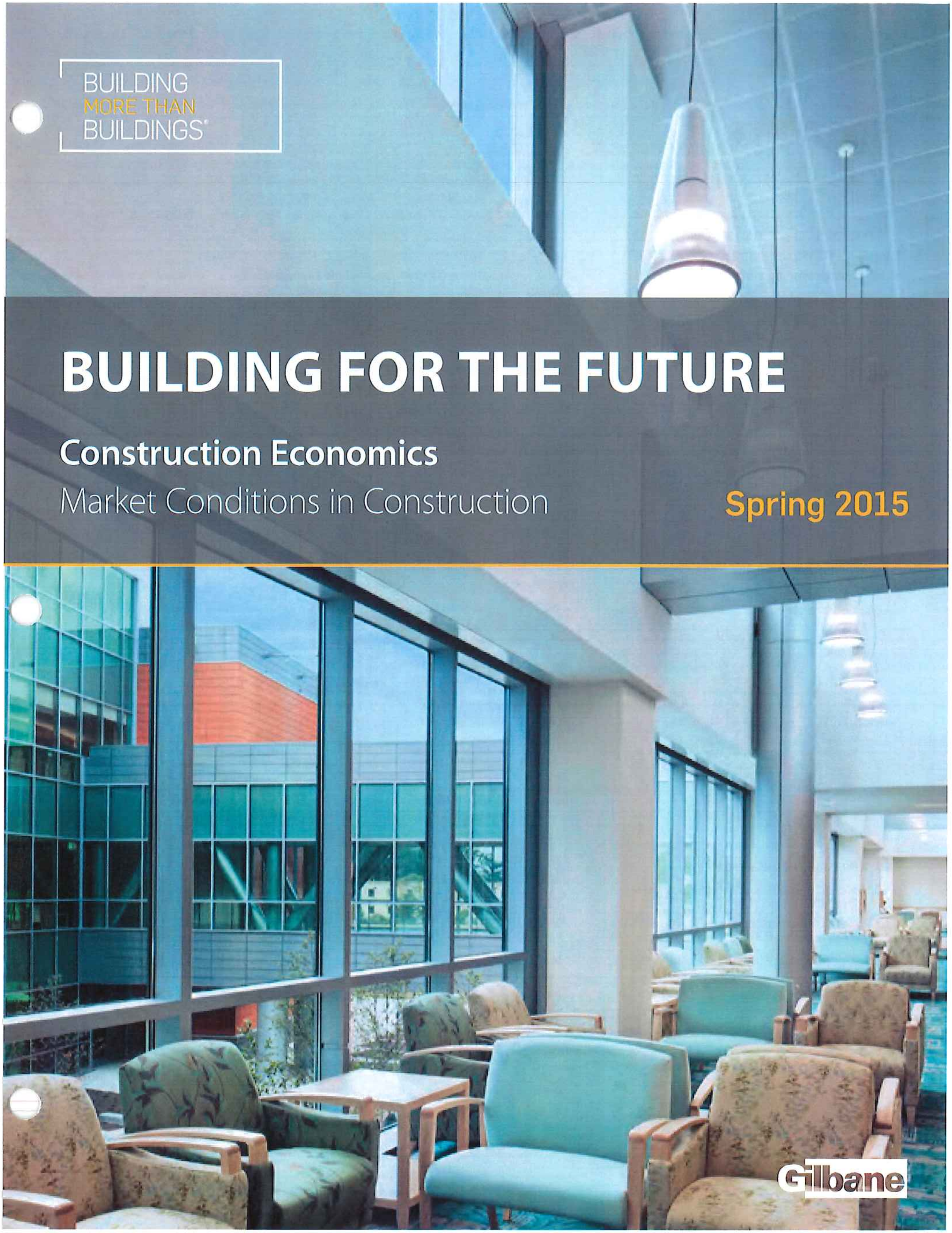

BUILDING FOR THE FUTURE

Construction Economics

Market Conditions in Construction

Spring 2015

Gilbane

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DATA INCLUDED IN THIS REPORT

DDA Construction Starts through February, released March 22, 2015

US Census Construction Spending (Put-In-Place) through February, released April 3, 2015

BLS Construction Jobs through mid-March, released April 1, 2015

Producer Price Index Materials through February, released March 22, 2015

Producer Price Index Markets through February, released March 22, 2015

Architectural Billings Index through February, released March 22, 2015

Dodge Momentum Index through March, released April 9, 2015

Consumer Inflation Index through February, released March 24, 2015

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Summary

CONSTRUCTION OUTLOOK

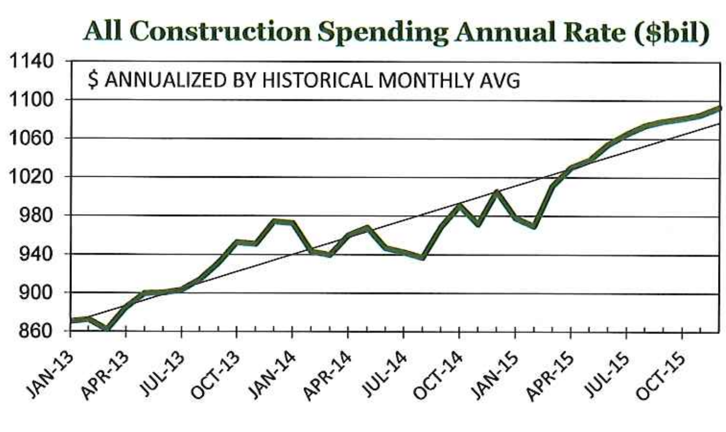
- Nonresidential new starts have been increasing at an average of 16% per year since 2012 lows.
- Nonresidential buildings starts from April 2014 through February 2015 reached the best three-month average and best six-month average since July 2008. Nonresidential buildings starts help predict the spending trend for the next one to two years.
- Even if new starts growth were to turn flat for rest of 2015 (which is not expected), those starts already recorded over the past 12 months indicate spending for nonresidential buildings in 2015 will increase 15% over 2014, the best growth since 2007.
- In the first quarter of 2015, the seasonally adjusted annual rate for all spending will average $980 billion. By year end 2015, it will be $1.080 trillion.
- 2015 spending advances will be supported by the strongest gains in nonresidential buildings spending in eight years. Residential spending will also help total spending advance. Nonbuilding infrastructure spending, after a brief gain, will go flat or decline at least until moderate growth resumes in the fourth quarter of 2015.

Q1 2015 OUTLOOK

$980 billion

Average seasonally adjusted annual rate for all spending in Q1 2015

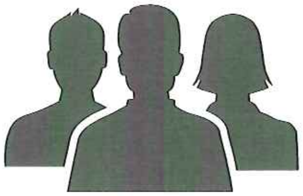
FIGURE A:
All Construction Spending Rate of Growth 2013-2015



Total spending for all types of construction will grow 9% year over year from 2014 to 2015. The year started at an annual rate of spending near $980 billion and should finish at a rate of $1.08 trillion.

As expected, nonresidential buildings contributed to the dips in March and June of 2014, but now will help lead the expansion throughout 2015.

RESTRAINTS TO GROWTH

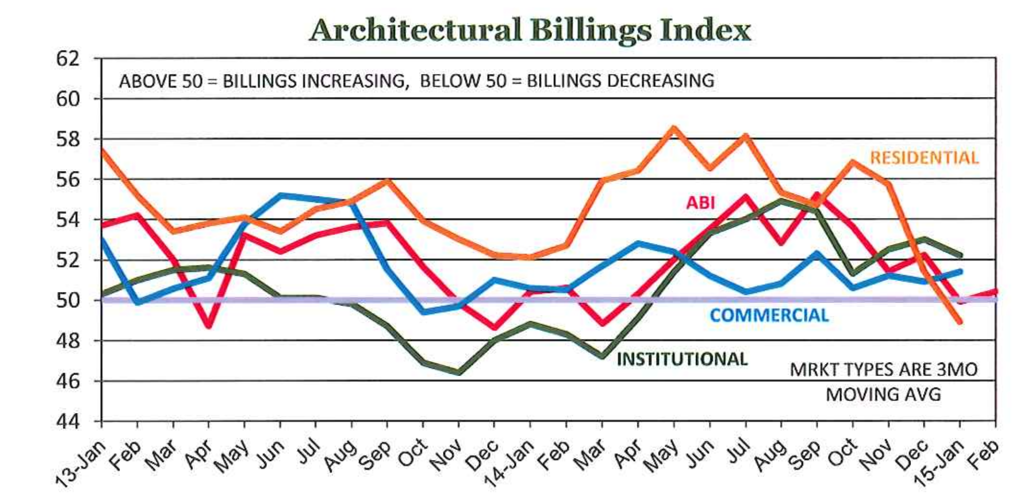


Hiring workers with the right skills will be a key constraint to economic growth in 2015.

- The BLS Job Openings and Labor Turnover Survey (JOLTS) for the construction sector is now at 166,000 unfilled positions. The number of open positions has been over 100,000 for 23 of the last 25 months and is currently increasing. This is a good sign for future hiring, but highlights the importance of workers having the right skills. An increase in job openings generally signifies that employers cannot find people with the right skills to fill open positions.
- In a recent Associated General Contractors (AGC) survey of contractors, 80% indicated some difficulty in acquiring trained workers.
- The period from July 2012 through August 2013 had the lowest average new starts for infrastructure work of any period in the last six years, until the first six months of 2014 went even lower. The effect of all of those low starts will result in constrained nonbuilding infrastructure spending continuing through 2015. Nonbuilding infrastructure starts help predict the spending trend for the next two to three years.
- Housing starts are off to a slow start. In February and March, new starts dropped well below expectations and will hold down totals for 2015. This could have the effect of lowering total residential spending by as much as 2%.

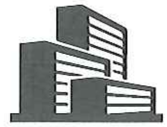
407,000 construction jobs have been gained in 15 months since December 2013.

FIGURE B:
Architectural Billings Index 2012-2014



THE EFFECTS OF RAPID GROWTH

- 407,000 construction jobs have been gained in 15 months since December 2013. At 27,000 jobs per month, that is the third fastest rate of construction jobs growth ever recorded. Only 1998 and 2005 were higher. In that same period, total hours worked also increased, effectively as if we added an additional 60,000 jobs. That's more than a 7% increase in labor, but at the same time there has been less than a 3% increase in volume output. That signifies a decline in productivity.
- As work volume begins to increase over the next few years, expect productivity to decline. There are many reasons why this will occur, among them: working longer hours until new workers are brought on; working more days; hiring less qualified workers; and acclimating new workers to the crew.
- Growth in nonresidential buildings and residential construction in 2014 and 2015 will lead to more significant labor demand. This may lead to labor shortages in some trades. This will drive up labor cost.
- Construction inflation in rapid growth years is much higher than average long term inflation.
- Long-term inflation is 3.3% for nonresidential buildings and is 3.5% for residential buildings.
- During rapid growth, inflation is 8% for nonresidential buildings and is 9% for residential buildings.



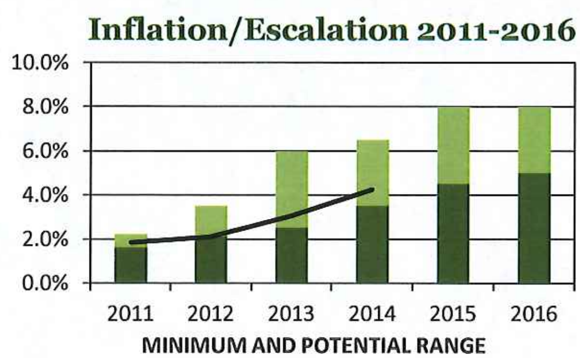
This could be the breakout year for nonresidential buildings. The outlook is for 15% growth in spending. Much of that gain is already recorded in new starts. Escalation will climb to levels typical of rapidly growing markets.

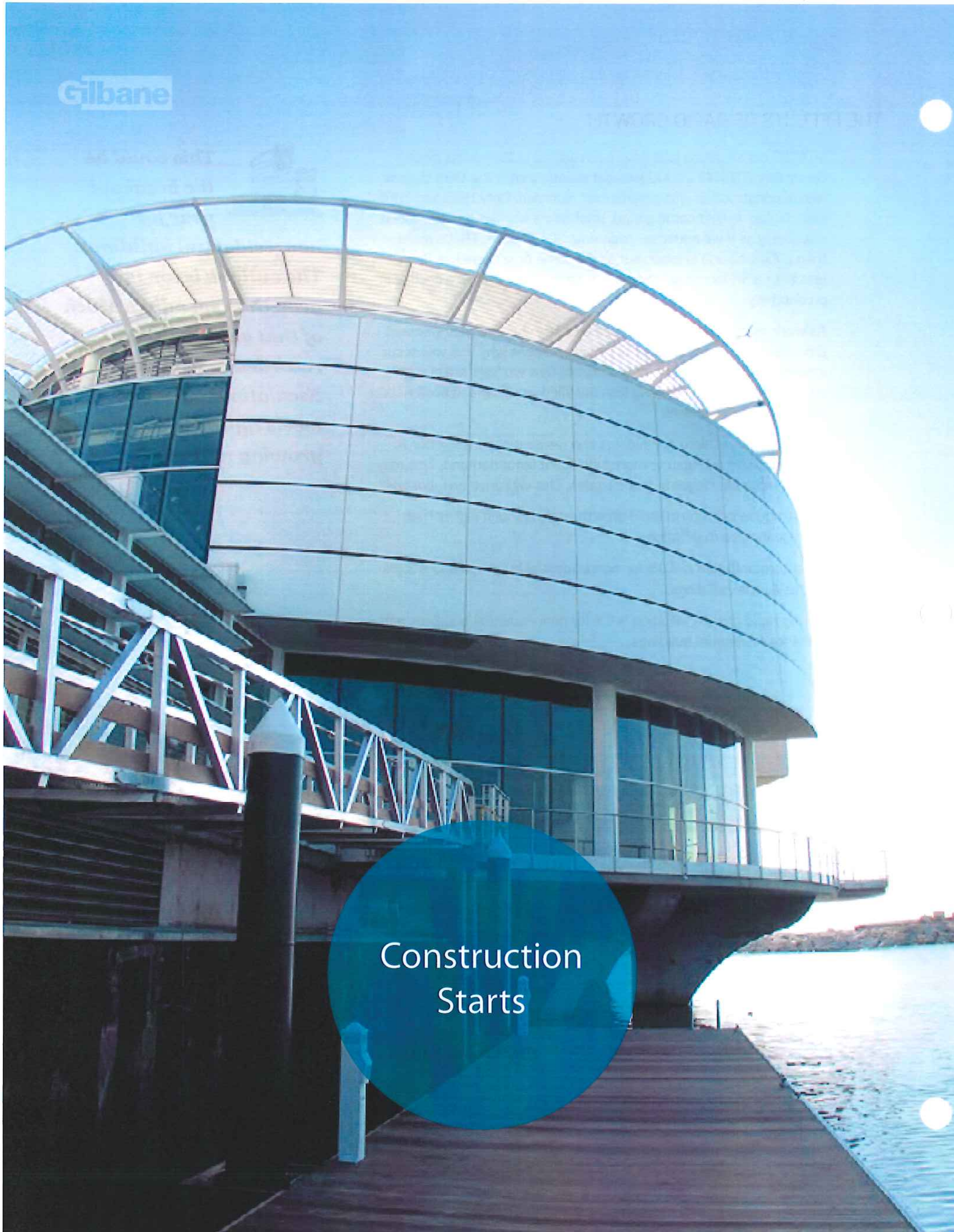
FIGURE C:
Inflation / Escalation 2011-2016

In order to capture increasing margins, future escalation will be higher than normal labor and material cost growth. Lagging regions will take longer to experience high escalation. Residential escalation is currently near, or even above, the upper end of the range.

For escalation back to year 2000, see Figure 29. An advised range of

- 4.5% to 8% for 2015
- 5.0% to 8% for 2016
- minimum 5% for 2017




Gilbane
Construction
Starts

Construction Starts

Construction Starts data is published monthly by Dodge Data & Analytics (DDA). Each month, they update the data for the previous month and for the data 12 months prior. The previous month and year prior updates are incorporated into the charts and tables. Although DDA may publish further updates to its data, this report does not track any data beyond the 12 month update. This may result in values here that differ slightly from other published DDA data.

Construction Starts data is volatile from month to month, and this may cause unusual peaks and valleys in the data. For that reason, a three-month moving average (3mma) of starts data is used. Also, to observe trends in the data, the latest month is compared to the last three months and the last six months of the Seasonally Adjusted Annual Rate (SAAR) data.

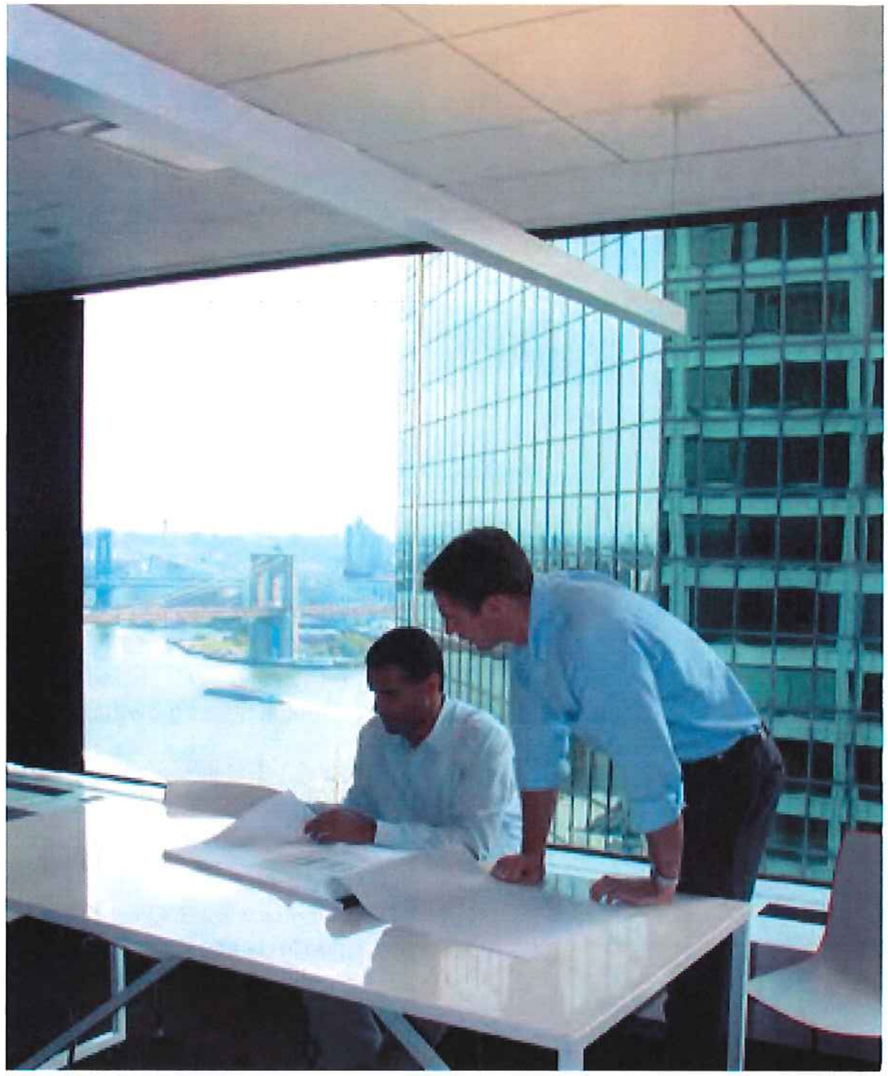
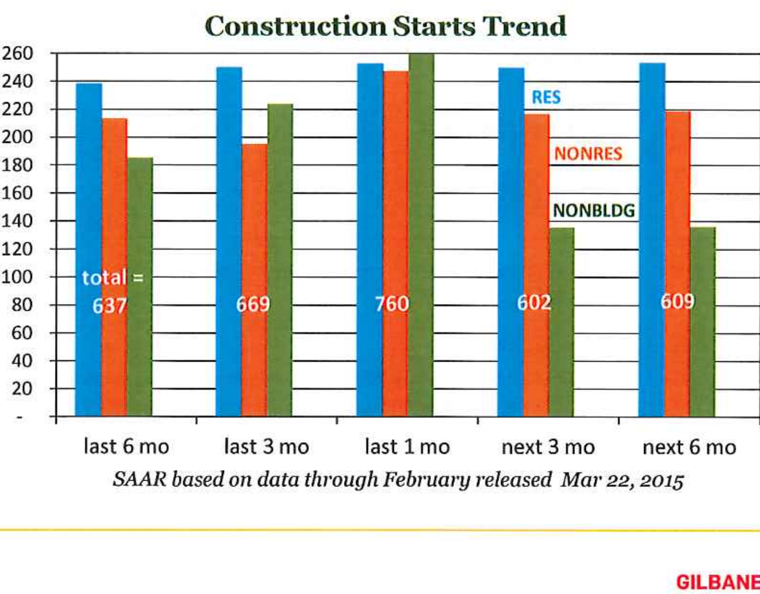


FIGURE 1:
Construction Starts Trends 2014-2015

Residential (Res) starts prior to 2014 showed rapid growth for two years, but then had no growth until Q3 2014. Expect 2015 growth to continue at a slower rate than 2012-2013.

Nonresidential buildings (Nonres) starts hit a 12-month low in February 2014 but reached a six-year high in recent months. Expect growth to moderate over the next three to six months.

Nonbuilding (Nonbldg) starts had been declining from a 2012 peak to mid-2014. Then Q4 2014 was strong and Jan-Feb 2015 posted the highest two month total on record. Expect growth to slow dramatically from Jan-Feb.



EXPECTATIONS FOR 2015 NEW CONSTRUCTION STARTS

- Nonresidential buildings starts help forecast the spending trend for the next one to two years.
- Residential buildings starts help forecast the spending trend for the next 9 to 15 months.
- Nonbuilding infrastructure starts help forecast the spending trend for the next two to three years.
- Nonresidential buildings starts in 2012 reached a 10-year low for two separate three-month periods. The 2012 low starts drove down the spending in 2013. Nonresidential new starts have been increasing at an average of 16% per year since those 2012 lows.
- Nonresidential buildings starts from April 2014 through February 2015 reached the best three-month average twice and the best six-month average once since July 2008. Although growth should continue, expect it will do so at a more moderate rate. Nonresidential starts growth may slow to +7% in 2015.
- Residential starts growth stalled from July 2013 through June 2014, but for the last 5 months (through February 2015) there has been a substantial increase to 24% annual growth. The growth rate is expected to slow and result in 12% total growth for 2015.
- Nonbuilding infrastructure starts for the first six months of 2014 is the lowest on record back to January 2008. For the last quarter of 2014, starts improved to the best in a year. Then in January and February, nonbuilding starts shot up 65% higher than Q4 2014. Nonbuilding starts experienced the most volatility. That rapid growth rate will not continue. But even with a 40% reduction in the next months, it will push total nonbuilding starts up to almost a 15% growth for 2015.

TABLE 1:
U.S. Construction Market Outlook New Starts 2009-2015

Total Construction Starts

	2009	2010	2011	2012	2013	2014	Gilbane Forecast 2015
NONRESIDENTIAL BUILDINGS	167,955	161,194	165,048	158,222	177,362	203,015	218,052
		-4.0%	2.4%	-4.1%	12.1%	14.5%	7.4%
RESIDENTIAL BUILDINGS	111,851	121,155	126,299	166,159	210,325	228,959	256,976
		8.3%	4.2%	31.6%	26.6%	8.9%	12.2%
NONBUILDING CONSTRUCTION	141,899	148,088	147,851	162,823	148,755	135,418	155,500
		4.4%	-0.2%	10.1%	-8.6%	-9.0%	14.8%
TOTAL CONSTRUCTION	421,705	430,437	439,198	487,204	536,442	567,392	630,528
PERCENT CHANGE YOY		2.1%	2.0%	10.9%	10.1%	5.8%	11.1%

dollars in millions
includes Dodge Data Analytics data for February 2015, released March 22, 2015
DDA data includes updates to 12-months ago data through February 2014
all data after February 2015 is predicted

FIGURES 2A, B, C

Note: All DDA Starts seasonally adjusted (SAAR) data is revised one month later, and not seasonally adjusted (NSA) data is revised 12 months later. These plots include both 12-month and one-month adjustments. The vertical lines show the revision month.

FIGURE 2A:
Construction Starts Nonresidential Buildings 2012-2015

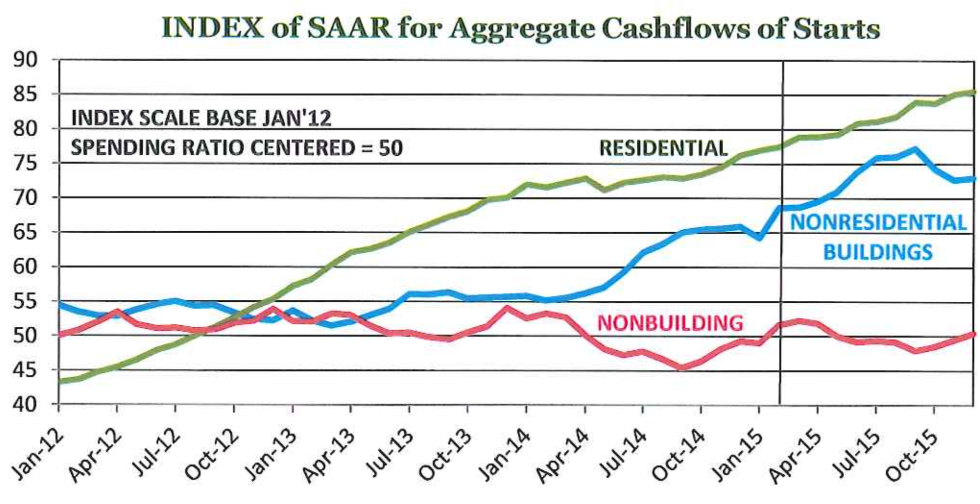
FIGURE 2B:
Construction Starts Nonbuilding Infrastructure 2012-2015

FIGURE 2C:
Construction Starts Residential Buildings 2012-2015

NEW CONSTRUCTION STARTS AS A LEADING INDICATOR

Dodge Data & Analytics' construction starts act as a leading indicator to spending. Starting with the three-month moving average of actual starts, using monthly cash flow, we spread out the value of the new project starts over the expected project duration from start to finish. Generally, project durations can range from six to nine months for small projects and up to 24 to 36 months for very large projects. Project duration and cash flow begins in the month the data is posted. The cumulative cash flow total in the current month from all monthly starts over the last two years shows the relative change in spending caused by change in starts.

FIGURE 3:
Construction Starts – Cumulative Cash Flow of Starts 2012-2015



The cash flow plot shows the slowdown that occurred in residential spending from January to September 2014. A decline in nonbuilding infrastructure projects in 2014 is very clear. For nonresidential buildings work, rapid growth will be seen through most of 2014 leading to a flat period in Q4 2014 before rapid growth resumes in Q1 2015 .

The following index chart (see Figure 4) shows the correlation among nonresidential building starts cash flow, the Architectural Billings Index (ABI), the Dodge Momentum Index (DMI) and actual nonresidential buildings spending. Starts data is from the aggregate cash flow previously explained. ABI and DMI data are moved out to their respective lead times; date and spending is real time. The ABI indicates growth if above 50 and a decline if it drops below 50. The commercial and institutional components of the ABI are shown for reference. Although there may be a one-month to three-month differential, there appears to be a correlation between the ABI and Starts, and they provide an indication of the strength and the direction that spending will move.

ANALYZING THE ARCHITECTURAL BILLINGS INDEX

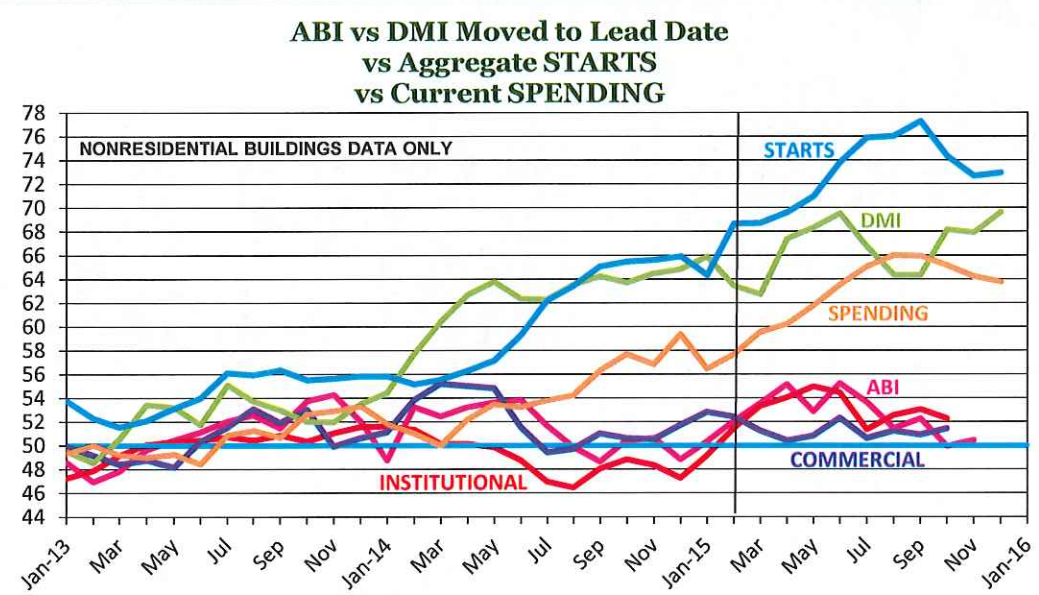
Above indicates growth

50

Below indicates decline

Both ABI and Starts cash flows indicated a mild slowdown in nonresidential buildings construction spending at the end of 2014 before a strong upturn in spending in 2015. Expect another drop in spending late in 2015. However, even if new starts growth were to turn flat for rest of 2015 (which is not expected), those starts already recorded over the past 12 months forecast spending for nonresidential buildings in 2015 will increase 15% over 2014, the best growth since 2007.

FIGURE 4:
Overlay of ABI – DMI – Starts – Spending by Lead Time



Construction Spending

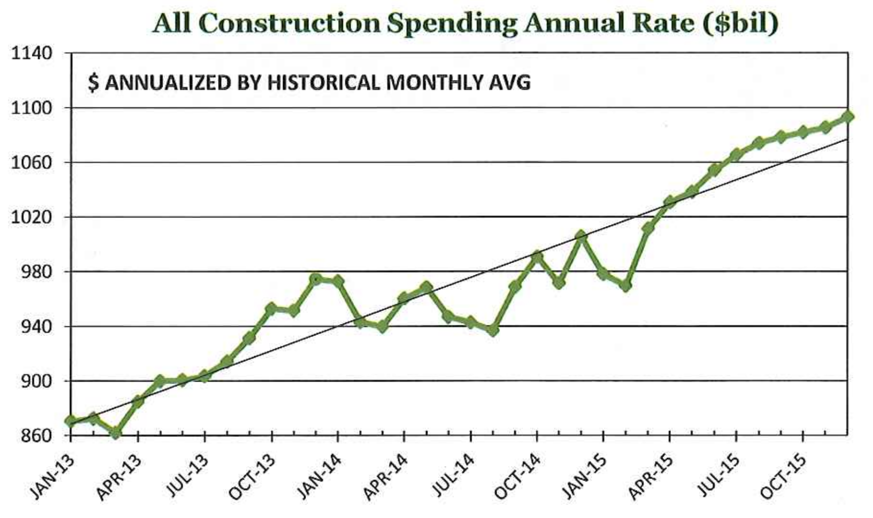
Construction Spending

Total spending for all types of construction in 2015 will reach $1.048 trillion, up 9.1% year over year from 2014 spending.

- 2015 spending will record the highest dollar amount year over year growth in 10 years.
- In Q1 2013, the monthly rate of spending was $870 billion.
- In Q1 2014, the monthly rate of spending averaged $950 billion.
- In Q1 2015, the monthly rate of spending will average $980 billion.
- By Q4 2015, the monthly rate of spending will average over $1.080 trillion.

For 2015, spending gains will be supported by the strongest gains in nonresidential buildings in eight years. Residential spending will also help total spending advance. Nonbuilding infrastructure spending, after a brief gain, will go flat or decline at least until growth returns in the fourth quarter.

FIGURE 5:
All Construction Spending Rate of Growth 2013-2015



The most recent (February) monthly construction spending report posted a slight decline month over month, but the data still show rather good trends. Overall spending was down because the power sector, the second largest sector after residential and the most volatile sector, dropped $4.2 billion (-4.5%), which is more than all other construction sectors combined. Absent the February decline in the power sector, total construction spending would have been up $3.5 billion (+0.4%).

- Manufacturing spending was up $4.5 billion in February, +6.8% month/month and +38% year/year
- Nonresidential Buildings spending is up 11% in a year and year/year growth is accelerating slowly.
- Public spending is up 8.8% in a year and reached the highest level of spending in 11 quarters.
- Total spending 3-month moving average for the last two months is the highest since Q4 2008.

TABLE 2:
Total Construction Spending Summary 2007- 2015

U.S. Total Construction Spending Summary

	TOTALS IN BILLIONS CURRENT U.S. DOLLARS								GILBANE
	Actual								FORECAST
	2007	2008	2009	2010	2011	2012	2013	2014	2015
NONRESIDENTIAL BLDGS	403.9	438.6	377.5	291.9	284.3	300.7	298.5	320.5	369.6
% CHANGE YEAR OVER YEAR	18.9%	8.6%	-13.9%	-22.7%	-2.6%	5.7%	-0.7%	7.4%	15.3%
NONBUILDING HVY ENGR	248.1	272.1	273.5	265.0	251.3	273.7	270.1	285.8	279.9
	19.4%	9.7%	0.5%	-3.1%	-5.2%	8.9%	-1.3%	5.8%	-2.1%
RESIDENTIAL	500.5	357.7	253.9	249.1	252.7	286.8	342.2	354.2	398.7
	-19.3%	-28.5%	-29.0%	-1.9%	1.4%	13.5%	19.3%	3.5%	12.6%
TOTAL	1152.5	1068.4	904.9	806.0	788.3	861.2	910.8	960.6	1048.3
	-1.3%	-7.3%	-15.3%	-10.9%	-2.2%	9.2%	5.7%	5.5%	9.1%

Residential includes new, remodeling, renovation and replacement work.
Source: U.S. Census Bureau, Department of Commerce.
Actual Spending data revised back to 2008 as of June 2014

A comparison of most recent projections is shown in Table 3. Gilbane projections are compared to CMD Group (CMD) and FMI.

CMD Forecast FMI Forecast

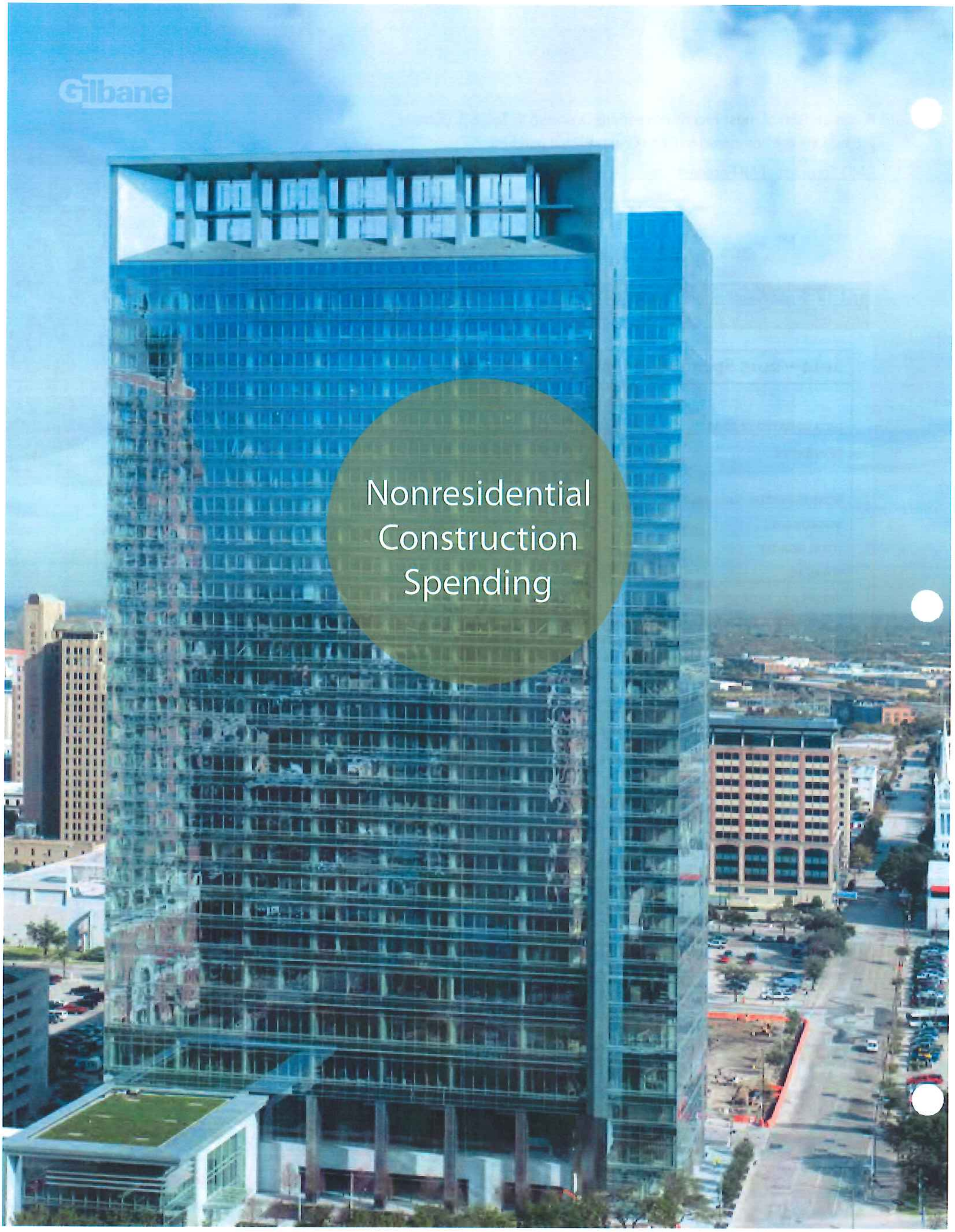
TABLE 3:
Total Spending Predictions Comparisons 2014-2015

2014 – 2015 Spending Predictions Comparisons

DATA UPDATED 12-10-14	2014 ACTUAL	2014 Gilbane	2014 CMD	2014 FMI	2015 Gilbane	2015 CMD	2015 FMI
RESIDENTIAL	**354**	358	365	375	399	413	399
NONRESIDENTIAL BUILDINGS	**320**	318	317	318	370	342	348
NONBUILDING	**286**	283	291	280	281	313	300
TOTAL NONRES	**606**	601	608	598	651	655	648
TOTAL ALL	**960**	959	973	973	1050	1068	1046

VALUES ARE BILLIONS OF DOLLARS

Gilbane data 2014 = Dec2014, 2015 = April2015
CMD data 2014 & 2015 = 12-05-2014 report
FMI data 2014 = Outlook 2014Q4, 2015 = Outlook 2015Q1
FMI Transportation and Communication moved from Buildings to Nonbuilding



Nonresidential Construction Spending

Nonresidential Construction Spending

Nonresidential construction consists of two main categories, nonbuilding infrastructure projects and nonresidential buildings.

Total spending for all nonresidential construction in 2015 will reach $650 billion, up 7.1% year over year from 2014. Growth is entirely due to nonresidential buildings. Nonbuilding infrastructure is expected to decline.

NONBUILDING INFRASTRUCTURE SPENDING

Nonbuilding projects are composed of heavy engineering, heavy industrial and infrastructure projects. They include transportation, communication, power, highway and street, sewage and waste disposal, water supply and conservation and development. Almost 60% of nonbuilding work is public work.

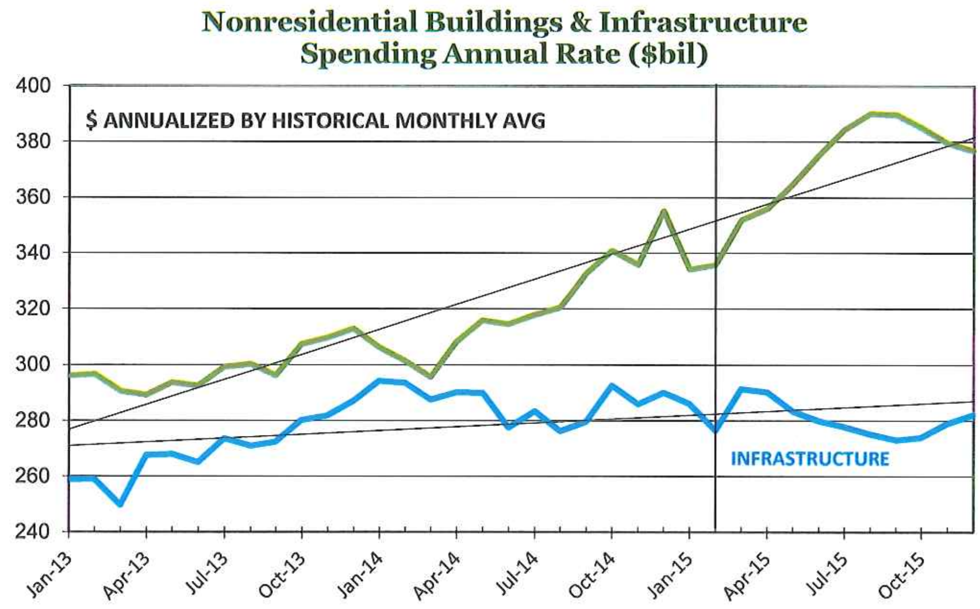
Total spending for nonbuilding infrastructure in 2015 will reach only $280 billion, a decline of 2.1% from 2014.

- In Q1 2013, the monthly rate of spending was $256 billion.
- In Q1 2014, the monthly rate of spending increased to an average $292 billion.
- In Q1 2015, the monthly rate of spending will slip to an average $285 billion.
- By Q3 2015, the monthly rate of spending will drop to $275 billion

The largest components of nonbuilding infrastructure work are power and highway/street. The power sector represents approximately 40% of all nonbuilding spending and highway/street represents about 35%. Erratic movement in new starts in the power industry causes unusual fluctuations in nonbuilding infrastructure spending. The period from July 2012 through August 2013 had the lowest average new starts for infrastructure work of any period in the last six years, until the first six months of 2014 went even lower. The effect of all of those low starts will result in constrained spending continuing through 2015.

In February 2015 the power sector experienced a $4.2 billion decline more than all other construction sectors combined. Power is down 4.5% from January and down 17% from February 2014. By itself, the decline in power dragged total construction spending for February into negative territory. Absent the decline in the power sector, total construction spending for February would have been up $3.5 billion (+0.4%).

FIGURE 6:
Nonresidential Buildings and Infrastructure Spending Growth 2013-2015



NONRESIDENTIAL BUILDINGS SPENDING

The Architectural Billings Index (ABI) marked a decline in design work up to April 2013 that is reflected in lower new nonresidential buildings starts. Spending bottomed at a nine-month low in March 2014. Both the ABI and new starts cash flows indicate nonresidential buildings spending will resume rapid growth through Q3 2015.

Architectural Billings Index

Spending hit
9 month low
March 2014

Total spending for nonresidential buildings construction in 2015 will reach $370 billion, a 15.3% increase from 2014.

- 2015 spending will record the highest dollar amount annual growth since 2007.
- In Q1 2013, the monthly rate of spending was $294 billion.
- In Q1 2014, the monthly rate of spending was $300 billion.
- In Q1 2015, the monthly rate of spending will average $340 billion.
- By Q4 2015, the monthly rate of spending will average $380 billion.

TABLE 4:
Spending Predictions Comparisons – Nonresidential Buildings 2014-2015

2014 - 2015 Spending Predictions Compared - Nonresidential Buildings

DATA UPDATED 8-11-14	LAST ESTIMATE 2014		EARLYESTIMATE 2015	
U S CENSUS FINAL ACTUAL 2014	**320**			
GILBANE BUILDING COMPANY	318	1	370	2
FMI	318	3	348	4
CONSTRUCTION MARKET DATA CMD	317	5	342	7
ASSOCIATED BUILDERS & CONTRACTORS	315	6	330	7
DODGE DATA & ANALYTICS	299	6	352	7
IHS GLOBAL INSIGHT	305	6	357	7
MOODY'S ECONOMY.COM	298	6	360	7
WELLS FARGO	299	6	331	7
		see notes		see notes

Values are billions of dollars

Gilbane data 1 = Dec'14 report, 2= Apr'15 report

FMI 3 = Outlook 2014 Q4, 4 = Outlook 2015 Q1

CMD 5 = Dec'14 report, 7 = AIA Jan 2015

6 = AIA Consensus report July 2014

7 = AIA Consensus report January 2015

FMI Transportation and Communication moved from Buildings to Nonbuilding

TABLE 5:
Percentage of Nonresidential Buildings Spending 2007-2015

Percentage of Nonresidential Buildings Spending

	2007	2008	2009	2010	2011	2012	2013	2014	GILBANE FORECAST 2015
EDUCATIONAL	24.0%	23.9%	27.3%	30.3%	29.9%	28.1%	26.1%	24.4%	22.7%
HEALTHCARE	10.8%	10.7%	11.9%	13.5%	14.0%	14.1%	13.9%	12.2%	11.2%
COMMERCIAL RETAIL	22.2%	19.7%	14.5%	13.7%	15.1%	15.7%	17.1%	17.8%	17.4%
OFFICE	16.2%	15.6%	13.8%	13.0%	12.7%	12.6%	12.6%	14.0%	14.2%
MANUFACTURING	10.1%	12.3%	15.3%	14.1%	14.3%	15.9%	16.1%	17.2%	17.2%
TOTAL	83.2%	82.2%	82.8%	84.6%	85.8%	86.5%	85.8%	85.6%	82.6%

These five market sectors represent over 80% of all nonresidential buildings spending: educational; healthcare; commercial retail; office and manufacturing.

The major institutional sectors, healthcare and education, both peaked in 2008, with education at an annual rate of $105 billion and healthcare at $47 billion. Education is 80% public while healthcare is 80% private.

Commercial peaked in 2007, while office peaked in 2008. Both declined 50% from their peaks. Commercial is 95% private and office is 70% private.

The manufacturing sector peaked in early 2009 but dropped 50% to hit a five-year low in January 2011. Anticipate that spending on new manufacturing buildings will reach a new high in 2015. Manufacturing is 100% private. See Table 6.

TABLE 6:
Construction Spending Major Nonresidential Markets 2007-2015

U.S. Total Construction Spending

TOTALS IN BILLIONS CURRENT U.S. DOLLARS
Actual

	2007	2008	2009	2010	2011	2012	2013	2014	GILBANE FORECAST 2015
EDUCATIONAL	96.8	104.9	103.2	88.4	85.0	84.6	78.0	78.4	83.8
% CHANGE YEAR OVER YEAR	14.0%	8.4%	-1.6%	-14.3%	-3.9%	-0.4%	-7.8%	0.5%	7.0%
HEALTHCARE	43.8	46.9	44.8	39.3	39.7	42.5	41.5	39.0	41.3
	13.8%	7.1%	-4.4%	-12.3%	0.9%	7.2%	-2.5%	-6.0%	6.0%
COMMERCIAL RETAIL	89.7	86.2	54.7	40.1	42.8	47.3	50.9	57.1	64.2
	16.9%	-3.9%	-36.5%	-26.7%	6.8%	10.6%	7.6%	12.0%	12.5%
OFFICE	65.3	68.6	51.9	37.9	36.0	37.8	37.6	44.7	52.6
	20.4%	5.1%	-24.3%	-27.1%	-4.9%	5.0%	-0.5%	18.9%	17.5%
MANUFACTURING	40.6	54.1	57.9	41.2	40.6	47.7	47.9	55.2	63.5
	24.4%	33.2%	7.0%	-28.9%	-1.5%	17.7%	0.4%	15.1%	15.0%
TOTAL	336.2	360.7	312.6	246.9	244.1	260.0	256.0	274.3	305.4
	32.2%	7.3%	-13.3%	-21.0%	-1.1%	6.5%	-1.6%	7.2%	11.3%

Source: U.S. Census Bureau, Department of Commerce.
includes public and private
Actual Spending data revised back to 2008 as of June 2014

Total spending for educational buildings in 2015 will reach $83.8 billion, a 7.0% increase from 2014, the first substantial increase since 2008.

Public educational projects are funded by tax dollars. Therefore, we may expect a delayed rebound in public educational spending due to future economic reactions. Since Q1 2009, public educational spending has declined 30% from $90 billion to $62 billion, but private educational spending declined only 11% from $19 billion to $17 billion. In the last two years, private educational spending declined 3%, but public spending has returned to positive.

Total spending for healthcare buildings in 2015 is expected to reach $41.3 billion, a 6.0% increase from 2014, yet still 12% below 2008 peak spending.

Total spending for commercial buildings in 2015 should reach $64.2 billion, up 12.5% from 2014, after a 12.0% increase in 2014. These are the largest increases since 2007.

Total spending for office buildings in 2015 should reach $52.4 billion, up 17.5% from 2014, on top of a 19% increase in 2014.

Total spending for manufacturing buildings in 2015 will reach $63.5 billion, up 15.0% from 2014, added to a 15% increase in 2014. Manufacturing spending surged $4.5 billion in February, +6.8% month/month and +38% year/year, potentially setting up to reach an all-time high in 2015.

TABLE 7:
Spending Predictions Comparisons – Major Nonresidential Markets 2014-2015

2014 - 2015 Spending Prediction Comparisons
Selected Nonresidential Buildings

GROWTH CHANGE 2014 VERSUS 2013	EDUCATIONAL	HEALTHCARE	COMMERCIAL	OFFICE	MANUFACTURING
DATA UPDATED 12-10-14	2014	2014	2014	2014	2014
ACTUAL 2014 TOTAL AS OF MARCH 1, 2015	**0.5%**	**-6.0%**	**12.0%**	**18.9%**	**15.1%**
GILBANE BUILDING COMPANY	0.9%	-6.5%	10.0%	17.0%	13.7%
CONSTRUCTION MARKET DATA (CMD)	0.2%	-7.1%	10.2%	18.2%	12.6%
FMI	0.6%	-1.1%	13.5%	9.9%	11.0%
ASSOCIATED BUILDERS & CONTRACTORS (ABC)	-1.0%	-6.7%	9.6%	18.4%	11.0%
DODGE DATA & ANALYTICS (DDA)	-1.9%	-4.6%	9.0%	15.2%	7.0%
GROWTH CHANGE 2015 VERSUS 2014	EDUCATIONAL	HEALTHCARE	COMMERCIAL	OFFICE	MANUFACTURING
DATA UPDATED 4-1-2015	2015	2015	2015	2015	2015
GILBANE BUILDING COMPANY	7.0%	6.0%	12.5%	17.5%	15.0%
CONSTRUCTION MARKET DATA (CMD)	5.0%	6.5%	8.9%	5.0%	10.4%
FMI	3.2%	4.4%	15.4%	10.7%	11.3%
ASSOCIATED BUILDERS & CONTRACTORS (ABC)	-1.1%	2.0%	9.1%	10.1%	6.4%
DODGE DATA & ANALYTICS (DDA)	4.0%	1.6%	13.7%	23.5%	14.9%

Gilbane data 2014 = Dec2014, 2015 = April2015
CMD data 2014 = 12-05-2014 report, 2015 = AIA Consensus Jan 2015
FMI data 2014 = Outlook 2014Q4, 2015 = Outlook 2015Q1
ABC data 2014 = Forecast 12-09-14, 2015 = AIA Consensus Jan 2015
DDA data 2014 = AIA Consensus July 2014, 2015 = AIA Consensus Jan 2015

PUBLIC/PRIVATE SPENDING

Total spending for public construction in 2015 will reach $282 billion, an increase of 2.2% from 2014. 2014 ended a four-year decline in public spending.

The largest public construction markets are highway and education. Those two markets alone represent more than half of all public construction, followed by transportation, a distant third, and waste disposal fourth. Together, those four markets account for nearly 75% of all public construction. Education is down slightly, but all together they are up 5%.

Private spending volume is almost two and a half times that of public spending. If we take out residential construction, private spending would be only 25% greater than public spending.

Private construction is predominantly residential. Ninety-six percent of all residential work is private and constitutes just over half of all private work. (A historical note: in 2005-2006, residential work constituted 70% of all private work and more than half of all construction spending). Power (15%), commercial (8%), manufacturing (7%) and office (5%) make up the next largest private building sectors.

Total spending for private construction in 2015 will reach $766 billion, an increase of 11.9% from 2014, although still 17% below the peak of $912 billion in 2006.

The growth in private spending for the last two years has been driven by residential, up 13% in 2012 and 19% in 2013. The industry is starting to see a shift in that nonresidential building in 2014 picked up pace and residential slowed. By 2016, they will contribute almost equally to growth in private spending.

TABLE 8:
Total Construction Spending Public vs. Private 2007-2015

U.S. Total Construction Spending

	TOTALS IN BILLIONS CURRENT U.S. DOLLARS ACTUAL								GILBANE FORECAST
	2007	2008	2009	2010	2011	2012	2013	2014	2015
PRIVATE	863.4	759.7	590.0	502.1	501.9	581.9	641.1	684.6	766.1
% change year over year	-5.3%	-12.0%	-22.3%	-14.9%	0.0%	15.9%	10.2%	6.8%	11.92%
PRIVATE RESIDENTIAL	493.2	350.3	245.9	238.8	244.1	280.6	336.2	348.9	392.7
PRIVATE NONRESIDENTIAL	370.2	409.4	344.1	263.3	257.8	301.4	304.9	335.6	373.4
PUBLIC	289.1	308.7	314.9	304.0	286.4	279.3	269.6	276.0	282.12
	13.1%	6.8%	2.0%	-3.5%	-5.8%	-2.5%	-3.5%	2.4%	2.2%
TOTAL	1152.5	1068.4	904.9	806.0	788.3	861.2	910.8	960.6	1048.3
	-1.3%	-7.3%	-15.3%	-10.9%	-2.2%	9.2%	5.7%	5.5%	9.1%

Source: U.S. Census Bureau, Department of Commerce.
Actual Spending data revised back to 2008 as of June 2014

RESIDENTIAL CONSTRUCTION SPENDING

Total spending for residential construction in 2015 will reach $399 billion, a 12.6% increase from 2014. After two strong years in 2012 and 2013, residential spending increased only 3.5% in 2014.

- In Q1 2012, the monthly rate of spending was $252 billion.
- By Q1 2013, the monthly rate of spending climbed to $318 billion, up 26% from Q1 2012.
- In Q1 2014, the monthly rate of spending was $359 billion, up 13% from Q1 2013.
- In the last three quarters, the monthly rate of spending has averaged only $353 billion.
- By Q4 2015, expect the monthly rate of spending will reach $428 billion.

The rate of growth in residential spending slowed from Q4 2013 to Q4 2104, but it appears the decline stopped and has remained about the same for the last 6 months. Expect rapid growth in the next few months. The average spending rate should grow 20% from Q4 2014 to Q4 2015.

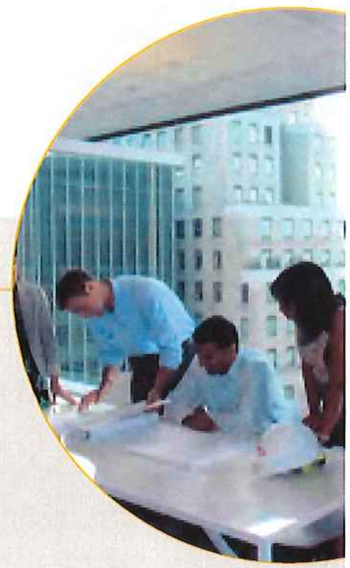
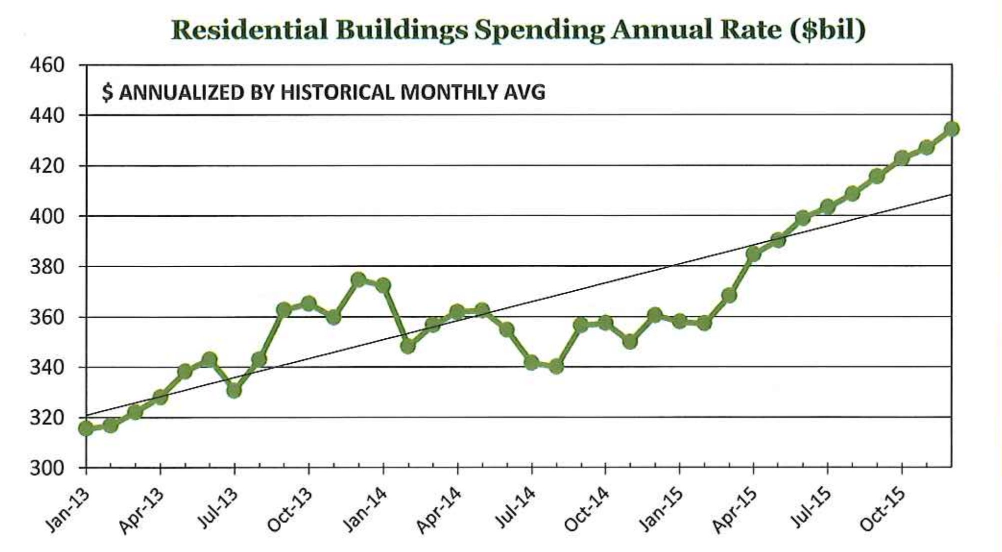


FIGURE 7:
Residential Buildings Spending Rate of Growth 2013-2015

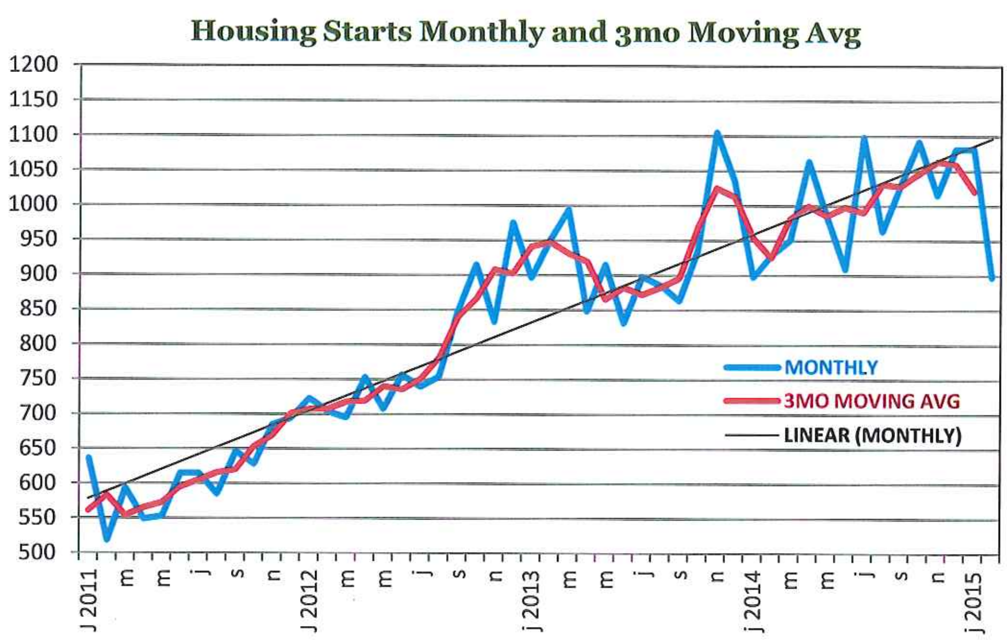


HOUSING STARTS

In January 2014, our report predicted 1,050,000 new housing starts for 2014, growth of only 125,000 new units. That estimate at the time was only in the 20th percentile of all estimates. All estimates had been repeatedly revised lower several times in 2014. By the time October data was released, the prediction was revised to 996,000 units, growth of 71,000. 2014 actually finished with 1,003,000 new starts, growth of 78,000 new units.

In January 2014, there were 14 estimates available for New Housing Starts in 2014 ranging from 1,045,000 to 1,390,000. Only six estimates were 1,100,000 or lower. The 1,390,000 outlier estimate was so unrealistic that it should have been thrown out. The average of all the others was 1,110,000 or expected growth of 185,000 new units over 2013. The industry has only once in the last 30 years achieved such a high growth rate, 186,000 units in 1992.

FIGURE 8:
New Housing Starts Seasonally Adjusted rate 2011-2015



Housing starts highest growth rates in the last 30 years were 186,000 in 1992, 169,000 in 1994 and 172,000 in 2012. A significant note is the 2012+2013 total for 2 years (172,000+144,000) is the highest 2 year total in 30 years.

Permits growth averaged over 6% per quarter for nine quarters through mid-2013. From Q3 2013 through Feb 2015, permits growth is averaging only 1.3% per quarter. Based on the low growth in permits, it was anticipated that starts and spending growth would slow dramatically in 2014. Both new starts and spending did slow considerably, with anticipated pickup in 2015.

Early estimates available for New Housing Starts in 2015 include three estimates that are 1,300,000 or higher, which implies a growth rate of 2 to 3 times the 30-year historical maximum growth rate. Those three estimates should be considered unachievable. The remaining estimates range from 1,100,000 to 1,170,000, with an average of 1,143,000 and are well within the achievable range.

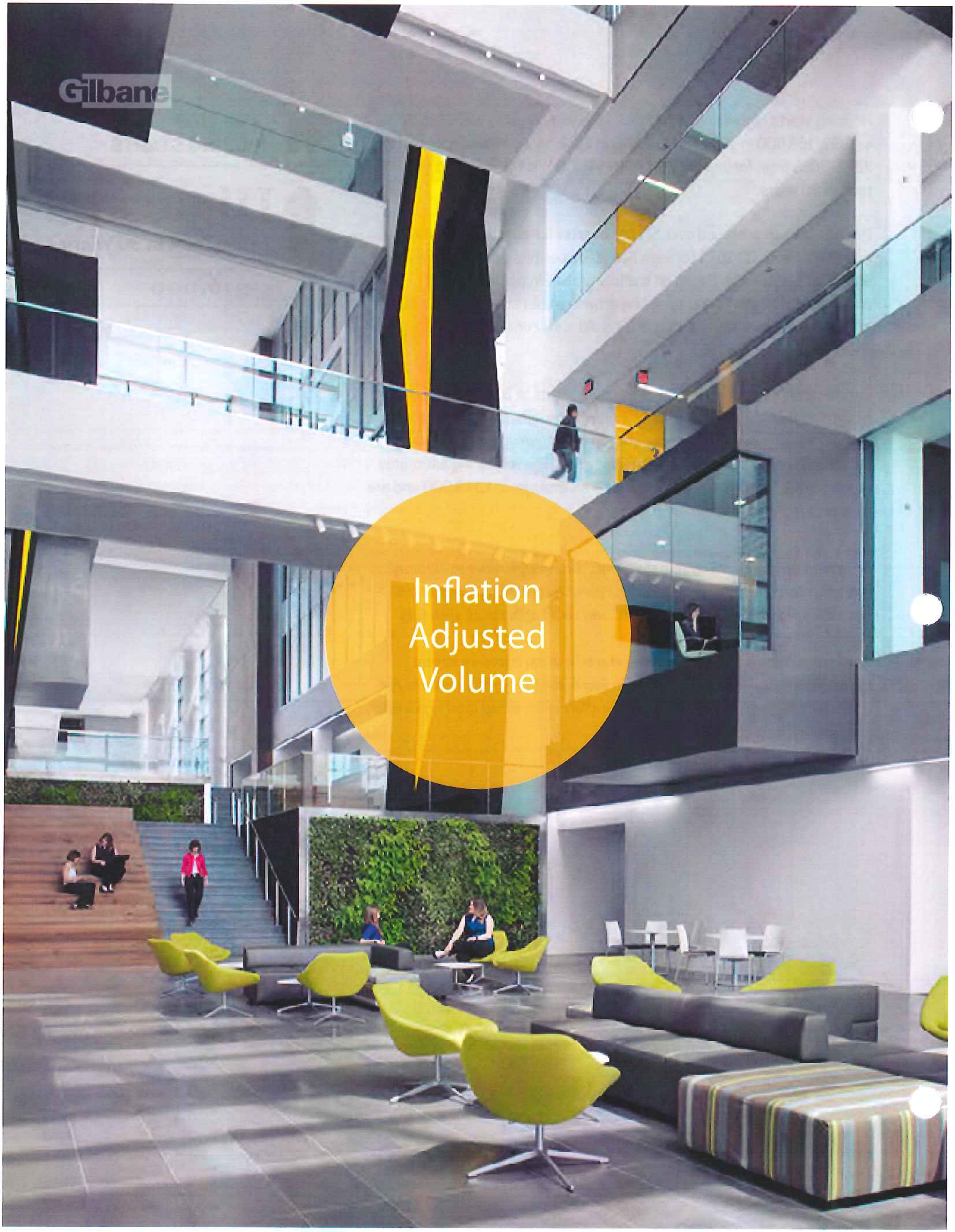
2015 housing starts are off to a slow start. From September to January, monthly starts were fairly consistent. February and March new starts have dropped well below expectations and could affect 2015 spending.

The revised estimate of new housing starts in 2015, based on strong growth from now until year end, is an increase of 120,000 new units for a total of 1,123,000. This could have the effect of lowering total residential spending by as much as 2%.

2012+2013
HOUSING STARTS

Highest
2 Year Total in 30 Years

316,000



Inflation Adjusted Volume

Inflation Adjusted Volume

Real volume can only be tracked by analyzing spending after inflation.

Spending or total revenue is typically reported in unadjusted dollars, or current dollars (for current dollars, see Table 2). Current dollars is a true indication of dollars spent within any given year, but does not give a true comparison of constant dollar volume from year to year. Current dollars are dollars within any given year. Constant dollar is defined as all dollars adjusted for inflation to represent dollars in the year to which they are adjusted, as in this report to 2015. To see a clear comparison of volume from year to year, we must look at inflation adjusted dollars, constant dollars (for constant dollars see Table 9).

If spending increases by 5% from one year to the next, but inflation drives up the cost of buildings by 3% during that same time, then inflation adjusted dollars would show that net volume actually increased by only 2% during that time period.

- Total construction and nonresidential buildings spending reached a bottom in January 2011.
- Total construction spending (revenue) from the 2011 bottom to the end of 2014 grew 22%. For that same period real construction volume grew by only 9%. The rest was inflation.
- Nonresidential construction spending (revenue) from the 2011 bottom until the end of 2014 grew 10%. For that same period, real construction volume declined by 2%. During that period, nonresidential buildings inflation was 12%.

2014 total construction volume just reached back to the level of 1993 in constant dollars. 2015 volume will be just below 1994 & 1995 volume.

Peak volume was fairly constant from 2004 through 2006. In today's constant dollars, peak volume reached $1.30 trillion dollars. 2015 predicted spending is still 20% below peak volume.

- Total construction volume decreased by 35% from 2005 through 2011.
- Residential construction volume decreased by 70% from 2005 through 2010.
- Nonresidential buildings construction volume decreased by 30% from 2008 through 2013.

Historically, volume grows on average less than 3.5% per year. At that rate, it will not return to peak volume before 2020.

Table 9 adjusts total construction spending for construction labor and materials inflation in addition to changes in productivity and in margin costs. All dollars in Table 9 analysis are adjusted to 2015 constant dollars. The rate of inflation each year is determined individually for nonresidential buildings, nonbuilding heavy engineering and residential.

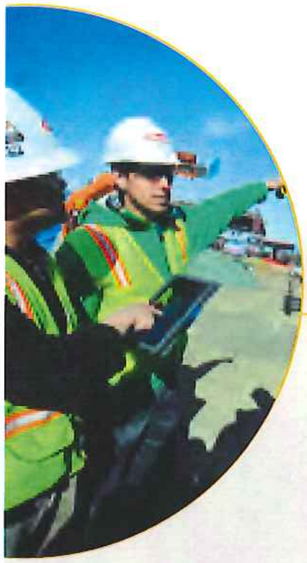


TABLE 9:
Total Construction Spending Summary 2007-2015 (constant 2015$)

U.S. Total Construction Spending - Volume

TOTALS IN BILLIONS U.S. DOLLARS ADJUSTED TO APR 2015 $

	ACTUAL								GILBANE FORECAST
	2007	2008	2009	2010	2011	2012	2013	2014	2015
NONRESIDENTIAL BLDGS	450.9	460.6	423.7	341.5	327.2	339.0	325.1	334.8	369.6
% CHANGE YEAR OVER YEAR	10.3%	2.1%	-8.0%	-19.4%	-4.2%	3.6%	-4.1%	3.0%	10.4%
NONBUILDING HVY ENGR	293.9	297.4	319.4	305.2	280.1	301.9	290.2	298.4	279.9
	12.2%	1.2%	7.4%	-4.4%	-8.2%	7.8%	-3.9%	2.8%	-6.2%
RESIDENTIAL	518.0	398.7	304.5	303.0	314.4	348.6	383.6	371.9	398.7
	-18.5%	-23.0%	-23.6%	-0.5%	3.8%	10.9%	10.0%	-3.1%	7.2%
TOTAL	1262.8	1156.6	1047.6	949.7	921.8	989.5	999.0	1005.2	1048.3
	-3.3%	-8.4%	-9.4%	-9.3%	-2.9%	7.4%	1.0%	0.6%	4.3%

Residential includes new, remodeling, renovation and replacement work.
Source $ Data: U.S. Census Bureau, Department of Commerce.
Indices references: Gilbane margin index, selling price indices, NAHB New Home Price Index, U S Census New Home Price Index, BLS PPI.
see Escalation Growth vs. Margin Cost for inflation/deflation adjusted margin cost

NOT ALL OF REVENUE GROWTH IS REAL VOLUME GROWTH

During the period from 1999 to 2006, total spending increased 55%, but real volume increased only 8%. Inflation accounted for the remainder of the cost growth in that eight-year period.

In the five boom years of constructing nonresidential buildings including 2004 through 2008, spending (on nonresidential buildings only) increased by 53%. However, real inflation adjusted volume increased by only 14%. Total inflation for nonresidential buildings in that five-year period was 38%, an average of near 8% per year.

In eight boom years of residential construction including 1998 through 2005, spending (for residential buildings only) increased by 88%. However, real inflation adjusted volume increased by only 29%. Total inflation for residential buildings in that eight-year period was 59%, an average of near 8% per year.

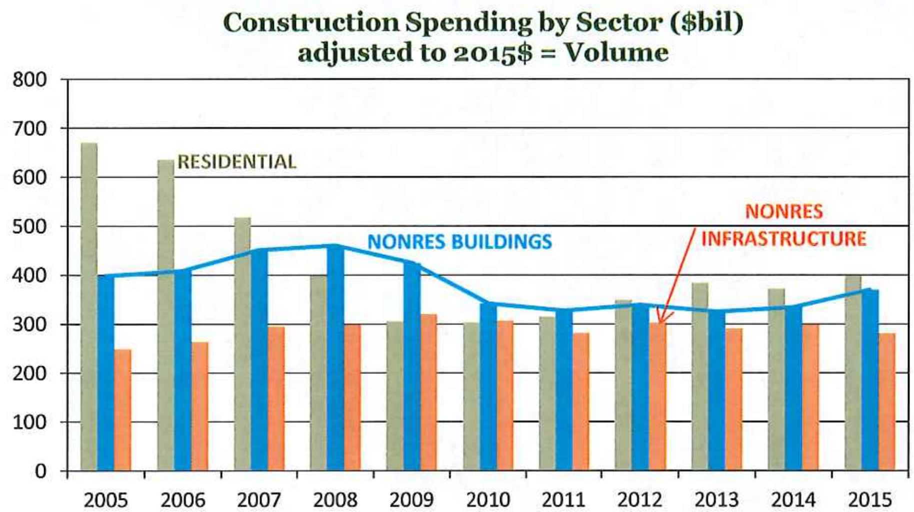
When we look at just the four highest spending growth years for residential construction (2003, 2004, 2005 and 2013) we see inflation for residential buildings in those rapid growth years increased at a rate over 9% per year.

INFLATION IS SIGNIFICANTLY AFFECTED BY RAPID GROWTH?

- Construction inflation in rapid growth years is much higher than average long-term inflation.
- Long-term 20-year inflation for nonresidential buildings is 3.3%
- Long-term 20-year inflation for residential buildings is 3.5%.
- In rapid growth years, inflation for nonresidential buildings is 8%.
- In rapid growth years, inflation for residential buildings is above 9%.

For 2015, expect 9.1% revenue growth, but due to rapidly increasing escalation, 2015 volume growth will be only about 4.3%.

FIGURE 9:
Construction Spending by Sector 2005-2015 (constant 2015$)



WHY IS IT SIGNIFICANT TO ANALYZE BOTH REVENUE AND VOLUME?

Contractor fees are generally determined as a percentage of revenue. However, workload volume determines the size of the workforce needed to accommodate the annual workload. It is valuable to know how many employees were required to accomplish the workload volume based on the past several years of data. From the standpoint of workforce planning, there is not so much concern with the value of the revenue as there is with the volume of the work. There is a bit more to this analysis, and this will be investigated further in the Jobs/Productivity section of this report.

Jobs and Unemployment

Jobs and Unemployment

The number of jobs is tracked as the measure of how many people are currently working to put-in-place the construction spending. The unemployment rate shows how many more people are available to go to work. Both added together shows the size of the workforce. The size of the workforce is important because it tells how many workers are available to draw from for future volume growth.

Table 9 includes both residential and nonresidential construction employment, as well as all trades and management personnel. The BLS suggests not using any single month but instead looking at long term trends in the data.

407,000 jobs were gained in 15 months since December 2013. Those 27,000 jobs per month is the third fastest rate of construction jobs growth ever recorded. Only 1998 and 2005 were higher.

TABLE 10:
Construction Employees All 2004 through March 2015

INDUSTRY: CONSTRUCTION
DATA TYPE: ALL EMPLOYEES, THOUSANDS

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YR AVG
2004	6848	6838	6887	6901	6948	6962	6977	7003	7029	7077	7091	7117	6973
2005	7095	7153	7181	7266	7294	7333	7353	7394	7415	7460	7524	7533	7333
2006	7601	7664	7689	7726	7713	7699	7712	7720	7718	7682	7666	7685	7690
2007	7725	7626	7706	7686	7673	7687	7660	7610	7577	7565	7523	7490	7627
2008	7476	7453	7406	7327	7274	7213	7160	7114	7044	6967	6813	6701	7162
2009	6567	6446	6291	6154	6100	6010	5932	5855	5787	5716	5696	5654	6017
2010	5580	5500	5537	5553	5520	5516	5508	5524	5501	5508	5506	5467	5518
2011	5432	5458	5476	5492	5516	5527	5547	5552	5588	5585	5588	5612	5531
2012	5629	5629	5628	5627	5608	5623	5632	5641	5649	5668	5684	5724	5645
2013	5746	5798	5815	5813	5833	5856	5854	5866	5893	5918	5953	5937	5857
2014	6006	6032	6062	6103	6114	6121	6152	6169	6191	6201	6231	6275	6138
2015	6316	6345	6344										

U.S. Bureau of Labor Statistics - 2009 through 2013 data was revised February 7, 2014.

The unemployment rate in construction is now at 9.5% after hitting a low of 6.4% in October 2014. Unemployment is seasonal, so it is normal for January/February/March to be higher than September/October/November. However, compare Jan-Feb-Mar to the same months in previous years and see that current unemployment is now at a seven-year low. The historical long-term average is between 6% and 8%.

Individually, neither jobs nor unemployment provides us the full picture about the condition of the workforce. The unemployment rate can be headed downward without equally increasing jobs. If the unemployment rate goes down, but there are few gains in the number of new jobs, then the number of people reported still in the workforce has gone down. The workforce can decline because workers have either retired, been discouraged from seeking work and no longer qualify for benefits, or moved on to another profession. For several years, the decline in the construction unemployment rate was almost entirely due to workers dropping out of the workforce.

The reduction in available workers in the workforce will continue to have a detrimental effect on cost and schedule. Without a large volume of available and trained workers in the unemployment pool to draw from, the rate of expansion may be constrained.

The total construction workforce hit a 15-year low in 2013 at about 6.4 million. Currently the workforce is growing and is near 7.0 million, still near a 15-year low, about 1.4 million (~17%) lower than the 2006-2007 peak.

The unemployment rate is not seasonally adjusted. This adds to the short-term fluctuation. The seasonal fluctuation can be seen in Figure 10 where the upper (blue) line shows a repeated annual rise and fall in the unemployment rate. This analysis counts the available workforce or the nonworking pool using the statistical trend line of the unemployment rate.

FIGURE 10:
Construction Jobs vs. Construction Workforce 2005-2014

WORKFORCE SHORTAGES

Some of the workers that were let go, moved on, or dropped out of the workforce had many years of experience and were highly trained. Unfortunately, some will never return. As a result, over the next few years the construction industry is going to be faced with a shortage of skilled, experienced workers. This will have the tendency to *DRIVE COSTS UP* and *QUALITY DOWN* due to the need to pay a premium for skilled workers and the necessity of training new workers in their job and company procedures.

› During periods of high volume and workforce expansion, productivity declines.

› Workforce shortages may force extended work schedules.

The BLS Job Openings and Labor Turnover Survey (JOLTS) for the construction sector is now 166,000 unfilled positions. The number of open positions has been over 100,000 for 23 of the last 25 months and is currently increasing. A relatively high rate of openings, this generally indicates high demand for labor and could lead to higher wage rates.

The job openings rate has been elevated since January 2013. The last time it stayed this high was 2007, leading into the peak of the previous expansion. A big difference is that this time around, we have 1.5 million (or 20%) less workers in the workforce. This is a good sign for future hiring, but highlights the importance of workers having the right skills. An increase in job openings generally signifies that employers cannot find people with the right skills to fill open positions.

5 Year Outlook

↓ ***Skilled Workers***

↓ ***Productivity***

↑ ***Labor Costs***

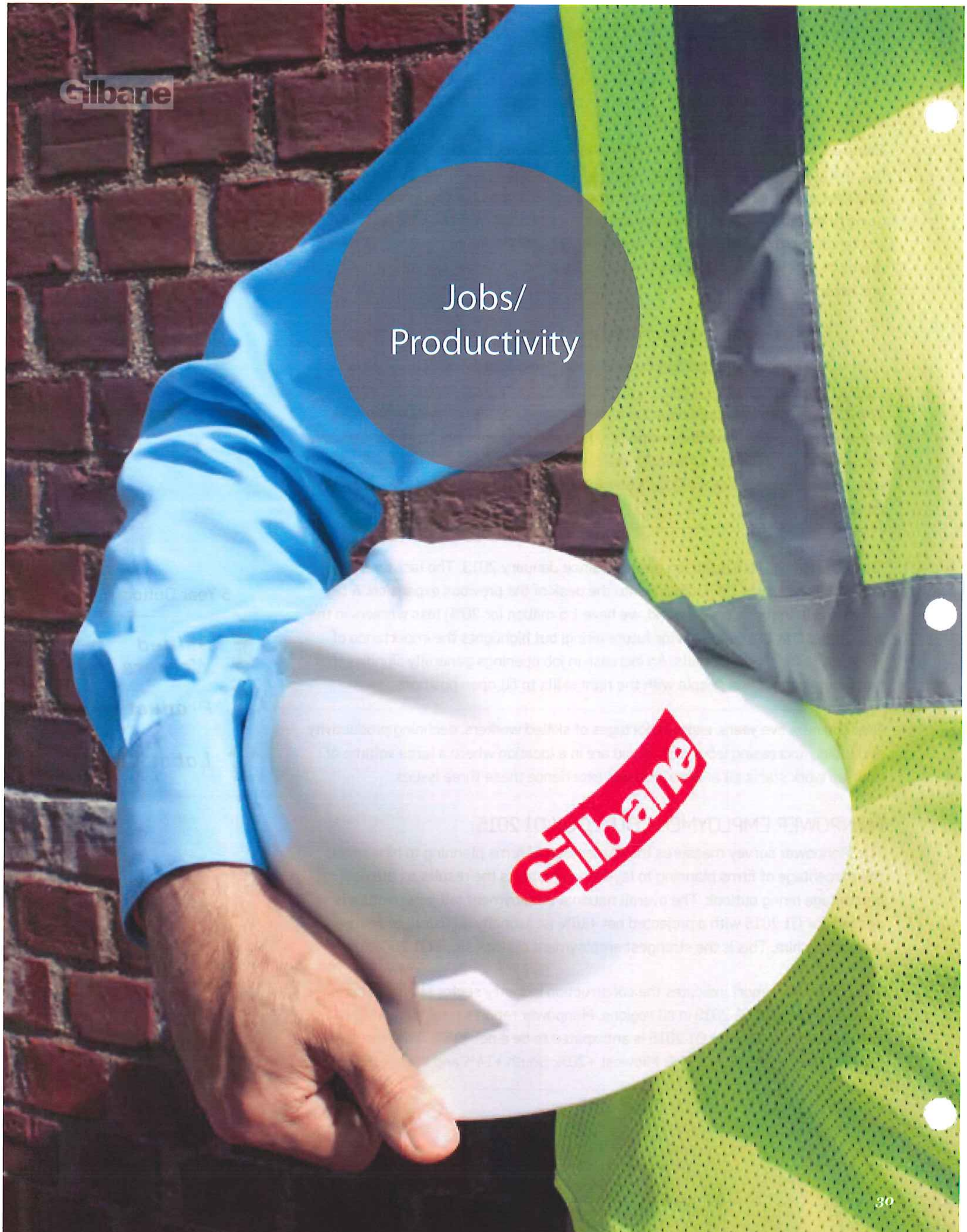
Over the next five years, expect shortages of skilled workers, declining productivity and rapidly increasing labor cost. If you are in a location where a large volume of pent-up work starts all at once, you will experience these three issues.

MANPOWER EMPLOYMENT OUTLOOK Q1 2015

The Manpower survey measures the percentage of firms planning to hire, minus the percentage of firms planning to lay-off, and reports the results as the net percentage hiring outlook. The overall national employment (all jobs) picture is positive for Q1 2015 with a projected net +16% (seasonally adjusted) of firms planning to hire. This is the strongest employment outlook since Q1 2008.

The Manpower report indicates the construction industry sector should experience increased hiring in Q1 2015 in all regions. Manpower reports total hiring in the construction industry for Q1 2015 is anticipated to be a net +15%. The Northeast expects a net increase of +14%; Midwest +20%; South +14% and West +15%.

Jobs/ Productivity

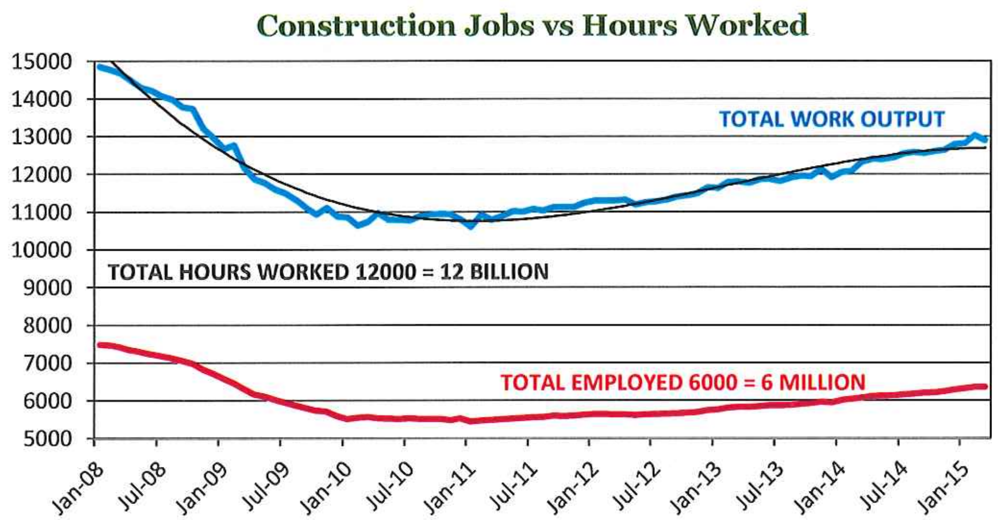


Jobs/Productivity

Productivity is a measure of unit volume per worker output, not dollars put-in-place per worker. To analyze productivity

- Use annual inflation adjusted constant volume, not annual unadjusted current spending.
- Use total work output which takes into account total employed X hours worked

FIGURE 11:
Construction Jobs vs. Total Workforce Hours Worked 2008-2015



The following productivity analysis is based on put-in-place revenues, inflation adjusted to constant 2015 dollars, and compared to actual manpower at average hours worked.

Figure 12 below shows a line plotted for the number of jobs per $1 billion spending unadjusted. That is a result obtained by using unadjusted spending current dollars without considering inflation. The unadjusted analysis does not represent constant dollar volume put-in-place and should not be used to determine productivity.

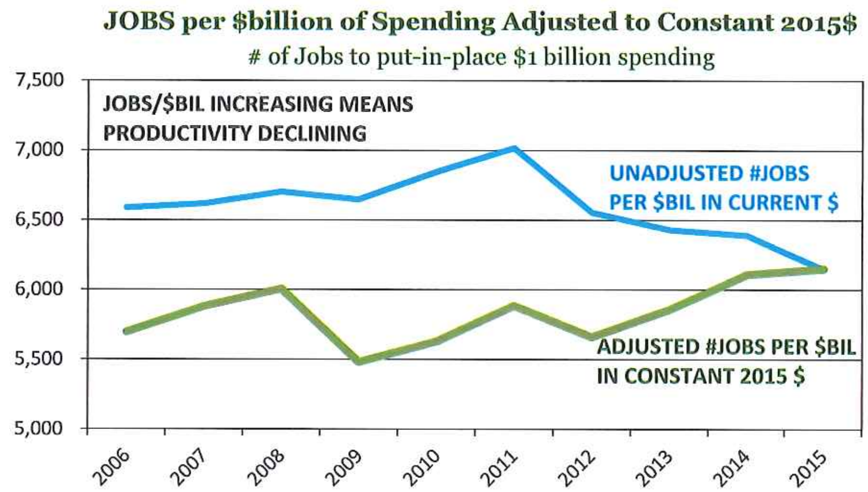
Figure 12 shows a line plotting the number of jobs per $billion in2015 dollars adjusted for inflation.

To explain how significant these differences might be, see the example below for the year 2014.

- Spending increased 5.5%, but after adjusting for inflation volume increased by only 0.6%.
- Jobs increased 3.7% but total hours worked by all employees increased 5.0%.

An unadjusted analysis would compare 5.5% spending growth to 3.7% jobs growth and show an increase in productivity. In reality, the correct analysis shows there was only a 0.6% increase in real volume compared to a 5.0% increase in hours worked. Productivity declined more than 4%.

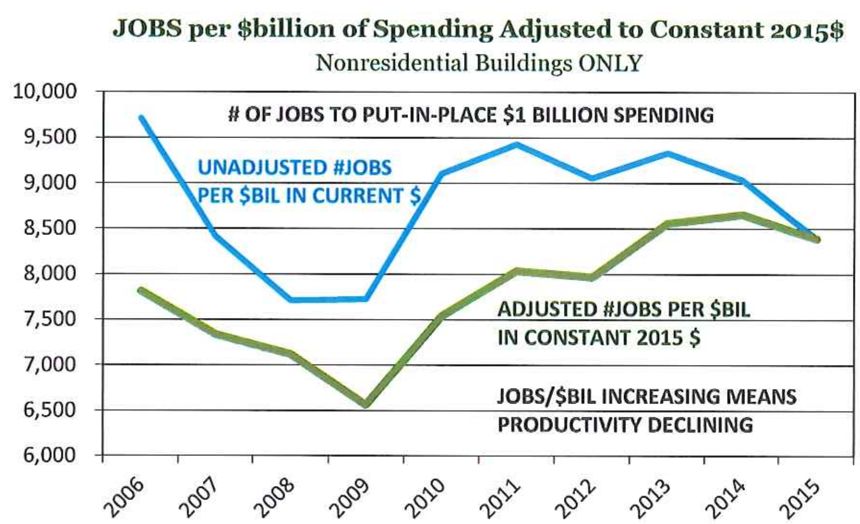
FIGURE 12:
Jobs per $billion 2006-2015 in constant 2015$ All Construction



Since 2012, the number of workers to complete $1 billion of constant volume has increased from about 5.65 million to 6.1 million. That's an 8% loss in productivity in three years.

Figure 13 below plots the exact same type of unadjusted and adjusted data as Figure 12, but represents only nonresidential buildings.

FIGURE 13:
Jobs per $billion 2006-2015 in constant 2015$ Nonresidential Buildings



All data in the previous charts show national averages. On average, $1 billion of spending supports approximately 6,000 construction jobs. In a location where the city cost index is 1.2, it would take $1.2 billion in spending to support 6,000 jobs and in a location where the city cost index is 0.85, only $850 million in spending would support 6,000 jobs.

$1 billion
spending supports
6,000
jobs
(on average)

When spending and jobs are on the decline, and with diminished workload providing no other options, workers and management find ways to improve out of necessity. But at some point, longer hours and additional work burden causes productivity to decline. Also, a return to volume growth results in an easing of performance. It appears the trend began to reverse in 2010. After two years of work output increases, the work output reversed and finally declined in 2011.

As workload begins to increase in coming years, net productivity gains will decline somewhat. This net effect cannot go unaddressed. The results of productivity declines are either decreased total output (if workforce remains constant) or increased workforce needed (if total workload remains constant).

JOBS EXPANSION MUST BE BASED ON VOLUME, NOT REVENUE

Contractor fees are often determined as a percentage of revenue. However, workload volume should be used for planning the size of the workforce. It is valuable to know, from the past several years of data, how many employees were required to accomplish the workload volume.

As an example, at the 2008 peak of construction cost, a building cost $12 million and took 100 men per year to build. In 2010, that same building potentially cost as little as $10 million to build, 20% less. Did it take 20% fewer men per year to build it? No, certainly not. That would be the fallacy of trying to determine jobs needed based on unadjusted revenue.

The building has not changed, only its cost has changed. It still has the same amount of steel and concrete, brick, windows, pipe and wire. Using revenue as a basis, we might be led to think we need 20% fewer workers. However, there is a need to base workers on inflation adjusted volume and productivity, not simply on direct annual revenue.

The rapid workforce expansion during a period of a high level of spending in the last 30 years led to significantly lower productivity.

WORKFORCE EXPANSION

During the most rapid sustained period of jobs expansion in the last 30 years, the workforce grew by 1,000,000 jobs over 36 months, only 15% over three years, resulting in an average of 28,000 jobs per month. Construction spending during that 36-month span increased 12%; however, inflation-adjusted constant dollar volume increased by less than 6%. This was during a period when construction volume reached the all-time peak. Such a rapid workforce expansion during a period of a high level of spending led to measurably significant lost productivity.

If we experience uninterrupted economic expansion at a rapid level during the next few years, it will produce an extremely active market, there will be worker shortages, and productivity will decline. When that occurs, it leads to rapidly increasing prices.

HOW MANY JOBS GET CREATED BY CONSTRUCTION?

Here are some details regarding how many jobs get created for every dollar spent on construction. For further reference, see "Jobs and Unemployment".

HISTORICAL AVERAGE

1 = $165,000

Job 2014 dollars

spent on construction

- Historical averages (adjusted for inflation) since year 2000 show the number of direct construction jobs supported by $1 billion in construction spending varies +/- from 6,000 jobs. That calculates to one job for every $165,000 (in 2014 dollars) spent on construction, or 6.0 to 7.0 jobs per $1,000,000 spent. Direct construction jobs include all Architecture/Engineering/Construction (AEC), but not, for instance, lumber or steel mill product manufacturing.
- In part, the wide variation in the number of jobs created is a result of productivity. In times of increasing work volume activity, productivity declines. In times of decreasing activity, productivity climbs. In 2009, construction activity declined drastically, but jobs declined even more, resulting in an 8% average increase of productivity. Because productivity increased, it took fewer workers to put in place the same volume of work. The net result is that $1 billion in spending supported far less jobs than previous years.
- As work volume starts to increase over the next few years, expect productivity to decline. There are many reasons why this will occur, among them: working longer hours until new workers are brought on; working more days; crowding the work area; hiring less qualified workers; and acclimating new workers to the crew.

There are several studies available, including one by the federal government and one by the Associated General Contractors of America (AGC), that state for every construction job, there are three additional jobs created in the economy. So while $1 billion of building construction may create 6,000 to 7,000 direct construction jobs, overall it generates approximately as many as 28,000 jobs in the economy.

The data in the above charts on jobs, unemployment and productivity includes only jobs counted in the official U.S. Census Bureau of Labor Statistics jobs report. These two recent report references, Pew Research Center – "Share of Unauthorized Immigrant Workers in Production, Construction Jobs Falls Since 2007" and NAHB's HousingEconomics.com "Immigrant Workers in the Construction Labor Force", both document that there is a large unaccounted for shadow workforce in construction. By some accounts 40% or more of the construction workforces in California and Texas are immigrant workers. Immigrants may comprise between 14% and 22% of the total construction workforce. It is not clear how many within that total may be included or not included in the U.S. Census BLS jobs report. However, the totals are significant enough that they may alter some of the results reported above. Future economic analysis in this report will attempt to identify the impacts on put-in-place construction and productivity.


Behind the
Headlines

Behind the Headlines

DECEMBER 2014 CONSTRUCTION SPENDING SMALLEST YEAR OVER YEAR HIKE IN 3 YEARS

Headlines like this always demand the question, why? Reading this, you might think December 2014 was a not such a good month. In fact, Q4 vs Q3 2014 was the strongest quarter to quarter growth since 2005, and ***December was the highest monthly spending since Dec 2008.*** So why was it the smallest year over year hike in 3 years? Because ***December 2013, to which it is being compared, was the most above average month of spending in the last six years.*** See Figure 5.

HOUSING STARTS WILL TOTAL 1,500,000 IN 2015, GROWTH OF 500,000 NEW UNITS

For a baseline, housing starts totaled 1,003,000 in 2014. To reach 1,500,000 in 2015, we would need to add 497,000 more than 2014. Is that achievable? Anything is possible, but it's not likely. Here's why.

In the last 30 years, the highest rates of new housing starts in any given year were 186,000 in 1992; 172,000 in 2012; and 169,000 in 1994. In four of the housing boom years, 2002 through 2005, the average new growth was 116,000 units per year. The 2012+2013 total for two years (172,000+144,000=316,000) is the highest two-year total in 30 years.

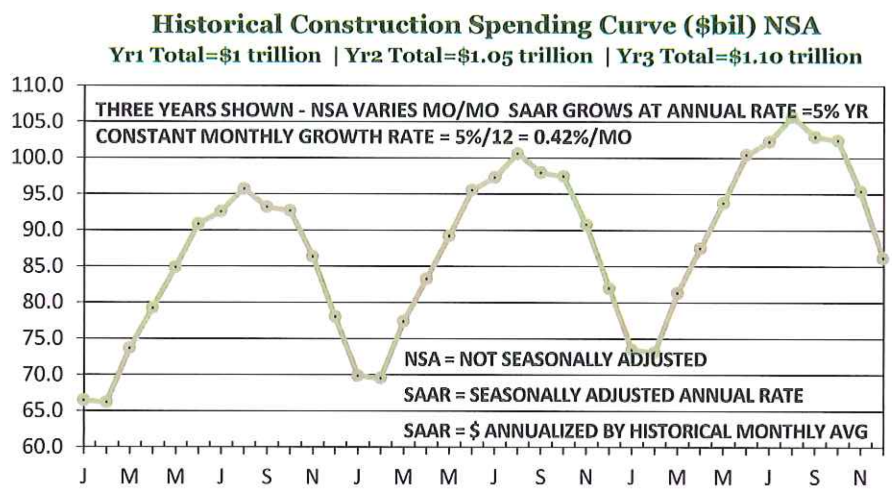
You need to go back to 1983, the last time we exceeded growth of 500,000 new units, but only then after declining 1 million units in four years. Growth of 300,000 units in a year is nearly double the best average growth in the last 30 years. Realistically, in a good year, we will add less than 200,000 new housing starts above the previous year. See Figure 8.

MONTHLY CONSTRUCTION VOLUME HAS BEEN TRENDING DOWN SINCE AUGUST 2014.

The U.S. Census reports two numbers for construction spending every month. The unadjusted actual amount spent in the month which is not seasonally adjusted (NSA) and the annual predicted total based on that monthly amount, or the seasonally adjusted annual rate (SAAR). The news article was referencing the NSA. It also refers to that as volume, but we'll allow that the discussion was referring to volume of dollars spent in a month. The months of June through October are always very busy spending months. The months December through March are the weakest spending months, every year. See Figure 14.

August is statistically the strongest spending month of the year with a real spending volume about 40% higher than January or February. In fact, it is completely normal to see actual monthly NSA spending decline every month from August to February. The NSA monthly rate of change doesn't tell us much. Although the most recent January and February NSA spending is nearly 30% below the preceding August, the SAAR trend is up. ***The SAAR monthly rate of change shows us gains and losses (See Figure 5). Keep track of the SAAR if you want to know if spending is increasing or decreasing. The three-month moving average of spending SAAR for the last two months has been the highest since Q4 2008.***

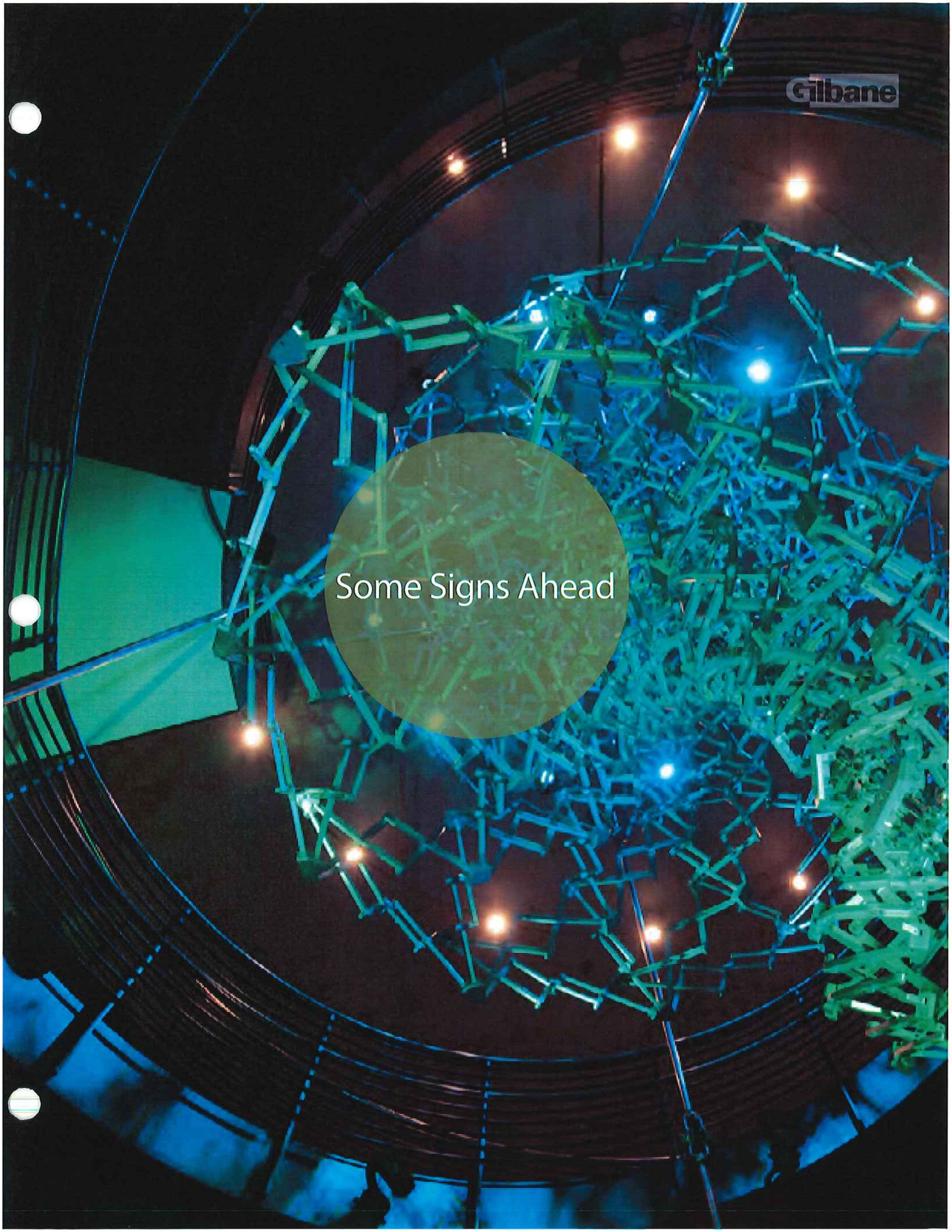
FIGURE 14:
Historical Construction Spending Curve – Not Seasonally Adjusted NSA$



CONSTRUCTION VOLUME INCREASED 20% IN LAST THREE YEARS

To correct this statement, it should read, "construction **spending** increased 20% in last three years". Very often spending and volume are interchanged, and that can lead to great confusion. Spending is a measure of dollars. Volume is a measure of units. To get real volume from spending, adjust spending for inflation. If spending increases by 5% from one year to the next, but inflation drives up the cost of buildings by 3% during that same time, then inflation adjusted dollars would show that net volume actually increased by only 2% during that time period.

Inflation actually increased 11% in the last three years. Actual inflation adjusted construction volume increased only 9% in the last three years. See Table 2 vs. Table 9.


Some Signs Ahead

Some Signs Ahead

The following reports can be accessed by clicking on the hyperlinks provided.

The Commercial Index has dipped into negative territory only three times in the last 21 months.

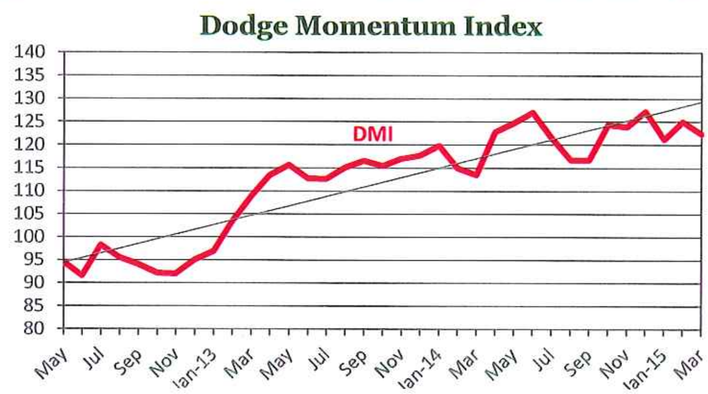
Architectural Billings Index (ABI) measures monthly work on the boards in architectural firms. It is a nine- to 12-month leading indicator to construction. Index values above 50 show increasing billing revenues, and below 50 indicates declining revenues. After 13 consecutive months being positive, the ABI Institutional Index went negative for 10 months. The Commercial Index has dipped into negative territory only three times in the last 21 months.

Associated Builders and Contractors (ABC) Construction Backlog Indicator (CBI) is a quarterly forward-looking economic indicator reflecting the amount of work that will be performed by commercial and industrial contractors in the months ahead. The CBI is measured in months of backlog and reflects the amount of construction work under contract, but not yet completed.

FIGURE 15:
Dodge Momentum Index

The DMI had strong upward movement in early 2013 but then settled into a more narrow range for 10 months. Two periods of advance in 2014 support a statistical trend UP.

The index shows strongest correlations in the commercial sector at a nine-month lag and the institutional sector at a 15-month lag.



ABC Charts and Graphs for Q4 2014 show strong advances after Q1 2014. Indices are at post-recession highs. The index was created in Q1 2009, so there is no comparison to pre-recession workload.

Dodge Momentum Index (DMI) is a monthly measure of nonresidential projects in planning, excluding manufacturing and infrastructure. It is a leading indicator of specific nonresidential construction spending by approximately 12 to 15 months. It shows two strong advances in the last 12 months and the three-year trend is showing 12% growth per year.

AIA Consensus First Half 2015 Construction Forecast is a semi-annual survey of construction economists' projections for future spending. Posted on the AIA economics page, the First Half 2015 report of average expectations for nonresidential construction shows expected growth of 7.7% for 2015 and 8.2% for 2016. Commercial and office construction sectors show high expectations for double digit growth.

AGC 2015 Construction Hiring and Business Outlook published in January 2015 indicates contractors are more optimistic than they have been since the recession began. It highlights that contractors expect markets to grow but also expect it will be more difficult to hire qualified workers.

Engineering News-Record 2015 First Quarterly Cost Report shows its general purpose cost indices up on average about 3.2% year over year. However, special purpose building indices for nonresidential buildings are up on average 2.0%, and selling price indices are up 5%. The difference between these indices is increased margins. (subscription required).

FMI 1st Quarter 2015 Nonresidential Construction Index (NRCI) is now 64.8, down slightly from last quarter but well up from all of 2013. The NCRI is a report based on a survey of opinions submitted by nonresidential construction executives. The NCRI declined in Q4 2013 but has strongly rebounded.

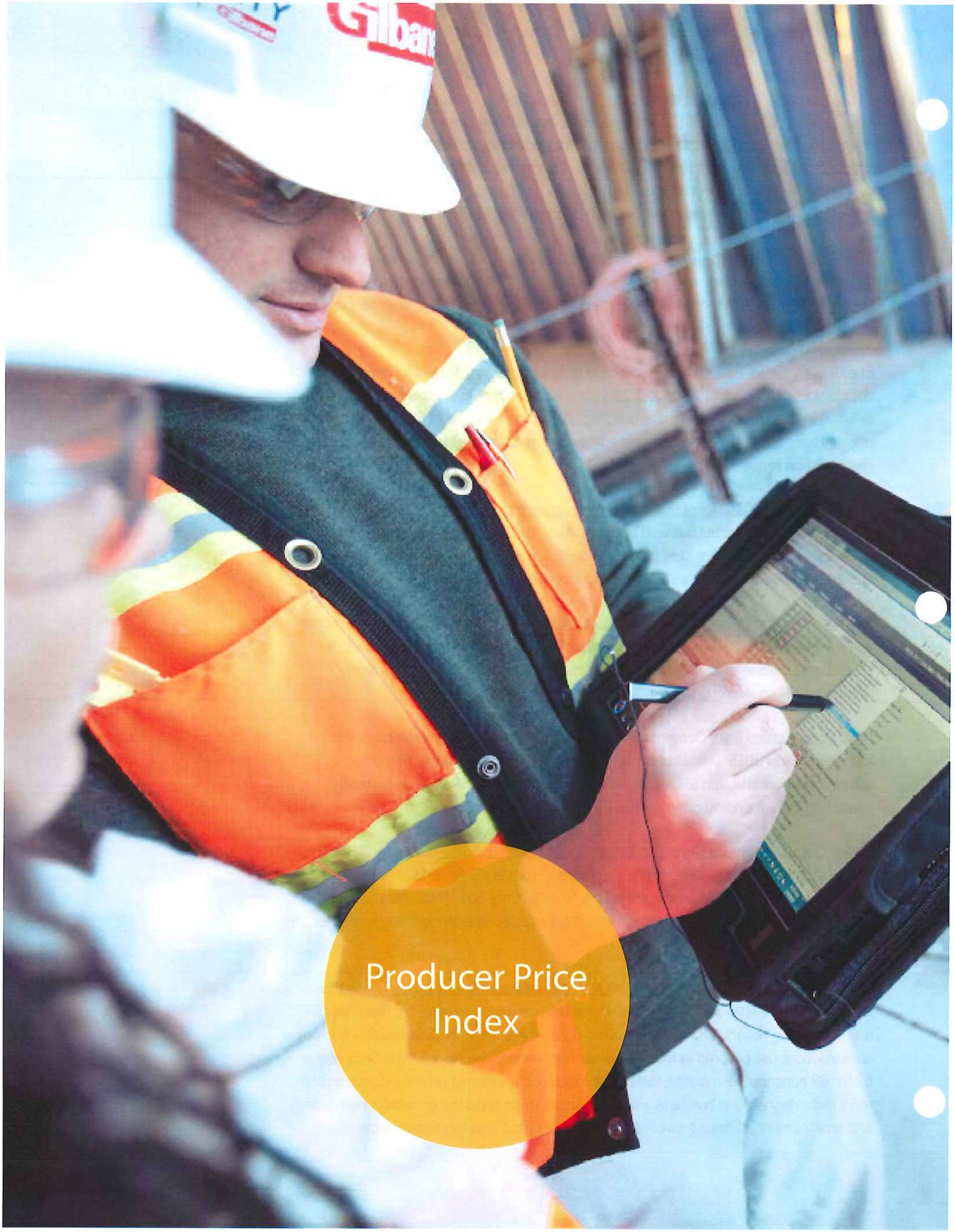
FMI Construction Outlook 1st Quarter 2015 Report predicts residential construction will increase 6% in 2015, office construction 11%, commercial construction 15%, educational construction 3% and healthcare construction 4%. FMI is currently predicting 8% spending growth in 2015.

CMD Construction Data December report predicts residential construction will increase 13% in 2015, office construction 5%, commercial construction 9%, educational construction 5% and healthcare construction 7%. CMD is currently predicting 10% spending growth in 2015.

Dodge Data & Analytics Construction report on Green Building states by 2015, half of all nonresidential building will be Green. From 2008 to 2011, the share of educational Green building went from 15% to 45%. Only 10% of building cost and function is operational. Green investment is also social, improving the environment for employees.

Institute for Supply Management (ISM) Non-Manufacturing Index (NMI) report for April 2015, is a better indicator of activity in the construction industry than the ISM manufacturing report. The NMI measures economic activity in 13 industries (including construction) not covered in the manufacturing sector. The April NMI is 56.5, above 52 for 63 consecutive months, indicating continued economic growth. Construction reported a decrease in business activity. Construction reported growth in new orders and employment, slower deliveries, higher prices paid, and increased backlog.

Producer Price Index



Producer Price Index

The U.S. Census Bureau Producer Price Index (PPI) data for February indicates the PPI for construction inputs increased 0.4% in the month but is down 3.9% year over year.

The February 2015 PPI for material inputs to all construction decreased 0.4% in the month, decreased 3.0% over three months and is down 3.9% in 12 months.

TABLE 11:
BLS PPI Materials February 2015

US Construction Producer Price Indexes - Feb 2015

MATERIALS PPI	PERCENT CHANGE VERSUS TO FEB 2015 FROM			12 Months	ANNUAL FOR 12 Months	12 Months
	JAN-15	NOV-14	FEB-14	2014	2013	2012
	1 month	3 months	12 months	last yr		
SUMMARY						
INPUTS TO ALL CONSTRUCTION	0.4	-3.0	-3.9	-0.9	1.3	1.4
INPUTS TO NONRESIDENTIAL	0.4			-1.9	0.9	0.9
COMMODITIES						
CEMENT	0.0	3.5	9.4	6.1	4.7	2.9
IRON & STEEL SCRAP	-19.3	-20.1	-33.8	-17.1	7.5	-15.6
MANUFACTURED MATERIALS						
DIESEL FUEL	3.3	-30.5	-41.0	-26.1	-0.9	2.1
ASPHALT PAVING	-1.3	-1.5	0.1	2.6	1.0	4.5
ASPHALT ROOFING/COATINGS	-3.0	-3.2	0.8	-0.3	-0.8	-0.3
READY MIX CONCRETE	0.4	1.1	4.3	5.0	2.9	2.6
CONCRETE BLOCK & BRICK	0.5	1.8	2.8	3.2	2.1	1.2
PRECAST CONC PRODUCTS	-0.1	4.5	6.1	6.7	1.6	2.4
BUILDING BRICK	-0.1	0.8	1.3	1.4	1.4	-2.6
COPPER & BRASS MILL SHAPES	-2.6	-7.4	-10.6	-4.5	-6.6	1.5
ALUMINUM MILL SHAPES	-0.9	-2.0	4.4	11.0	-4.6	-1.9
HR STRUCTURAL SHAPES	-4.0	-10.9	-9.0	4.7	-5.3	-8.5
STEEL PIPE AND TUBE	-0.8	-1.0	-2.0	-0.9	-5.1	-6.1
FAB. STRUCTURAL STEEL	0.3	1.8	0.5	0.6	-0.6	1.6
FAB. BAR JOISTS AND REBAR	-0.3	-0.3	2.5	2.9	0.4	2.6
GYPSUM PRODUCTS	3.9	4.2	1.6	5.0	16.2	14.1
INSULATION MATERIALS	0.4	1.4	0.5	2.7	6.7	5.4
LUMBER AND PLYWOOD	-1.3	-2.2	-1.8	3.1	10.0	11.1
SHEET METAL PRODUCTS	0.4	1.0	2.1	2.7	-2.2	-1.3

All data not seasonally adjusted
Source: Producer Price Index. Bureau of Labor Statistics

Producer Price Index (PPI) tracks cost to produce construction materials – providing a strong indicator for inflation trends.

Cement, aluminum shapes, ready-mix concrete and precast concrete products increased the most in price year over year.

Diesel fuel, copper and steel products decreased the most in price year over year.

PPI ITEMS THAT **INCREASED** THE MOST IN PRICE YEAR OVER YEAR:

- Cement, aluminum shapes, ready-mix concrete and precast concrete products

PPI ITEMS THAT **DECREASED** THE MOST IN PRICE YEAR OVER YEAR:

- Diesel fuel, copper and steel products

The relative impact of cost changes for several materials is a function of how much the material is used within a typical building. For example, for a typical nonresidential building:

- 10% increase in gypsum wallboard material increases typical project cost by 0.05% to 0.08%.
- 10% increase in copper material increases typical project cost by 0.20% to 0.60%.
- 10% increase in concrete material increases typical project cost by 0.20% to 0.60%.
- 10% increase in structural steel material increases typical project cost by 0.50% to 1.00%.

The PPI for construction materials gives us an indication whether costs for material inputs are going up or down. The PPI tracks producers' cost to supply finished products. This tells us if contractors are paying more or less for materials and generally indicates what to expect in the trend for inflation.

UNDERSTAND PPI TRENDS TO HELP INTERPRET THE DATA

- 60% of the time, the highest increase of the year in the PPI is in the first quarter
- 90% of the time, the highest increase of the year is in the first six months.
- 75% of the time, two-thirds of the annual increase occurs in the first six months.
- **In 20 years, the highest increase for the year has never been in Q4**
- 60% of the time, the lowest increase of the year is in Q4
- **50% of the time, Q4 is negative, yet in 22 years the PPI was negative only twice**

So when you see monthly news reports from the industry exclaiming, "PPI is up strong for Q1" or "PPI dropped in the 4th Qtr." it helps to have an understanding that this may not be unusual at all and instead may be the norm.


Gilbane
Material Price
Movement

Material Price Movement

When the cost to the supplier goes up, it almost always gets immediately passed along in full to the consumer. When the cost to the supplier goes down, the savings trickle down to the consumer very slowly.

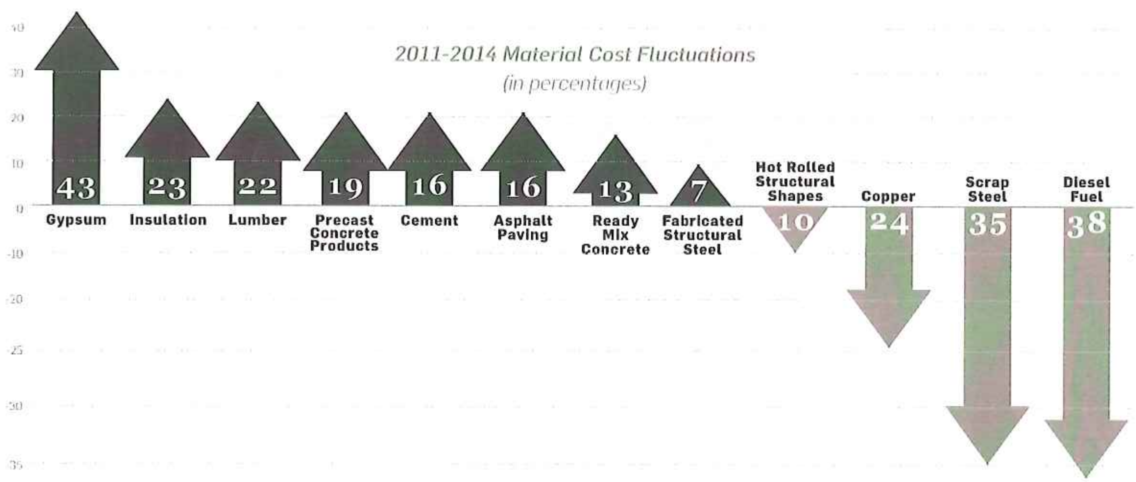
Cost for material inputs to all construction decreased 0.9% in the last 12 months.
Cost for material inputs to nonresidential construction decreased 1.9% in the last 12 months.
These decreases in input prices are almost entirely due to a 26% drop in the cost of diesel fuel.

TABLE 12:
BLS PPI Markets 2011-2014

US Construction Producer Price Indexes - Feb 2015

MARKETS Inputs PPI	ANNUAL FOR 12 months 2014 LAST YR	12 months 2013	12 months 2012	12 months 2011
INPUTS TO ALL CONSTRUCTION	-0.9	1.3	1.4	5.2
INPUTS TO NONRESIDENTIAL	-1.9	0.9	0.9	5.7
INPUTS TO COMMERCIAL	-0.3	0.9	1.2	4.9
INPUTS TO INDUSTRIAL	-1.5	0.8	0.8	5.2
INPUTS TO HGHWY/HVY ENGR	-2.7	0.9	0.8	6.1
INPUTS TO RESIDENTIAL	0.0	1.7	2.0	4.8

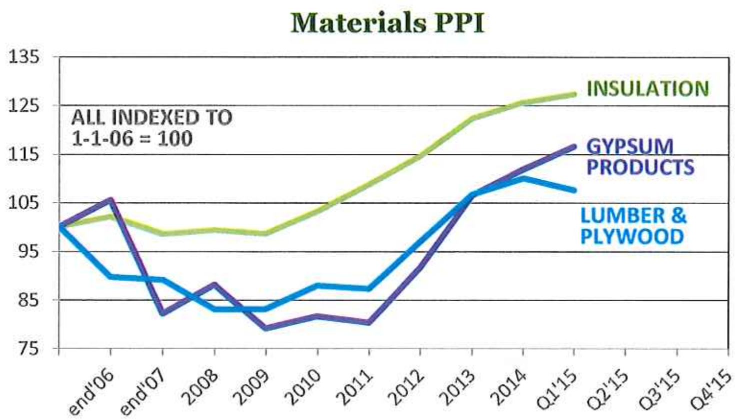
All data not seasonally adjusted
Data Source: Producer Price Index. Bureau of Labor Statistics



This extreme variability means individual trade assessments require individual material index data. Costs of gypsum, lumber and plywood and insulation are driven primarily by residential markets. Structural steel products are driven more by nonresidential markets.

GYPSUM / LUMBER / INSULATION

FIGURE 16:
Materials PPI Index Gypsum Lumber Insulation 2006-2015



Random Lengths, a lumber industry newsletter, recently reported the composite price index for 15 key framing lumber prices at $336, down 20% from the November 2014 high of $. 2014 low was $362 set in April.

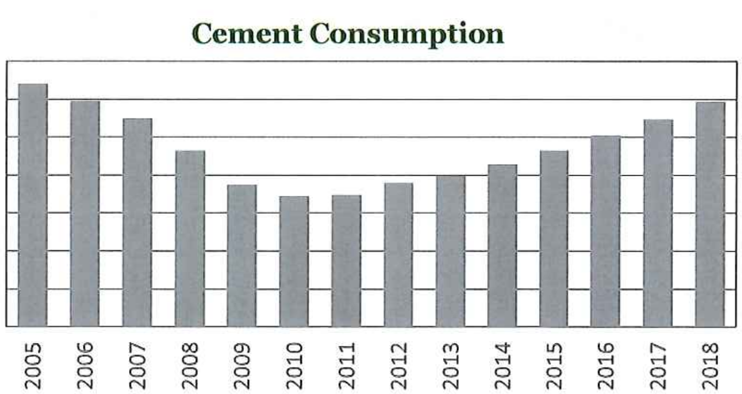
70% of lumber demand is driven by residential housing.

CEMENT / CONCRETE / ASPHALT /BRICK / BLOCK

Portland Cement Association (PCA) reports the volume of cement demand as an indicator of economic activity. It is a reliable coincident indicator. PCA reported an 8.9% rise in consumption in 2012, and consumption grew 4.5% in 2013. 2014 is projected to grow by 8.1%.

Nearly two-thirds of U.S. cement consumption occurs in the six months between May and October. Rising consumption and prices leading into summer can lead to large shifts in demand and seasonal pricing and is not an indicator of long-term growth but only reflects periodic seasonal fluctuating consumption rates. Look at total annual volumes for trends.

FIGURE 17:
Cement Consumption 2005-2018



For 2010 and 2011, cement consumption decreased 46% from peak 2008. At the start of 2013, PCA predicted consumption for 2013 would grow 8%. PCA revised data shows 2013 was only 4.5% growth over 2012. 2014 growth came in at 7.9%. PCA projects consumption by 2018 will be 119mmt. That will require five years of minimum 8.5% growth.

Cement prices increased 2.9% in 2012, after dropping four years in a row. Cement prices increased 4.7% in 2013 and 6.1% in 2014. IHS Global predicts cement prices will rise 5.0% in 2015.

FIGURE 18:
Materials PPI Index Cement Concrete Asphalt 2006-2015

Ready Mix Concrete price increased 2.9% for 2013. For 2014 the PPI shows another 5.0% increase. That's an 8% increase in two years.

In the last 3 months, ready mix is up 1.1% and cement is up 3.5%. Asphalt paving is down 1.5%.

Global Insight predicts cement prices will rise 5.0% in 2015.

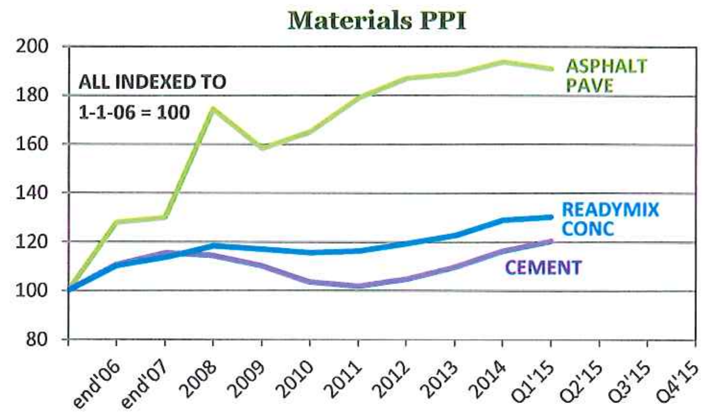
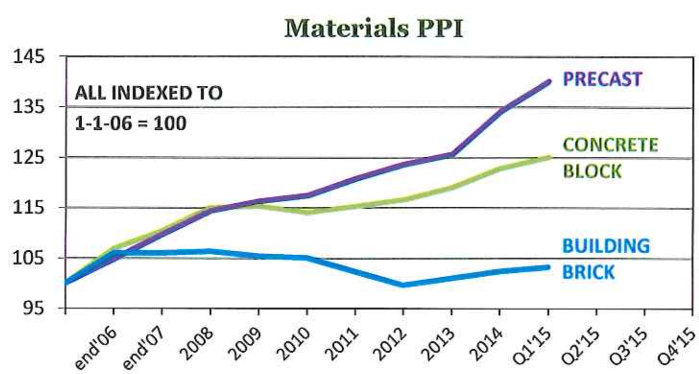


FIGURE 19:
Materials PPI Index Brick Block Precast 2006-2015

Concrete block and brick increased only 2.1% in 2013 and 3.2% in 2014. Cost is up another 1.8% in the last 3 months.

Precast product prices took a big turn up in 2014 rising 6.7%. Prices are still on the rise.

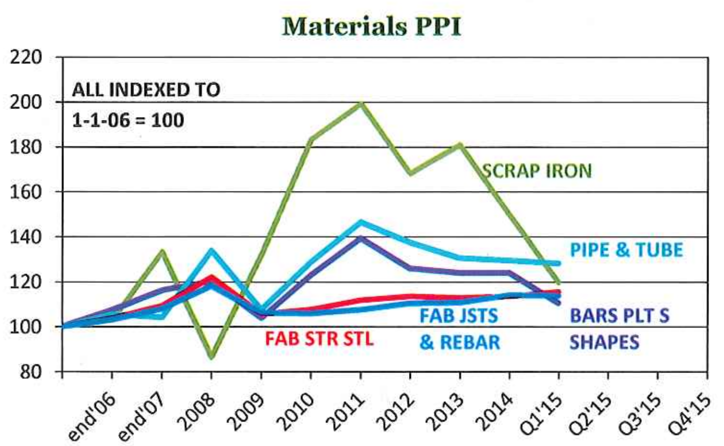


STRUCTURAL STEEL / REINFORCING BAR

The construction industry is the largest consumer of steel products worldwide. Approximately 100 million tons of steel is produced annually in the United States. More than 40 million tons of that is delivered to the construction industry. The next largest industries combined (automotive, equipment and machinery) do not consume as much steel as construction.

Structural steel is the most used structural framing material in the United States, with a 58% of market share for nonresidential and multi-story residential buildings, based on square footage built. The next closest framing material, concrete, holds only 21% market share.

FIGURE 20:
Materials PPI Index Iron and Steel Products 2006-2015



The rapid rise in 2008 mirrors the rapid acceleration in bid pricing to the peak in Q3-Q4 2008 and the precipitous fall from that peak. By mid-2009, the mill price of steel products had experienced a 40% decline, retreating to a 2004 low. Today the PPI for pipe, tube, bars and plates has recovered all of those losses, but not fabricated structural, joists or rebar.

Gerdau reports year-to-date steel mill capacity utilization currently at 67.7% as of April 4, 2015. Capacity utilization a year ago was at 77.1%. Year-to-date, U.S. mills have operated at an average utilization rate of 72.9%. This leaves considerable room for capacity expansion and this will tend to hold down prices.

Steel demand in 2013 was flat from 2012. Early in 2013, economic analysis indicated that there was over-capacity in steel production. This did prove to be true, and it helped cause steel prices to fall or remain flat in 2013. In 2014 demand was up.

Engineering News-Record's (ENR) latest data indicates that wide flange steel prices have decreased for three consecutive months, bringing prices to only 1.2% higher than a year ago.

The February PPI shows fabricated structural steel cost is up only 0.5% in the last 12 months. The ENR report also indicates most steel products have been declining in cost the last three months.

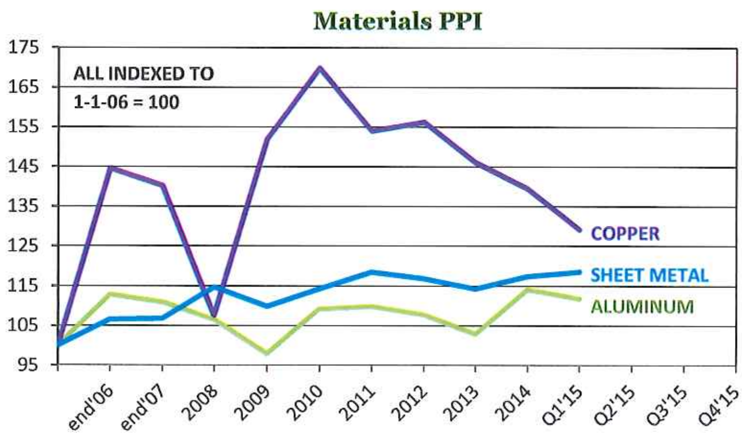
Structural steel is very much dependent on recycled steel. Structural steel is made 90% from scrap steel. Scrap prices are down 34% in the last year.

COPPER/ALUMINUM/SHEET METAL

FIGURE 21:
Materials PPI Index Aluminum Copper Sheet Metal 2006-2015

Copper material prices hit an all-time high of $4.60/lb. in February 2011, up 25% from October 2010. By September 2011, the price dropped back to $3.10/lb. The price in November 2012 was $3.50/lb., about equal with where it was in November 2011.

From April 2014 until October 2014, copper ranged between $3.00 and $3.25/lb. In January 2015, copper dropped below $2.50/lb. Recently it has fluctuated near $2.70/lb. During that same period, the last 12 months, the PPI for copper and brass mill shapes is down 10%.



What makes copper so important to watch?

Copper is a leading economic indicator that has rarely (if ever) failed to indicate the direction of world economies. When copper rises in price, world economies are leading into expansion. When copper drops in price, a decline in world economies very quickly follows. Copper prices and the U.S. workforce move almost perfectly together. Also, because copper is so widely used in buildings, and manufacturing facilities must be built to see a big increase in production, copper demand is an excellent predictor of industrial production 12 months out.

Click here to view copper price charts on metalprices.com

What drives copper prices up or down? Unlike some other metals, it is not speculation. Quite often it is demand. Increasing demand equals increasing prices. When demand wanes, prices drop.

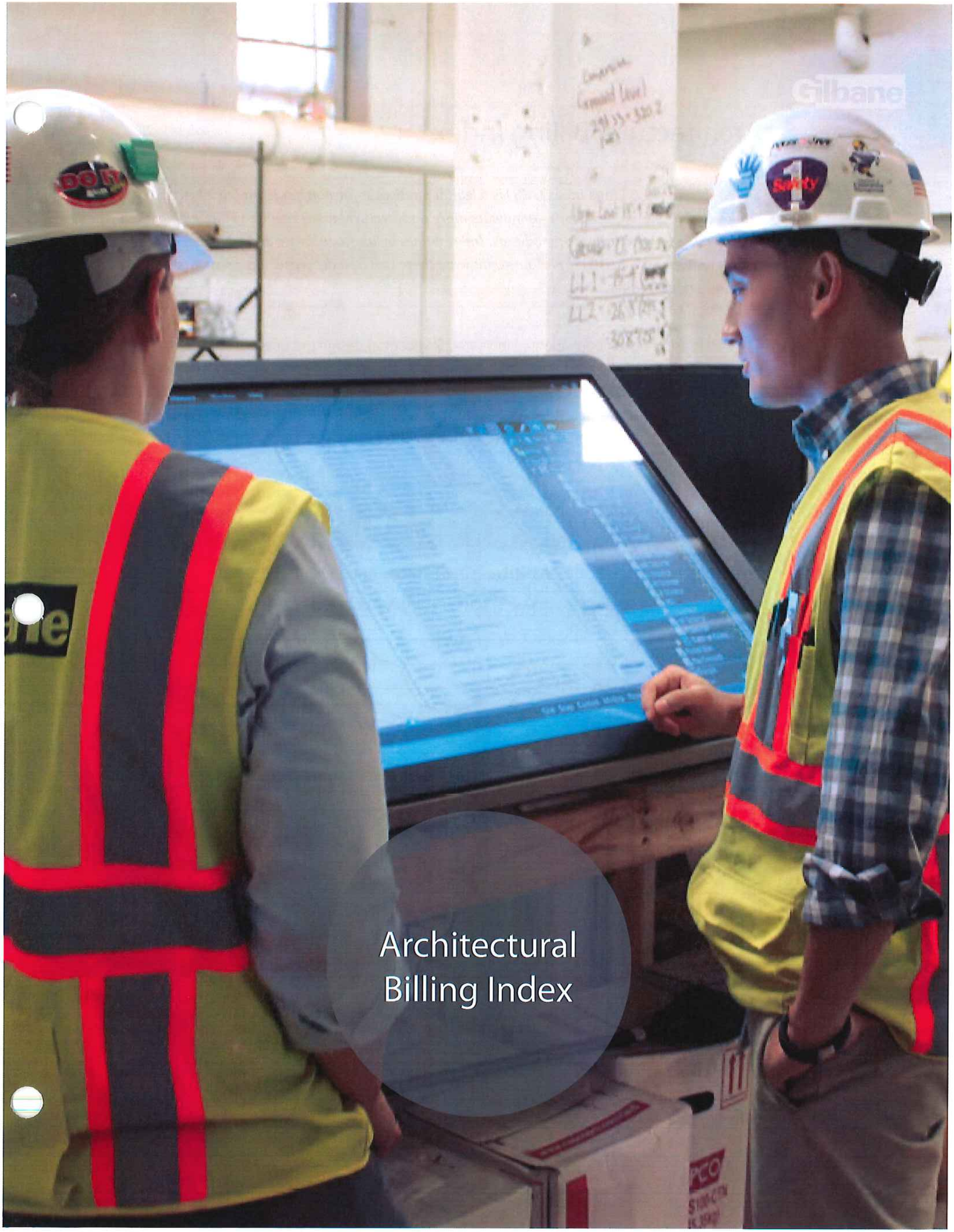
What effects do copper price changes have on the cost of projects?

Roughly speaking, copper material is about:

- 10% electrical contract or 1% of cost of project
- 5% of an HVAC contract or 0.6% of cost of project
- 10% of a plumbing contract or 0.3% of cost of project

So, for an average project, copper material can represent approximately 2% of the total cost of the project. Therefore, a 10% increase in the cost of copper will increase the cost of a project by 0.2%.

There are exceptions. For example, if copper is 2% of the total cost of the typical project, it is probably 4% to 5% of total cost on a heavy mechanical/electrical project, such as a data center. So a 10% increase in the cost of copper increases the total cost of a data center by 0.4% to 0.5%. For a copper roof, material is 65% of total cost and can represent ~1% of typical project cost.



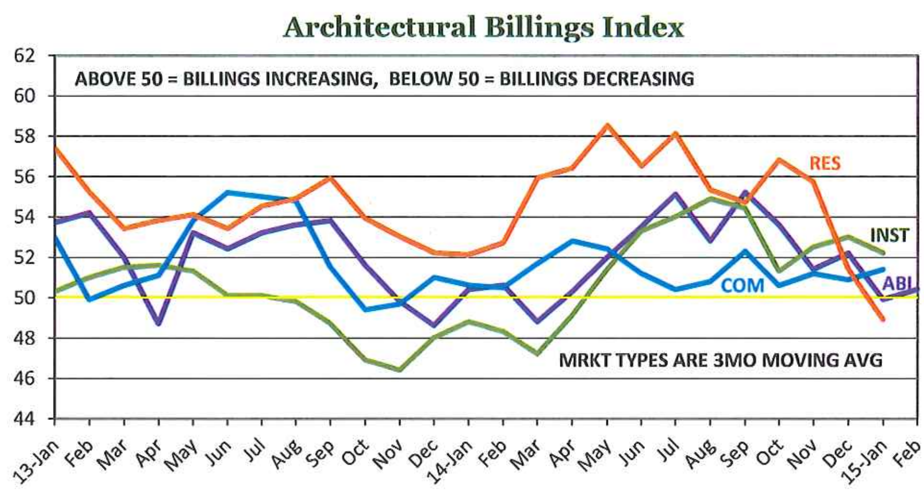
Architectural Billing Index

Architectural Billing Index

The Architectural Billings Index (ABI) is a leading indicator for nonresidential work nine to 12 months out. Index values above 50 indicate more architectural firms reporting increasing billings than firms reporting decreasing billings. Index values below 50 indicate declining workload. Index values remaining consistently below 50 indicate there will be a decrease in construction spending nine to 12 months later.

The ABI is primarily a nonresidential indicator. Residential design projects account for only about 15% of the total index. Office buildings, hotels, shopping centers, banks, warehouses, manufacturing plants and other commercial properties represent 35-40% of the index. Institutional buildings account for 45-50% of the index. Typically, institutional facilities are the last nonresidential building sector to recover from a downturn.

FIGURE 22:
Architectural Billings Index ABI 2012-2015

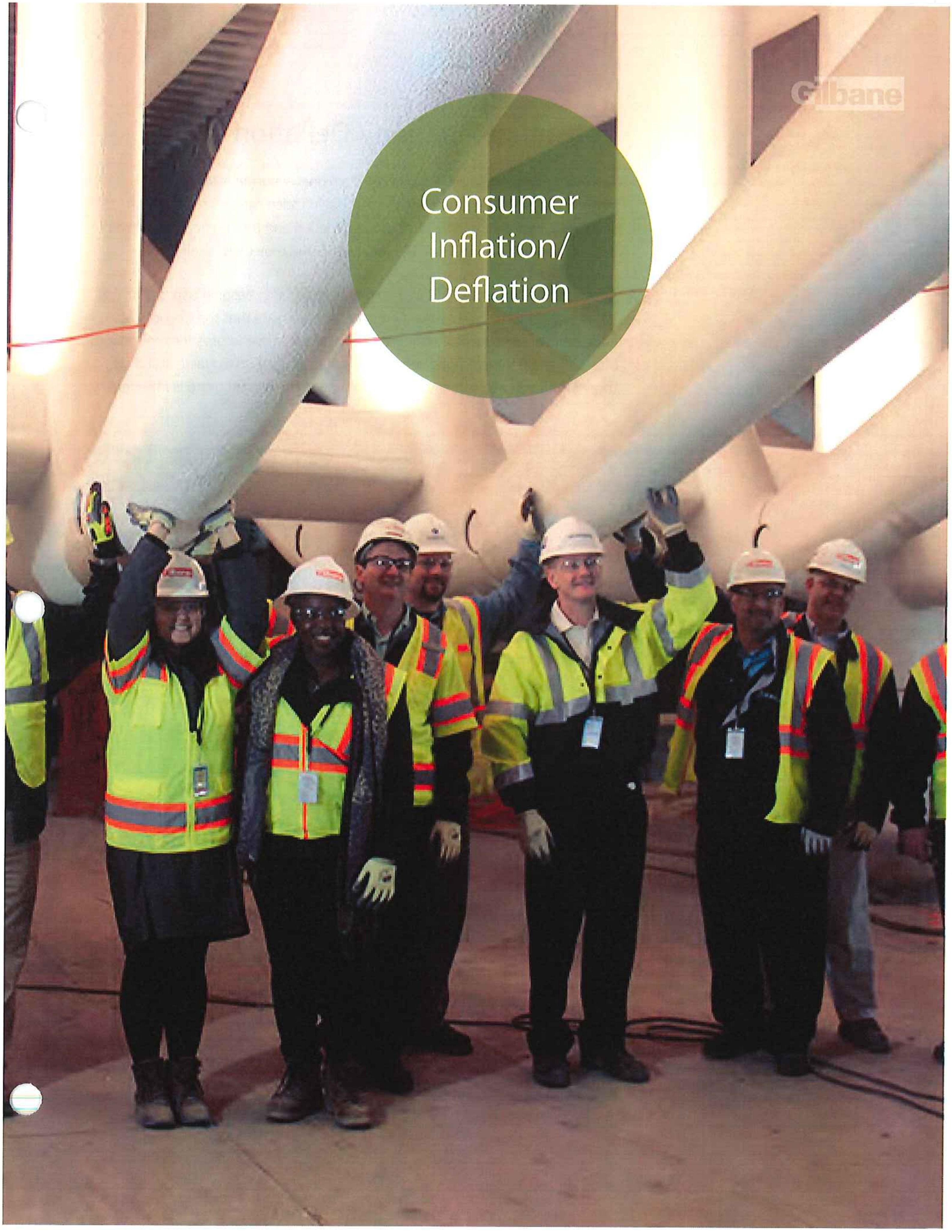


The 2012 drop in the ABI from March through June predicted nonresidential work would be down through Q4 2012 into Q1 2013 with recovery starting in Q2 2013. Institutional billings were declining from January 2011 to June 2012, and commercial work declined from April to August 2012. It was expected that spending in Q1 and Q2 2013 to be down and it was down.

The March-April 2013 ABI indicated a decline in spending for Q1 2014, which did occur.

The November 2013 to April 2014 ABI indicated another brief slowdown in nonresidential spending during Q1 2015. Billings are currently experiencing a modest decline in January and February nonresidential spending after a strong December 2014 gain.

Consumer Inflation/ Deflation

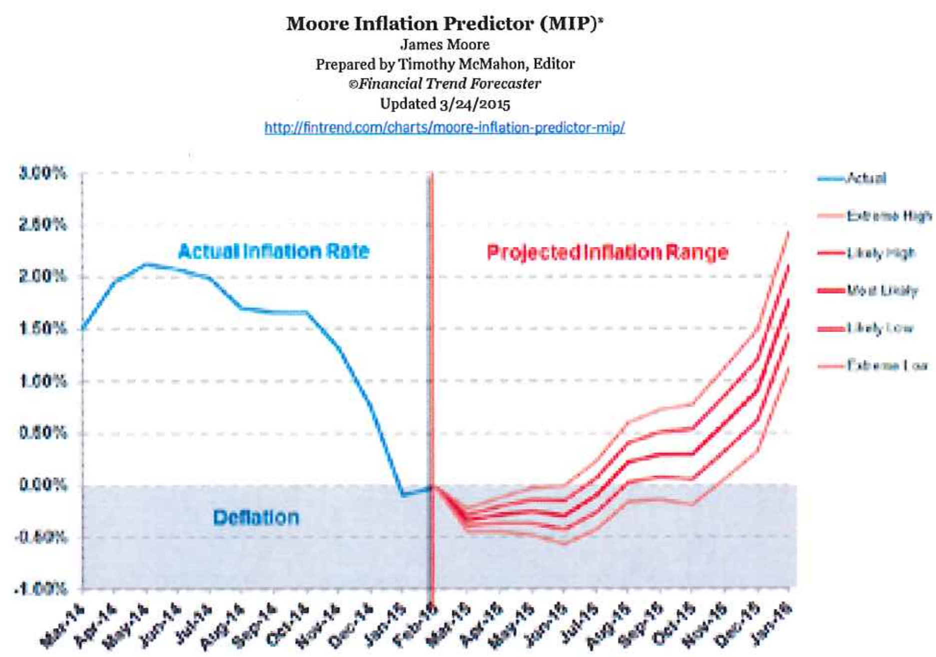


Consumer Inflation / Deflation

The Moore Inflation Predictor© (MIP) is a highly accurate graphical representation of the future direction of the inflation rate. It has a 97%+ accuracy rate forecasting inflation rate direction and turning points and over 90% of the time the inflation rate falls within the projected "likely" range.

A review of long-term inflation data shows there are seasonal aspects of inflation with some fairly consistent trends. It appears that the majority of inflation occurs in the first half of the year and then moderates for the second half. Since 2001, there have been eight deflationary fourth quarters and only three inflationary fourth quarters, even though the overall trend is inflationary.

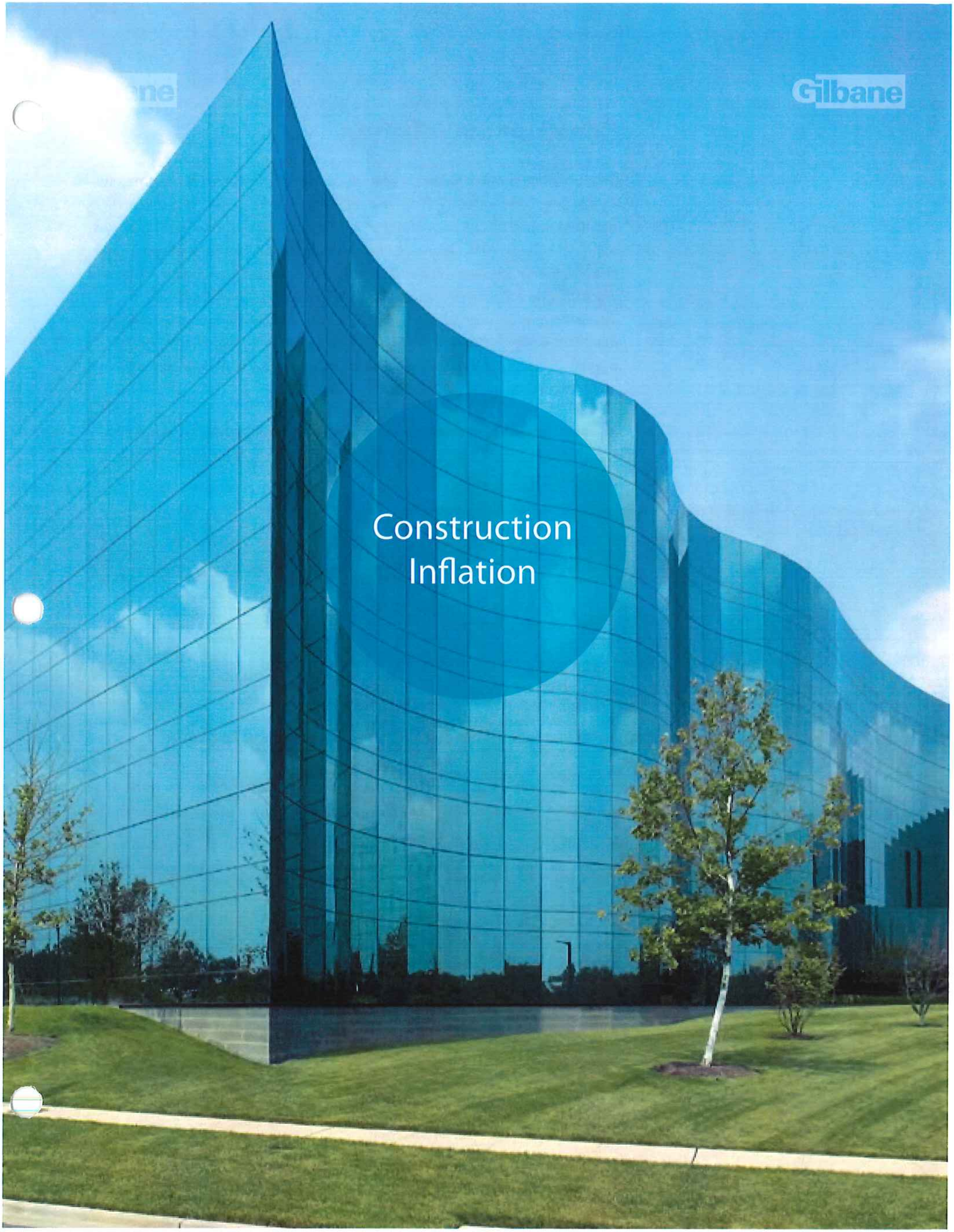
FIGURE 23:
Moore Inflation Predictor Consumer Inflation 2014-2015



MIP chart used by permission, Tim McMahon, Editor, Financial Trend Forecaster www.fintrend.com

In 2013, MIP predicted peak inflation most likely at 2.4% and year end inflation at 1.7%. Actual results in 2013 were peak inflation at 2.0% and year end inflation at 1.5%. For 2014, MIP predicted peak inflation most likely at 1.9% and year end inflation below 2.0%. Actual results in 2014 were peak inflation at 2.2% and year end inflation below 1.0%. MIP is predicting a period of deflation from January 2015 through June 2015 with a rapid rise of 1.5% in the second half of 2015.

Construction Inflation

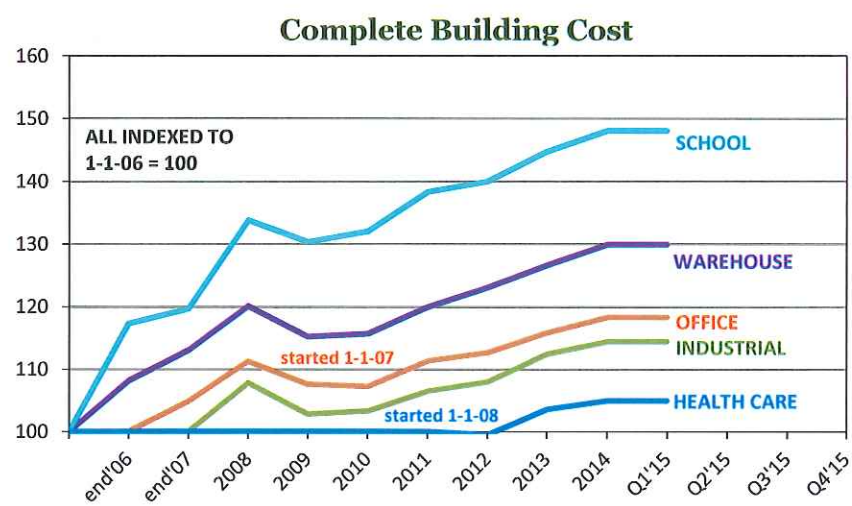


Construction Inflation

Construction inflation, based on several decades of trends, is approximately double consumer inflation. From mid-2009 to late 2011, that long-term trend did not hold up. During that period, construction inflation/deflation was primarily influenced by depressed bid margins, which had been driven lower due to diminished work volume. Over the last 24 months, that has changed. Work volume has increased and short-term construction inflation has increased now to more than double consumer inflation. If consumer inflation reacts to money policies by accelerating, and if it holds true that long-term trends eventually return to the norm, we may soon be experiencing rapid acceleration in construction inflation.

The U.S. Construction Producer Price Index tables for Buildings Complete, which includes the cost complete as charged by the builder, represents true inflation cost of buildings.

FIGURE 24:
Complete Building Cost Index by Building Type 2006-2015



NONRESIDENTIAL BUILDINGS INFLATION

- as depicted by US Census PPI completed buildings data:
  - 2013 building cost inflation ranged from 2.8% to 4.1%
  - 2014 building cost inflation ranged from 1.3% to 2.6%
- as depicted by Industry Selling Price Indices including margins:
  - 2013 building cost inflation ranged from 3.1% to 4.1%
  - 2014 building cost inflation ranged from 4.2% to 4.4%

NEW HOUSING PRICE INFLATION

- as depicted by US Census and Industry Actual Cost Indices:
  - 2013 building cost inflation ranged from 7.3% to 9.6%
  - 2014 building cost inflation ranged from 6.7% to 6.9%

Construction volume will continue to increase in coming months and that will continue to support increasing margins. Therefore a building's total construction (final cost) inflation will outpace construction labor and materials inflation.

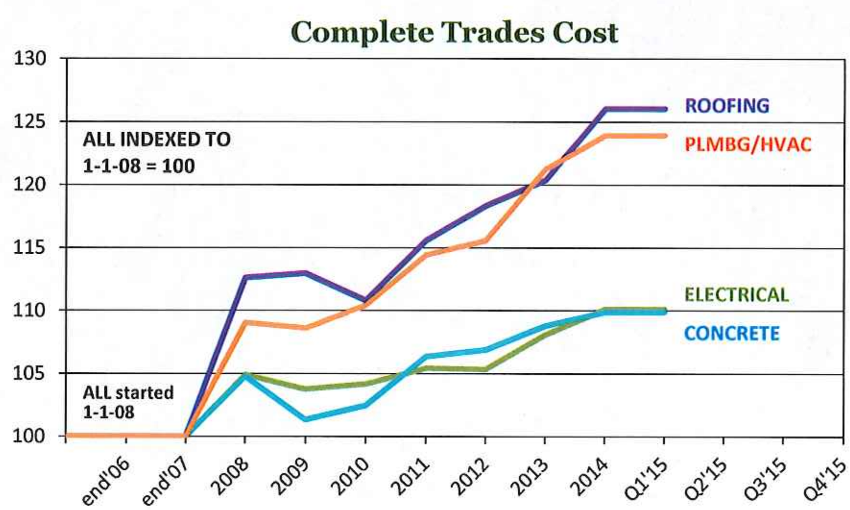
Expect nonresidential construction cost inflation to remain above 4% for several years. See "Escalation" for near-term and long-term recommendations.

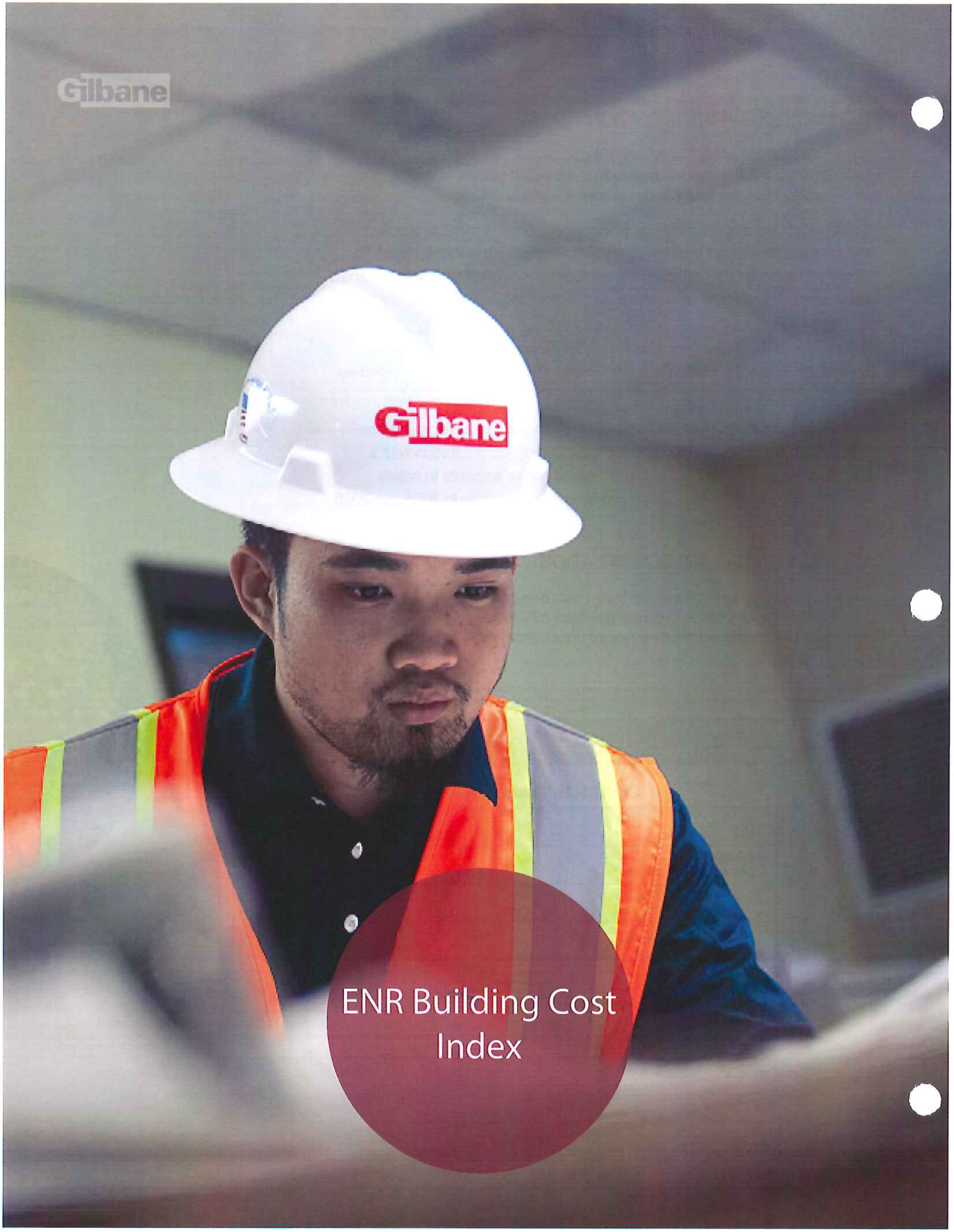
These average values, useful for adjusting whole building costs, cannot be considered to adjust a unique contract type. Construction inflation with a historical average range from 3% to 8% would not be accurate to adjust asphalt paving or shingles. Asphalt products increased 10% in 2005 and 2006 and 20% in both 2008 and 2009.

NONRESIDENTIAL TRADES INFLATION

- as depicted by PPI complete trades cost data, shows:
  - 2013 trades cost inflation ranged from 1.7% to 4.9%.
  - 2014 trades cost inflation ranged from 1.0% to 4.7%.

FIGURE 25:
Complete Trades Cost Index by Trade 2006-2015





ENR Building Cost Index

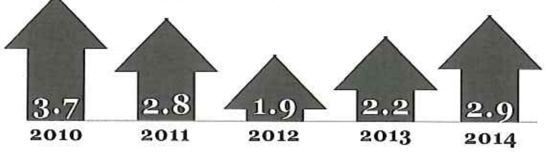
ENR Building Cost Index

The December 2014 Engineering News-Record 20 Cities Average Building Cost Index (ENR-BCI) is 5480, up 2.9% year over year. Cleveland and St. Louis show a much higher than average inflation rate. Atlanta, Baltimore, Boston and Dallas are below the ENR average inflation rate.

The ENR-BCI is one of the most well-known and most widely-used building cost indices. However, its long-term strengths can also be weaknesses, particularly in times of fluctuating selling prices because:

- It is made up of a small shopping basket of labor and materials. Therefore, it is not always the best representation of all building types, which can vary considerably in composition.
- That shopping basket includes no representation for any mechanical, electrical or plumbing items, which can comprise 30%-50% of the cost of the building. In many cases, the shopping basket comprises less than 20% of the building cost.
- Building materials differ widely in rate and timing of cost growth and can dramatically affect the cost of projects. In 2009, while structural steel products declined in price by 10% to 15%, copper products increased in price by 40%.

ENR-BCI Index Fluctuations
(in percentages)



The ENR-BCI index increased 3.7% in 2010, 2.8% in 2011, 1.9% in 2012, 2.2% in 2013, and 2.9% in 2014.

- ENR-BCI does not take into consideration bid prices, so it often does not represent the final cost of buildings. Bid prices are referred to as Selling Price, and this is not included in the ENR-BCI. Selling prices show increased or reduced margin bids due to market activity.

There were several monthly declines in the ENR index from late 2008 through early 2010, but the annual average has gone up every year for 70 years. More importantly, from Q2 2008 through much

TABLE 13
ENR Building Cost Index History

ENR's Building Cost Index History (2000-2014)

Base = 1913=100	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANNUAL AVERAGE
2000	3503	3523	3536	3534	3558	3553	3545	3546	3539	3547	3541	3548	3539
2001	3545	3536	3541	3541	3547	3572	3625	3605	3597	3602	3596	3577	3574
2002	3581	3581	3597	3583	3612	3624	3652	3648	3655	3651	3654	3640	3623
2003	3648	3655	3649	3652	3660	3677	3683	3712	3717	3745	3765	3757	3693
2004	3767	3802	3859	3908	3956	3996	4013	4027	4102	4129	4128	4123	3984
2005	4112	4116	4127	4168	4189	4195	4197	4210	4242	4265	4312	4329	4205
2006	4335	4337	4330	4335	4331	4340	4356	4359	4375	4431	4462	4441	4369
2007	4432	4432	4411	4416	4475	4471	4493	4512	4533	4535	4558	4556	4485
2008	4557	4556	4571	4574*	4599	4640	4723	4733	4827	4867	4847	4797	4691
2009	4782	4765	4767	4761	4773	4771	4762	4768	4764	4762	4757	4795	4769
2010	4800	4812	4811	4816	4858	4888	4910	4905	4910	4947	4968	4974	4884
2011	4969	5007	5010	5028	5035	5059	5074	5091	5098	5104	5113	5115	5059
2012	5115	5122	5144	5150	5167	5170	5184	5204	5195	5203	5213	5210	5174
2013	5226	5246	5249	5257	5272	5286	5281	5277	5285	5308	5317	5326	5278
2014	5324	5321	5336	5357	5370	5375	5383	5390	5409	5439	5469	5480	5387
2015	5497	5488	5487										

Data reprinted by permission Engineering News-Record - ENR.com

The annual average ENR Index has gone up every year for 70 years.

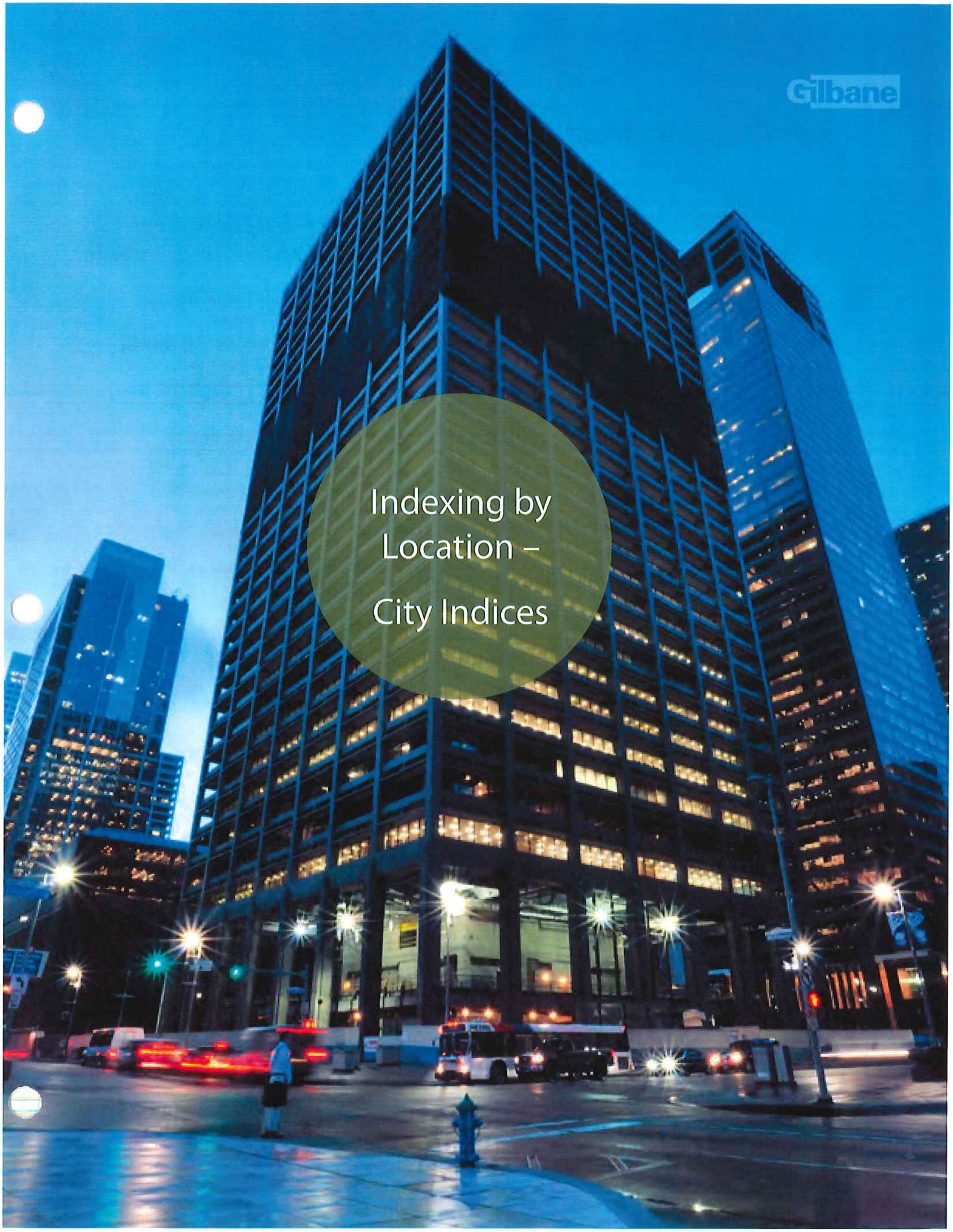
of 2011, during the only recent period of true deflation, the ENR-BCI would indicate a 10% cost increase! The actual final cost of buildings, documented by several reliable measures, from Q2 2008 through Q4 2010 went down by 8% to 13%.

Whenever there are very active periods or very depressed periods of construction activity, contractor selling prices rise or fall accordingly, and since it does not track selling price, the ENR-BCI cannot reflect accurately what effect selling price had on the cost of buildings during those periods. Nonetheless, the ENR-BCI is often relied upon as an indicator of cost movement over time.

You must take into consideration the selling price of buildings, past and present, if you hope to accurately index the cost of buildings over time.

Selling prices are not captured in the ENR Index. For a procedure to adjust for actual selling prices see the "Indexing – Addressing the Fluctuation in Margins" section of this report, and refer to Figure 28: Escalation Growth vs. Margin Cost. This is particularly important for those of you using conceptual cost modeling tools such as the Gilbane CostAdvisor.

Indexing by Location – City Indices



Indexing By Location – City Indices

FIGURE 26:
City Location Cost Index 2014

Equally important as indexing for time is the process of indexing for location. The practice of using historical projects, regardless of location, to get an idea of cost of future projects is quite common. Not only must project costs be moved over time, but also move the location. City indices provide the means to move project costs from one location to another.

Suppose the historical project was built in Phoenix and the goal is to determine the cost of a similar project built in Boston.

Assume

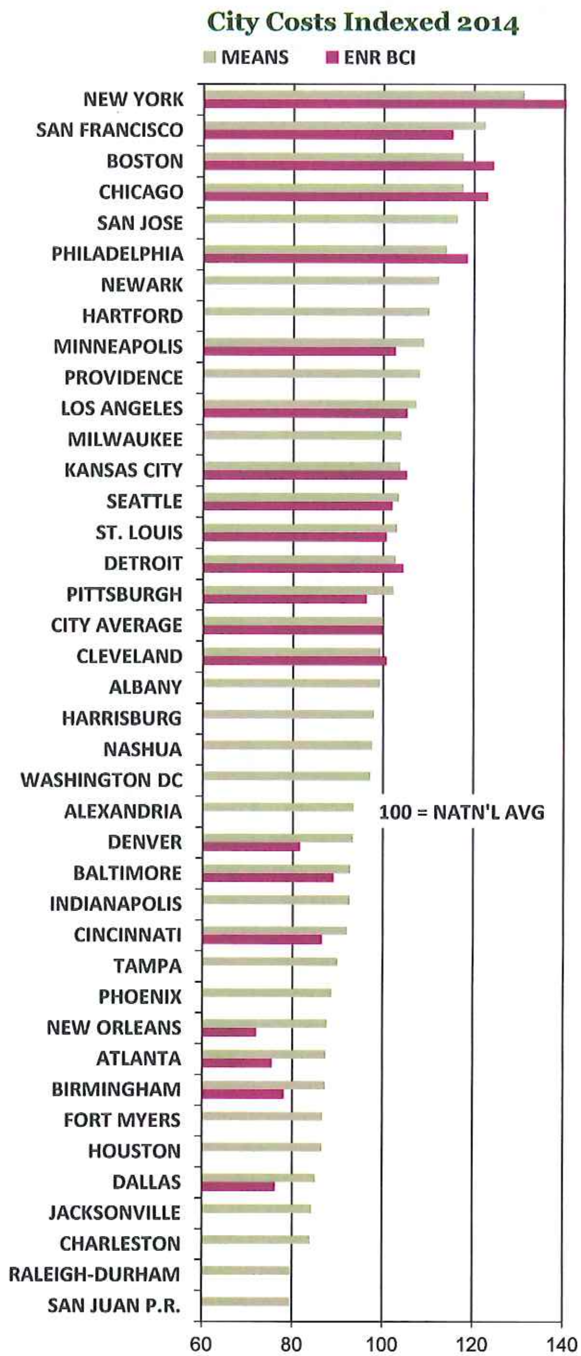
- Project cost as built = $10,000,000
- Boston index = 120
- Phoenix index = 90

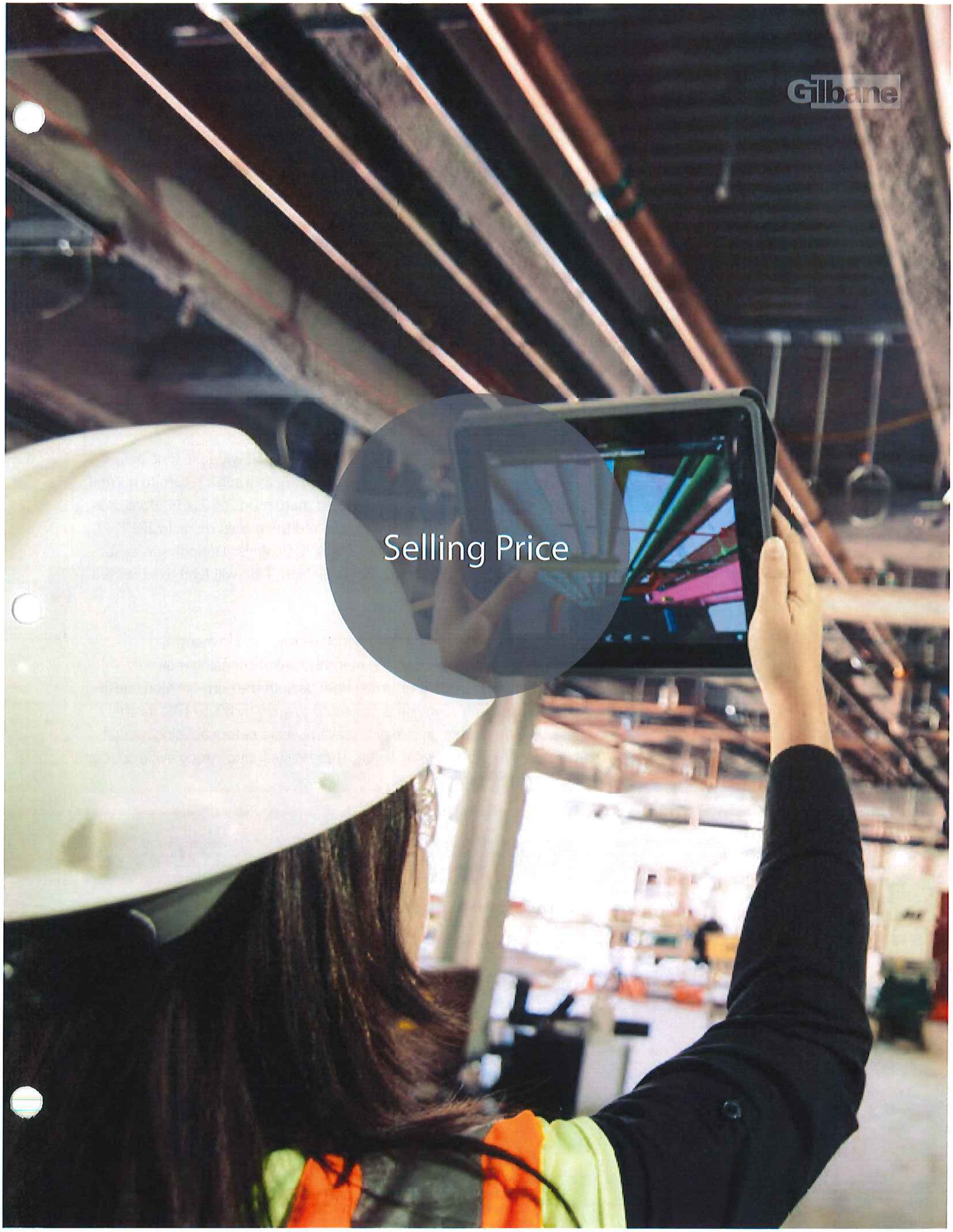
Move costs to Boston from Phoenix;
Divide "To" city by "From" city
Multiply original cost by factor.

- Boston / Phoenix = 120/90 = 1.33x
- $10,000,000 x 1.33 = $13,300,000.

Through this example, you can see the danger of simply using unadjusted project costs from one location to determine costs in another location. Without adjusting for differences in cost due to location, it is possible to over- or under- state project costs by substantial amounts.

ENR provides city indices for 20 major metropolitan cities. RS Means annually updates tables for hundreds of cities. The chart here lists 40 major cities from highest to lowest RS Means index. The ENR index is shown for those available.





Selling Price

Selling Price

Selling price is the total price at which a contractor is willing to bid to win a project, even if that selling price eliminates all profit from the bid.

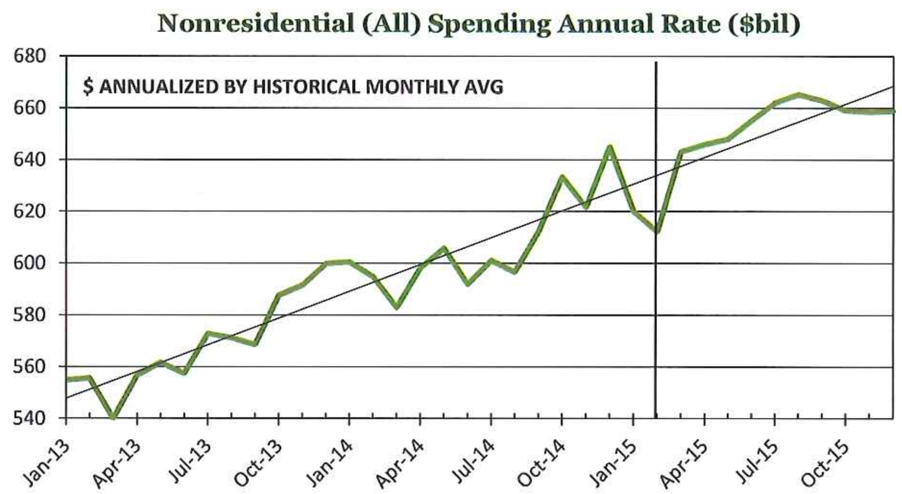
Increasing activity leads to higher selling price.

Few inflation or material/labor cost predictors address the issue of bidders raising or lowering margins in bids and hence affecting what is known as selling price. Selling price is dramatically affected by economic conditions such as market volume and contractor booked revenue. When market volume is low, contractor's margin, or selling price, comes down. As business volume picks up, and once contractors secure more work, even if material prices stay low, contractors begin to increase their margins and selling price increases.

In many areas, selling prices are still depressed, and it will take time before workload volumes increase to a point that contractors see a return to normal margins. Nearly 75% of contractors lowered margins in 2010 bids. More than 75% kept margins the same in 2011 or lowered them even more. In 2012 and 2013 we saw margins increasing. The AGC Business Outlook survey for 2014 indicates optimism at a post-recession high. That will lead to increased margins.

The industry is currently in a growth period as reflected in monthly construction spending. Although the monthly rate of spending took a significant drop in Q1 2013, it returned right back to the normal trend line in Q4 2013. Construction spending is projected to grow by 6% to 10% for the next several years. Although it may be several years before building market activity returns to pre-recession levels, there is clear and strong evidence that the rate of activity is increasing.

FIGURE 27:
Nonresidential (All) Spending Rate of Growth 2013-2015



Contractors need to recover the cost for all expenses that affect their cost to build. Any cost not recovered is taken as a reduction to margin or reduced selling price. Cost recovered over and above expenses raises selling price and is a growth to margins.

- On average, labor cost represents approximately 35% - 40% of building cost.
- On average, materials cost represents approximately 50% -55% of building cost.
- Equipment and contractor services represent 10% of building cost
- Margins are applied on all 100% of building costs.

On average, labor cost represents approximately 35% - 40% of building cost.

Labor wage cost growth is generally 2% to 3% per year. The labor wage cost long-term average is 3%. Labor demand and changes in labor productivity either increases or decreases total labor cost. In growth periods, labor demand tends to increase wages, and productivity generally declines, increasing overall labor cost.

Materials cost growth is tracked by several reports such as the PPI. Materials costs fluctuate widely, but in general, in times of higher demand, material prices go up.

Equipment and services have the least effect on overall project cost. Contractor efficiencies or unusual project conditions may vary this cost.

Margins represent contractor overhead and profit. Selling price includes contractor margins and is market activity dependent. Competition will cause project bid margins to move lower. Increasing volume will allow margins to move higher.

If...	Then Cost to Project...
Labor wage ⬆ by 3%	+1.2%
Productivity ⬇ by 2%	+0.8%
Material costs ⬆ by 5%	+2.5%
Services costs ⬆ by 5%	+0.5%
Margin ⬆ by 1%	+1.0%

During a period of low volume and competitive pricing (assuming no room for margins to move lower), margins are not increasing. During a period of margin recovery, anticipate a 1% to 1.5% annual increase to margins until margins fully recover.

When there is substantial growth in the volume of projects coming to bid, the need to keep margins reduced will diminish, and margins will return to normal. There is no room left for depressed market activity to move margins lower. Expect margins to increase slowly over time.

Margins vary considerably by market and activity within individual markets.

MARGINS INCREASING OR DECREASING?

Indices like the PPI MTRLS deal only with materials costs or prices charged at the producer level. They do not include delivery, equipment, installation, or markups, nor do they reflect the cost of services provided by the general contractor or construction manager.

Total project cost encompasses all of these other costs. Whole Buildings Completed PPI doesn't give us any details about the retail price of the materials used, but it does include all of the contractors costs incurred for delivery, labor for installation and markups on the final product delivered to the consumer, the building owner.

The PPI for construction materials IS NOT an indicator of construction inflation. It is missing the selling price. In 2010, the PPI for construction inputs was up 5.3%, but the selling price was flat. In 2009, PPI for inputs was flat, but construction inflation as measured by cost of buildings decreased 8% to 10%.

For several years, many construction firms have been competing for a very low volume of new work. In 2011 and 2012, construction spending, adjusted for inflation to get real volume, reached a 20-year low. There was little work available for bidders, forcing contractors to remain extremely competitive. As a result, contractors had been unable to pass on all cost increases to the owner. This had the effect of keeping selling price low, reducing both contractors and producers margins. In some cases, margins may be reduced to a loss just to get work.

Expect whole building costs to rise and remain above material/labor inflation as long as work volume continues to increase.

TABLE 14:
BLS PPI Buildings Completed 2011-2014

US Construction Producer Price Indexes - Feb 2015

BUILDINGS COMPLETED	ANNUAL FOR			
WHOLE BUILDING COST	2014	2013	2012	2011
INPUTS TO NONRESIDENTIAL	-1.9	0.9	0.9	5.7
NEW NONRESIDENTIAL BLDGS	2.1	3.3	1.5	4.0
NEW INDUSTRIAL BLDG	1.8	4.1	1.4	3.1
NEW WAREHOUSE BLDG	2.6	2.9	2.6	3.7
NEW SCHOOL BLDG	2.3	3.4	1.2	4.8
NEW OFFICE BLDG	2.1	2.8	1.2	3.8
NEW HEALTH CARE BLDG	1.3	4.1	-0.5	NA

except inputs, includes labor, material overhead and profit
Source: Producer Price Index. Bureau of Labor Statistics

To analyze the trend in margin movement, we need to combine data from several inputs. Spending data and jobs data provides what we need to determine productivity. Producer Price Index (PPI) gives the cost of materials from the producer, but not the cost the contractor charges for the material. Whole building cost gives us the price charged by the contractor to the client, the total cost for all labor, materials, equipment, overhead and profit. Compare all these, and we can determine the difference between the costs to the contractor and what the contractor charges. That difference is the margin added to get the selling price.

TABLE 15:
BLS PPI Margins Completed 2011-2014

US Construction Producer Price Indexes - Feb 2015

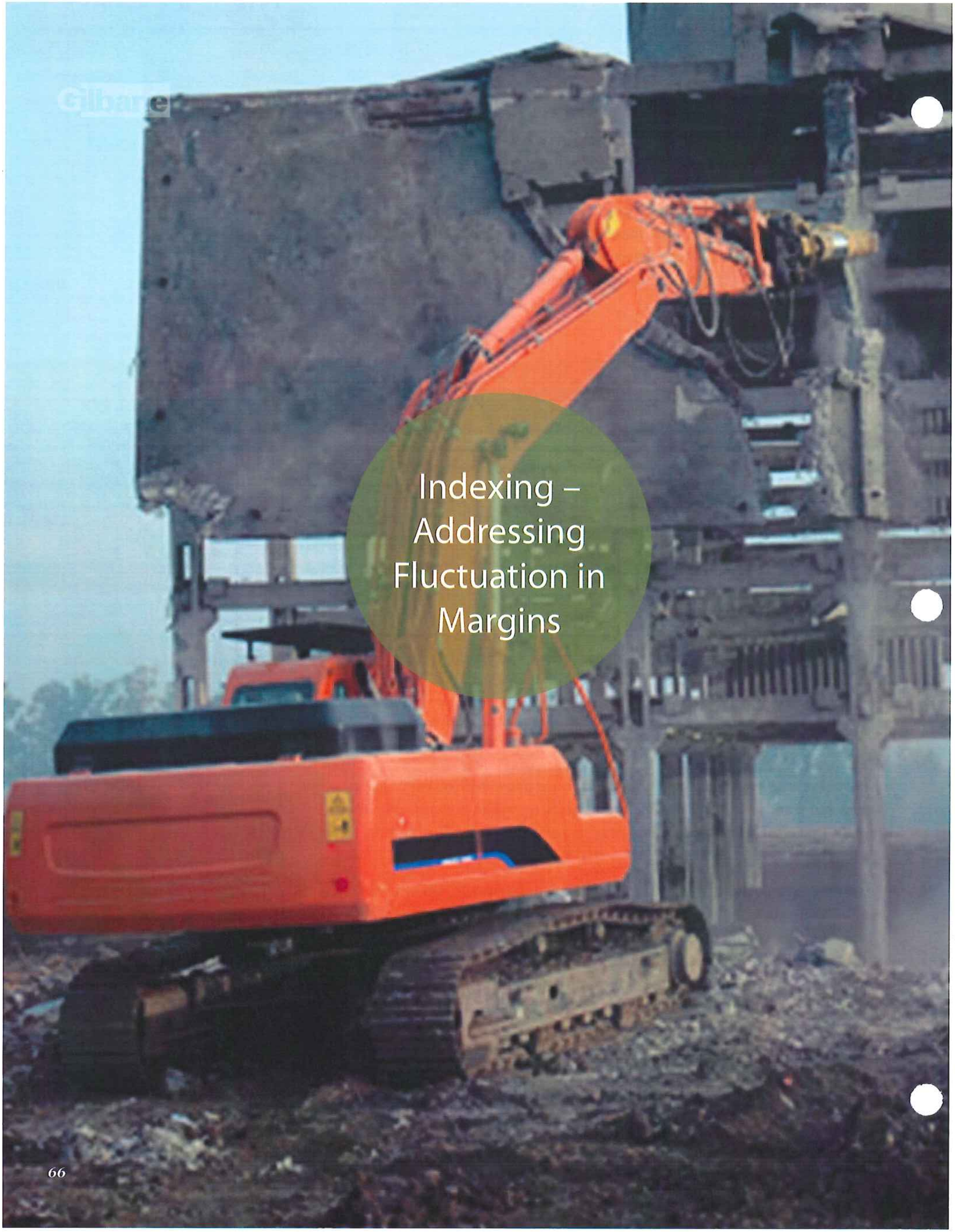
MARGINS COMPLETED	ANNUAL FOR			
WHOLE BUILDING COST	2014	2013	2012	2011
INDEPENDENT INDEX AVG	4.3	4.1	2.8	-2.7
NEW NONRSDNTL BLDGS	1.63	-0.74	2.2	-0.3
NEW INDUSTRIAL BLDG	1.10	0.06	2.2	-0.9
NEW WAREHOUSE BLDG	2.37	-0.78	3.4	-0.3
NEW SCHOOL BLDG	1.69	-0.86	1.9	0.5
NEW OFFICE BLDG	0.88	-1.13	1.8	-0.1
NEW HEALTH CARE BLDG	0.69	-0.16	0.2	NA

(-) margins decreasing (+) margins increasing
All data adjusted for inflation
Source: Producer Price Index. Bureau of Labor Statistics

Margin growth resumed in 2012. Margins ended down in 2013, but in some cases remained near flat. The PPI data shows 2014 growth in margins finished up. Independent selling prices show 2014 margins increasing by over 2%.

The flow of projects coming to bid during the coming months will strongly influence the cost movement of the bids. If the volume of projects coming to bid decreases, overall construction business will remain depressed and bids will remain low, strongly influenced by depressed margins. When there is a continued increase in the volume of projects coming to bid, the need to keep margins reduced will diminish and margins will continue a return to normal.

Indicators are pointing to growth signs, and that will eventually lead to a more normal bidding environment and higher margins.



Indexing – Addressing Fluctuation in Margins

Indexing - Addressing Fluctuation in Margins

The cost of previously built buildings is often looked at as a historical guide for what to expect in the future. Escalation indices allow the cost of buildings to be moved over time. City indices allow location to be moved. To index accurately, both margin and productivity movement need to be reviewed to determine what effect they might have on current cost compared to current index.

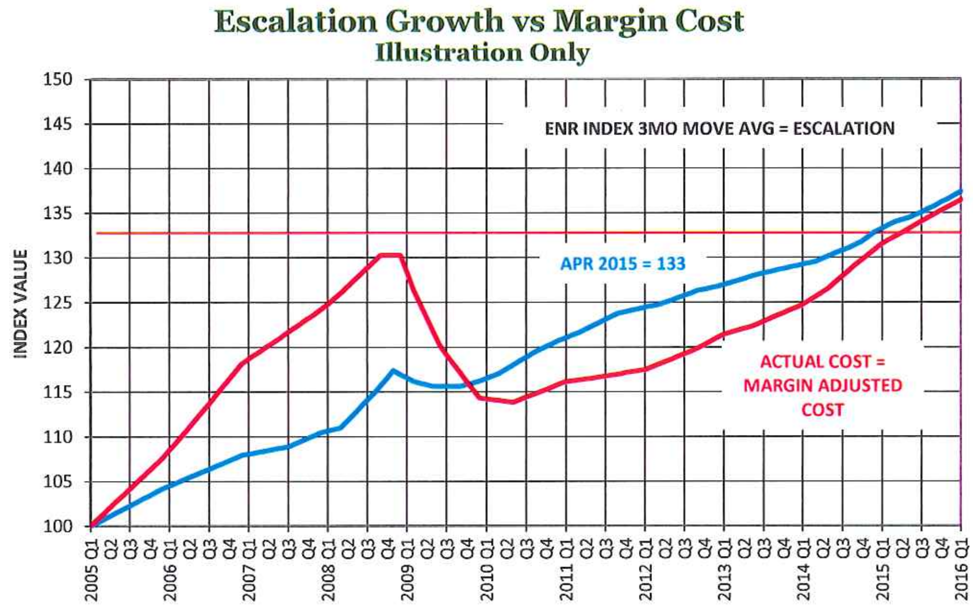
Average costs of buildings from Q2 2008 through Q4 2010 fell by 13% to 15%. However, normal labor/material indices increased by 4% during that time. Normal indices will not account for all changes in individual material costs, wages, productivity changes and margin fluctuations.

Standard labor and material index tables will not address the inflection points in this unusual time period, nor will standard labor and material inflation factors address productivity or margin fluctuation. Figure 28, "Escalation Growth vs. Actual Margin Cost", illustrates this unusual period and provides a means to properly account for these unusual occurrences.

In Figure 28, the blue line indicates ENR-BCI actual values through April 2014 and predicted escalation near 3% over the next two years. The plotted values are three-month moving averages to smooth out the line. The red (thicker) line indicates Contractor Bid Price Movement or Adjusted Margin Cost representative of bids received.

Very low margin cost in mid-2010 reflects contractor bids at low cost to secure a portion of a dramatically reduced amount of available work. Predicted future cost shows long-term cost growth, which accounts for both normal labor/material escalation equal to the escalation outlined above, and a very slow but steady 0.5% per quarter recovery of margins over the next few years.

FIGURE 28:
Escalation Growth vs. Actual Margin Cost 2005-2015



How to Use the Above Graph:

If your project is not previously indexed using ENR-BCI, reference only the Margin index (red line).

Pick the date for midpoint of the historical reference project.

At that date, draw a vertical line so it passes through both curves.

Now pick today's date.

At that date, draw a vertical line so it passes through both curves.

Record the ENR Index at the historical reference date and today.

Record the Margin Cost Index at the historical reference date and today.

Subtract historical ENR index from today's ENR index. Label that value A.

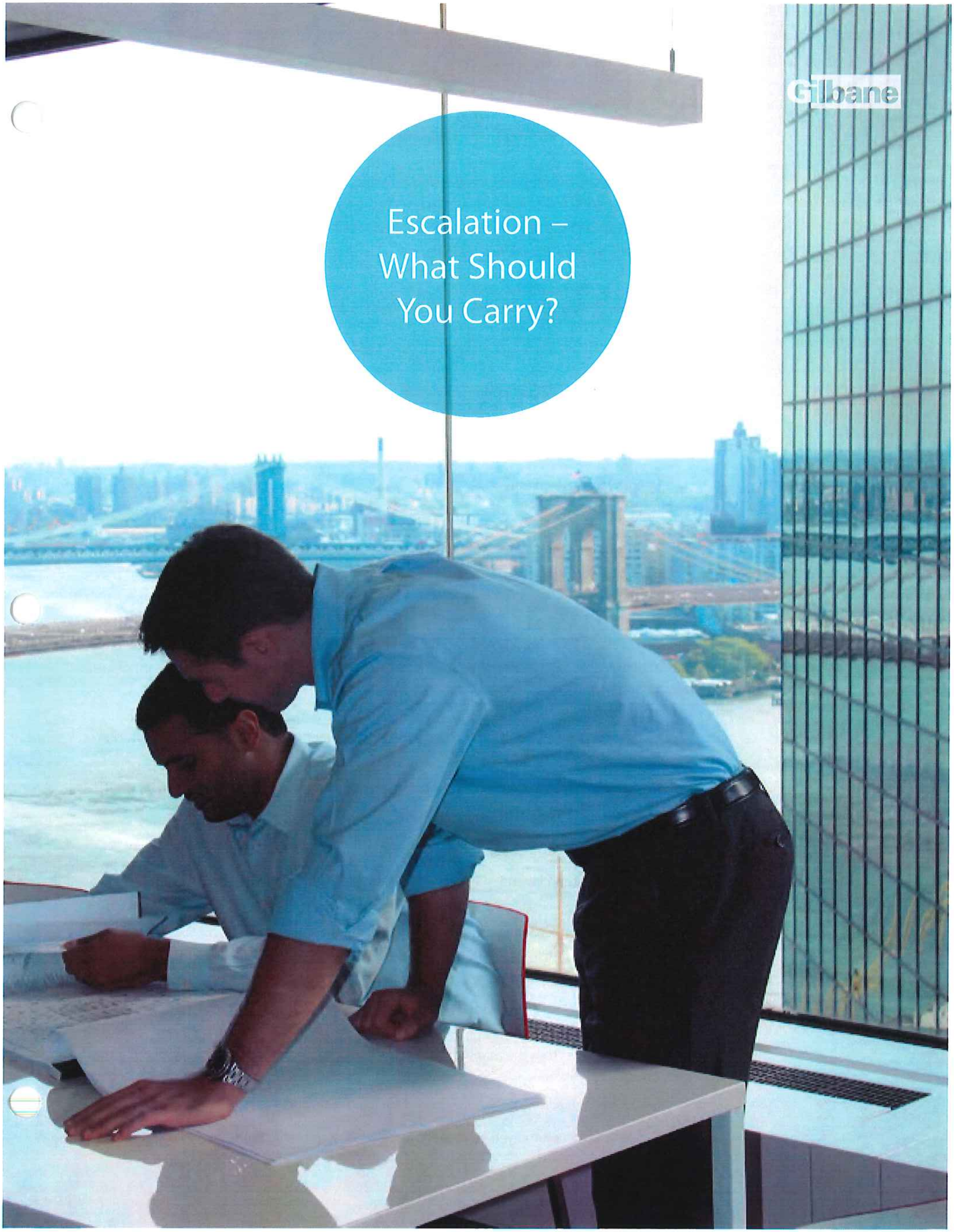
Subtract historical Margin index from today's Margin index. Label that value B.

Pay attention to sign (+ or -).

The difference between the movement due to the ENR index and the Margin Cost Index is the needed correction factor. Use the differences from the ENR Index (A) and the Margin Index (B) to develop an adjustment factor for your project. Since baseline is 100, all factors are the same as percentages.

B minus A = Margin Adjustment factor. Pay attention to signs (+ or -).

CostAdvisor users can record the Margin Adjustment value determined here into the Similarity Adjustment factor field. Treat all system indexing and future escalation as you would normally.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Escalation –
What Should
You Carry?

Escalation – What Should You Carry?

Escalation is typically thought of as one simple value. An estimator typically prepares a budget in today's dollars, but then must escalate the total estimate to the midpoint of the project construction schedule. As explained in prior sections, when determining escalation, the value must account for several factors.

Escalation must account for all anticipated differences from today's cost to expected future cost.

TO MOVE COSTS FROM TODAY'S DOLLARS TO FUTURE DOLLARS, WE MUST ACCOUNT FOR THE CUMULATIVE EFFECT OF:

- Market activity
- Labor wage rate changes
- Productivity changes
- Materials cost changes
- Equipment cost changes
- Margins fluctuations

The following escalation recommendations are based on the previous analysis of anticipated market activity, labor and material cost movement, productivity expectations and anticipated margin movement.

- Looking back at Q4 2014, we expected construction activity growth in most major sectors. Healthcare and infrastructure heavy engineering declined, but manufacturing buildings began to expand rapidly.
- Residential construction expanded, although at a somewhat slower rate than 2012-2013.
- Nonresidential buildings activity began to increase more rapidly.
- In 2015, we can expect construction activity growth in all major sectors.
- In 2015, commercial and office construction are expected to experience very high growth.
- Pent-up demand, particularly in the public sector, for example K-12, may result in a higher rate of activity, although this may not show up until later in 2015.
- For both 2015 and 2016, the general consensus across several construction economic reports is growth in spending of 8% to 11%.
- Inflationary pressures may push the rate of material cost increases higher. All material cost increases from the manufacturer through the supplier may be passed along to the owner.
- Labor shortages may be significant resulting in higher labor retention costs.
- Growing work volume will have the effect of reducing productivity, driving up labor cost.

- Contractors may increase margins 1% to 2% per year.
- Any assumption of low escalation (3%-3.5%) requires that market activity does not experience strong growth. All signs indicate otherwise.

Historical labor and material index growth is 75% in 20 years. That is 3.75% simple index growth per year or 2.85% compounded inflation cost growth for 20 years.

Historical as-sold building cost growth is 89% for 20 years. That is 4.45% simple index growth per year or 3.25% compounded inflation cost growth for the last 20 years.

Historical average spending growth is 7% per year (not including 2008 to 2011 when spending declined 35%).

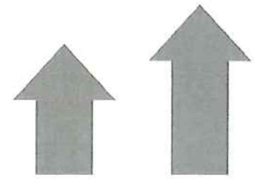
Since the U.S. Census began keeping construction spending records in 1993, it has reached a rate of spending growth over 10% per year only twice and only three other years have exceeded 9% per year growth.

FOR NONRESIDENTIAL BUILDINGS

- In years when spending growth exceeded 10%, as-sold cost escalation was 9% to 11%.
- Potentially there may be escalation similar to the growth years of 2005 through 2007 when (for nonresidential buildings) spending grew 43%, and escalation averaged 9% per year for three years. All leading indicators point to continued growth for the next few years.

For each year above, consider your market. If you are in a market area or sector that has expectations of a huge volume of work that may start within a narrow window of time, then market pricing can turn rapidly for you.

TOTAL ESCALATION



2014 3.5 - 6.5% | **2015 & 2016** 4.5 - 8%

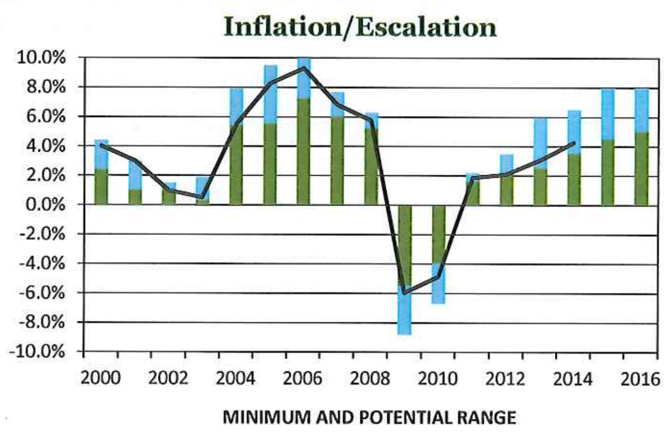
Total Escalation for 2014 = 3.5% to 6.5%

Total Escalation for 2015 and 2016 = 4.5% to 8%

FIGURE 29:
Inflation / Escalation Minimum and Potential 2000-2016

Prior to economic expansion and then downturn, long-term escalation averaged 3.5% for 20 years. There does not seem to be a scenario which returns the industry to escalation as low as that long-term average at least for several years beyond the above noted predictions.

Potential inflationary periods, declining productivity and even slight continued margin growth for several years lead to a recommendation of a minimum long-term escalation beyond 2016 of no less than 4%.



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The information in this report is not specific to any one region. The information is limited to the United States and does not address international economic conditions.

Author Ed Zarenski, a 42-year construction veteran and a member of the Gilbane team for 35 years, managed multi-million dollar project budgeting, owner capital plan cost control, value engineering and life cycle cost analysis. As a construction economics analyst, he compiles economic information and provides data analysis and opinion for this quarterly report.

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This report and the materials contained therein are provided as estimates and projections for what may happen in the future. Information herein is believed to be reliable but Gilbane does not warrant its completeness or accuracy. Gilbane, its related business entities and the author make no guarantee that the projections and expectations will reflect actual future market and industry behavior and the information is used at the reader's own risk.

Data Sources

Along with countless news articles, these sources are used for data in this report:

- American Institute of Architects – www.aia.org/practicing/economics/index.htm
- American Iron and Steel Institute - steel.org
- American Recycler - americanrecycler.com
- Associated Builders and Contractors - abc.org
- Associated General Contractors of America - agc.org
- Bloomberg L.P. Financial News - Bloomberg.com
- Bureau of Labor Statistics - Stats.BLS.gov
- Construction Industry Round Table – cirt.org
- CMD - CMDGroup.com (formerly Reed Construction Data)
- Data Digest – DataDigest
- Dodge Data & Analytics - construction.com/about-us/press
- Economic Cycle Research Institute - businesscycle.com
- Engineering News-Record - ENR.com
- Financial Trend Forecaster - Fintrend.com
- FMI Management Consulting - FMINET.com
- IHS Global Insight - ihs.com
- Institute for Supply Management - ism.ws
- Metal Prices – metalprices.com
- Producer Price Indexes - bls.gov/ppi
- Random Lengths - randomlengths.com
- U.S. Census Bureau - census.gov

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Financial Trend Forecaster Moore Inflation Predictor graph reprinted by permission.

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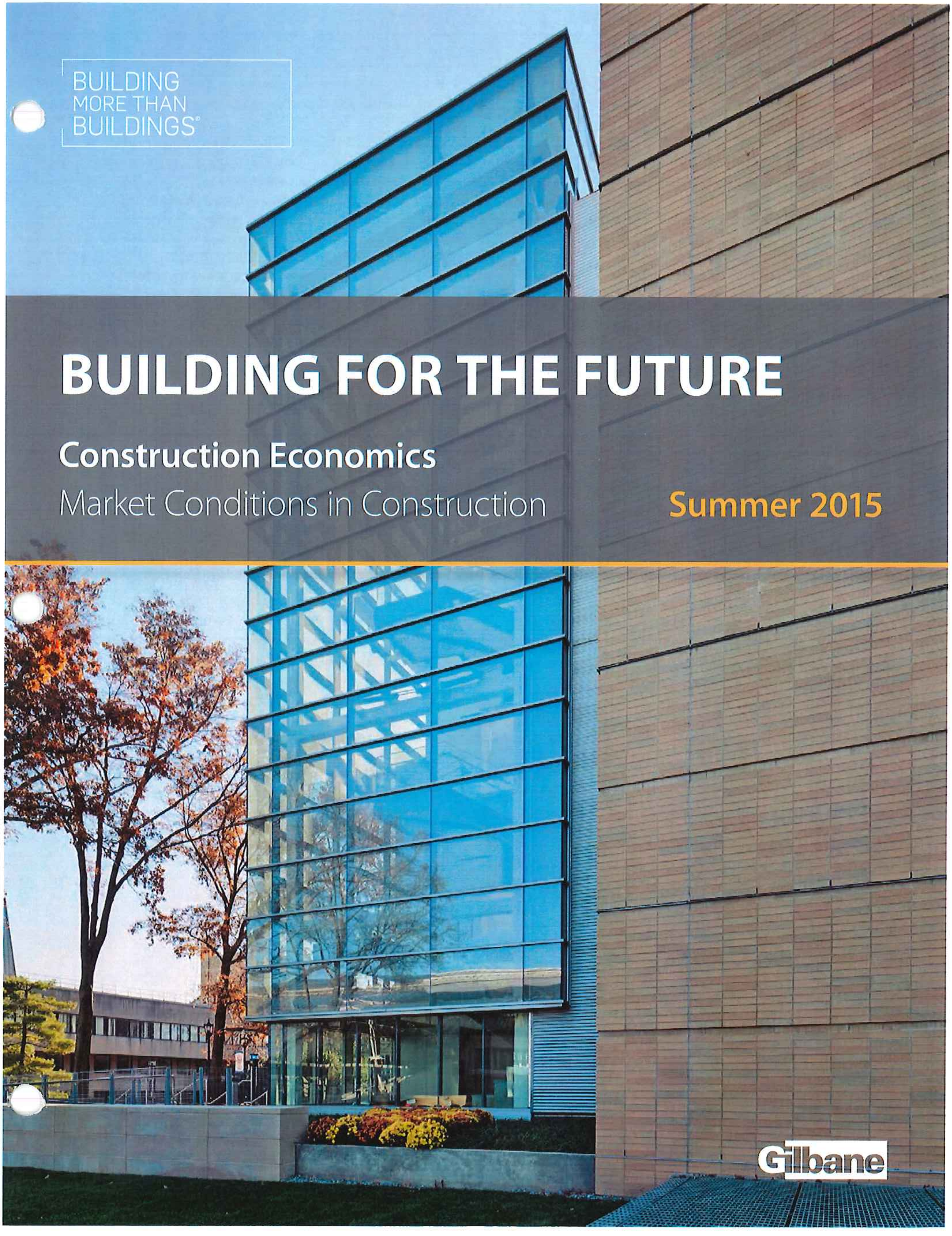
Market Conditions in Construction

Summer 2015



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CONTENTS

DATA INCLUDED IN THIS REPORT

DDA Construction Starts through June, released July 22, 2015

US Census Construction Spending (Put-In-Place) through June, released August 3, 2015

BLS Construction Jobs through mid-July, released August 7, 2015

Producer Price Index Materials through June, released July 22, 2015

Producer Price Index Markets through June, released July 22, 2015

Architectural Billings Index through June, released July 22, 2015

Dodge Momentum Index through July, released August 7, 2015

Consumer Inflation Index through June, released July 17, 2015

TABLES

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Summary

CONSTRUCTION OUTLOOK

- Construction spending is increasing at the fastest rate of growth since 2004-2005. The outlook is very encouraging.
- Construction spending will grow 10%+ for 2015 and 8%+ in 2016.
- In the first quarter of 2015, the seasonally adjusted annual rate for all spending averaged $997 billion. In the last quarter of 2015, spending will average greater than $1.100 trillion.
- 2015 spending advances will be supported by the strongest gains in nonresidential buildings spending in eight years.
- Construction starts for new nonresidential buildings for the last five quarters were the five highest since Q3 2008.
- Residential spending in 2015 will resume the post-recession advance after a lackluster 2014.
- Spending overall annual rate will increase at an average rate of growth near 1% per month for the next 12 months.
- Spending for nonresidential buildings will increase at an average rate near 1.5% per month for the next nine months.
- Residential spending will increase at a rate greater than 1% per month for the next 12 months.
- Nonbuilding infrastructure spending, after a brief gain, will go flat or decline until moderate growth resumes in the fourth quarter of 2015. The better outlook is nonbuilding new starts from January to May 2015, which totaled the highest on record and that will improve spending. In 2016, spending will be up.

Q3 2015 OUTLOOK

$1.06 Trillion

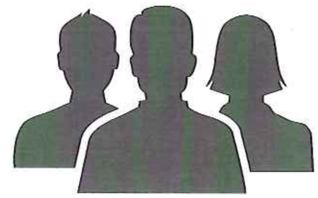
Average seasonally adjusted annual rate for all spending in Q2 2015

FIGURE A:
All Construction Spending Rate of Growth 2013-2015

Total spending for all types of construction will grow 11% year over year from 2014 to 2015. The year started at an annual rate of spending near $995 billion and should finish at a rate of $1.100 trillion.

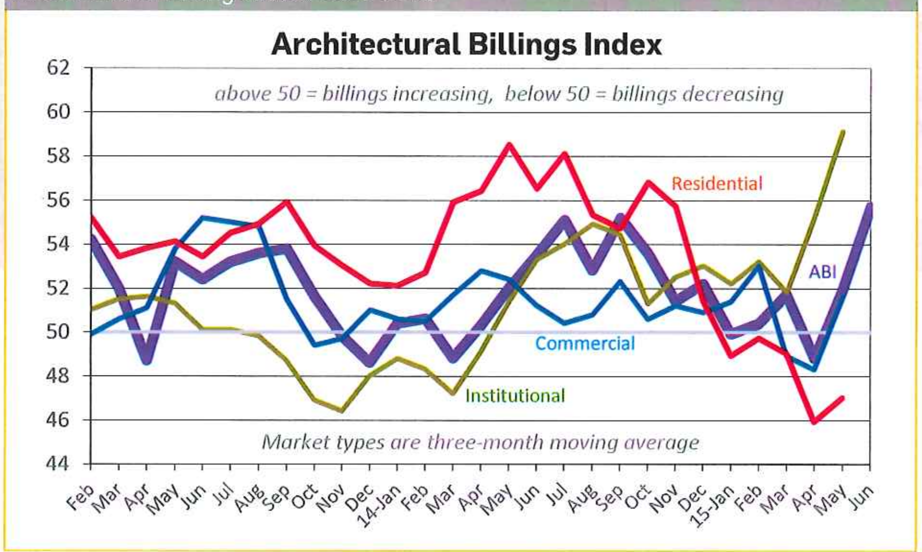
RESTRAINTS TO GROWTH

- The BLS Job Openings and Labor Turnover Survey (JOLTS) for the construction sector for June is at 143,000 unfilled positions. The number of open positions has been over 100,000 for 26 of the last 28 months and has been trending up since 2012. An increase in job openings generally signifies that employers cannot find people with the right skills to fill open positions.
- In a recent Associated General Contractors (AGC) survey, 80% of contractors indicated some difficulty in acquiring trained workers.
- A recent National Association of Home Builders (NAHB) survey indicates labor shortages have become more widespread than reported in 2014.
- New nonbuilding infrastructure work starts have been mixed over the last two years, with both new highs and new lows. Even with the most recent five months of new highs, the up and down spending pattern we've been seeing will continue at least until the end of 2016.
- Housing starts were off to a slow start. In February and March, new starts dropped well below expectations and will hold down total starts for 2015.



Hiring workers with the right skills will be a key constraint to economic growth in 2015 & 2016.

FIGURE B:
Architectural Billings Index 2013-2015



THE EFFECTS OF RAPID GROWTH

- From 2012 through 2014, the most current completed period, construction spending grew 21%. Inflation was 11%, so volume increased only 10%. However, work output increased by 13%. In this current growth cycle, productivity loss is at 3%.
- 2015 predicted spending growth is near 11%. The current four-year period of spending growth (2012-2015) will be almost identical to 2003-2006 (33%) and 1996-1999 (32%), which have been the two fastest growth periods on record with two of the highest rates inflation and productivity loss.
- As work volume begins to increase over the next few years, expect productivity to decline. There are many reasons why this will occur, among them: working longer hours until new workers are brought on; working more days; hiring less qualified workers; and acclimating new workers to the crew.
- Growth in nonresidential buildings and residential construction in 2014 and 2015 will lead to more significant labor demand. This may lead to labor shortages in some trades. This will drive up labor cost.
- Construction inflation is very likely to advance more rapidly than some owners have planned for, potentially requiring that some project budgets be revisited before projects can begin.
- Construction inflation in rapid growth years is much higher than average long term inflation.
- Long-term inflation is 3.3% for nonresidential buildings and 3.5% for residential buildings.
- During rapid growth periods, inflation is 8% for nonresidential buildings and 9% for residential buildings.

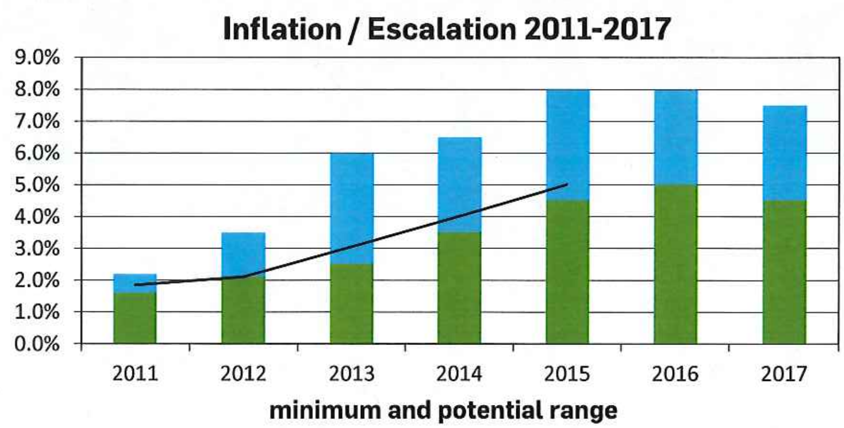
This could be the breakout year for nonresidential buildings. The outlook now is for 20% growth in spending. Most of that gain is already recorded in new starts, the strongest in seven years. Escalation will climb to levels typical of rapidly growing markets.

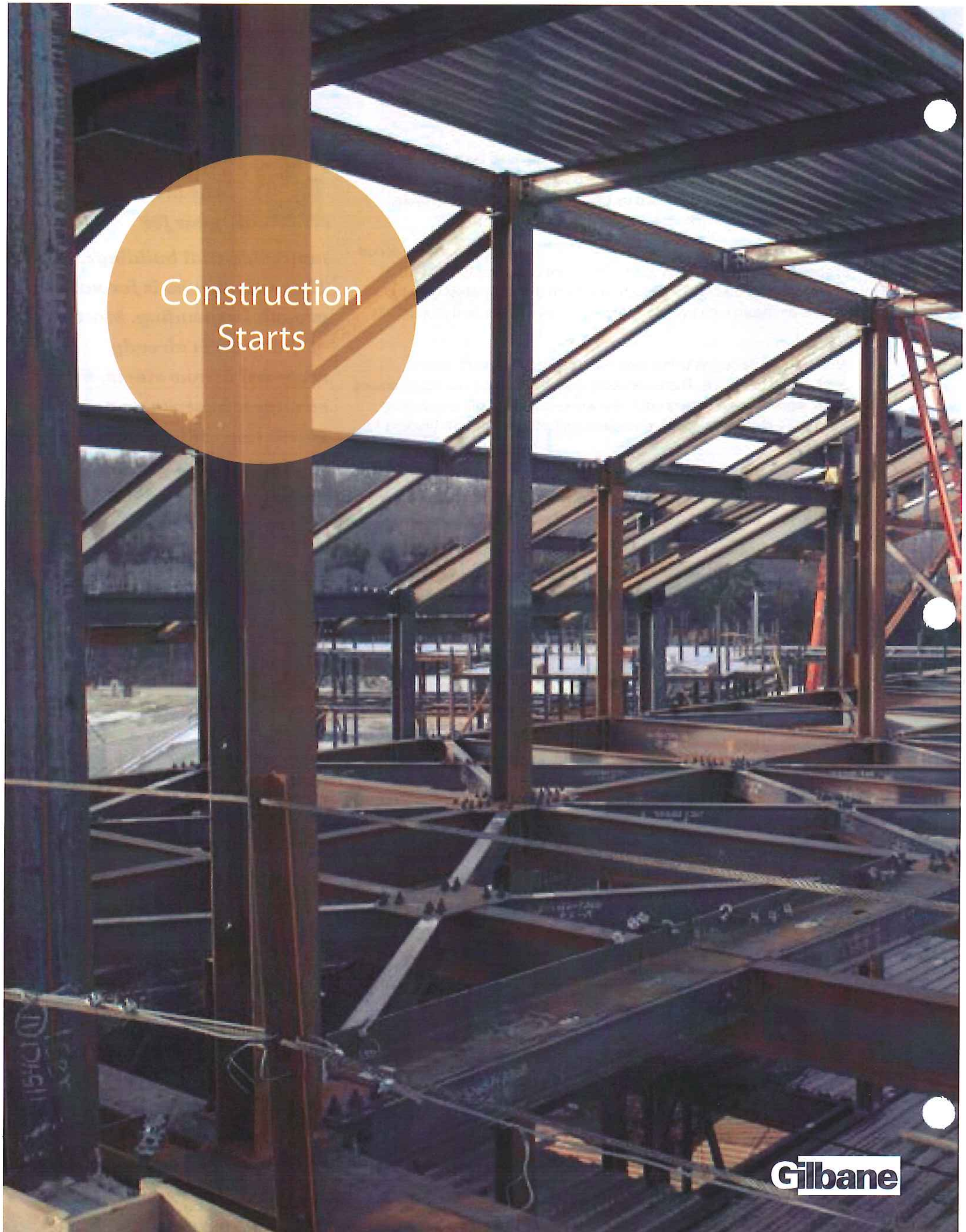
FIGURE C:
Inflation / Escalation 2011-2017

In order to capture increasing margins, future escalation will be higher than normal labor and material cost growth. Lagging regions will take longer to experience high escalation. Residential escalation is currently near, or even above, the upper end of the range.

For escalation back to year 2000, see Figure 30. Recommended range:

- 4.5% to 8% for 2015
- 5.0% to 8% for 2016
- 4.5% to 7.5% for 2017




Construction
Starts
Gilbane

Construction Starts

Construction Starts data is published monthly by Dodge Data & Analytics (DDA). Each month, they update the data for the previous month and for the 12 months prior. The previous month and year prior updates are incorporated into the charts and tables. Although DDA may publish further updates to its data, this report does not track any data beyond the 12 month update. This may result in values here that differ slightly from other published DDA data.

Construction Starts data is volatile from month to month, and this may cause unusual peaks and valleys in the data. For that reason, a three-month moving average (3mma) of starts data is used. Also, to observe trends in the data, the latest month is compared to the last three months and the last six months of the Seasonally Adjusted Annual Rate (SAAR) data.

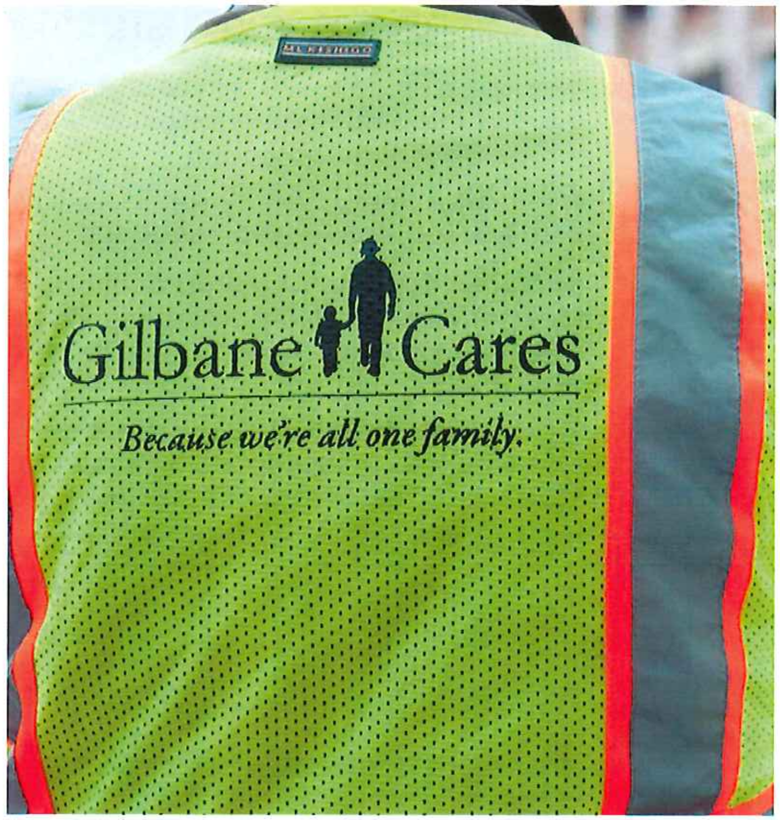
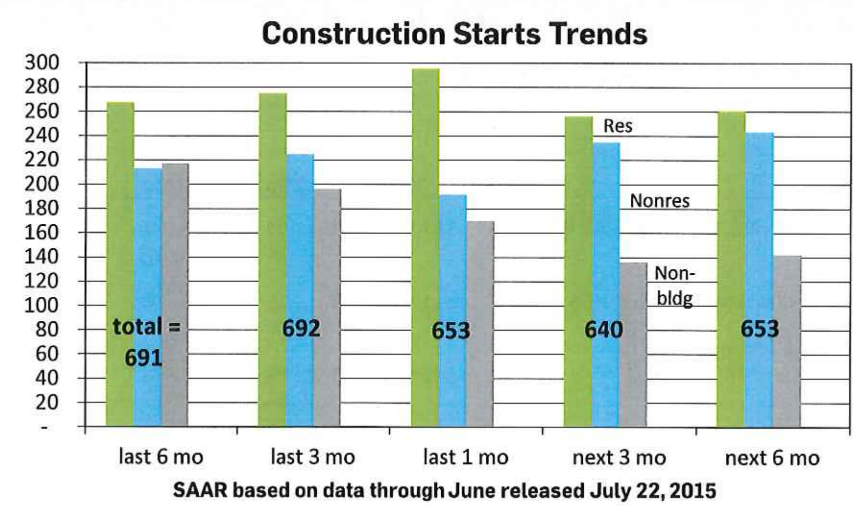


FIGURE 1:
Construction Starts Trends 2015

Residential (Res) starts in 2012 and 2013 had rapid growth of 25% to 30%. In 2014, there was only 10% growth. 2015 will show 15% growth and the most total residential starts since 2006.

Nonresidential buildings (Nonres) starts hit a 12-month low in February 2014 but reached a seven-year high in recent months. Growth has already started and is expected to continue to moderate over the next six months.

Nonbuilding (Nonbldg) starts had been declining from a 2012 peak to mid-2014. **Then Q4 2014 was strong, and Jan-May 2015 posted the highest nonbuilding starts on record.** Expect second half 2015 starts to slow 40% from Jan-May.



EXPECTATIONS FOR 2015 NEW CONSTRUCTION STARTS

- June total construction starts dropped 15% below the May eight-year high, yet still closed the best quarter and best first half since 2006. Nonbuilding starts are the surprise contributor to strong growth.
- Nonresidential buildings starts reached a 10-year low in 2012. Nonresidential starts have been increasing at an average of 17% per year since those 2012 lows.
- Nonresidential buildings starts since March 2014 posted the best five quarters since the third quarter of 2008. Although growth should continue, expect it will do so at a more moderate rate. Nonresidential buildings starts may slow to total only +4.5% in 2015.
- Residential starts growth stalled from July 2013 through June 2014, but for the five months of January through May 2015, starts have reached a nine-year high. Growth rate is expected to slow but still result in 14% total growth for 2015.
- Nonbuilding infrastructure starts total for the first six months of 2014 is the lowest on record back to January 2008. For the last quarter of 2014, starts improved to the best in a year. Then for the first five months of 2015, nonbuilding starts shot up nearly 50% to the highest on record. Nonbuilding starts experience the most volatility. That rapid growth rate will not continue. Starts are expected to drop by 33% from first half to second half 2015, finishing with 25% growth for 2015.
- Nonresidential buildings starts help forecast the spending trend for the next one to two years.
- Residential buildings starts help forecast the spending trend for the next 9 to 18 months.
- Nonbuilding infrastructure starts help forecast the spending trend for the next two to three years.

TABLE 1:
U.S. Construction Market Outlook New Starts 2009-2015

Total Construction Starts

	2009	2010	2011	2012	2013	2014	GILBANE FORECAST 2015
NONRESIDENTIAL BUILDINGS	167,955	161,194 -4.0%	165,048 2.4%	158,222 -4.1%	177,362 12.1%	218,911 23.4%	**228,785 4.5%**
RESIDENTIAL BUILDINGS	111,851	121,155 8.3%	126,299 4.2%	166,159 31.6%	210,325 26.6%	231,803 10.2%	**267,753 13.8%**
NONBUILDING CONSTRUCTION	141,899	148,088 4.4%	147,851 -0.2%	162,823 10.1%	148,755 -8.6%	142,167 -4.4%	**178,057 25.2%**
TOTAL CONSTRUCTION PERCENT CHANGE YOY	421,705	430,437 2.1%	439,198 2.0%	487,204 10.9%	536,442 10.1%	592,881 10.5%	**670,595 13.1%**

dollars in millions
includes Dodge Data Analytics data for June 2015 released July 22, 2015
DDA data includes updates to 12-months ago data through June 2014
all data after June 2015 is predicted

FIGURE 2A:
Construction Starts Nonresidential Buildings 2012-2015

FIGURE 2B:
Construction Starts Nonbuilding Infrastructure 2012-2015

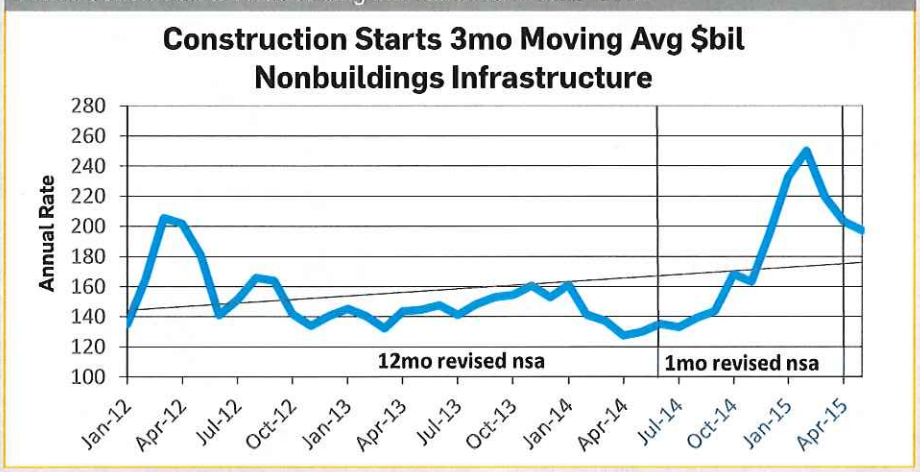
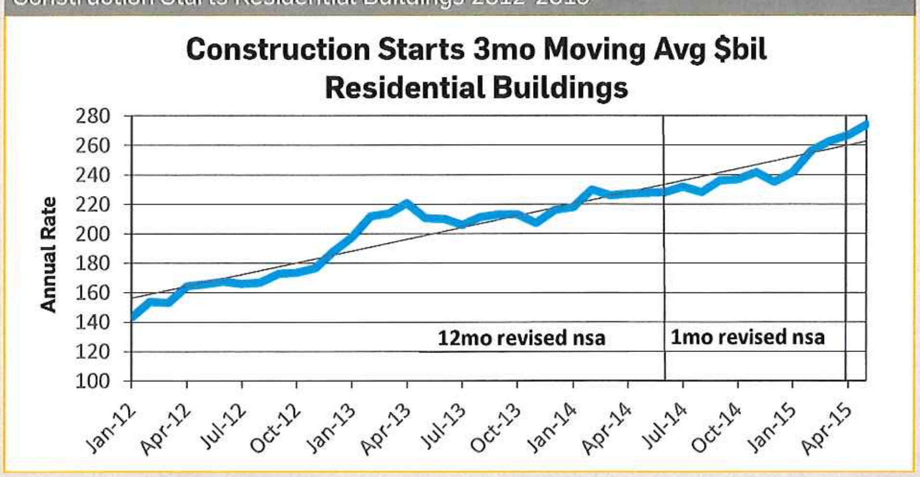


FIGURE 2C:
Construction Starts Residential Buildings 2012-2015



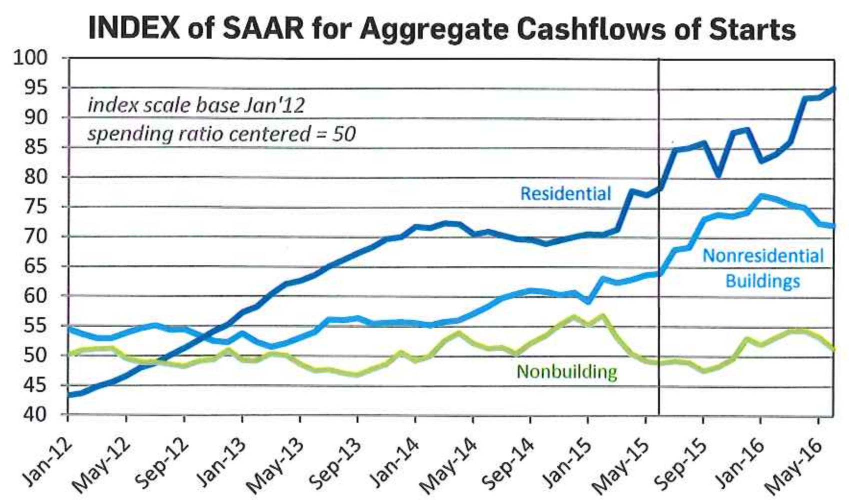
FIGURES 2A, B, C

Note: All DDA Starts seasonally adjusted (SAAR) data is revised one month later, and not seasonally adjusted (NSA) data is revised 12 months later. These plots include both 12-month and one-month adjustments. The vertical lines reflect the revision month.

NEW CONSTRUCTION STARTS AS A LEADING INDICATOR

Dodge Data & Analytics' construction starts act as a leading indicator to spending. Beginning with the three-month moving average of actual starts, using monthly cash flow, the value of the new project starts is spread out over the expected project duration from start to finish. Generally, project durations can range from six to twelve months for small projects and, on average, 24 to 30 months for large projects. Unique large projects can last three to four years. Project duration and cash flow begins in the month the data is posted. Monthly cash flow can be quite uneven due to the variance in the duration of starts. The cumulative cash flow total in the current month from all monthly starts over the previous months/years shows the relative change in spending caused by change in starts. This relative change in cash flow provides the basis to predict changes in future construction spending.

FIGURE 3:
Construction Starts – Cumulative Cash Flow of Starts 2012-2016



The following index chart (see Figure 4) shows the correlation among nonresidential building starts cash flow, the Architectural Billings Index (ABI), the Dodge Momentum Index (DMI) and actual nonresidential buildings spending. Starts data is from the aggregate cash flow previously explained. ABI and DMI data are moved out to their respective lead times; date and spending is real time. The ABI indicates growth if above 50 and a decline if it drops below 50. The commercial and institutional components of the ABI are shown for reference. Although there may be a one-month to three-month differential, there appears to be a correlation between the ABI and Starts, and they provide an indication of the strength and the direction that spending will move.

ANALYZING THE ARCHITECTURAL BILLINGS INDEX

Above indicates growth

50

Below indicates decline

Both ABI and Starts cash flows indicated a mild slowdown in nonresidential buildings construction spending at the end of 2014 before a strong upturn in spending in 2015. Expect another drop in spending late in 2015. Even if new nonresidential buildings starts growth were to turn flat for rest of 2015 (which is not expected), those starts already recorded over the past 12 months predict that spending for nonresidential buildings in 2015 will increase 20% over 2014, the best growth since 2007.

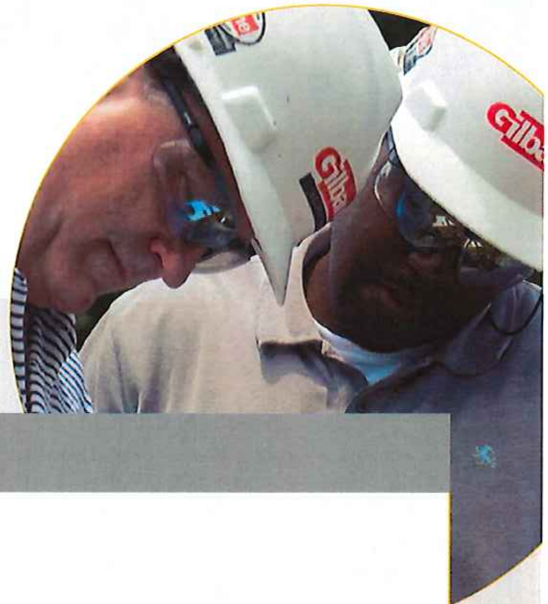
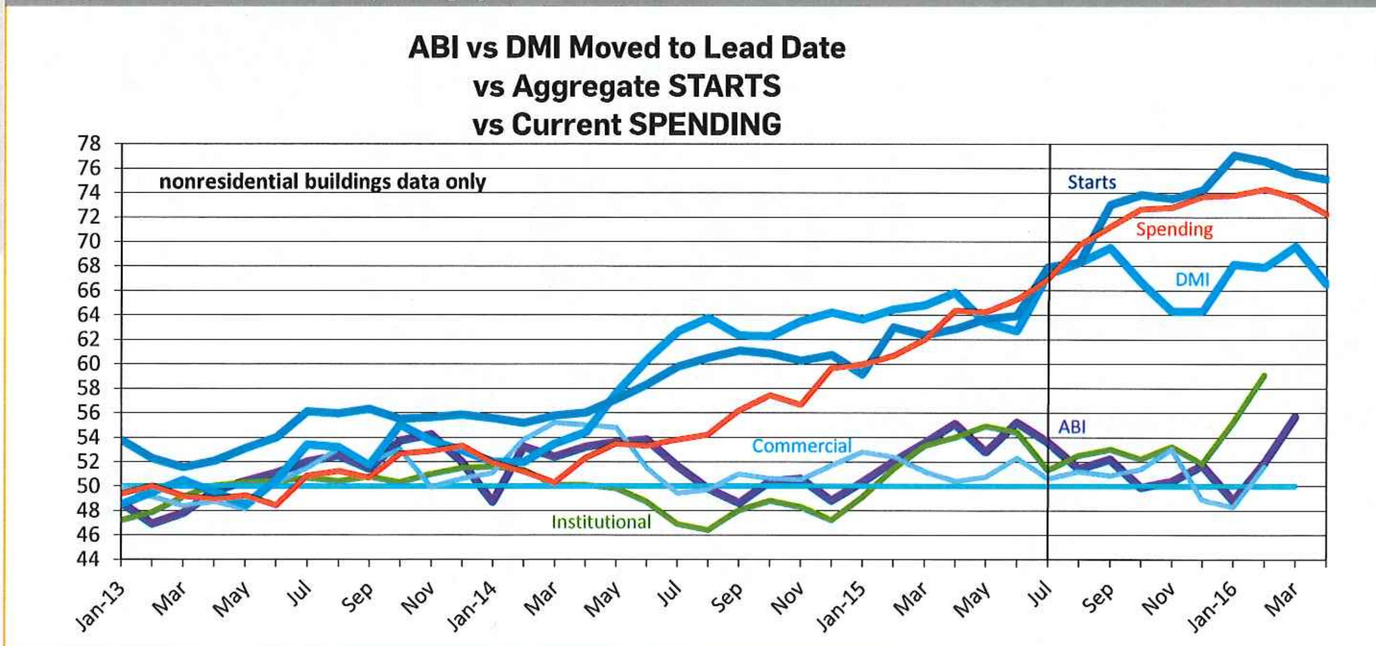
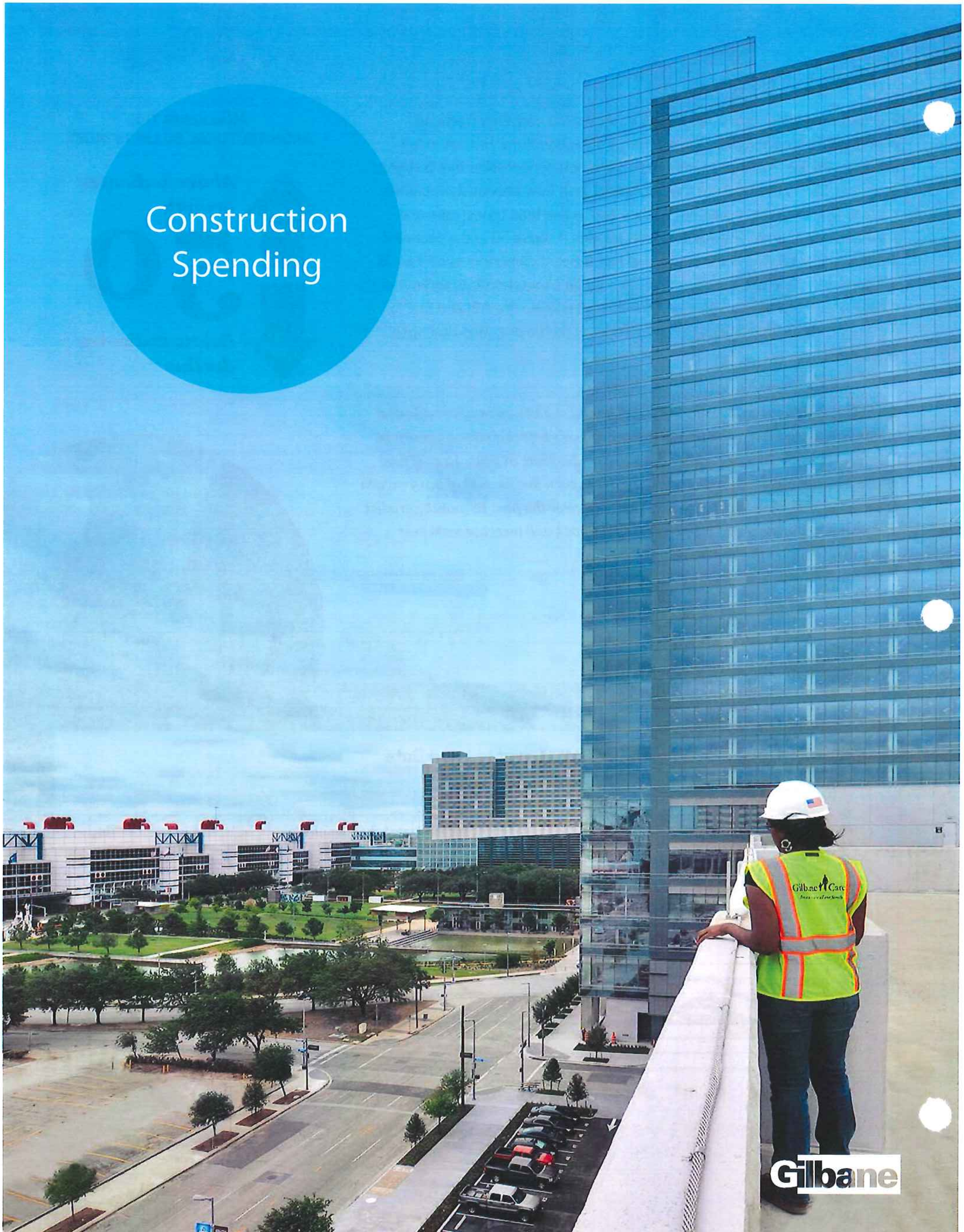


FIGURE 4:
Overlay of ABI – DMI – Starts – Spending by Lead Time



Construction Spending



Gilbane

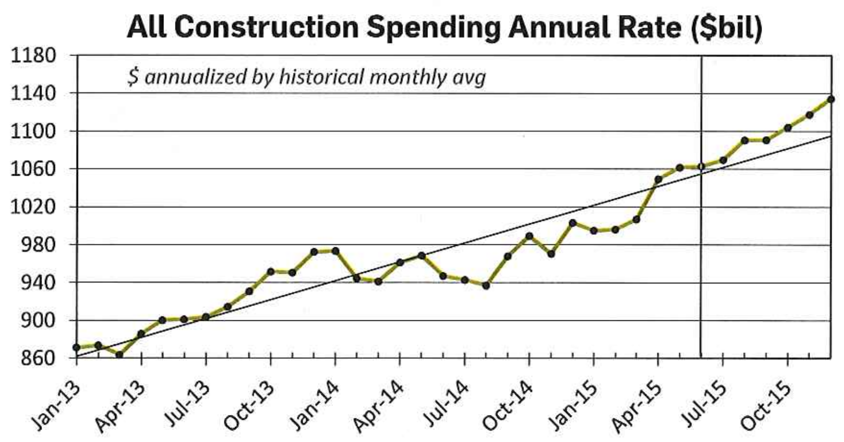
Construction Spending

Total spending for all types of construction in 2015 will reach $1.067 trillion, up 10.9% year over year from 2014 spending.

- 2015 spending will record the highest dollar amount year over year growth in 10 years.
- In Q1 2013, the monthly rate of spending was $870 billion.
- In Q1 2014, the monthly rate of spending was $950 billion.
- In Q1 2015, the monthly rate of spending was $997 billion.
- By Q4 2015, the monthly rate of spending will average over $1.100 trillion.

For 2015, spending gains will be supported by the strongest gains in nonresidential buildings in eight years. Residential spending will also help total spending advance. Nonbuilding infrastructure spending, after a brief gain, will go flat or decline until growth returns in the fourth quarter.

FIGURE 5:
All Construction Spending Rate of Growth 2013-2015



The most recent (June) monthly construction spending report posted only a slight gain month over month from May, but the data still shows rather exceptional trends. May plus June spending is the highest two-month total in six and one-half years. Q2 2015 is the highest quarter since Q3 2008. At this rate, 2015 is on track to experience the second-highest ever dollar growth in spending, more than $100 billion. Only 2005 was greater.

- In the last three quarters, construction spending registered the fastest growth rate in over nine years. 11.5% growth in nine months = +15%/yr annualized. The growth rate will slow in the second half 2015 to finish the year up 11%.
- Manufacturing spending year-to-date versus same months in 2014 is up 56%. The last four months are each up more than 60% versus the same month in 2014. This level of growth will continue for at least the next three months.
- Nonresidential buildings spending year-to-date versus same months in 2014 increased 21%, the fastest rate of growth on record.
- Public spending is up 8% in a year and reached the highest level of spending in 12 quarters.

TABLE 2:
Total Construction Spending Summary 2007-2015

U.S. Total Construction Spending Summary

	TOTALS IN BILLIONS CURRENT U.S. DOLLARS								GILBANE
				Actual					FORECAST
	2007	2008	2009	2010	2011	2012	2013	2014	2015
NONRESIDENTIAL BLDGS	403.9	438.6	377.5	291.9	284.3	300.7	303.1	330.1	**396.7**
% CHANGE YEAR OVER YEAR	18.9%	8.6%	-13.9%	-22.7%	-2.6%	5.7%	0.8%	8.9%	**20.2%**
NONBUILDING HVY ENGR	248.1	272.1	273.5	265.0	251.3	273.7	274.0	288.2	**281.7**
	19.4%	9.7%	0.5%	-3.1%	-5.2%	8.9%	0.1%	5.2%	**-2.2%**
RESIDENTIAL	500.5	357.7	253.9	249.1	252.7	286.8	341.2	343.8	**388.1**
	-19.3%	-28.5%	-29.0%	-1.9%	1.4%	13.5%	18.9%	0.7%	**12.9%**
TOTAL	1152.5	1068.4	904.9	806.0	788.3	861.2	918.3	962.1	**1066.5**
	-1.3%	-7.3%	-15.3%	-10.9%	-2.2%	9.2%	6.6%	4.8%	**10.9%**

Residential includes new, remodeling, renovation and replacement work.

Source: U.S. Census Bureau, Department of Commerce.

Actual Spending data includes 2013 & 2014 revisions 7-1-2015

A comparison of most recent 2015 spending projections is shown in Table 3. Gilbane projections are compared to CMD Group (CMD) and FMI. While both CMD and FMI have lowered their projections since their early 2015 estimate, Gilbane's projection has increased.

CMD Forecast FMI Forecast

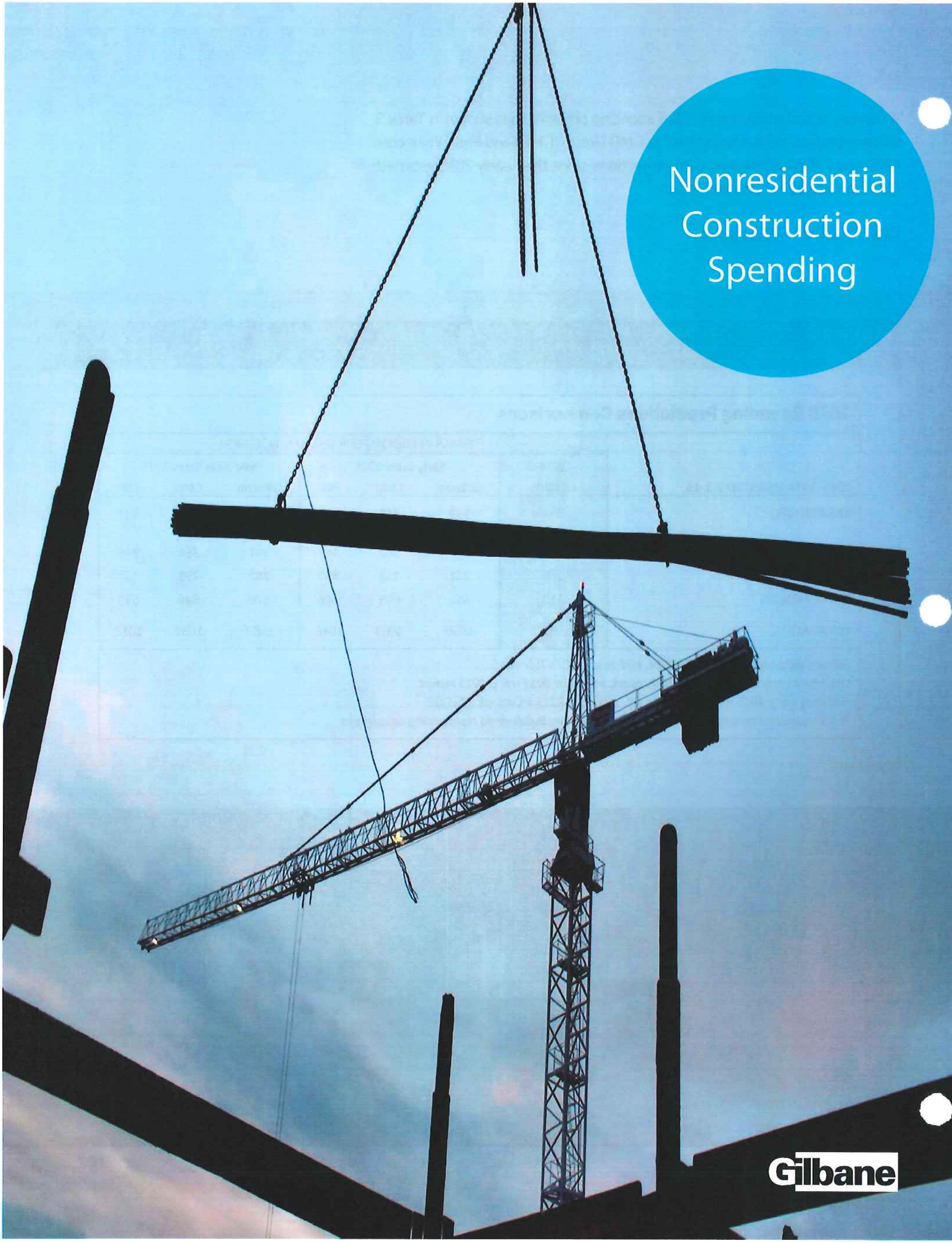
TABLE 3:
Total Spending Predictions Comparisons 2015

2015 Spending Predictions Comparisons

	TOTALS IN BILLIONS CURRENT U.S. DOLLARS						
	2014	Early Estm 2015			Mid-Year Estm 2015		
2014 DATA UPDATED 7-1-15	**ACTUAL**	Gilbane	CMD	FMI	Gilbane	CMD	FMI
RESIDENTIAL	**344**	399	419	399	388	384	382
NONRESIDENTIAL BUILDINGS	**330**	370	342	348	397	354	346
NONBUILDING	**288**	281	313	300	282	293	284
TOTAL NONRES	**618**	651	655	648	679	646	630
TOTAL ALL	**962**	1050	1068	1046	1067	1031	1012

Gilbane data early 2015 = Dec 2014, mid-year 2015 = July 2015
CMD data early 2015 = 12-05-2014 report, mid-year 2015 = 6-3-2015 report
FMI data early 2015 = Outlook 2014 Q4, mid-year 2015 = Outlook 2015 Q2
FMI Transportation and Communication moved from Buildings to Nonbuilding to conform

Nonresidential Construction Spending



Nonresidential Construction Spending

Nonresidential construction consists of two main categories, nonbuilding infrastructure projects and nonresidential buildings.

Total spending for all nonresidential construction in 2015 will reach $678 billion, up 9.7% from 2014. Growth is entirely due to nonresidential buildings, up 21% year-to-date. Nonbuilding infrastructure is down 2.6% year-to-date.

NONBUILDING INFRASTRUCTURE SPENDING

Nonbuilding projects are composed of heavy engineering, heavy industrial and infrastructure projects. They include transportation, communication, power, highway and street, sewage and waste disposal, water supply and conservation and development. Almost 60% of nonbuilding work is public work.

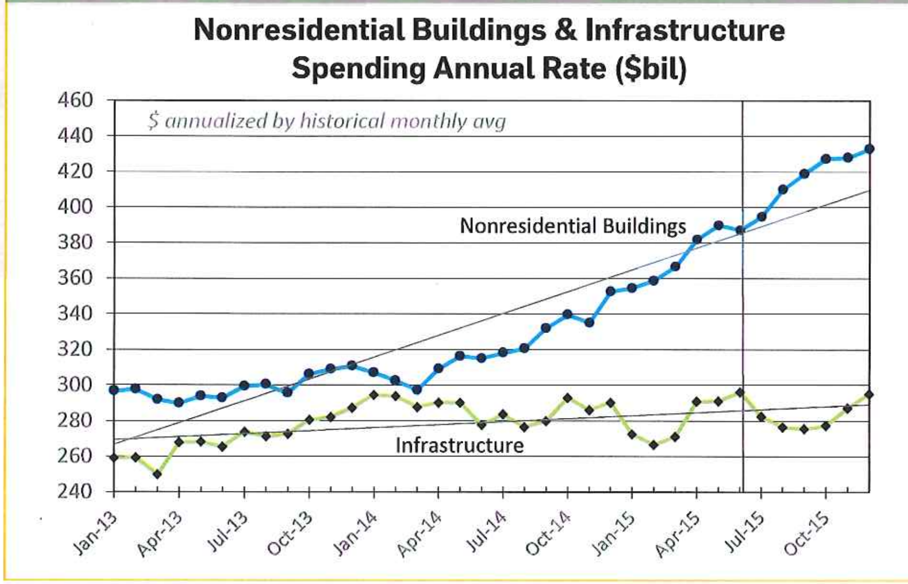
Total spending for nonbuilding infrastructure in 2015 will reach only $282 billion, a decline of 2.2% from 2014.

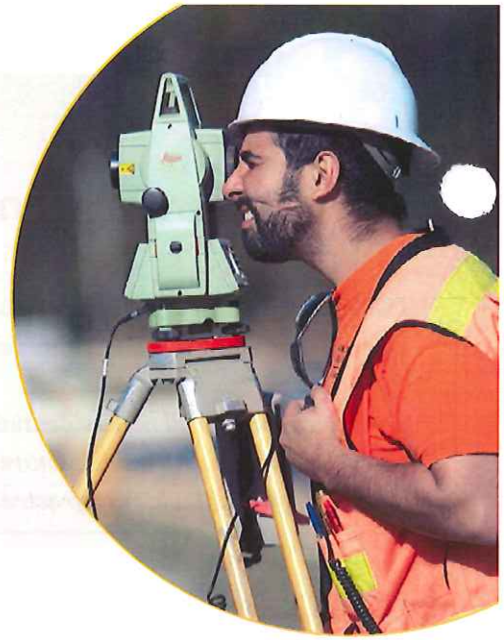
- In Q1 2013, the monthly rate of spending was $256 billion.
- In Q1 2014, the monthly rate of spending increased to an average $292 billion.
- In Q1 2015, the monthly rate of spending slipped to only $270 billion.
- By Q4 2015, the monthly rate of spending will reach only $280 billion, but by Q1 2016, spending will be over $300 billion.

The largest components of nonbuilding infrastructure work are power and highway/street. The power sector represents approximately 40% of all nonbuilding spending and highway/street represents about 35%. Erratic movement in new starts in the power industry causes unusual fluctuations in nonbuilding infrastructure spending. The period from July 2012 through August 2013 had the lowest average new starts for infrastructure work of any period in the last six years, until the first six months of 2014 went even lower. The effect of all of those low starts will result in constrained spending continuing through 2015.

January through May 2015 posted the highest nonbuilding starts on record. Even though new starts will slow in the second half of 2015, this elevated level of nonbuilding starts will result in increased spending over the next few quarters. Nonbuilding infrastructure will realize spending gains into 2016.

FIGURE 6:
Nonresidential Buildings and Infrastructure Spending Growth 2013-2015





NONRESIDENTIAL BUILDINGS SPENDING

Nonresidential buildings spending remained relatively flat from August 2011 to March 2014. Both the ABI and cash flow of new starts correlated with that spending pattern, and both also indicated the growth that would occur since then. Nonresidential buildings spending year-to-date versus same months 2014 is up 21%. Nonresidential buildings spending will continue rapid growth through Q3 2015.

Total spending for nonresidential buildings construction in 2015 will reach $397 billion, a 20.2% increase from 2014.

- 2015 spending will record the highest dollar amount annual growth since 2007 and the highest percent growth ever recorded.
- In Q1 2013, the monthly rate of spending was $295 billion.
- In Q1 2014, the monthly rate of spending was $302 billion.
- In Q1 2015, the monthly rate of spending climbed to $360 billion.
- By Q4 2015, the monthly rate of spending will average $430 billion.

2015 nonresidential buildings spending could reach 20% growth above 2014. Two-thirds of that will come from starts recorded in 2014. Cash flow of starts is indicating big monthly gains through October.

NONRESIDENTIAL BUILDINGS

Spending hit
6 year high
first half 2015

% growth achieved
highest recorded
first half 2015 vs. first half 2014

TABLE 4:
Spending Predictions Comparisons – Nonresidential Buildings 2015

2015 Spending Predictions Comparisons - Nonresidential Buildings

DATA UPDATED 7-1-15	EARLY ESTIMATE 2015		MID-YEAR ESTIMATE 2015	
U.S. CENSUS FINAL ACTUAL 2014 = 330				
GILBANE BUILDING COMPANY	370	1	397	2
FMI	348	3	346	4
CONSTRUCTION MARKET DATA CMD	342	5	354	6
ASSOCIATED BUILDERS & CONTRACTORS	330	7	342	8
DODGE DATA & ANALYTICS	352	7	358	8
IHS GLOBAL INSIGHT	357	7	358	8
MOODY'S ECONOMY.COM	360	7	363	8
WELLS FARGO	331	7	346	8
		see notes		*see notes*

VALUES ARE BILLIONS OF DOLLARS

Gilbane data 1 = Dec 2014 report, 2= Aug 2015 report
FMI data 3 = Outlook 2014 Q4, 4 = Outlook 2015 Q2
CMD 5 = Dec 2014 report, 6 = June 2015 report
7 = AIA Consensus report January 2015
8 = AIA Consensus report July 2015
FMI Transportation and Communication moved from Buildings to Nonbuilding to conform

TABLE 5:
Construction Spending Major Nonresidential Markets 2007-2015

U.S. Total Construction Spending

	TOTALS IN BILLIONS CURRENT U.S. DOLLARS Actual								GILBANE FORECAST
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
EDUCATIONAL	96.8	104.9	103.2	88.4	85.0	84.7	79.1	79.7	**85.3**
% CHANGE YEAR OVER YEAR	13.9%	8.4%	-1.6%	-14.3%	-3.9%	-0.4%	-6.6%	0.8%	**7.1%**
HEALTHCARE	43.8	46.9	44.8	39.3	39.7	42.5	40.7	38.4	**41.1**
	13.7%	7.2%	-4.4%	-12.3%	0.9%	7.2%	-4.4%	-5.6%	**7.0%**
COMMERCIAL RETAIL	89.7	86.2	54.7	40.1	42.8	47.3	53.2	62.7	**68.2**
	16.9%	-3.9%	-36.5%	-26.7%	6.8%	10.6%	12.3%	18.0%	**8.8%**
OFFICE	65.3	68.6	51.9	37.8	36.0	37.8	38.0	46.1	**55.8**
	20.4%	5.1%	-24.3%	-27.1%	-4.9%	5.0%	0.5%	21.3%	**21.1%**
MANUFACTURING	40.6	54.1	57.9	41.2	40.6	47.7	50.5	57.8	**87.7**
	24.4%	33.2%	7.0%	-28.9%	-1.5%	17.7%	5.9%	14.3%	**51.9%**
TOTAL	336.1	360.7	312.6	246.9	244.1	260.1	261.5	284.7	**338.2**
	17.1%	7.3%	-13.3%	-21.0%	-1.1%	6.6%	0.5%	8.9%	**18.8%**

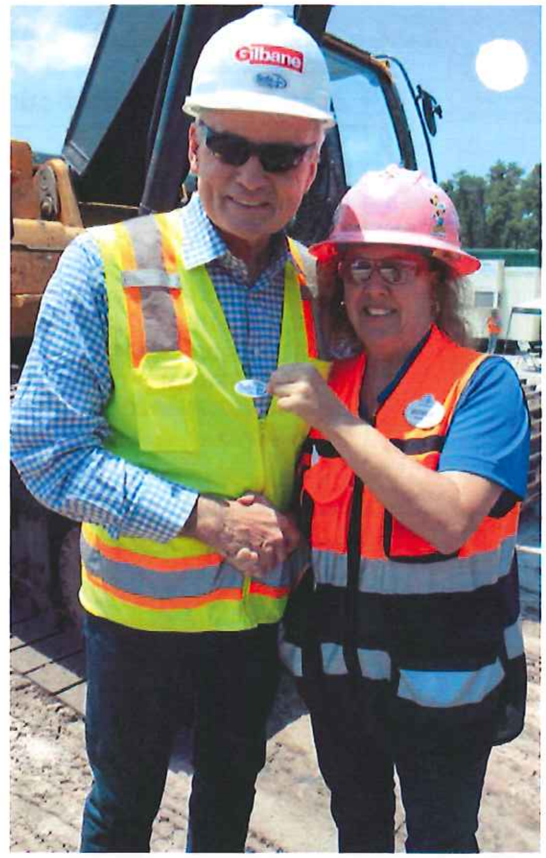
Source: U.S. Census Bureau, Department of Commerce.
Includes public and private
Actual Spending data includes 2013 & 2014 revisions 7-1-2015

These five market sectors represent over 80% of all nonresidential buildings spending: educational; healthcare; commercial retail; office and manufacturing.

The major institutional sectors, healthcare and education, both peaked in late 2008 and early 2009. Education spending reached a peak seasonally adjusted annual rate (SAAR) of $110 billion. Healthcare peaked at $47 billion. Educational declined 35% to a Q4 2013 low. Healthcare dropped 20% to a low in Q4 2014. Education is 80% public while healthcare is 80% private.

Commercial/retail peaked at a rate of $98 billion in Q1 2008. Office peaked at $77 billion in Q1 2008. Commercial/retail experience a rapid decline of 60% to a 15 year low in Q4 2010. Office declined 50% from its peak to a low in Q2 2013. Commercial/retail is 95% private; office is 70% private.

The manufacturing sector peaked in early 2009 at a rate of $70 billion but then dropped 50% to hit a five-year low in January 2011. It quickly climbed from that bottom but remained between $40 and $50 billion until March 2014. Manufacturing is 100% private.



Spending for educational buildings in 2015 will total $85.3 billion, a 7.1% increase from 2014, the first substantial increase since 2008.

Since Q1 2009, public educational spending declined 30%, from a SAAR of $90 billion to $62 billion, but private educational spending declined only 11%, from $19 billion to $17 billion. Educational spending hit a low in Q4 2013 not seen since 2004, but since then monthly spending has increased 15% and is projected to reach $89 billion by December 2015, a 7% gain for 2015 and a 6% gain for 2016.

Total spending for healthcare buildings in 2015 is expected to reach $41.1 billion, a 7.0% increase from 2014.

Healthcare spending hit an eight-year low in Q4 2014 at $38 billion. It is now up to $40 billion. Healthcare spending will reach an annual rate of $43 billion by year end and will average a 7% gain for 2015 and 6% for 2016.

Total spending for commercial/retail buildings in 2015 should reach $68.2 billion, up 8.8% from 2014. 2014 spending was recently revised upward from $57.1 billion to $62.7 billion to reflect 18% above 2013, the largest increase since 2007.

Commercial/retail experienced the most drastic drop in spending of all nonresidential market types. From Q1 2008 to Q4 2010, it dropped 60% from a peak SAAR of $99 billion to $37 billion. In inflation adjusted constant dollars, this is the lowest spending on record for commercial/retail buildings. Spending rebounded very nicely in the three years 2012-2014 as the strongest growth market sector during that period. Spending is now up to a rate of $67 billion, but growth will slow from here on forward. Commercial retail will realize gains of 8.8% for 2015 and 5.4% in 2016.

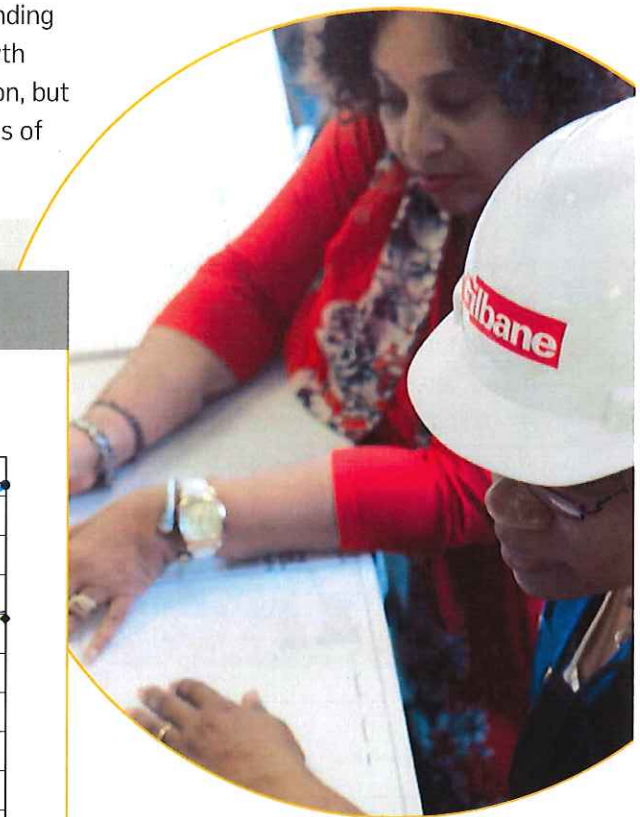
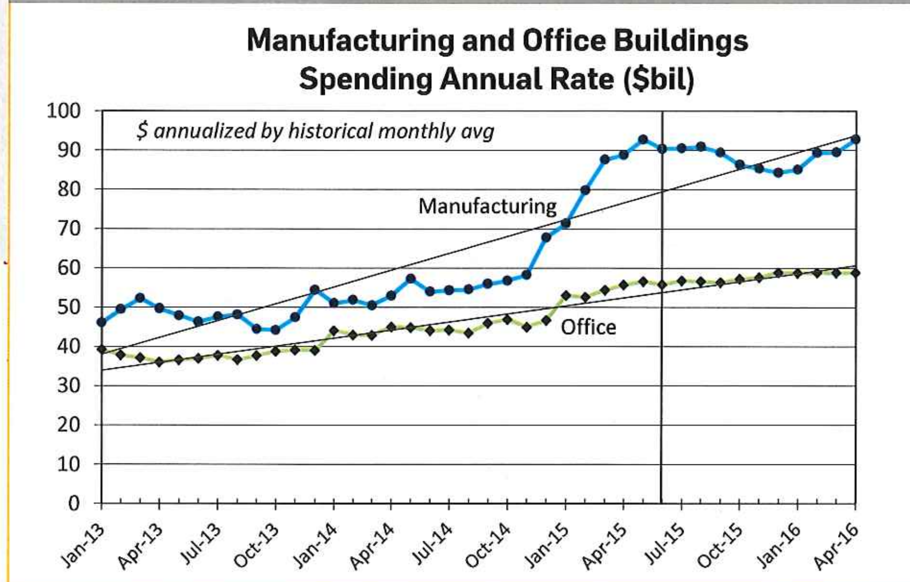


FIGURE 7:
Manufacturing and Office Buildings Spending Growth 2013-2016

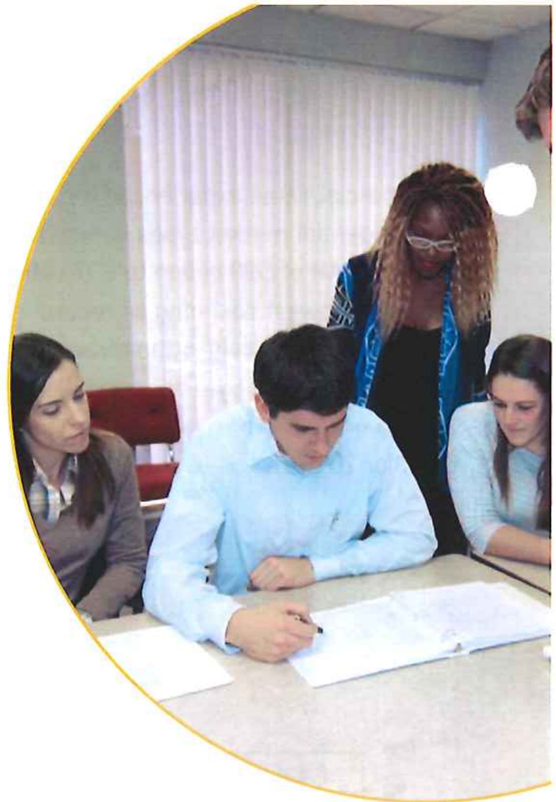


Total spending for office buildings in 2015 should reach $55.8 billion, up 21.1% from 2014, on top of a 21.3% increase in 2014. Office spending experienced surges in both early 2014 and early 2015. It will maintain upward momentum in 2016 but at a slower pace.

Office building spending hit its post-recession low in Q2 2013 but very quickly turned up in 2014. Year over year growth in 2014, and now in 2015, is over 20%. However, a slowdown in new starts over the last three quarters will slow growth over the next 12 months to less than 10%. Office spending will gain 21.1% in 2015 but only 8.4% in 2016.

Total spending for manufacturing buildings in 2015 will reach $86.4 billion, up nearly 50% from 2014. No market sector has ever before recorded a 50% year over year increase.

Manufacturing buildings spending has risen from a SAAR rate of $50 billion in Q1 2014 to $90 billion over the last four months, an 80% increase in the rate of spending over 16 months. In 2014, DDA posted an 87% increase in new starts for manufacturing buildings. The cash flow of those starts is indicating spending growth in 2015 of greater than 50% over 2014. Spending should dip 5% to 10% from September 2015 to March 2016 but then resume increasing throughout the second half of 2016 to an average of $97 billion for the entire second half of 2016.



Even with a second half 2015 decline in new starts of 20% from current levels and a drop in spending from current levels of 5% by December, manufacturing will still finish 2015 up 50% over 2014. This may position manufacturing as the #1 contributor to nonresidential buildings spending, replacing perennial leader educational. Manufacturing buildings spending will average a 50% gain in 2015 and a 9% gain in 2016.

TABLE 6:
Construction Spending Major Nonresidential Markets 2014-2015

2014-2015 Spending Prediction Comparisons
Selected Nonresidential Buildings

GROWTH CHANGE 2014 VERSUS 2013	EDUCATIONAL	HEALTHCARE	COMMERC/RTL	OFFICE	MANUFACTURING
DATA UPDATED 12-10-14	2014	2014	2014	2014	2014
ACTUAL 2014 TOTAL AS OF JULY 1, 2015	**0.8%**	**-5.6%**	**18.0%**	**21.3%**	**14.3%**
GILBANE BUILDING COMPANY (GILBANE)	0.9%	-6.5%	10.0%	17.0%	13.7%
CONSTRUCTION MARKET DATA (CMD)	0.2%	-7.1%	10.2%	18.2%	12.6%
FMI	0.6%	-1.1%	13.5%	9.9%	11.0%
ASSOCIATED BUILDERS & CONTRACTORS (ABC)	-1.0%	-6.7%	9.6%	18.4%	11.0%
DODGE DATA & ANALYTICS	-1.9%	-4.6%	9.0%	15.2%	7.0%
GROWTH CHANGE 2015 VERSUS 2014	EDUCATIONAL	HEALTHCARE	COMMERC/RTL	OFFICE	MANUFACTURING
DATA UPDATED 8-3-2015	2015	2015	2015	2015	2015
GILBANE BUILDING COMPANY	7.0%	6.0%	9.0%	21.0%	50.0%
CONSTRUCTION MARKET DATA (CMD)	3.5%	5.5%	12.0%	14.0%	18.0%
FMI	-0.2%	1.5%	13.0%	11.3%	16.9%
ASSOCIATED BUILDERS & CONTRACTORS (ABC)	-1.6%	-0.3%	8.4%	9.8%	19.6%
DODGE DATA & ANALYTICS (DDA)	2.9%	0.4%	13.7%	19.2%	24.6%

Gilbane data 2014 = Dec 2014, 2015 = Jul 2015
CMD data 2014 = 12-05-2014 report, 2015 = June 2015 report
FMI data 2014 = Outlook 2014 Q4, 2015 = Outlook 2015 Q2
ABC data 2014 = Forecast 12-09-14, 2015 = AIA Consensus July 2015
Dodge Data Analytics 2014 = AIA Consensus July 2014, 2015 = AIA Consensus July 2015

PUBLIC/PRIVATE SPENDING

Total spending for public construction in 2015 will reach $285 billion, an increase of 3.6% from 2014. 2014 ended a four-year decline in public spending.

The largest public construction markets are highway and education. These two markets alone represent more than half of all public construction, followed by transportation, a distant third, and waste disposal fourth. Together, these four markets account for nearly 75% of all public construction. Education is down slightly, but all together these markets are up 5%.

Private spending volume is almost two and one-half times that of public spending. If we take out residential construction, private spending would be only 25% greater than public spending.

Private construction is predominantly residential. Ninety-six percent of all residential work is private and this constitutes just about half of all private work. (A historical note: in 2005-2006, residential work constituted 70% of all private work and more than half of all construction spending). Manufacturing (11%), power (10%), commercial/ retail (8%), office (6%) and healthcare (4%) make up the next largest private building sectors.

Total spending for private construction in 2015 will reach $781 billion, an increase of 13.8% from 2014, although still 14.5% below the peak of $912 billion in 2006.

This year, private spending is being driven up by manufacturing, which represents 50% of the gains in year-to-date private spending. Power construction, the most volatile sector, is down 25% from this time last year, lowering total private spending growth by almost 4%.

TABLE 7:
Total Construction Spending Public vs. Private 2007-2015

U.S. Total Construction Spending

TOTALS IN BILLIONS CURRENT U.S. DOLLARS

	ACTUAL								GILBANE FORECAST
	2007	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
PRIVATE	863.4	759.7	590.0	502.1	501.9	581.9	647.7	686.4	**781.1**
% change year over year	-5.3%	-12.0%	-22.3%	-14.9%	0.0%	15.9%	11.3%	6.0%	**13.8%**
PRIVATE RESIDENTIAL	493.2	350.3	245.9	238.8	244.1	280.6	335.4	338.7	**381.9**
PRIVATE NONRESIDENTIAL	370.2	409.4	344.1	263.3	257.8	301.4	312.3	347.7	**399.2**
PUBLIC	289.1	308.7	314.9	304.0	286.4	279.3	270.6	275.7	**285.4**
	13.1%	6.8%	2.0%	-3.5%	-5.8%	-2.5%	-3.1%	1.9%	**3.6%**
TOTAL	1152.5	1068.4	904.9	806.0	788.3	861.2	918.3	962.1	**1066.5**
	-1.3%	-7.3%	-15.3%	-10.9%	-2.2%	9.2%	6.6%	4.8%	**10.9%**

Source: U.S. Census Bureau, Department of Commerce.
Actual Spending data includes 2013 & 2014 revisions 7-1-2015

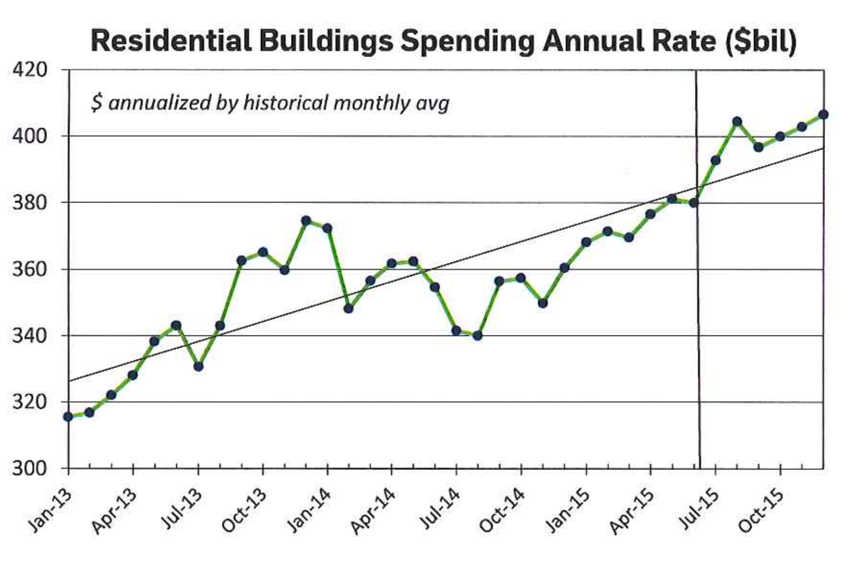
RESIDENTIAL CONSTRUCTION SPENDING

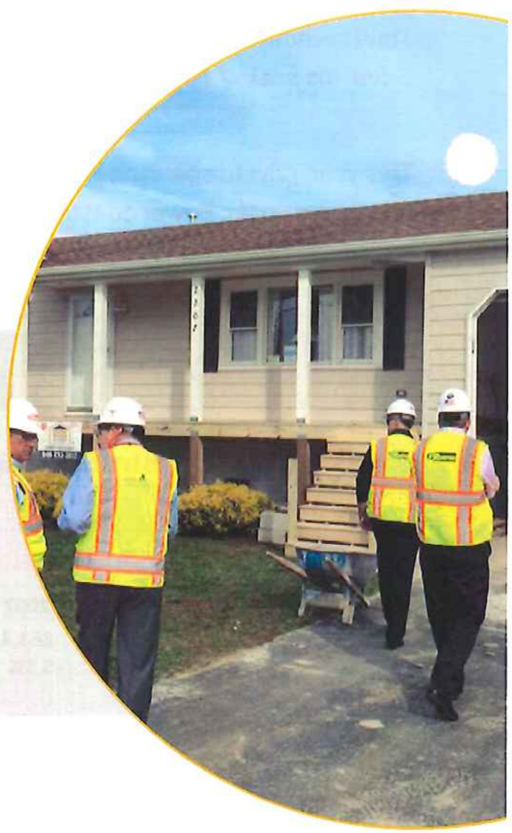
Total spending for residential construction in 2015 will reach $388 billion, a 12.9% increase from 2014. After two strong years in 2012 and 2013, residential spending increased only 0.7% in 2014.

- In Q1 2012, the monthly rate of spending was $253 billion.
- By Q1 2013, the monthly rate of spending climbed to $318 billion, up 26% from Q1 2012.
- In Q1 2014, the monthly rate of spending was $359 billion, up 13% from Q1 2013.
- In the second half of 2014, the monthly rate of spending averaged only $351 billion.
- For the first half of 2015, spending has averaged $374 billion.
- By Q4 2015, the monthly rate of spending will reach $400 billion.

The rate of growth in residential spending slowed from Q4 2013 to Q4 2014, but it appears the decline has reversed and is now growing at a 14% annual rate. Expect rapid growth in the next few months. In the last 10 months, new construction starts posted by DDA are 14% above the previous 10 months. Cash flow based on these new starts is indicating that the residential spending SAAR will grow 8% just in the May to September period. Residential spending will gain 12.9% in 2015 over 2014 and 12.0% in 2016.

FIGURE 8:
Residential Buildings Spending Rate of Growth 2013-2015





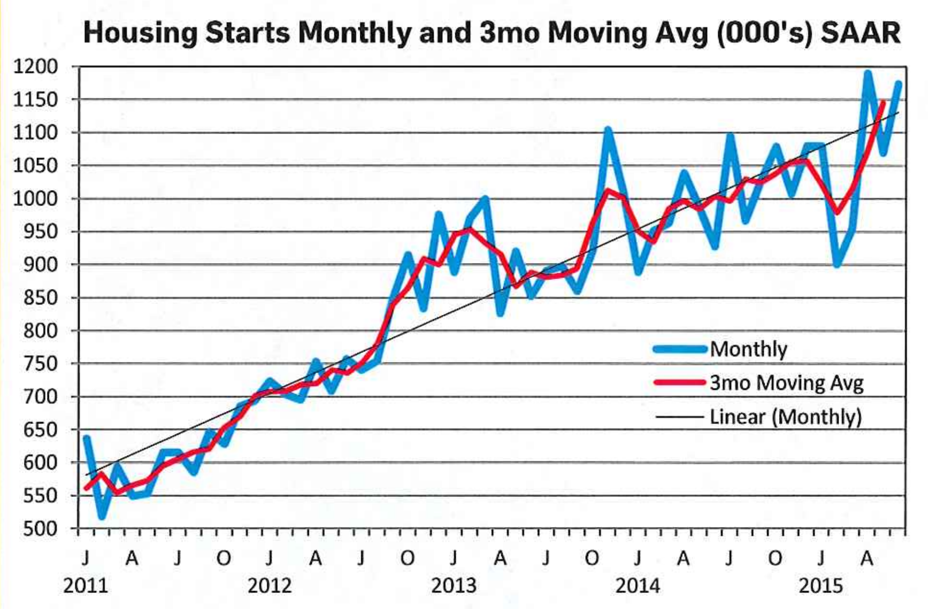
HOUSING STARTS

New Housing starts totaled 1,003,000 in 2014. Early estimates available for New Housing Starts in 2015 included three estimates that were 1,300,000 to 1,500,000, which implies a growth rate of about twice to nearly three times the 30-year historical maximum growth rate. Those three estimates should be considered unachievable.

Housing starts highest growth rates per year in the last 30 years were 186,000 in 1992, 169,000 in 1994 and 172,000 in 2012.

The remaining early estimates range from 1.1 million to 1.17 million with an average of 1.143 million and are well within the achievable range. Seven mid-year estimates range from 1.1 million to 1.2 million with an average of 1.134 million.

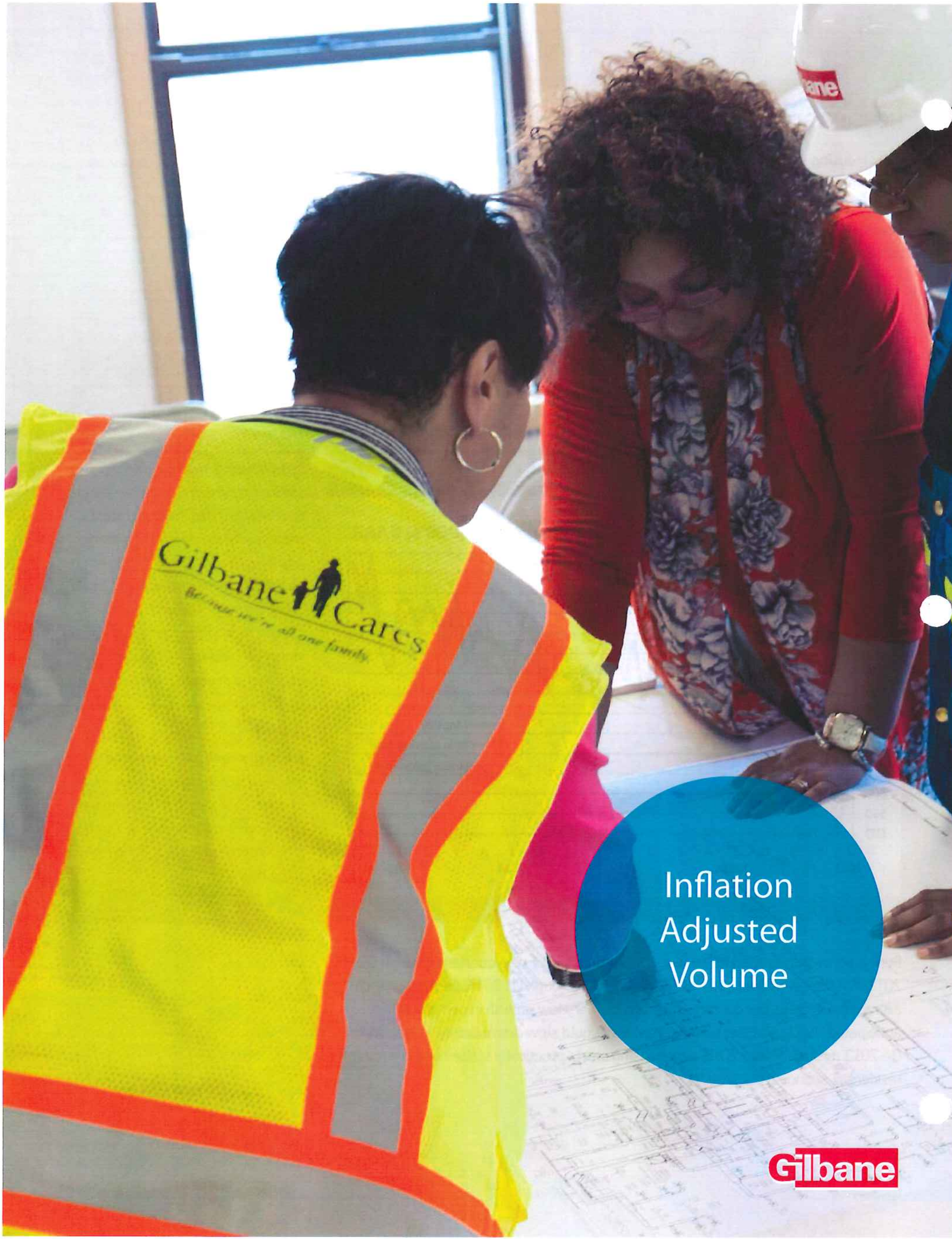
FIGURE 9:
New Housing Starts Seasonally Adjusted Rate 2011-2015



2015 housing starts are off to a slow start. From September 2014 to January 2015, monthly starts were fairly consistent. February and March new starts dropped well below expectations and could affect 2015 spending. However, the average of the April-May-June starts jumped up 17% to an eight-year high, probably offsetting any earlier slump.

Our mid-year estimate of new housing starts in 2015, based on starts in place, volume of permits and steady growth from now until year end, is an increase of 130,000 new units above 2014, for a total of 1,133,000.

Permits growth averaged more than 6% per quarter for nine quarters through Q2 2013. For the seven quarters including Q3 2013 through Q1 2015, permits growth averaged only 1.0% per quarter. Based on the very low growth in permits, it was anticipated that starts and spending growth would slow dramatically. In fact, from Q4 2013 through March 2015, new housing starts practically stalled and the rate of residential spending declined.



Inflation Adjusted Volume

Gilbane

Inflation Adjusted Volume

Real construction volume can only be found by analyzing spending after inflation.

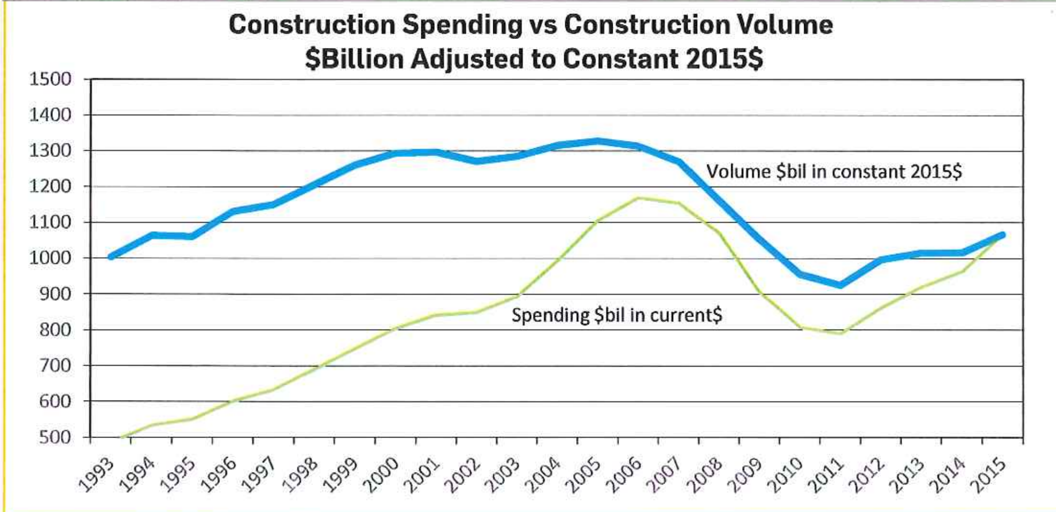
Spending or total revenue is typically reported in unadjusted dollars, or current dollars (for current dollars, see Table 2). Current dollars is a true indication of dollars spent within any given year, but does not give a true comparison of constant dollar volume from year to year. Current dollars are dollars within any given year. Constant dollar is defined as all dollars adjusted for inflation to represent dollars in the year to which they are adjusted, as in this report to 2015. To see a clear comparison of volume from year to year, we must look at inflation adjusted dollars, constant dollars (for constant dollars see Table 8).

If spending increases by 5% from one year to the next, but inflation drives up the cost of buildings by 3% during that same time, then inflation adjusted dollars would show that net volume actually increased by only 2% during that time period.

- Residential buildings, nonresidential buildings, and total construction spending all reached a low in January 2011.
- For the four-year period from January 2011 to the end of 2014, as measured by five independent well-known indices:
    - Composite total construction inflation was 12%.
    - Nonresidential buildings inflation was 11%.
    - Residential buildings inflation was 15%.
- Total construction spending (revenue) from January 2011 to the end of 2014 grew 23%, but composite construction inflation during that period was 12%. For that four-year period, real construction volume grew by only 11%. The remainder of 12% revenue growth was due to inflation.
- Nonresidential buildings construction spending (revenue) from January 2011 until the end of 2014 grew 23%. During that period, nonresidential buildings inflation was 11%. Real nonresidential buildings construction volume growth for that four-year period was 12%.
- Residential buildings construction spending (revenue) from January 2011 until the end of 2014 grew 43%. During that period, residential inflation was 15%. Real residential buildings construction volume growth for that four-year period was 28%.

2014 total construction volume just reached back to the level of 1993 and 2010 in constant dollars. 2015 volume will be about equal with 1995 and 2009 volume.

FIGURE 10:
Construction Spending vs Volume Constant 2015$ 1993-2015



Peak volume was fairly constant from 2004 through 2006. In today's constant dollars, peak volume reached $1.30 trillion dollars. 2015 predicted spending is still 20% below peak volume.

On average, volume grows less than 3.5% per year historically. At that rate, it will not return to peak volume before 2020.

Table 8 adjusts total construction spending for construction labor and materials inflation in addition to changes in productivity and margin costs. All dollars in Table 8 analysis are adjusted to 2015 constant dollars. The rate of inflation each year is determined individually for nonresidential buildings, nonbuilding heavy engineering and residential.

TABLE 8:
Total Construction Spending Summary 2007-2015 (constant 2015$)

U.S. Total Construction Spending - Volume

TOTALS IN BILLIONS U.S. DOLLARS ADJUSTED TO AUGUST 2015 $

	ACTUAL								GILBANE FORECAST
	2007	2008	2009	2010	2011	2012	2013	2014	**2015**
NONRESIDENTIAL BLDGS	456.8	466.6	429.3	346.0	331.5	343.5	334.5	349.3	**396.7**
% CHANGE YEAR OVER YEAR	10.3%	2.1%	-8.0%	-19.4%	-4.2%	3.6%	-2.6%	4.4%	**13.6%**
NONBUILDING HVY ENGR	296.0	299.4	321.5	307.1	281.9	303.8	296.3	302.9	**281.7**
	12.2%	1.2%	7.4%	-4.5%	-8.2%	7.8%	-2.5%	2.2%	**-7.0%**
RESIDENTIAL	516.2	393.9	301.7	302.6	311.1	349.3	384.6	363.3	**388.1**
	18.8%	-23.7%	-23.4%	0.3%	2.8%	12.3%	10.1%	-5.5%	**6.8%**
TOTAL	1269.0	1159.8	1052.5	955.8	924.5	996.6	1015.3	1015.4	**1066.5**
	-3.4%	-8.6%	-9.3%	-9.2%	-3.3%	7.8%	1.9%	0.0%	**5.0%**

Residential includes new, remodeling, renovation and replacement work.
Source $ Data: U.S. Census Bureau, Department of Commerce.
Indices references: Gilbane margin index, selling price indices, NAHB New Home Price Index, U S Census New Home Price Index, BLS PPI. see Escalation Growth vs. Margin Cost for inflation/deflation adjusted margin cost

NOT ALL OF REVENUE GROWTH IS REAL VOLUME GROWTH

During the period from 1999 to 2006, total spending increased 55%, but real volume increased only 9%. Inflation accounted for the remainder of the cost growth in that eight-year period.

In the five boom years of constructing nonresidential buildings including 2004 through 2008, spending (on nonresidential buildings only) increased by 53%. However, real inflation adjusted volume increased by only 14%. ***Total inflation for nonresidential buildings in the five-year period 2004 through 2008 was 38%, an average of near 8% per year.***

In eight boom years of residential construction including 1998 through 2005, spending (for residential buildings only) increased by 88%. However, real inflation adjusted volume increased by only 32%. ***Total inflation for residential buildings in the eight-year period 1998 through 2005 was 56%, an average of 7% per year.***

When we look at just the four highest spending growth years for residential construction (2003, 2004, 2005 and 2013) we see inflation for residential buildings in those rapid growth years increased at a rate over 9% per year.

INFLATION IS SIGNIFICANTLY AFFECTED BY RAPID GROWTH?

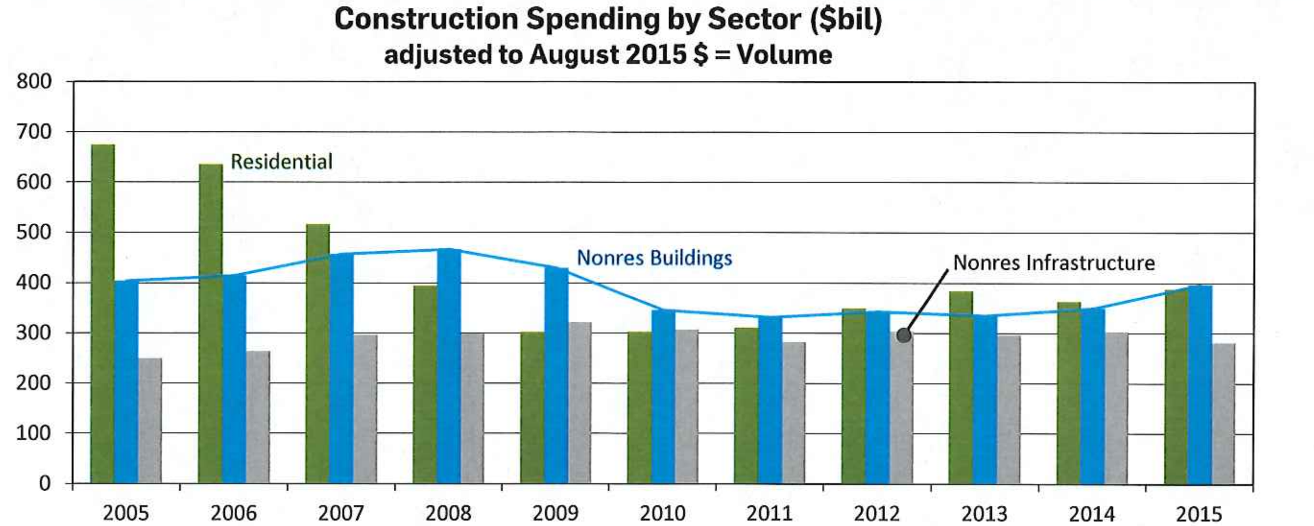
- Construction inflation in rapid growth years is much higher than average long-term inflation.
- Long-term 20-year inflation for nonresidential buildings is 3.3%
- Long-term 20-year inflation for residential buildings is 3.5%.
- In rapid growth years, inflation for nonresidential buildings is 8%.
- In rapid growth years, inflation for residential buildings is above 9%.

WHY IS IT SIGNIFICANT TO ANALYZE BOTH REVENUE AND VOLUME?

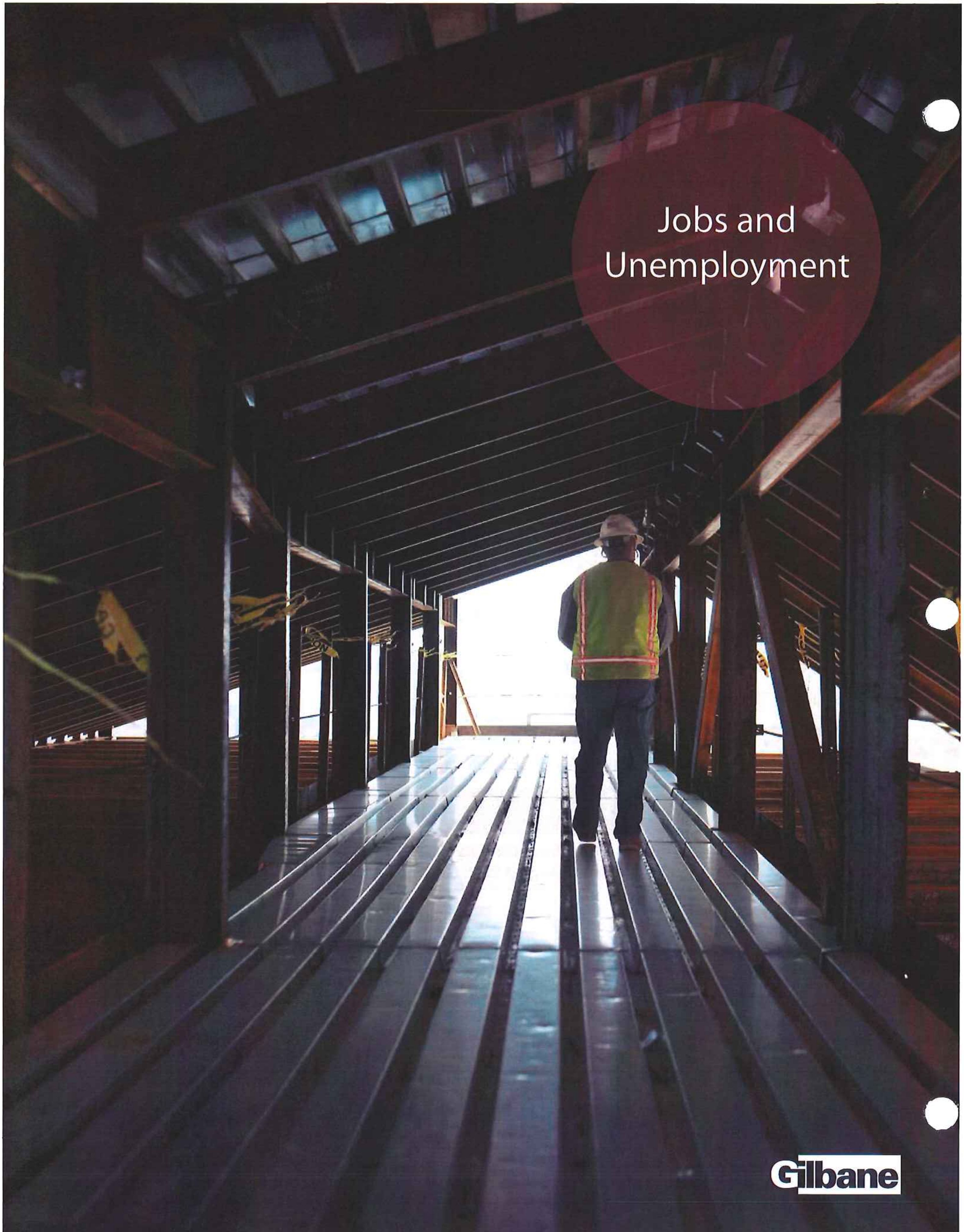
Contractor fees are generally determined as a percentage of revenue. However, workload volume determines the size of the workforce needed to accommodate the annual workload. It is valuable to know how many employees were required to accomplish the workload volume based on the past several years of data. From the standpoint of workforce planning, there is not so much concern with the value of the revenue as the volume of the work.

For 2015, 10.9% revenue growth is predicted, but due to rapidly increasing escalation, 2015 volume growth will be only about 5%.

FIGURE 11:
Construction Spending by Sector 2005-2015 (constant 2015$)



Jobs and Unemployment



Jobs and Unemployment

The number of jobs is tracked as the measure of how many people are currently working to put-in-place the construction spending. The unemployment rate shows how many more people are available to go to work. Both added together shows the size of the workforce. The size of the workforce is important because it tells how many workers are available to draw from for future volume growth.

Table 9 includes both residential and nonresidential construction employment, as well as all trades and management personnel. The BLS suggests not using any single month but instead looking at long term trends in the data.

2014 saw near-record growth of 338,000 jobs, exceeded only by 1998 and 2005, both during the fastest spending growth periods within the past 30 years. In the first seven months of 2015, we've added only 108,000 more jobs. Since the bottom in January, 950,000 jobs have been added at a growth of 17.5%.

TABLE 9:
Construction Employees All 2004 through July 2015

INDUSTRY: CONSTRUCTION
DATA TYPE: ALL EMPLOYEES, THOUSANDS

YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YR AVG
2004	6848	6838	6887	6901	6948	6962	6977	7003	7029	7077	7091	7117	6973
2005	7095	7153	7181	7266	7294	7333	7353	7394	7415	7460	7524	7533	7333
2006	7601	7664	7689	7726	7713	7699	7712	7720	7718	7682	7666	7685	7690
2007	7725	7626	7706	7686	7673	7687	7660	7610	7577	7565	7523	7490	7627
2008	7476	7453	7406	7327	7274	7213	7160	7114	7044	6967	6813	6701	7162
2009	6567	6446	6291	6154	6100	6010	5932	5855	5787	5716	5696	5654	6017
2010	5580	5500	5537	5553	5520	5516	5508	5524	5501	5508	5506	5467	5518
2011	5432	5458	5476	5492	5516	5527	5547	5552	5588	5585	5588	5612	5531
2012	5629	5629	5628	5627	5608	5623	5632	5641	5649	5668	5684	5724	5645
2013	5746	5798	5815	5813	5833	5856	5854	5866	5893	5918	5953	5937	5857
2014	6006	6032	6062	6103	6114	6121	6152	6169	6191	6201	6231	6275	6138
2015	6316	6347	6335	6365	6377	6377	6383						

U.S. Bureau of Labor Statistics- 2009 through 2013 data was revised February 7, 2014.

The unemployment rate in construction is now at 5.5% and has been below 7% for the last three months. However, unemployment is seasonal. It is normal for December through March to be much higher than June through November. Comparisons can be made to the same months in previous years. Average unemployment for the last three months, 6.2%, is at a nine-year low.

The historical long-term average seasonally adjusted unemployment rate is between 6% and 8%. This means, regardless whether markets are very active or slow, there is historically at least 6% of the construction workforce not working. Average unemployment for the last 12 months is 7.7%.

Individually, neither jobs nor unemployment provides us the full picture about the condition of the workforce. The unemployment rate can be headed downward without equally increasing jobs. If the unemployment rate goes down, but there are few gains in the number of new jobs, then the number of people reported still in the workforce has gone down. The workforce can decline because workers have either retired, been discouraged from seeking work and no longer qualify for benefits, or moved on to another profession. For several years, the decline in the construction unemployment rate was almost entirely due to workers dropping out of the workforce.

The reduction in available workers in the workforce will continue to have a detrimental effect on cost and schedule. Without a large volume of available and trained workers in the unemployment pool to draw from, the rate of expansion may be constrained.

The total construction workforce hit a 15-year low in 2013 at about 6.4 million. Currently the workforce is growing and is near 7.0 million, still near a 15-year low, about 1.4 million (~17%) lower than the 2006-2007 peak.

The unemployment rate is not seasonally adjusted. This adds to the short-term fluctuation. The seasonal fluctuation can be seen in Figure 12 where the upper (blue) line shows a repeated annual rise and fall in the unemployment rate. This analysis counts the available workforce or the nonworking pool using the statistical trend line of the unemployment rate.

FIGURE 12:
Construction Jobs vs. Construction Workforce 2005-2015

WORKFORCE SHORTAGES

Some of the workers that were let go, moved on, or dropped out of the workforce had many years of experience and were highly trained. Unfortunately, some will never return. As a result, over the next few years the construction industry is going to be faced with a shortage of skilled, experienced workers. This will have the tendency to ***DRIVE COSTS UP*** and ***QUALITY DOWN*** due to the need to pay a premium for skilled workers and the necessity of training new workers in their job and company procedures.

- During periods of high volume and workforce expansion, productivity declines.
- Workforce shortages may force extended work schedules.

The BLS Job Openings and Labor Turnover Survey (JOLTS) for the construction industry is now at 143,000 unfilled positions. Although down this month, the openings rate has been trending upward since 2012. A relatively high rate of openings, this generally indicates high demand for labor and could lead to higher wage rates.

The job openings rate has been elevated since January 2013. The last time it stayed this high was 2007, leading into the peak of the previous expansion. A big difference this time around is that we have 1.5 million (or 20%) fewer workers in the workforce. This is a good sign for future hiring, but highlights the importance of workers having the right skills. An increase in job openings generally signifies that employers cannot find people with the right skills to fill open positions.

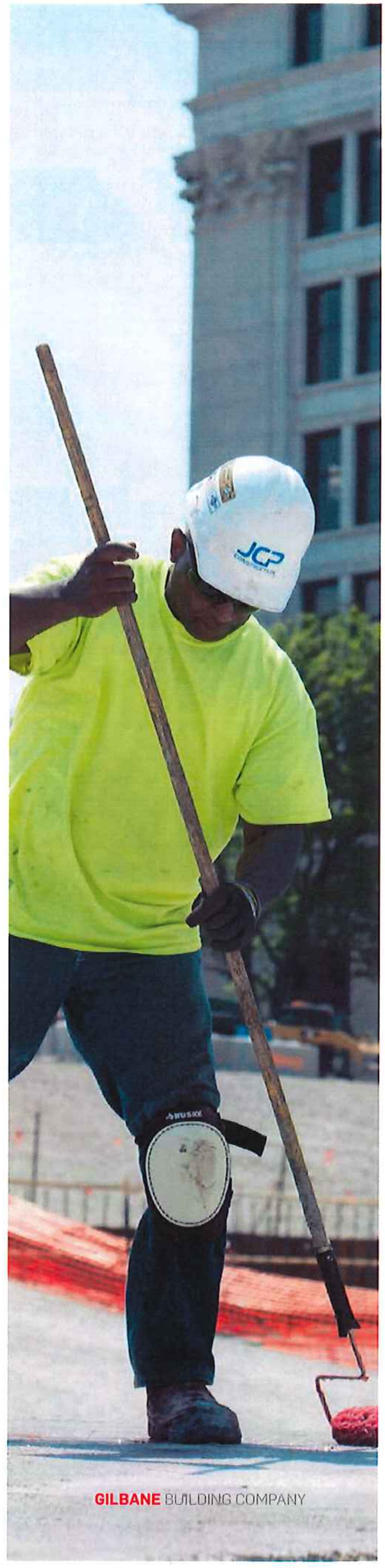
A recent NAHB survey indicates labor shortages have become more widespread than reported in 2014. ***The most common effects of skilled labor shortages have been the need to pay higher wages and difficulty completing projects on time.***

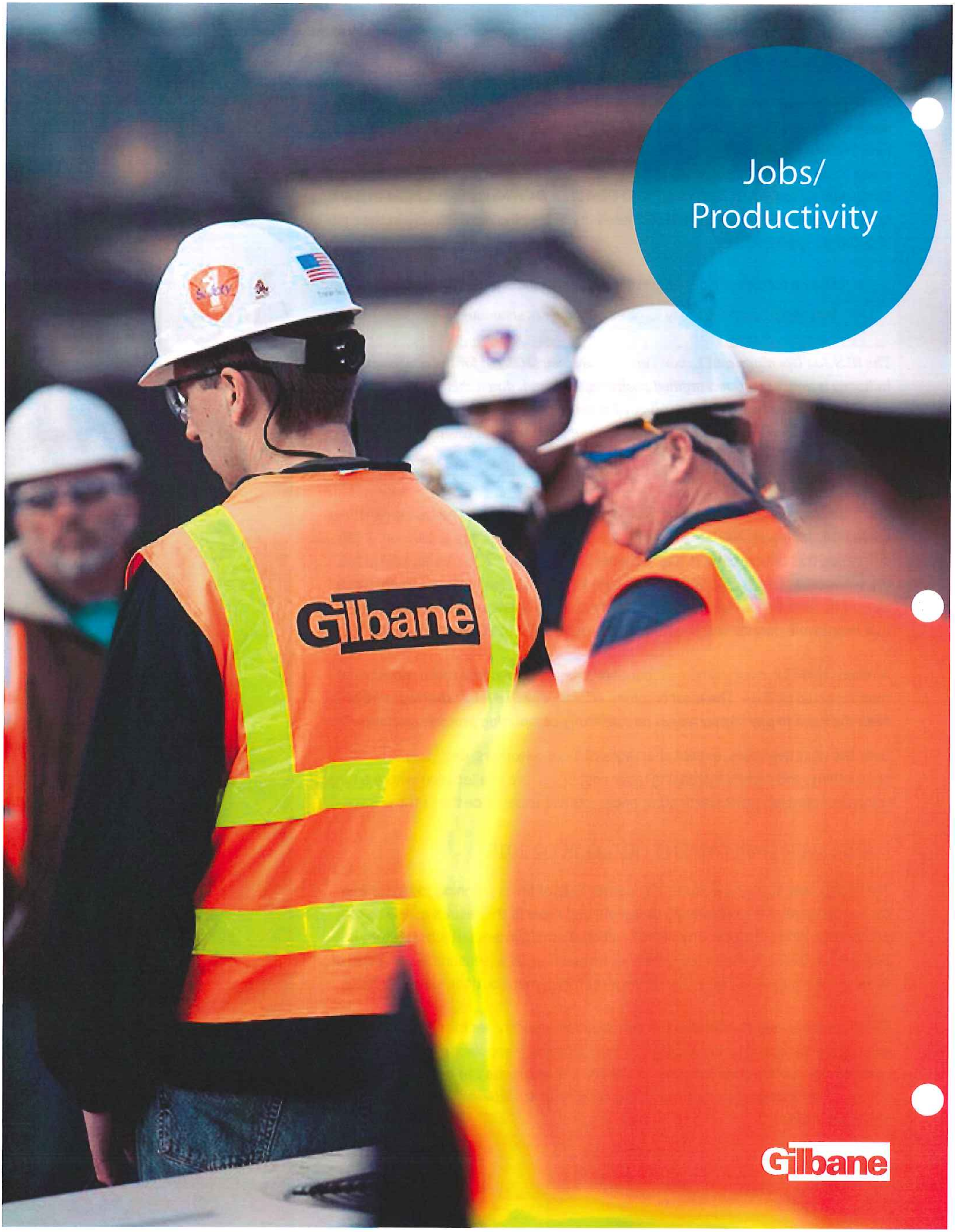
Over the next five years, expect shortages of skilled workers, declining productivity, and rapidly increasing labor cost. If you are in a location where a large volume of pent-up work starts all at once, you will experience these three issues.

MANPOWER EMPLOYMENT OUTLOOK Q2 2015

The Manpower survey measures the percentage of firms planning to hire, minus the percentage of firms planning to lay-off, and reports the results as the net percentage hiring outlook. The overall national employment (all jobs) picture is positive for Q2 2015 with a projected net increase of 16% (seasonally adjusted) of firms planning to hire. This is the strongest employment outlook since Q1 2008.

The Manpower report indicates the construction industry sector should experience increased hiring in Q2 2015 in all regions. Manpower reports total hiring in the construction industry for Q2 2015 is anticipated to be a net increase of 15%. The Northeast expects a net increase of 14%; Midwest +18%; South +13% and West +17%.





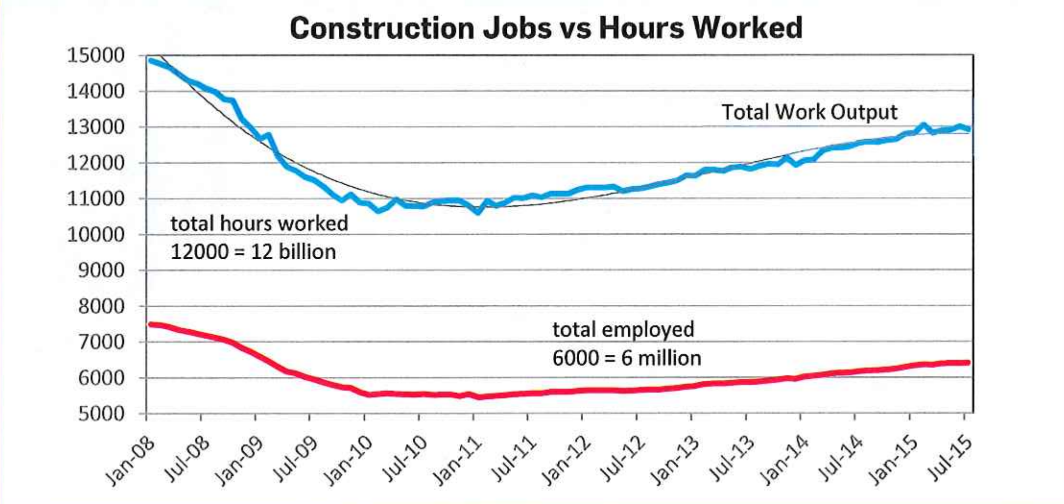
Jobs/ Productivity

Jobs/Productivity

Productivity is a measure of unit volume per worker output, not dollars put-in-place per worker. To analyze productivity:

- Use annual inflation adjusted constant volume, not annual unadjusted current spending.
- Use total work output, which takes into account total employed multiplied by hours worked.

FIGURE 13:
Construction Jobs vs. Total Workforce Hours Worked 2008-2015



The following productivity analysis is based on put-in-place revenues, inflation adjusted to constant 2015 dollars, and compared to actual manpower at average hours worked.

Figure 14 below shows a line plotted for the number of jobs per $1 billion spending unadjusted. That is a result obtained by using unadjusted spending current dollars without considering inflation and jobs without consideration of hours worked. The unadjusted analysis should not be used to determine productivity.

Figure 14 shows a line plotting the number of jobs per $billion in current 2015 dollars adjusted for inflation using jobs adjusted for hours worked. Use this line to track changes in productivity.

To explain how significant these differences might be, see the example below.

- Total construction spending reached a bottom in January 2011. For the four-year period from January 2011 to the end of 2014:
  Total construction spending (revenue) grew 23%;
  Composite total construction inflation was 12%;
  Real construction volume grew by only 11%;
  Jobs grew 840,000 from the low of 5,432,000, or 15.5%;
  Hours worked increased from 37.5/wk to a four-year average of 38.7, or 3.2%.

An unadjusted analysis would compare total construction spending growth of 23% to 15.5% jobs growth. That would indicate more spending got added than jobs, which would show an increase in productivity of 7.5%. But that is not correct.

The adjusted analysis shows that after 12% inflation is factored out, there was only an 11% increase in real construction volume. That volume should be compared to the work output (jobs plus hours on entire workforce) which is an increase of slightly more than 18.7%. In the correct analysis we see over the four-year period, we put in place 11% additional volume of work, but added almost 19% additional work output during the same period. Real productivity declined by 8% in four years.

FIGURE 14:
Jobs per $billion 2006-2015 in constant 2015$ All Construction

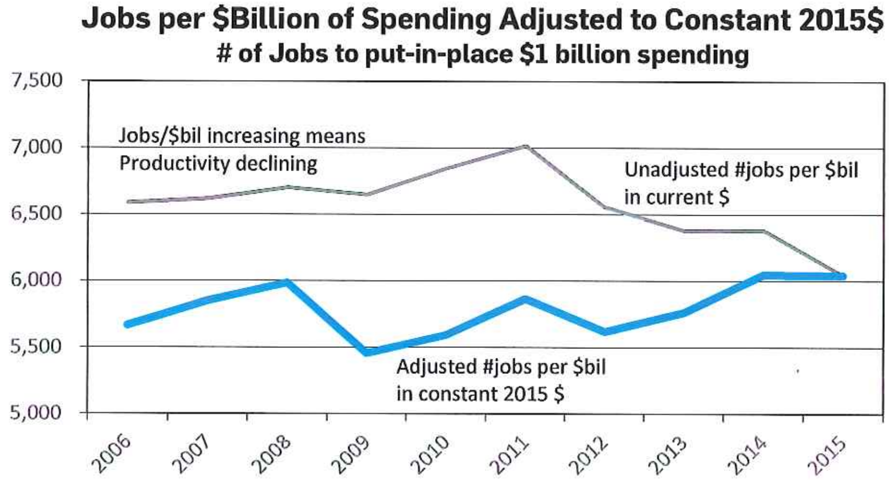
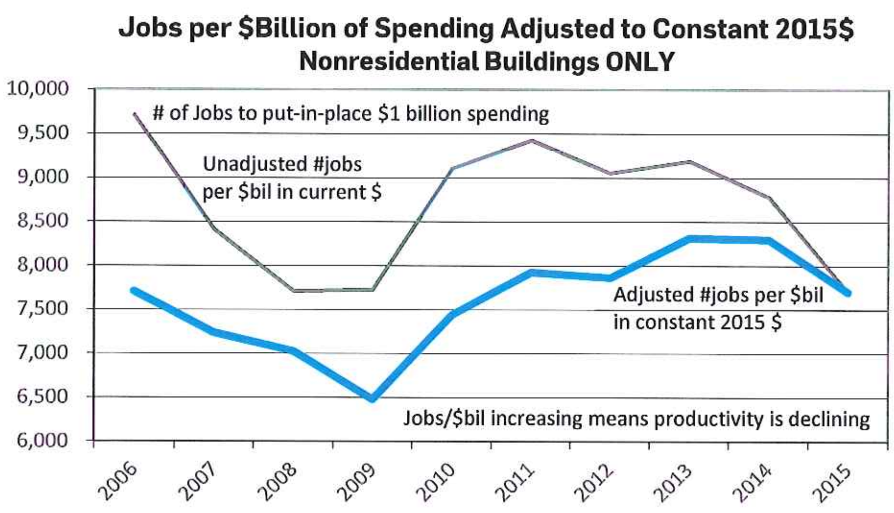
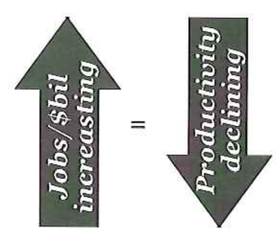


Figure 15 below plots the exact same type of unadjusted and adjusted data as Figure 14, but represents only nonresidential buildings.

FIGURE 15:
Jobs per $billion 2006-2015 in constant 2015$ Nonresidential Buildings Only





All data in the previous charts show national averages. On average, $1 billion of spending supports approximately 6,000 construction jobs. In a location where the city cost index is 1.2, it would take $1.2 billion in spending to support 6,000 jobs and in a location where the city cost index is 0.85, only $850 million in spending would support 6,000 jobs.

$1 billion
spending supports
6,000
construction jobs

(on average)

When spending and jobs are on the decline, and with diminished workload providing no other options, workers and management find ways to improve out of necessity. But at some point, longer hours and additional work burden causes productivity to decline. Also, a return to volume growth results in an easing of performance.

As workload begins to increase in coming years, net productivity gains will decline somewhat. This net effect cannot go unaddressed. The results of productivity declines are either decreased total output (if workforce remains constant) or increased workforce needed (if total workload remains constant).

JOBS EXPANSION MUST BE BASED ON VOLUME, NOT REVENUE

Contractor fees are often determined as a percentage of revenue. However, workload volume should be used for planning the size of the workforce. It is valuable to know, from the past several years of data, how many employees were required to accomplish the workload volume.

Here is a simple example:

At the 2008 peak of construction cost, a building cost $12 million and took 100 men per year to build. In 2010, after two years of deflation, that same building potentially cost as little as $10 million to build, 20% less. Did it take 20% fewer men per year to build it? No, certainly not. That would be the fallacy of trying to determine jobs needed based on unadjusted revenue.

The building has not changed, only its cost has changed. It still has the same amount of steel and concrete, brick, windows, pipe and wire. Using revenue as a basis, we might be led to think we need 20% fewer workers. However, there is a need to base workers on inflation adjusted volume and productivity, not simply on direct annual revenue.

WORKFORCE EXPANSION

What happens in periods of rapid spending growth and workforce expansion?

From 1996 through 1998, during the most rapid sustained period of jobs expansion in the last 30 years, the workforce grew by 1,000,000 jobs over 36 months, 19% over three years. Construction spending during that 36-month span increased 24%. However, inflation adjusted constant dollar volume increased by only 13%. Productivity declined by 6%.

Rapid workforce expansion during a period of high spending growth leads to significantly lower productivity.

From 2004 through 2006, construction spending increased by 28%, the most rapid pace on record. The workforce added 860,000 jobs, an increase of 15%. But inflation during that three-year period was 25%, the highest ever recorded. Real inflation adjusted volume increased by only 3%. Productivity declined by 12%, the most ever.

These spans were both periods when construction volume was rapidly expanding and approaching or at the all-time peak. Such a rapid workforce expansion during high spending growth led to measurably significant lost productivity. We are currently in a similar period.

From 2012 through 2014, the most current completed period, construction spending grew 21%, approaching the levels in the examples above. Inflation was 11%, so volume increased only 10%. Work output increased by 13%.

In this current growth cycle, we are currently at a productivity loss of 3%. With 2015 predicted spending near 11%, the current four-year period will be almost identical to 2003-2006 (33%) and 1996-1999 (32%), the two fastest growth periods on record with two of the highest rates inflation and productivity loss. 2015 may be similar to these previous periods.

If we continue to experience uninterrupted economic expansion at a rapid level, even for just the next few years, it will produce an extremely active extended duration market unlike anything ever measured. The workforce will expand, but there will be skilled worker shortages, and productivity will decline. When that occurs, it leads to rapidly increasing prices.

HISTORICAL AVERAGE

1 = $165,000

Job 2014 dollars

spent on $ construction

HOW MANY JOBS GET CREATED BY CONSTRUCTION?

Here are some details regarding how many jobs get created for every dollar spent on construction. For further reference, see "Jobs and Unemployment".

- Historical averages (adjusted for inflation) since year 2000 show the number of direct construction jobs supported by $1 billion in construction spending varies +/- from 6,000 jobs. That calculates to one job for every $165,000 (in 2014 dollars) spent on construction, or 6.0 to 7.0 jobs per

$1,000,000 spent. Direct construction jobs include all Architecture/Engineering/Construction (AEC), but not, for instance, lumber or steel mill product manufacturing.

- In part, the wide variation in the number of jobs created is a result of productivity. In times of increasing work volume activity, productivity declines. In times of decreasing activity, productivity climbs. In 2009, construction activity declined drastically, but jobs declined even more, resulting in an 8% average increase of productivity. Because productivity increased, it took fewer workers to put in place the same volume of work. The net result is that $1 billion in spending supported far less jobs than previous years.
- As work volume starts to increase over the next few years, expect productivity to decline. There are many reasons why this will occur, among them: working longer hours until new workers are brought on; working more days; crowding the work area; hiring less qualified workers; and acclimating new workers to the crew.

There are several studies available, including one by the federal government and one by the Associated General Contractors of America (AGC), that state for every construction job, there are three additional jobs created in the economy. So while $1 billion of building construction may create 6,000 to 7,000 direct construction jobs, overall it generates approximately as many as 28,000 jobs in the economy.

The data shown previously in this section on jobs, unemployment and productivity includes only jobs counted in the official U.S. Census Bureau of Labor Statistics jobs report. These two recent report references, Pew Research Center – "Share of Unauthorized Immigrant Workers in Production, Construction Jobs Falls Since 2007" and NAHB's HousingEconomics.com "Immigrant Workers in the Construction Labor Force", both document that there is a large unaccounted for shadow workforce in construction. By some accounts, 40% or more of the construction workforces in California and Texas are immigrant workers. Immigrants may comprise between 14% and 22% of the total construction workforce. It is not clear how many within that total may be included or not included in the U.S. Census BLS jobs report. However, the totals are significant enough that they may alter some of the results reported above. Future economic analysis will attempt to identify the impacts on put-in-place construction and productivity but there is currently a level of uncertainty in this data.


Behind the
Headlines
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Behind the Headlines

JUNE CONSTRUCTION SPENDING FALTERS, SMALLEST GAIN IN FIVE MONTHS

Consensus estimates predicted June spending would come in 0.6% above May. Actual came in at only 0.1% above May, hinting that construction spending is slowing down. So, what's the real story?

The original May reading posted July 1, 2015 was $88.167 billion in actual spending for the month, giving a seasonally adjusted annual rate (SAAR) reading of $1.036 trillion. So the consensus was expecting for June a SAAR reading of $1.036 x 1.006 = $1.042 trillion.

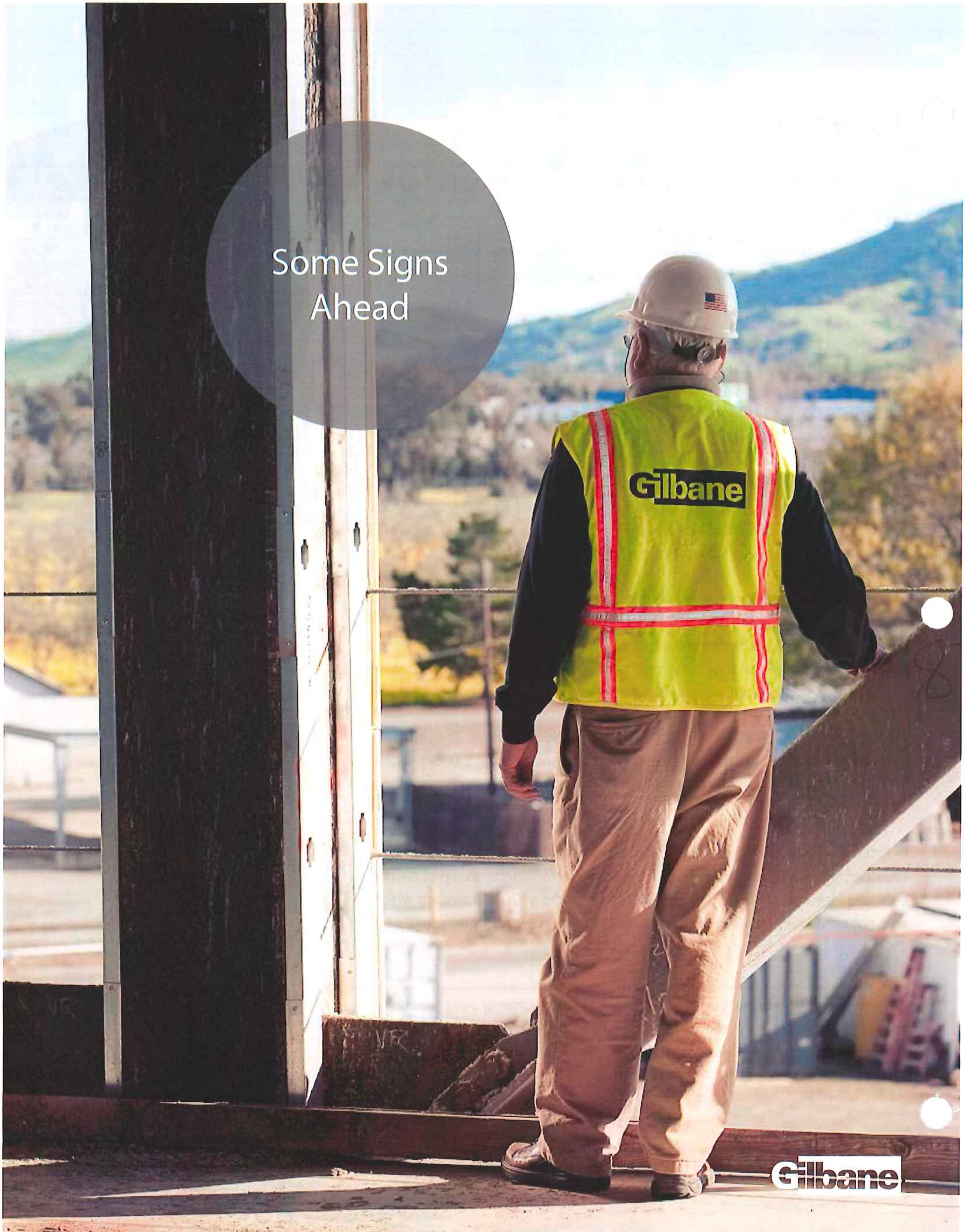
When the June reading was posted in the Census Construction Spending August 3, 2015 release, the May value had been revised upward to an actual of $90.756 billion that gave May a revised SAAR reading of $1.063 trillion. June was posted at $96.609 billion for a SAAR of $1.065 trillion. June was only 0.1% higher than May, missing the estimate which expected 0.6%.

The reality is this: June was predicted to come in at 0.6% over the original May value. June was expected to be $1.042 trillion. June actually came in at $1.065 trillion, 0.1% above the revised May value, but May had been revised upward by 2.7%. The headlines called June a miss because it finished up only 0.1% instead of the consensus expectation of 0.6%.

Did June spending falter, hinting at a slowdown? No! Not at all. The June percent was low compared to a revised May but June came in 1.065/1.042 = 2.2% higher than the dollar value that would have resulted from the consensus estimate.

In fact, not only was May revised up, but April was also revised upward. All together, the April and May revisions and June performance on top of an elevated May added $6 billion to the first six months of 2015 spending which was not predicted. That's enough to push the total growth for the year up by 1%!

The second quarter of 2015 compared to the second quarter of 2014 was the second fastest rate of growth in over nine years. And the last three quarters combined produced the fastest growth rate in over nine years. We're on a roll!


Some Signs
Ahead
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Some Signs Ahead

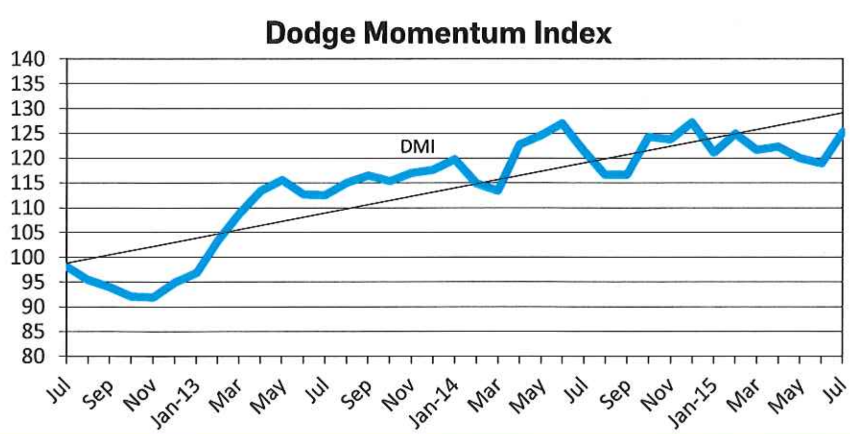
The following reports can be accessed by clicking on the hyperlinks provided.

Architectural Billings Index (ABI) measures monthly work on the boards in architectural firms. It is a nine- to 12-month leading indicator to construction. Index values above 50 show increasing billing revenues, and below 50 indicates declining revenues. After the ABI Institutional Index went negative for nine months, for 13 consecutive months since May 2014 it has been positive. The Commercial Index has dipped into negative territory only three times in the last 27 months. The residential index remained positive from August 2011 through December 2014. Since then it has been negative.

The Institutional ABI Index, up 13 consecutive months, hit 59 in June, highest in a decade.

Associated Builders and Contractors (ABC) Construction Backlog Indicator (CBI) is a quarterly forward-looking economic indicator reflecting the amount of work that will be performed by commercial and industrial contractors in the months ahead. The CBI is measured in months of backlog and reflects the amount of construction work under contract, but not yet completed.

FIGURE 16:
Dodge Momentum Index



The DMI had two periods of advance in 2014, supporting a trend UP in 2015 spending. However the DMI trend since December 2014 has been down, indicating a slowing in 2016.

The index shows strongest correlations in the commercial sector at a nine-month lag and the institutional sector at a 15-month lag.

ABC Charts and Graphs for Q2 2015 show strong advances after Q1 2014 peaking in Q3 2014. Indices are at post-recession highs. Although the index dropped the last two quarters, it is still higher than any time through Q1 2014. The index was created in Q1 2009, so there is no comparison to pre-recession workload.

Dodge Momentum Index (DMI) is a monthly measure of nonresidential projects in planning, excluding manufacturing and infrastructure. It is a leading indicator of specific nonresidential construction spending by approximately 12 to 15 months. It shows two strong advances in the last 12 months and the three-year trend is showing 12% growth per year.

AIA Consensus Second Half 2015 Construction Forecast is a semi-annual survey of construction economists' projections for future spending. Posted on the AIA economics page the Second Half 2015 report of expectations for nonresidential construction shows predicted growth has been revised upward to 8.9% for 2015. It remains at 8.2% for 2016. All commercial sectors and the industrial (manufacturing) sector show expectations for double digit growth in 2015. The AIA consensus of spending growth for manufacturing buildings is 22% for 2015. Gilbane data predicts 50% growth in 2015 spending for manufacturing buildings.

AGC 2015 Construction Hiring and Business Outlook published in January 2015 indicates contractors are more optimistic than they have been since the recession began. It highlights that contractors expect markets to grow but also expect it will be more difficult to hire qualified workers.

Engineering News-Record 2015 Second Quarterly Cost Report shows general purpose cost indices up on average about 2.4% year over year. However, selling price building indices for nonresidential buildings (not reported in the ENR Second Quarter report) are up on average 5%. The difference between these indices is increased margins.

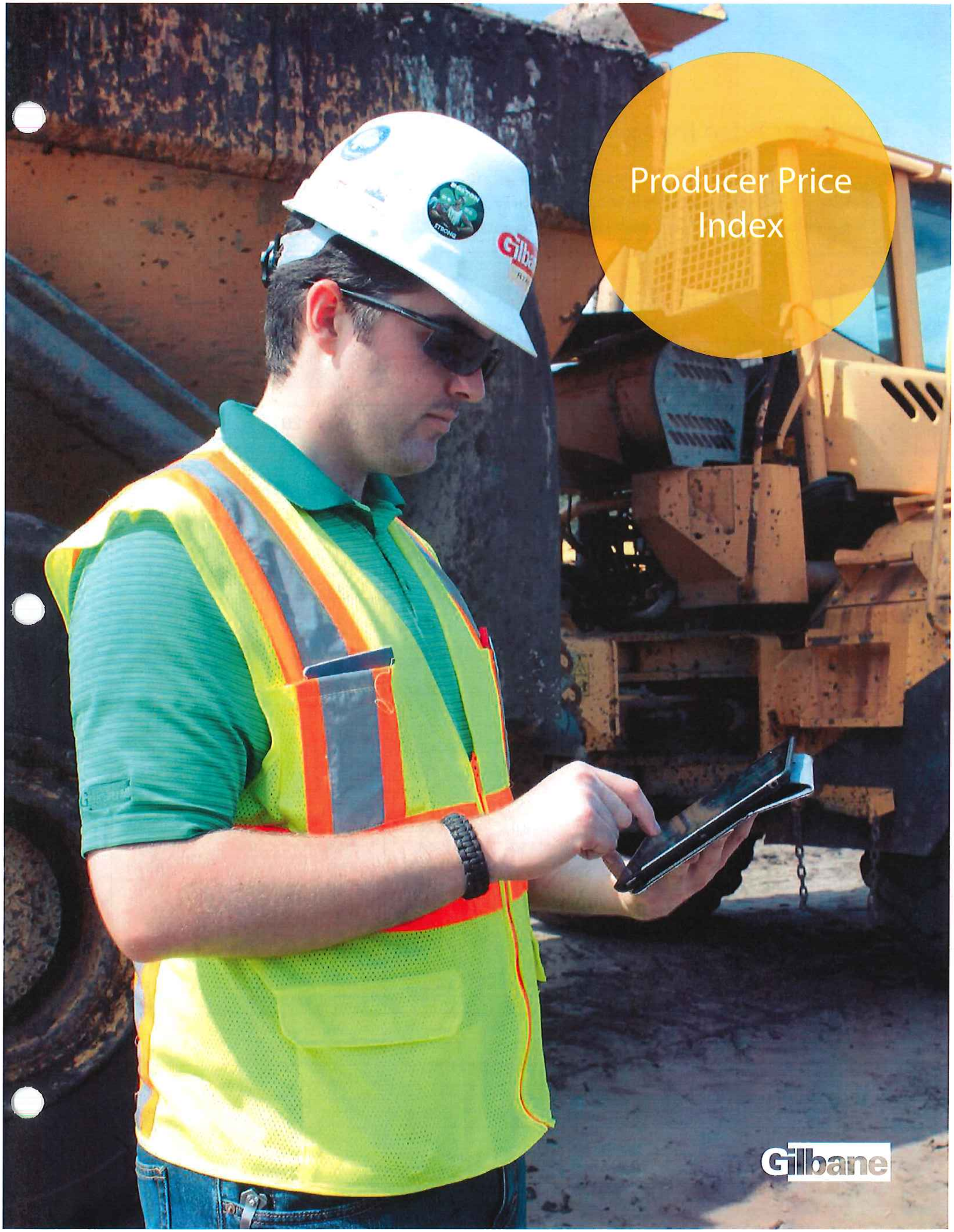
FMI Second Quarter 2015 Nonresidential Construction Index (NRCI) is now 64.9, up only slightly from last quarter but well up from all of 2013. The NCRI is a report based on a survey of opinions submitted by nonresidential construction executives. The NCRI declined in Q3 and Q4 2014 from a very strong Q2 2014. It has rebounded since then but is still just shy of the peak mark set in Q2 2014.

FMI Construction Outlook Second Quarter 2015 Report predicts residential construction will increase 8% in 2015, office construction 11%, commercial/retail construction 13%, educational construction 0% and healthcare construction 2%. FMI is currently predicting 5% spending growth in 2015.

CMD Construction Data June report predicts residential construction will increase 8.5% in 2015, office construction 14%, commercial/retail construction 12%, educational construction 3.5% and healthcare construction 5.5%. CMD is currently predicting 7.3% spending growth in 2015.

Institute for Supply Management (ISM) Non-Manufacturing Index (NMI) Report for July 2015 is a better indicator of activity in the construction industry than the ISM manufacturing report. The NMI measures economic activity in 13 industries (including construction) not covered in the manufacturing sector. The July NMI is 60.3, above 52 for 66 consecutive months, indicating continued economic growth. Construction reported growth in business activity, new orders, employment, and increased backlog. Construction also reported slower deliveries but no change in prices paid, and increased backlog.

Producer Price Index



Producer Price Index

The U.S. Census Producer Price Index (PPI) data for June 2015 indicates the PPI for material inputs to all construction increased 0.1% in the month and 0.6% over three months and is up 0.5% year-to-date.

Producer Price Index (PPI) tracks cost to produce construction materials – providing a strong indicator for inflation trends.

TABLE 10:
BLS PPI Materials June 2015

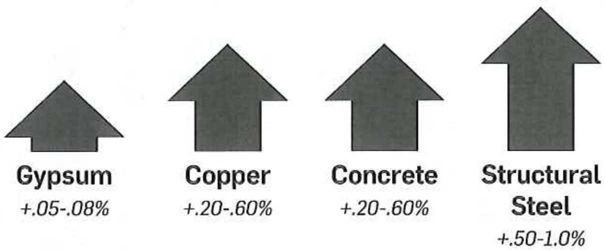
US Construction Producer Price Indexes - June 2015

MATERIALS PPI	PERCENT CHANGE VERSUS TO JUNE 2015 FROM			ANNUAL FOR		
	May-15 1 month	Mar-15 3 months	Jun-14 12 months	12 Months 2014 last yr	12 Months 2013	12 Months 2012
SUMMARY						
INPUTS TO ALL CONSTRUCTION	0.1	0.6		-0.9	1.3	1.4
INPUTS TO NONRESIDENTIAL	0.1	0.9		-1.9	0.9	0.9
COMMODITIES						
CEMENT	-0.4	1.9	7.1	6.1	4.7	2.9
IRON & STEEL SCRAP	7.1	9.6	-27.7	-17.1	7.5	-15.6
MANUFACTURED MATERIALS						
DIESEL FUEL	-1.8	2.8	-35.4	-26.1	-0.9	2.1
ASPHALT PAVING	-0.6	-2.9	-4.1	2.5	1.0	4.5
ASPHALT ROOFING/COATINGS	-0.4	-1.0	-2.1	2.5	-0.8	-0.3
READY MIX CONCRETE	-0.1	1.5	4.6	5.5	2.9	2.6
CONCRETE BLOCK & BRICK	0.2	-0.7	2.1	3.2	2.1	1.2
PRECAST CONC PRODUCTS	0.0	0.9	5.5	6.5	1.6	2.4
BUILDING BRICK	0.2	-0.7	2.1	3.2	1.4	-2.6
COPPER & BRASS MILL SHAPES	-2.2	3.0	-3.6	-4.5	-6.6	1.5
ALUMINUM MILL SHAPES	-3.4	-5.7	-2.3	10.9	-4.6	-1.9
HR STRUCTURAL SHAPES				5.9	-5.3	-8.5
STEEL PIPE AND TUBE	-1.1	-7.1	-11.0	0.0	-5.1	-6.1
FAB. STRUCTURAL STEEL	0.7	0.6	1.1	1.4	-0.6	1.6
FAB. BAR JOISTS AND REBAR	0.7	1.2	1.3	2.5	0.4	2.6
GYPSUM PRODUCTS	-1.5	-1.8	-0.1	5.1	16.2	14.1
INSULATION MATERIALS	-0.1	0.7	-0.4	2.5	6.7	5.4
LUMBER AND PLYWOOD	-0.5	-3.2	-7.0	3.3	10.0	11.1
SHEET METAL PRODUCTS	0.0	-0.2	1.3	2.5	-2.2	-1.3

All data not seasonally adjusted
Source: Producer Price Index. Bureau of Labor Statistics

The relative impact of cost changes for several materials is a function of how much the material is used within a typical building.

For a typical nonresidential building, a 10% increase in the cost of these materials has this impact on the overall cost of the building:



The PPI for construction materials gives us an indication whether costs for material inputs are going up or down. The PPI tracks producers' cost to supply finished products. This tells us if contractors are paying more or less for materials and generally indicates what to expect in the trend for inflation.

PPI TRENDS HELP TO INTERPRET THE DATA

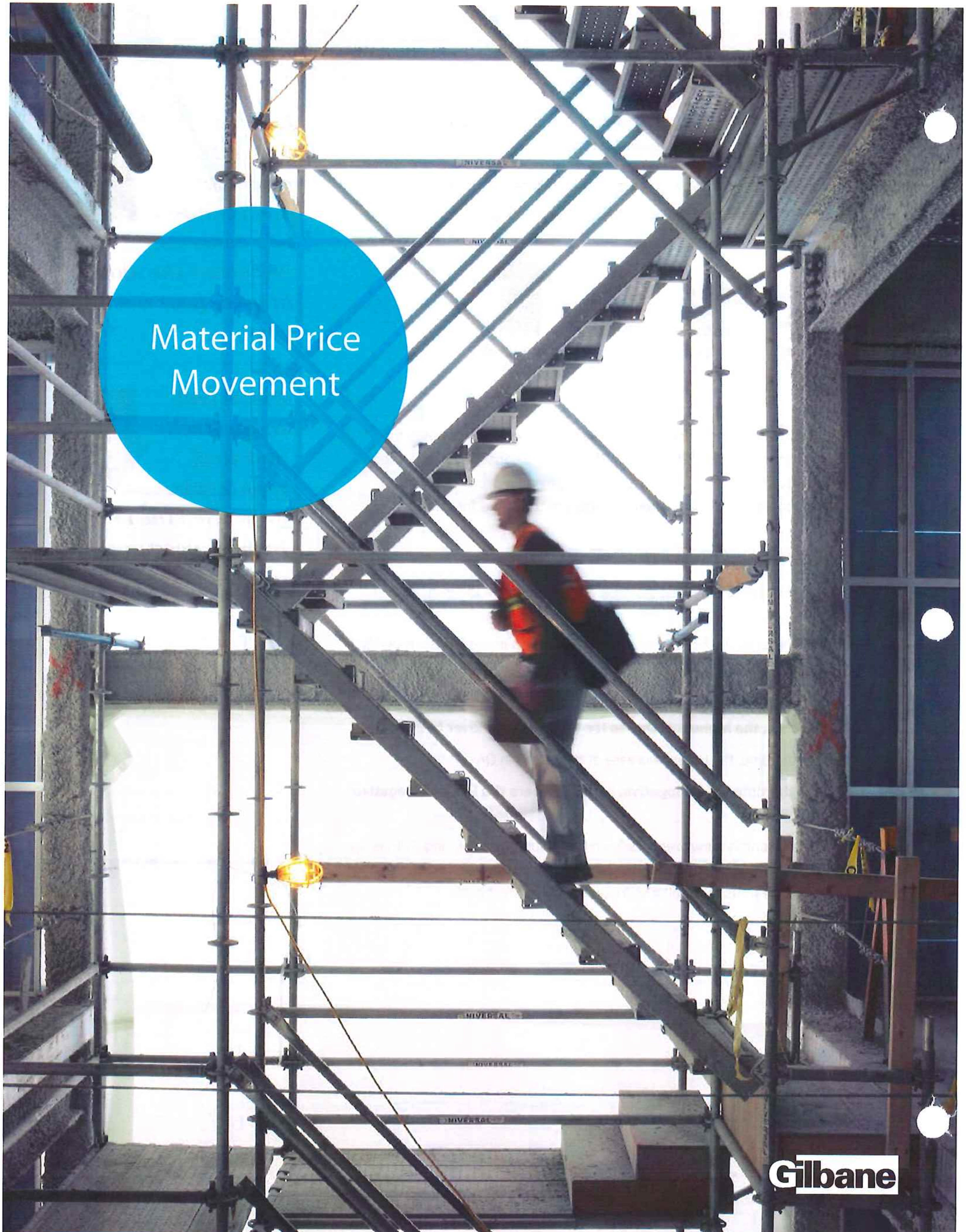
- 60% of the time, the highest increase of the year in the PPI is in the first quarter.
- 90% of the time, the highest increase of the year is in the first six months.
- 75% of the time, two-thirds of the annual increase occurs in the first six months.
- **In 20 years, the highest increase for the year has never been in Q4.**
- 60% of the time, the lowest increase of the year is in Q4.
- **50% of the time, Q4 is negative, yet in 22 years the PPI was negative only twice.**

So when you see monthly news reports from the industry exclaiming, "PPI is up strong for Q1" or "PPI dropped in the 4th Qtr." it helps to have an understanding that this may not be unusual at all and instead may be the norm.

Cement, precast products, and ready-mix concrete increased the most in price year over year.

Diesel fuel, scrap steel, and steel pipe & tube decreased the most in price year over year.

Material Price Movement



Material Price Movement

When the cost to the supplier goes up, it almost always gets immediately passed along in full to the consumer. When the cost to the supplier goes down, the savings trickle down to the consumer very slowly.

Cost for material inputs:

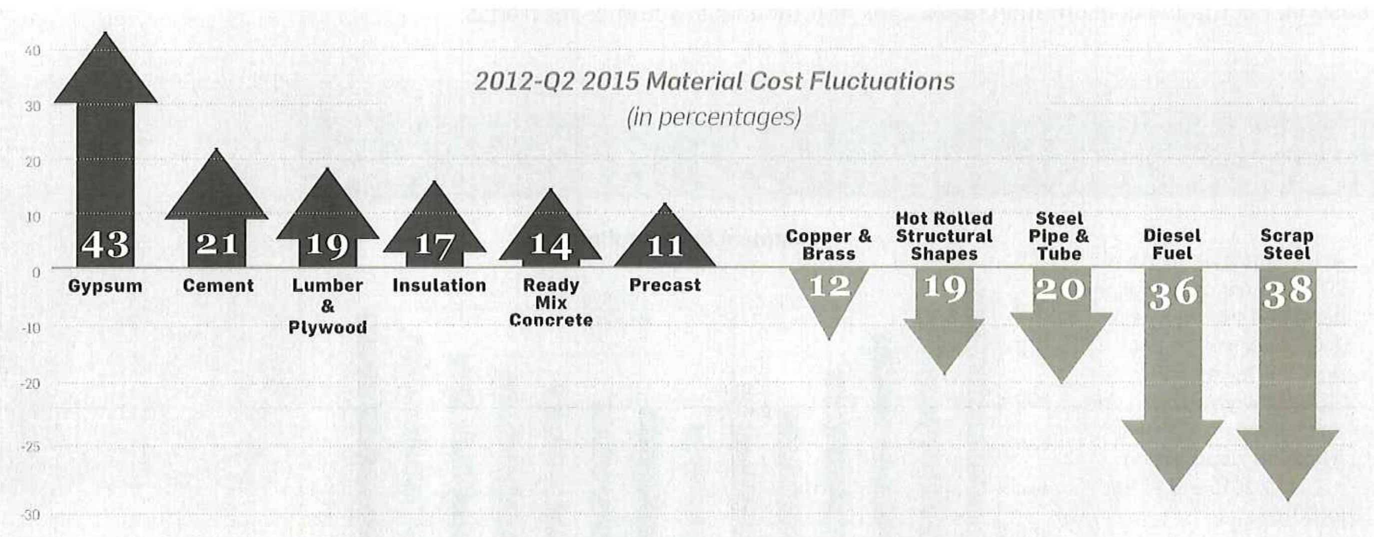
- *to all construction decreased 0.9% last year but is up 0.5% for 2015 year-to-date.*
- *to nonresidential construction decreased 1.9% last year but is up 0.5% for 2015 year-to-date.*

TABLE 11:
BLS PPI Markets 2011-2015

US Construction Producer Price Indexes - June 2015

MARKETS Inputs PPI	6 months 2015 YR TO DATE	ANNUAL FOR 12 months 2014 LAST YEAR	12 months 2013	12 months 2012	12 months 2011
INPUTS TO ALL CONSTRUCTION	0.5	-0.9	1.3	1.4	5.2
INPUTS TO NONRESIDENTIAL	0.5	-1.9	0.9	0.9	5.7
INPUTS TO COMMERCIAL	0.6	-0.3	0.9	1.2	4.9
INPUTS TO INDUSTRIAL	0.8	-1.5	0.8	0.8	5.2
INPUTS TO HGHWY/HVY ENGR	0.4	-2.7	0.9	0.8	6.1
INPUTS TO RESIDENTIAL	0.6	0.0	1.7	2.0	4.8

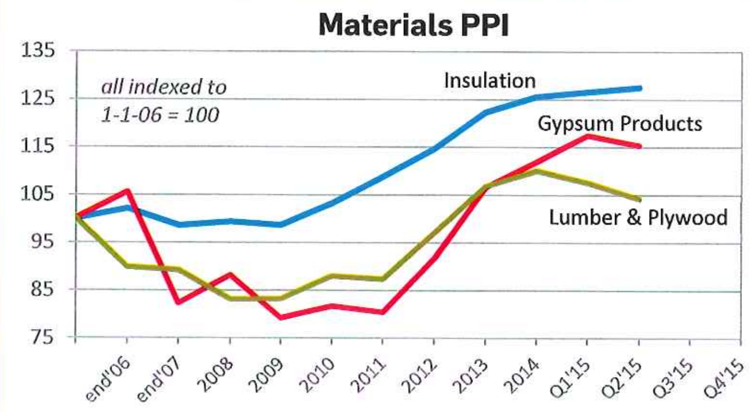
All data not seasonally adjusted
Data Source: Producer Price Index. Bureau of Labor Statistics



This extreme variability means individual trade assessments require individual material index data. Costs of gypsum, lumber and plywood and insulation are driven primarily by residential markets. Structural steel products are driven more by nonresidential markets.

GYPSUM / LUMBER / INSULATION

FIGURE 17:
Materials PPI Index Gypsum Lumber Insulation 2006-2015



Random Lengths, a lumber industry newsletter, recently reported the composite price index for 15 key framing lumber prices at $326, down 22% from the November 2014 high of $420. 2014 low was $362 set in April.

70% of lumber demand is driven by residential housing.

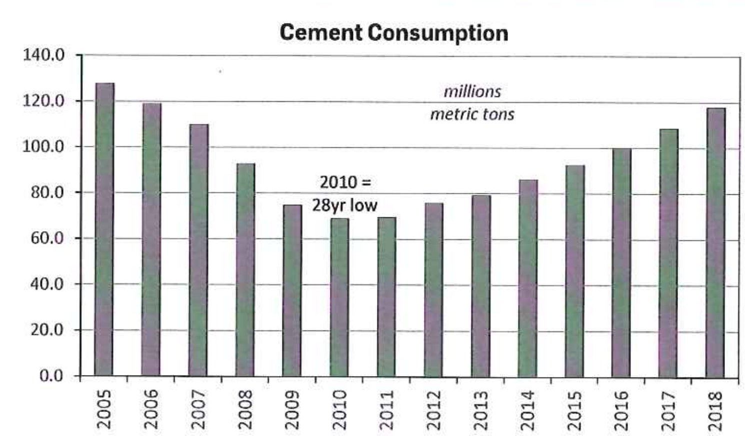
CEMENT / CONCRETE / ASPHALT / BRICK / BLOCK

Portland Cement Association (PCA) reports the volume of cement demand as an indicator of economic activity. It is a reliable coincident indicator. PCA reported an 8.9% rise in consumption in 2012, and consumption grew 4.5% in 2013. Consumption grew more than expected in 2014, up 8.7%.

Nearly two-thirds of U.S. cement consumption occurs in the six months between May and October. Rising consumption and prices leading into summer can lead to large shifts in demand and seasonal pricing and is not an indicator of long-term growth but only reflects periodic seasonal fluctuating consumption rates. Look at total annual volumes for trends.

FIGURE 18:
Cement Consumption 2005-2018

At the bottom in 2010 and 2011, cement consumption decreased 46% from peak 2005. Volume is up 25% since the 28-year low in 2010. 2014 growth came in at 8.7%. Portland Cement Association is predicting +7.5% for 2015 and +7.9% for 2016.



Cement prices increased 2.9% in 2012, after dropping four years in a row. Cement prices increased 4.7% in 2013 and 6.1% in 2014. IHS Global predicted cement prices will rise 5.0% in 2015. Cement price is already up 5.9% year-to-date and demand is increasing.

FIGURE 19:
Materials PPI Index Cement Concrete Asphalt 2006-2015

Ready Mix Concrete price increased 2.9% for 2013 and another 5.0% in 2014. That's an 8% increase in two years.

Year-to-date 2015, ready mix is up 3.0% and cement is up 5.9%. Asphalt paving is down 5.3%.

Global Insight predicts cement prices will rise 5.0% in 2015.

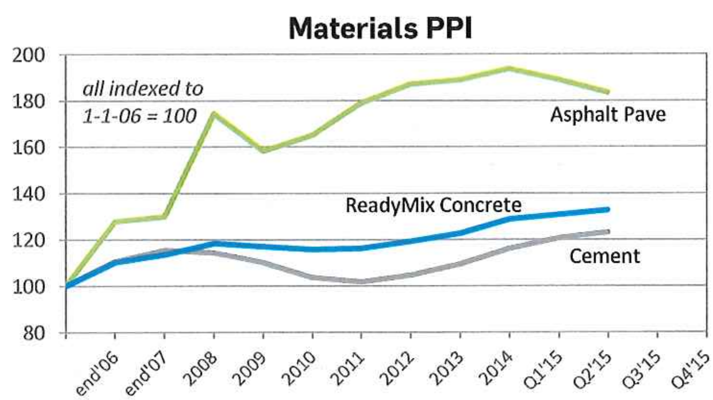
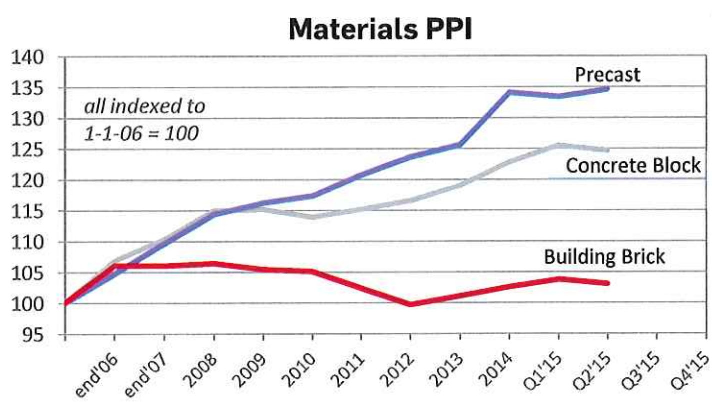


FIGURE 20:
Materials PPI Index Brick Block Precast 2006-2015



Concrete block and brick increased only 2.1% in 2013 and 3.2% in 2014.

Cost is up 1.5% year-to-date.

Precast product prices took a big turn up in 2014 rising 6.7%. Prices are up only 0.4% year-to-date.

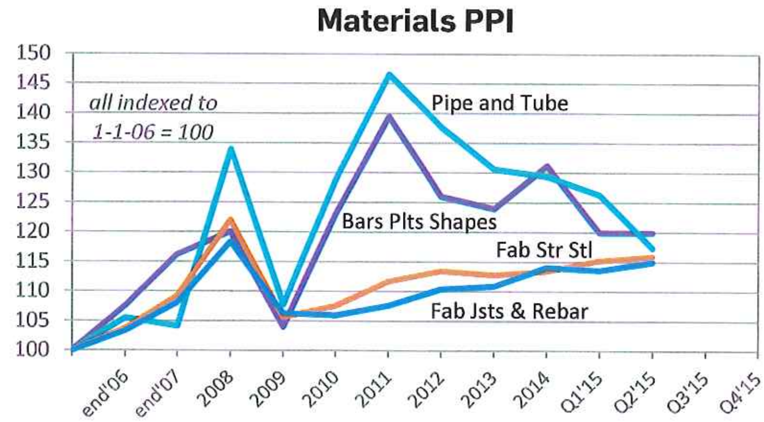
STRUCTURAL STEEL / REINFORCING BAR

The construction industry is the largest consumer of steel products worldwide. Approximately 100 million tons of steel is produced annually in the United States. More than 40 million tons of that is delivered to the construction industry. The next largest industries combined (automotive, equipment and machinery) do not consume as much steel as construction.

Structural steel is the most widely used structural framing material in the United States, with a 58% of market share for nonresidential and multi-story residential buildings, based on square footage built. The next closest framing material, concrete, holds only 21% market share.

FIGURE 21:
Materials PPI Index Iron and Steel Products 2006-2015

The rapid rise in 2008 mirrors the rapid acceleration in bid pricing to the peak in Q3-Q4 2008 and the precipitous fall from that peak. By mid-2009, the mill price of steel products had experienced a 40% decline, retreating to a 2004 low. Since the 2011 high, the price trend has been lower for pipe & tube and structural shapes.



Steel.org reports year-to-date steel mill capacity utilization currently at 73.4% as of August 8, 2015. Capacity utilization a year ago was at 80.2%. Year-to-date, U.S. mills have operated at an average utilization rate of 72.5% and have produced 7.8% less steel than the same period in 2014. This leaves considerable room for capacity expansion and this will tend to hold down prices.

Steel demand in 2013 was flat from 2012. Early in 2013, economic analysis indicated that there was over-capacity in steel production. This did prove to be true, and it helped cause steel prices to fall or remain flat in 2013. Steel demand was up in 2014 and 2015 demand is up.

The June PPI shows fabricated structural steel cost is up only 1.1% in the last 12 months.

Structural steel is very much dependent on recycled steel. Structural steel is made 90% from scrap steel. Scrap prices are down 28% in the last year and down 38% from a 10-year peak in 2011.

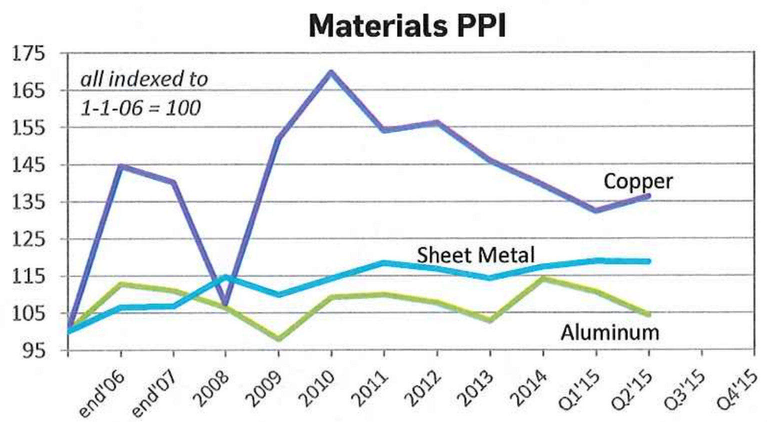
COPPER/ALUMINUM/SHEET METAL

FIGURE 22:
Materials PPI Index Aluminum Copper Sheet Metal 2006-2015

Copper material prices hit an all-time high of $4.60/lb. in February 2011, up 25% from October 2010. By September 2011, the price dropped back to $3.10/lb.

From April 2014 until October 2014, copper ranged between $3.00 and $3.25/ lb. In January 2015, copper dropped below $2.50/lb. August 2015 price for copper is near $2.35/lb.

The PPI shows copper down 20% from the high at the end of 2010.



What makes copper so important to watch?

Copper is a leading economic indicator that has rarely (if ever) failed to indicate the direction of world economies. When copper rises in price, world economies are leading into expansion. When copper drops in price, a decline in world economies very quickly follows. Copper prices and the U.S. workforce move almost perfectly together. Also, because copper is so widely used in buildings, and manufacturing facilities must be built to see a big increase in production, copper demand is an excellent predictor of industrial production 12 months out.

[Click here to view copper price charts on metalprices.com]

What drives copper prices up or down? Unlike some other metals, it is not speculation. Quite often it is demand. Increasing demand equals increasing prices. When demand wanes, prices drop.

What effects do copper price changes have on the cost of projects?

Roughly speaking, copper material is about:

- 10% electrical contract or 1% of cost of project
- 5% of an HVAC contract or 0.6% of cost of project
- 10% of a plumbing contract or 0.3% of cost of project

So, for an average project, copper material can represent approximately 2% of the total cost of the project. Therefore, a 10% increase in the cost of copper will increase the cost of a project by 0.2%.

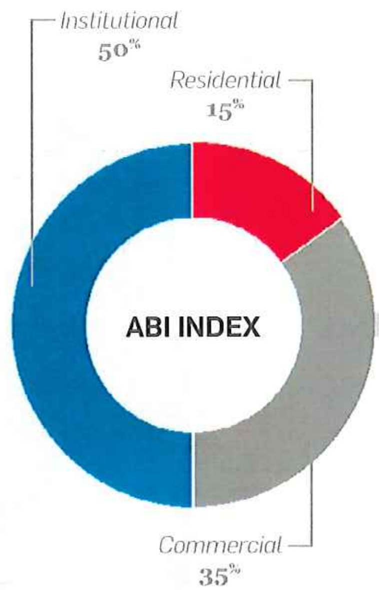
There are exceptions. For example, if copper is 2% of the total cost of the typical project, it is probably 4% to 5% of total cost on a heavy mechanical/electrical project, such as a data center. So a 10% increase in the cost of copper increases the total cost of a data center by 0.4% to 0.5%. For a copper roof, material is 65% of total cost and can represent ~1% of typical project cost.

Architectural Billings Index

Gilbane

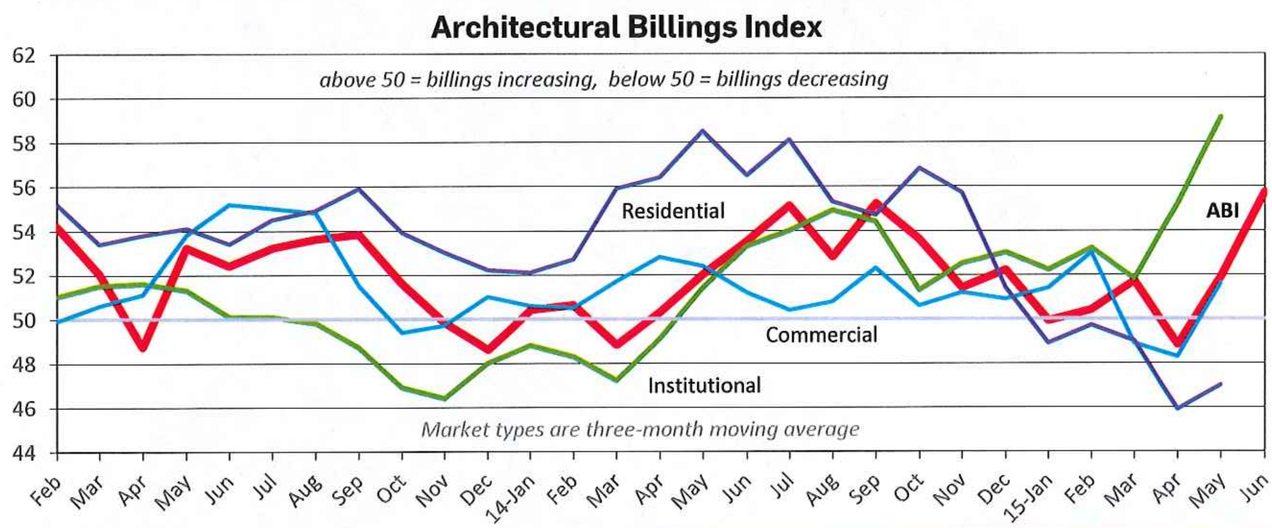
Architectural Billings Index

The Architectural Billings Index (ABI) is a leading indicator for nonresidential work nine to 12 months out. Index values above 50 indicate more architectural firms reporting increasing billings than firms reporting decreasing billings. Index values below 50 indicate declining workload. Index values remaining consistently below 50 indicate there will be a decrease in construction spending nine to 12 months later.



The ABI is primarily a nonresidential indicator. Residential design projects account for only about 15% of the total index. Office buildings, hotels, shopping centers, banks, warehouses, manufacturing plants and other commercial properties represent 35-40% of the index. Institutional buildings account for 45-50% of the index. Typically, institutional facilities are the last nonresidential building sector to recover from a downturn.

FIGURE 23:
Architectural Billings Index ABI 2013-2015



Institutional billings are indicating moderate growth until Q4 2015, then strong growth based on a new index high. Commercial billings are indicating slow growth or flat spending until Q4 2015 with a potential dip at year end before growth resumes. The overall ABI index seems to indicate a decline in spending around December or January. This downturn is being influenced by a two-month negative reading in the commercial index coinciding with a five-month negative reading in the residential index.

However, the residential ABI does not necessarily track with residential spending. Since the residential ABI has very little input from single family buildings that mostly do not require architectural design work, a shift from multifamily to single family residential construction could cause the residential ABI to drop but still result in active residential markets.

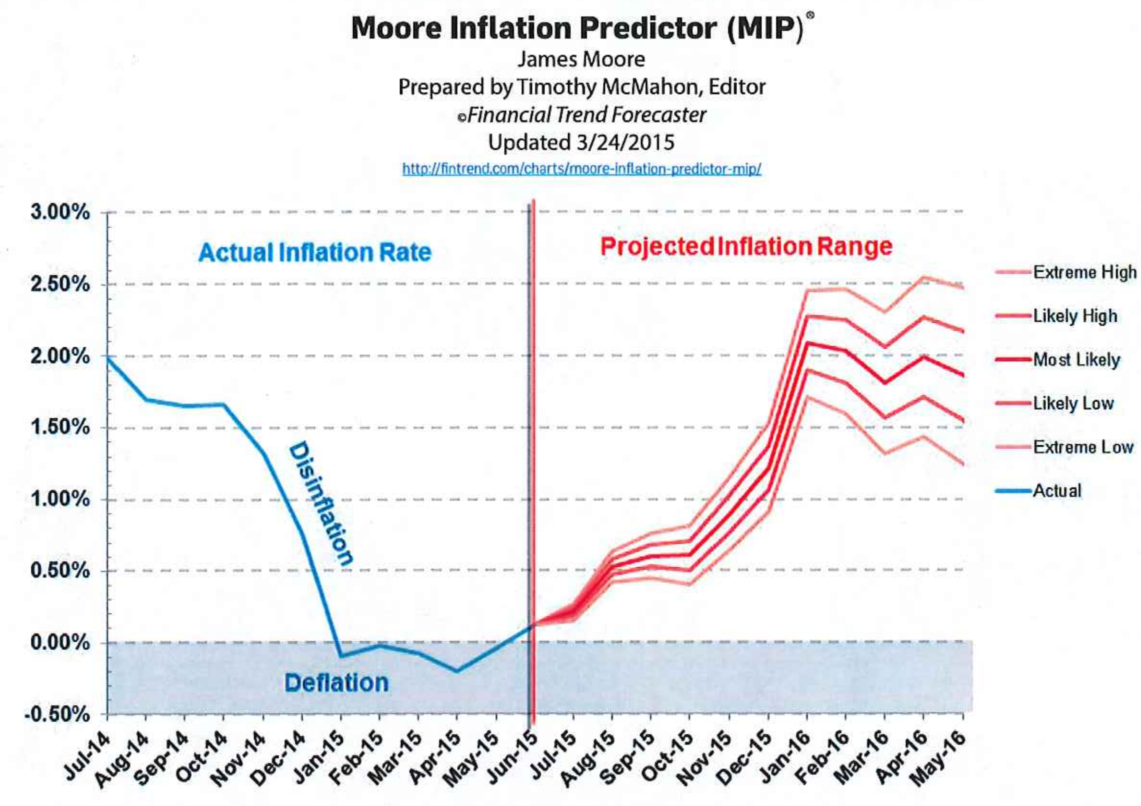
Consumer Inflation/ Deflation

Consumer Inflation / Deflation

The Moore Inflation Predictor© (MIP) is a highly accurate graphical representation of the future direction of the inflation rate. It has a 97%+ accuracy rate forecasting inflation rate direction and turning points and over 90% of the time the inflation rate falls within the projected "likely" range.

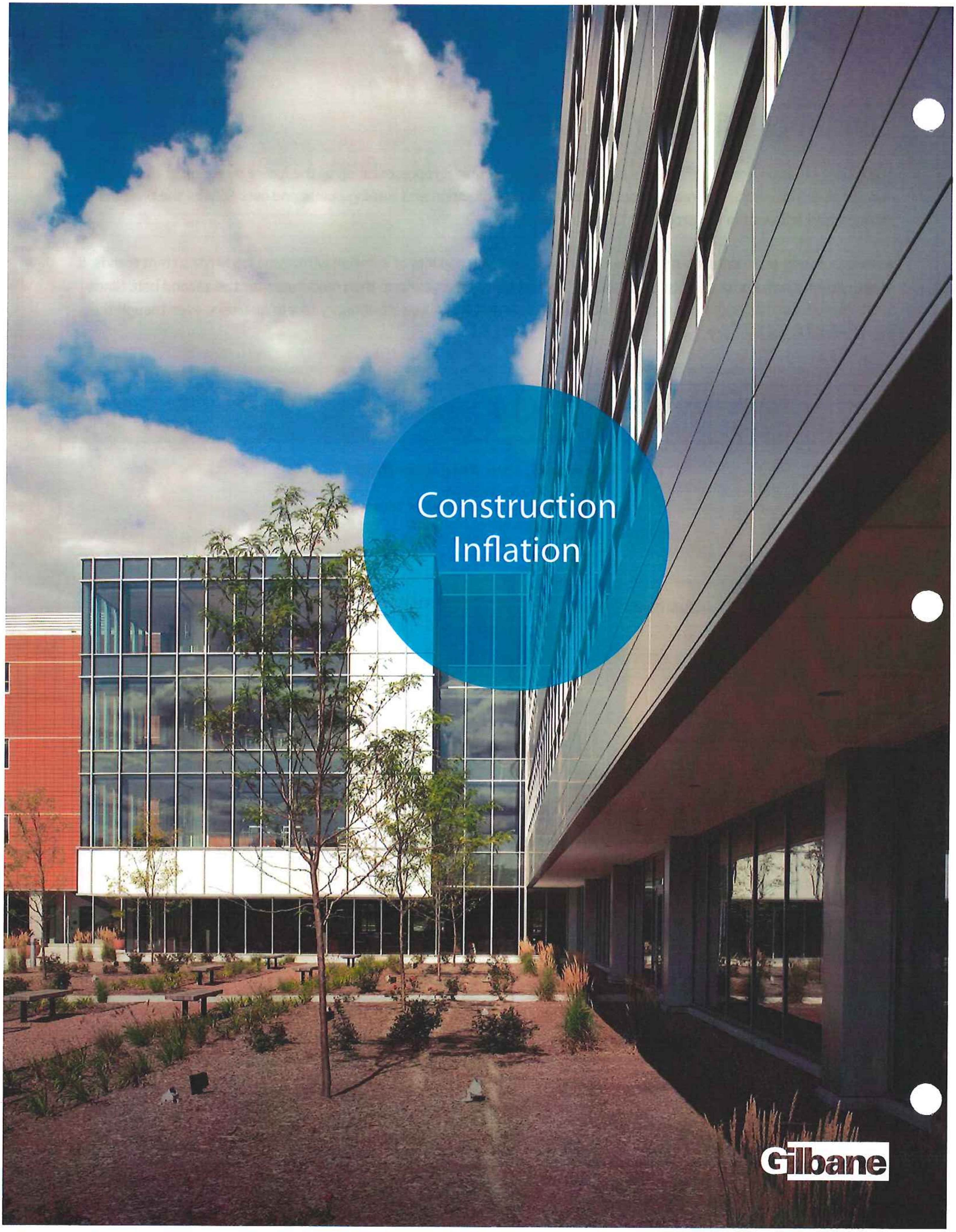
A review of long-term inflation data shows there are seasonal aspects of inflation with some fairly consistent trends. It appears that the majority of inflation occurs in the first half of the year and then moderates for the second half. Since 2001, there have been eight deflationary fourth quarters and only three inflationary fourth quarters, even though the overall trend is inflationary.

FIGURE 24:
Moore Inflation Predictor Consumer Inflation 2014-2016



MIP chart used by permission, Tim McMahon, Editor, Financial Trend Forecaster www.fintrend.com

MIP 2013 and 2014 predicted inflation versus actual results that were only 0.1% and 0.2% off. MIP predicted a period of deflation from January 2015 through June 2015 with a rapid rise of 1.5% in the second half of 2015. Actual results show deflation from January through May and a very slight +0.12% inflation in June. MIP is now predicting a most likely rise to 2% inflation by year end.



Construction Inflation

Construction Inflation

Construction inflation, based on several decades of trends, is approximately double consumer inflation. From mid-2009 to late 2012, that long-term trend did not hold up. During that period, construction inflation/deflation was primarily influenced by depressed bid margins, which had been driven lower due to diminished work volume. Over the last 24 months, that has changed. Work volume has increased and short-term construction inflation, near 5% for both 2013 and 2014 and on track to go above 5% in 2015, has increased to more than double consumer inflation. It appears construction inflation is already advancing well ahead of consumer inflation, which supports that consumer inflation is not an indication of movements in construction inflation.

The U.S. Construction Producer Price Index tables for Buildings Complete, which includes the cost complete as charged by the builder, represents one indicator of construction inflation.

FIGURE 25:
Complete Building Cost Index by Building Type 2006-2015

NONRESIDENTIAL BUILDINGS INFLATION

As depicted by US Census PPI completed buildings data:

› 2013 building cost inflation ranged from 2.8% to 4.1%.

› 2014 building cost inflation ranged from 1.3% to 2.6%.

As depicted by Industry Selling Price Indices including margins:

› 2013 building cost inflation ranged from 3.1% to 4.1%.

› 2014 building cost inflation ranged from 4.2% to 4.4%.

NEW HOUSING PRICE INFLATION

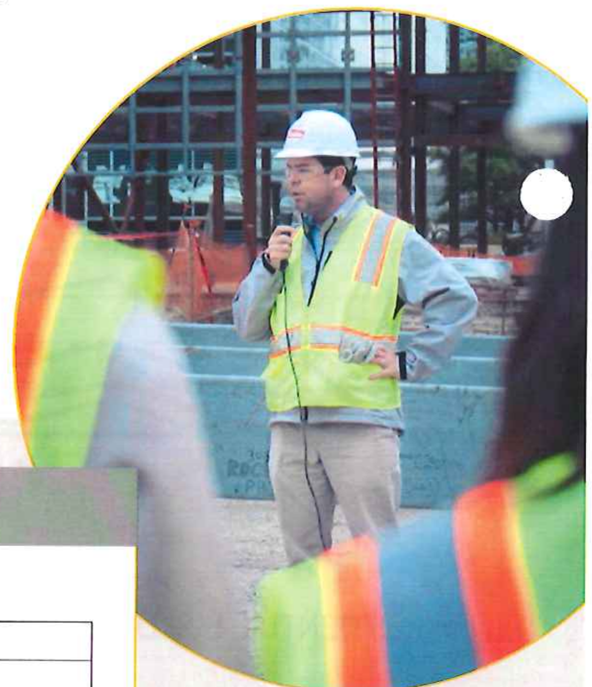
As depicted by US Census and Industry Actual Cost Indices:

- 2013 building cost inflation ranged from 6.5 to 9.6%.
- 2014 building cost inflation ranged from 6.6% to 6.7%.

Construction spending is increasing at the fastest rate in over 10 years. That will continue to support increasing margins. Therefore a building's total construction (final cost) inflation will outpace construction labor and materials inflation.

Expect nonresidential construction cost inflation to remain above 4% for several years. See "Escalation" for near-term and long-term recommendations.

These average values, useful for adjusting whole building costs, cannot be considered to adjust a unique contract type. Construction inflation with a historical average range from 3% to 8% would not be accurate to adjust asphalt paving or shingles. Asphalt products increased 10% in 2005 and 2006 and 20% in both 2008 and 2009.

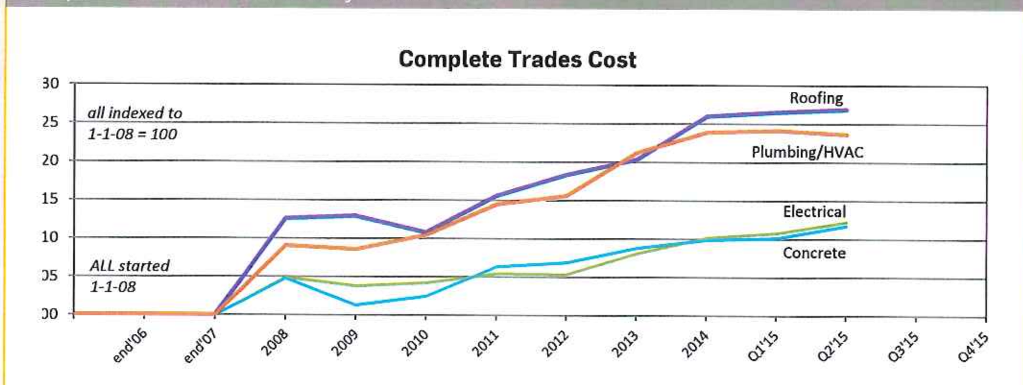


NONRESIDENTIAL TRADES INFLATION

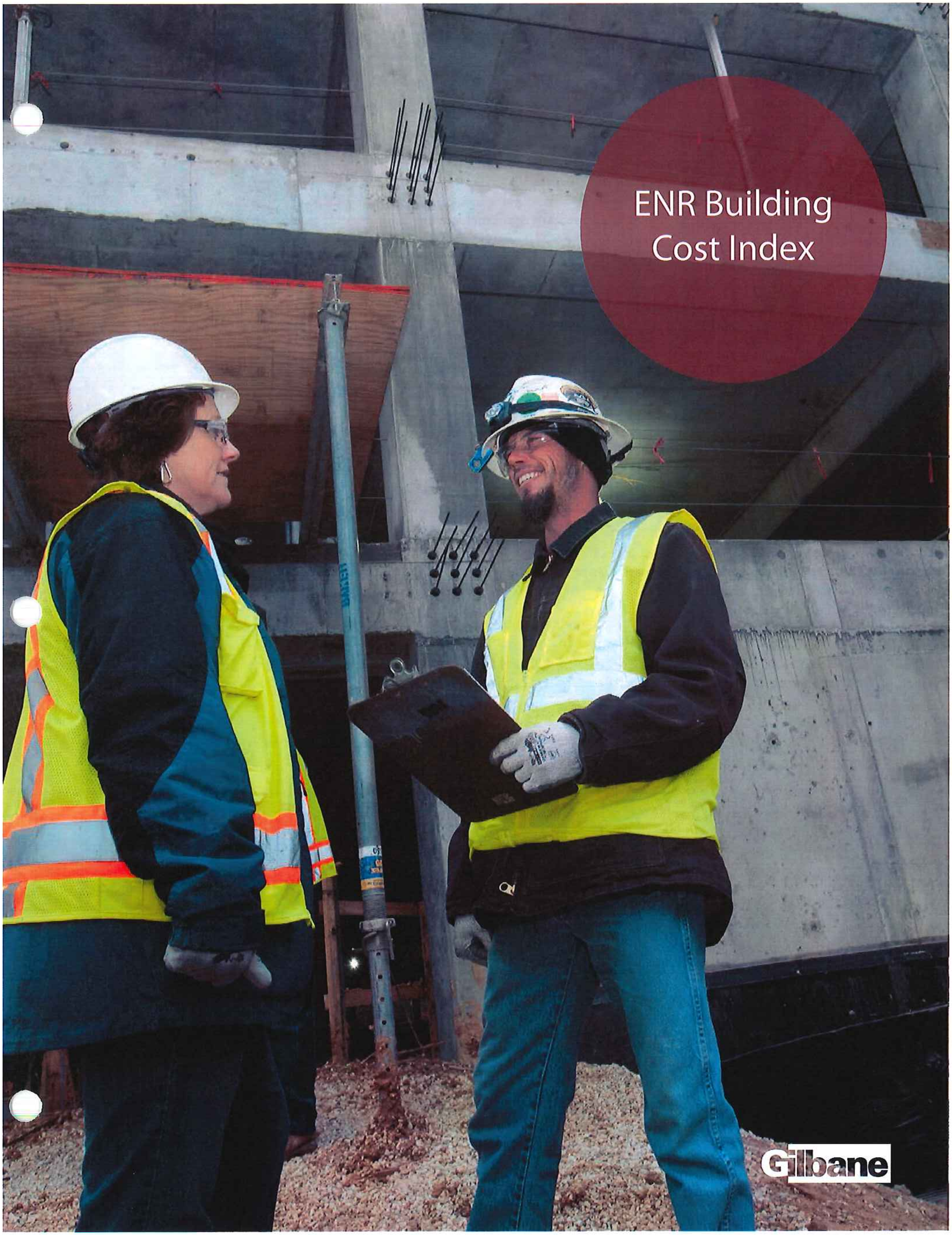
As depicted by PPI complete trades cost data:

- 2013 trades cost inflation ranged from 1.7% to 4.9%
- 2014 trades cost inflation ranged from 1.0% to 4.7%

FIGURE 26
Complete Trades Cost Index by Trade 2006-2015

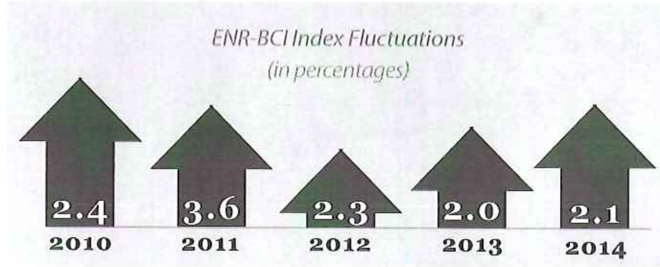


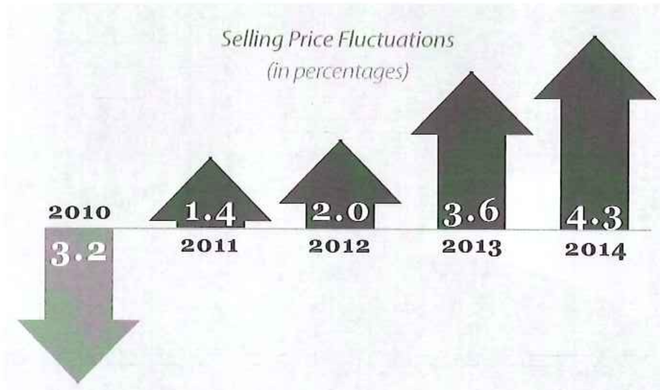
ENR Building Cost Index



ENR Building Cost Index

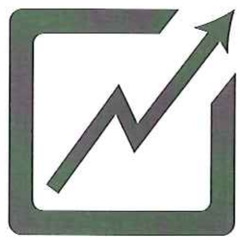
The August 2015 Engineering News-Record 20 Cities Average Building Cost Index (ENR-BCI) is 5515, up 2.3% year over year. New York City is at 9.1%. Cincinnati, St. Louis, Boston and Chicago show a higher than average inflation rate. Atlanta, Cleveland, Dallas, Denver, Kansas City, and Los Angeles are below the ENR average inflation rate. Baltimore and Birmingham are showing deflation.





The ENR-BCI is one of the most well-known and most widely-used building cost indices. However, its long-term strengths can also be weaknesses, particularly in times of fluctuating selling prices because:

- It is made up of a small shopping basket of labor and materials. Therefore, it is not always the best representation of all building types, which can vary considerably in composition.
- That shopping basket includes no representation for any mechanical, electrical or plumbing items, which can comprise 30%-50% of the cost of the building. In many cases, the shopping basket comprises less than 20% of the building cost.
- Building materials differ widely in rate and timing of cost growth and can dramatically affect the cost of projects. In 2009, while structural steel products declined in price by 10% to 15%, copper products increased in price by 40%.



The annual average ENR Index has gone up every year for 70 years.

ENR-BCI does not take into consideration bid prices, so it often does not represent the final cost of buildings. Bid prices are referred to as Selling Price, and this is not included in the ENR-BCI. Selling prices show increased or reduced margin bids due to market activity.

There were several monthly declines in the ENR index from late 2008 through early 2010, but the annual average has gone up every year for 70 years. More importantly, from Q2 2008 through Q2 2011, during the only recent period in which true deflation occurred, the ENR-BCI would indicate a 10% cost increase! The actual final cost of buildings, documented by several reliable measures, from Q2 2008 through Q4 2010 went down by 8% to 13%.

Whenever there are very active periods or very depressed periods of construction activity, contractor selling prices rise or fall accordingly, and since the ENR-BCI does not track selling price, it cannot reflect accurately what effect selling price had on the cost of buildings during those periods. Nonetheless, the ENR-BCI is often relied upon as an indicator of cost movement over time.

You must take into consideration the selling price of buildings, past and present, if you want to accurately index the cost of buildings over time.

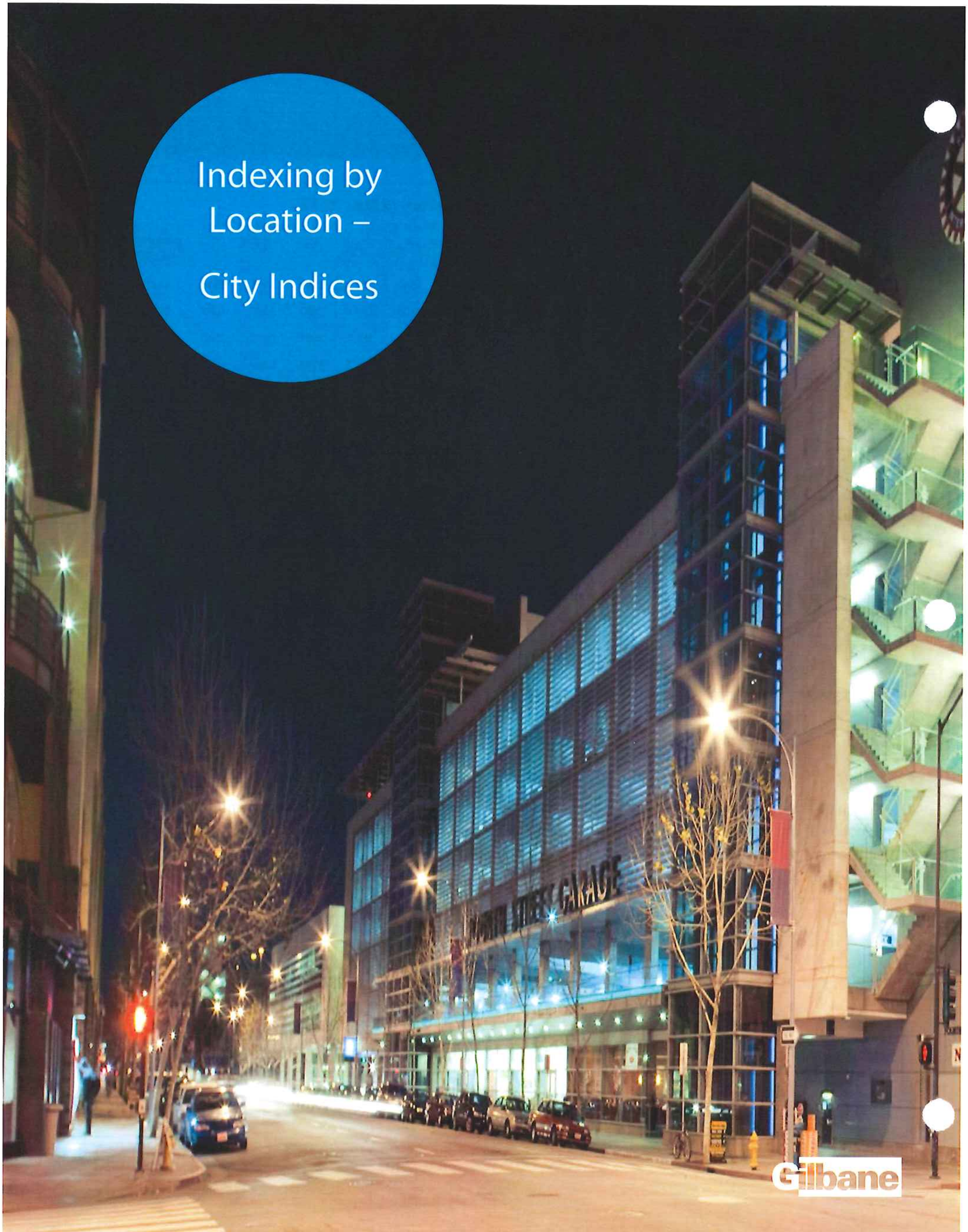
TABLE 12
ENR Building Cost Index History

ENR's Building Cost Index History (2000-2015)													
Base = 1913=100	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**ANNUAL AVERAGE**
2000	3503	3523	3536	3534	3558	3553	3545	3546	3539	3547	3541	3548	3539
2001	3545	3536	3541	3541	3547	3572	3625	3605	3597	3602	3596	3577	3574
2002	3581	3581	3597	3583	3612	3624	3652	3648	3655	3651	3654	3640	3623
2003	3648	3655	3649	3652	3660	3677	3683	3712	3717	3745	3765	3757	3693
2004	3767	3802	3859	3908	3956	3996	4013	4027	4102	4129	4128	4123	3984
2005	4112	4116	4127	4168	4189	4195	4197	4210	4242	4265	4312	4329	4205
2006	4335	4337	4330	4335	4331	4340	4356	4359	4375	4431	4462	4441	4369
2007	4432	4432	4411	4416	4475	4471	4493	4512	4533	4535	4558	4556	4485
2008	4557	4556	4571	4574*	4599	4640	4723	4733	4827	4867	4847	4797	4691
2009	4782	4765	4767	4761	4773	4771	4762	4768	4764	4762	4757	4795	4769
2010	4800	4812	4811	4816	4858	4888	4910	4905	4910	4947	4968	4974	4884
2011	4969	5007	5010	5028	5035	5059	5074	5091	5098	5104	5113	5115	5059
2012	5115	5122	5144	5150	5167	5170	5184	5204	5195	5203	5213	5210	5174
2013	5226	5246	5249	5257	5272	5286	5281	5277	5285	5308	5317	5326	5278
2014	5324	5321	5336	5357	5370	5375	5383	5390	5409	5442	5468	5480	5387
2015	5497	5488	5487	5501	5490	5507	5510	5515					

Data reprinted by permission Engineering News-Record - ENR.com

For a procedure to adjust for actual selling prices see the "Indexing – Addressing the Fluctuation in Margins" section of this report, and refer to Figure 29: Escalation Growth vs. Actual Margin Cost. This is particularly important for those using conceptual cost modeling tools such as the Gilbane CostAdvisor.

Indexing by Location – City Indices



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Indexing By Location – City Indices

FIGURE 27:
City Location Cost Index 2015

Equally important as indexing for time is the process of indexing for location. The practice of using historical projects, regardless of location, to get an idea of cost of future projects is quite common. Not only must project costs be moved over time, but also move the location. City indices provide the means to move project costs from one location to another.

Suppose the historical project was built in Phoenix and the goal is to determine the cost of a similar project built in Boston.

Assume

› Project cost as built = $10,000,000

› Boston index = 120

› Phoenix index = 90

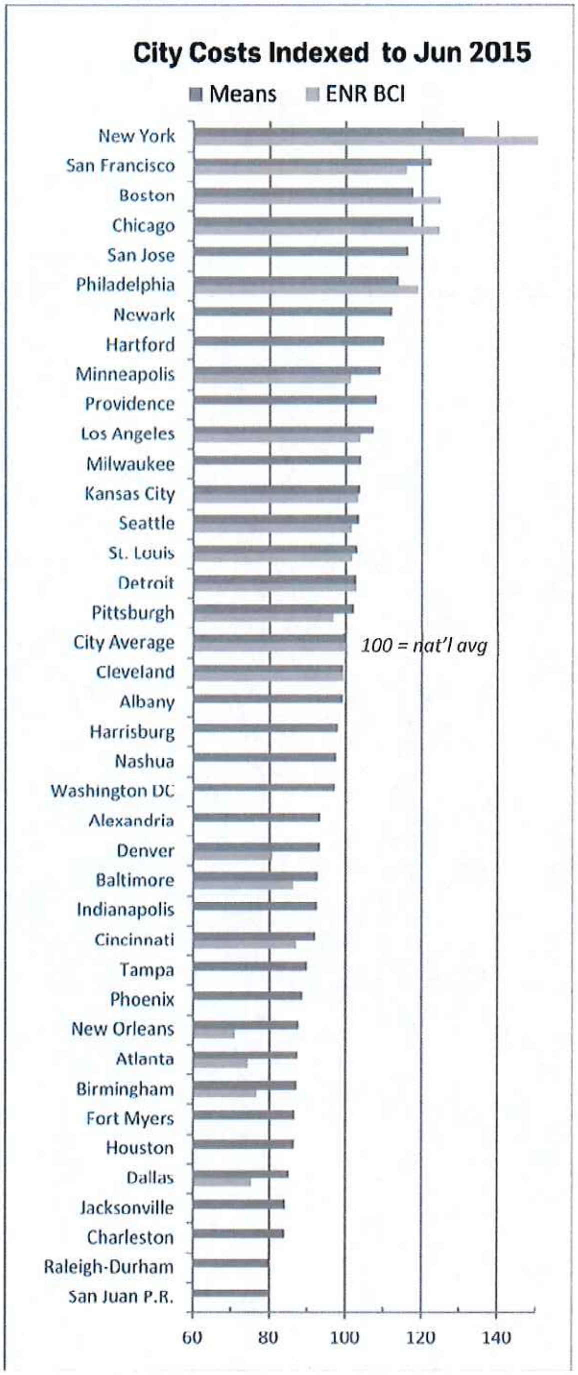
Move costs to Boston from Phoenix;
Divide "To" city by "From" city
Multiply original cost by factor.

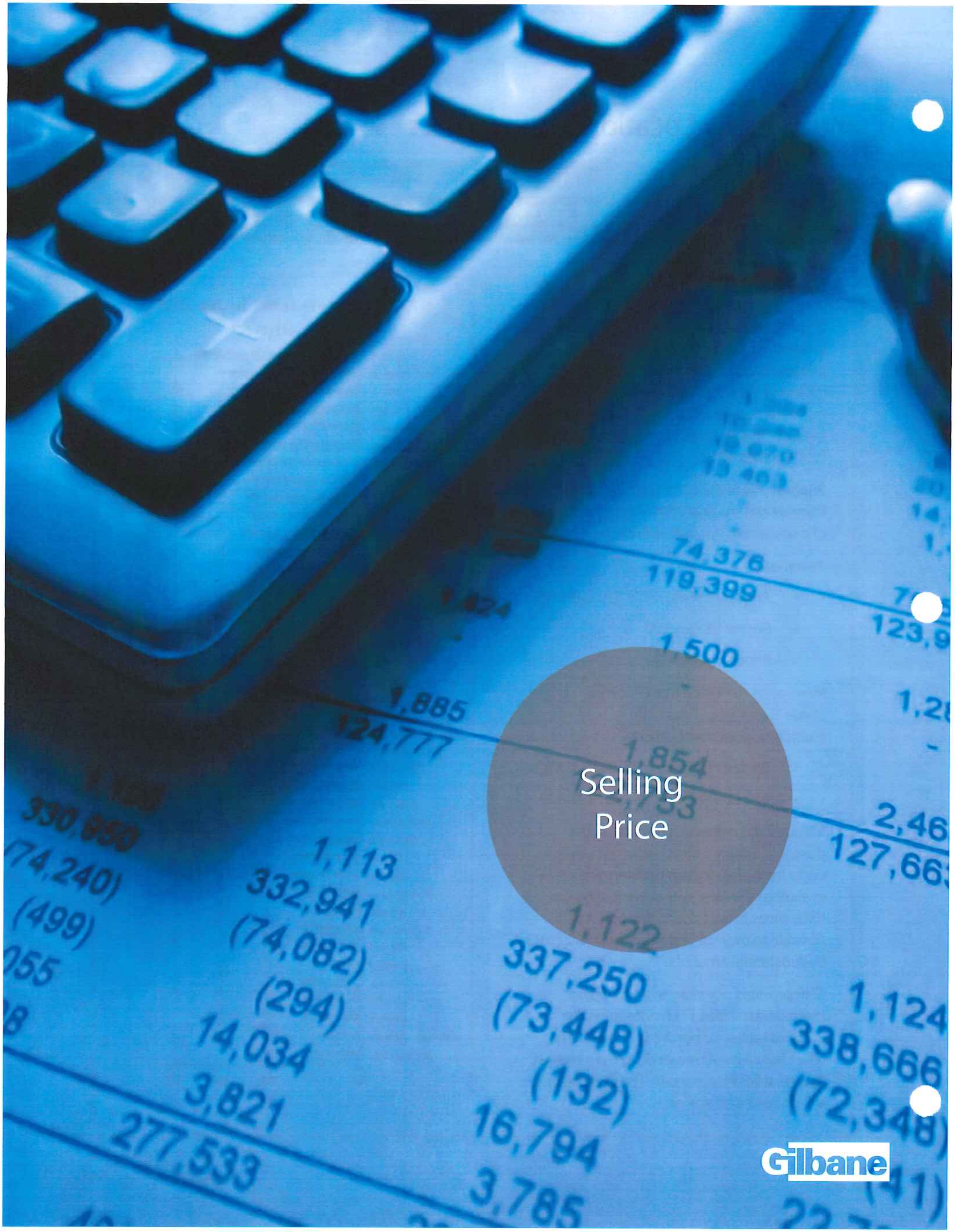
› Boston / Phoenix = 120/90 = 1.33x

› $10,000,000 x 1.33 = $13,300,000

Through this example, you can see the danger of simply using unadjusted project costs from one location to determine costs in another location. Without adjusting for differences in cost due to location, it is possible to over- or under-state project costs by substantial amounts.

ENR provides city indices for 20 major metropolitan cities. RS Means annually updates tables for hundreds of cities. The chart here lists 40 major cities from highest to lowest RS Means index. The ENR index is shown for those available.





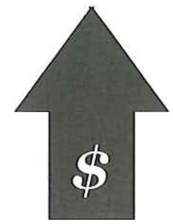
Selling Price

Selling Price

Selling price is the total price at which a contractor is willing to bid to win a project, even if that selling price eliminates all profit from the bid.

Few inflation or material/labor cost predictors address the issue of bidders raising or lowering margins in bids and hence affecting what is known as selling price. Selling price is dramatically affected by economic conditions such as market volume and contractor booked revenue. When market volume is low, contractor's margin, or selling price, comes down. As business volume picks up, and once contractors secure more work, even if material prices stay low, contractors begin to increase their margins and selling price increases.

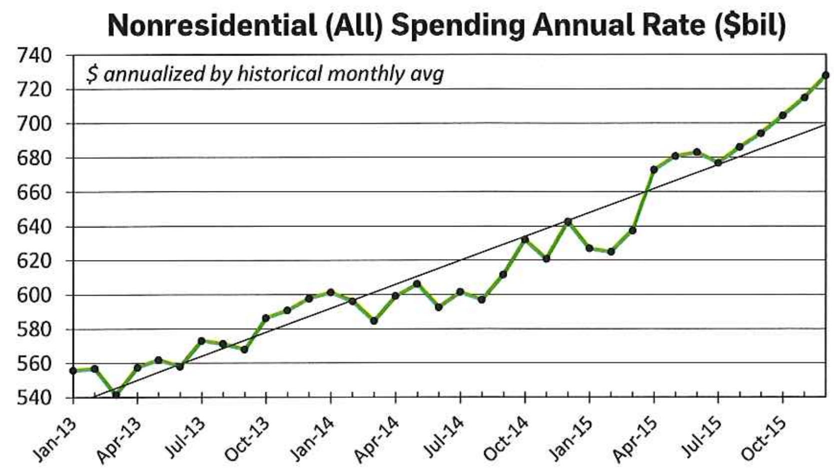
Increasing activity leads to higher selling price.



In some areas, selling prices are still depressed, and it will take time before workload volumes increase to a point that contractors see a return to normal margins. In 2012 and 2013, margins were increasing. The AGC Business Outlook survey for 2014 indicates optimism at a post-recession high. That will lead to increased margins.

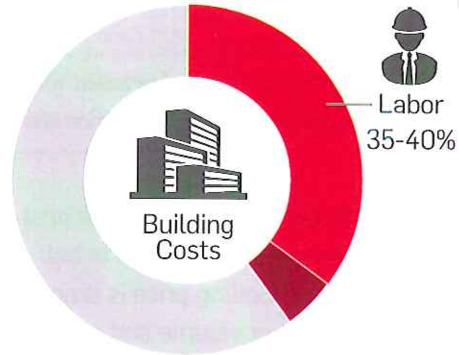
The industry is currently in a growth period as reflected in monthly construction spending. Construction spending is increasing at the fastest rate of growth in over 10 years. From beginning to end of 2015, the rate of spending will increase by 15%. Construction spending is projected to grow by 6% to 10% for the next several years. Although it may be several years before building market activity returns to pre-recession levels, there is clear and strong evidence that the rate of activity is increasing. A growth trend leads to higher margins.

FIGURE 28:
Nonresidential (All) Spending Rate of Growth 2013-2015



Contractors need to recover the cost for all expenses that affect their cost to build. Any cost not recovered is taken as a reduction to margin or reduced selling price. Cost recovered over and above expenses raises selling price and is a growth to margins.

- On average, labor cost represents approximately 35% - 40% of building cost.
- On average, materials cost represents approximately 50% -55% of building cost.
- Equipment and contractor services represent 10% of building cost.
- Margins are applied on all 100% of building costs.



On average, labor cost represents approximately 35% - 40% of building cost.

Labor wage cost growth is generally 2% to 3% per year. The labor wage cost long-term average is 3%. Labor demand and changes in labor productivity either increases or decreases total labor cost. In growth periods, labor demand tends to increase wages, and productivity generally declines, increasing overall labor cost.

Materials cost growth is tracked by several reports such as the PPI. Materials costs fluctuate widely, but in general, in times of higher demand, material prices go up.

Equipment and services have the least effect on overall project cost. Contractor efficiencies or unusual project conditions may vary this cost. Margins represent contractor overhead and profit. Selling price includes contractor margins and is market activity dependent. Competition will cause project bid margins to move lower. Increasing volume will allow margins to move higher.

If...	Then Cost to Project...
Labor wage ↑ by 3%	+1.2%
Productivity ↓ by 2%	+0.8%
Material costs ↑ by 5%	+2.5%
Services costs ↑ by 5%	+0.5%
Margin ↑ by 1%	+1.0%

During a period of low volume and competitive pricing (assuming no room for margins to move lower), margins are not increasing. During a period of margin recovery, anticipate a 1% to 1.5% annual increase to margins until margins fully recover.

When there is substantial growth in the volume of projects coming to bid, the need to keep margins reduced will diminish, and margins will return to normal. There is no room left for depressed market activity to move margins lower. Expect margins to increase slowly over time.

Margins vary considerably by market and activity within individual markets.

MARGINS INCREASING OR DECREASING?

Indices like the PPI MTRLS deal only with materials costs or prices charged at the producer level. They do not include delivery, equipment, installation, or markups, nor do they reflect the cost of services provided by the general contractor or construction manager.

Total project cost encompasses all of these other costs. Whole Buildings Completed PPI doesn't give us any details about the retail price of the materials used, but it does include all of the contractors costs incurred for delivery, labor for installation and markups on the final product delivered to the consumer, the building owner.

The PPI for construction materials IS NOT an indicator of construction inflation. It is missing the selling price. In 2010, the PPI for construction inputs was up 5.3%, but the selling price was flat. In 2009, PPI for inputs was flat, but construction inflation as measured by cost of buildings decreased 8% to 10%.

For several years, many construction firms have been competing for a very low volume of new work. In 2011 and 2012, construction spending, adjusted for inflation to get real volume, reached a 20-year low. There was little work available for bidders, forcing contractors to remain extremely competitive. As a result, contractors had been unable to pass on all cost increases to the owner. This had the effect of keeping selling price low, reducing both contractors' and producers' margins. In some cases, margins may be reduced to a loss just to get work.

Expect whole building costs to rise and remain above material/labor inflation as long as work volume continues to increase.

TABLE 13:
BLS PPI Buildings Completed 2011-2014

US Construction Producer Price Indexes - June 2015

BUILDINGS COMPLETED	ANNUAL FOR			
WHOLE BUILDING COST	2014	2013	2012	2011
INPUTS TO NONRESIDENTIAL	-1.9	0.9	0.9	5.7
NEW NONRSDNTL BLDGS	2.1	3.3	1.5	4.0
NEW INDUSTRIAL BLDG	1.8	4.1	1.4	3.1
NEW WAREHOUSE BLDG	2.6	2.9	2.6	3.7
NEW SCHOOL BLDG	2.3	3.4	1.2	4.8
NEW OFFICE BLDG	2.1	2.8	1.2	3.8
NEW HEALTH CARE BLDG	1.3	4.1	-0.5	NA

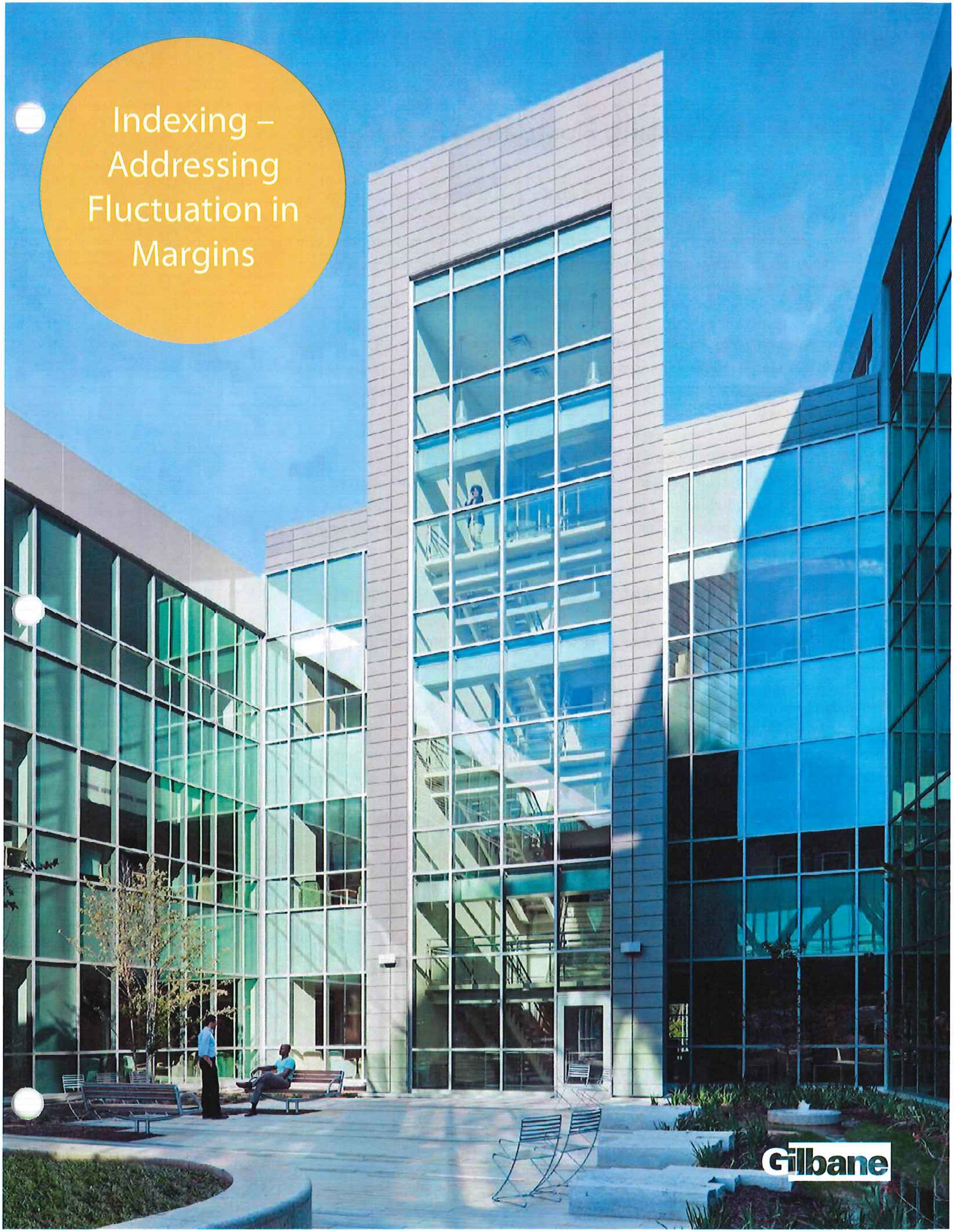
except inputs, includes labor, material overhead and profit
Source: Producer Price Index. Bureau of Labor Statistics

Margin growth resumed in 2012. Independent selling price indices show 2014 margins increasing by over 2%.

The flow of projects coming to bid during the coming months will strongly influence the cost movement of the bids. If the volume of projects coming to bid decreases, overall construction business will remain depressed and bids will remain low, strongly influenced by depressed margins. When there is a continued increase in the volume of projects coming to bid, the need to keep margins reduced will diminish and margins will continue a return to normal.

Indicators are pointing to growth signs, and that will eventually lead to a more normal bidding environment and higher margins.

Indexing – Addressing Fluctuation in Margins



Indexing - Addressing Fluctuation in Margins

The cost of previously built buildings is often looked at as a historical guide for what to expect in the future. Escalation indices allow the cost of buildings to be moved over time. City indices allow location to be moved. To index accurately, both margin and productivity movement need to be reviewed to determine what effect they might have on current cost compared to current index.

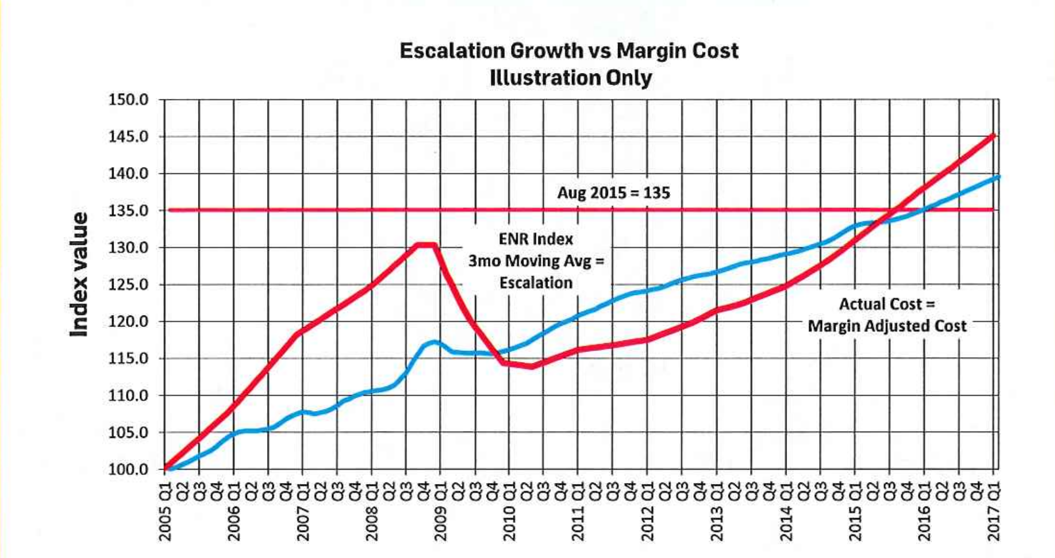
Average costs of buildings from Q2 2008 through Q4 2010 fell by 13% to 15%. However, normal labor/material indices increased by 4% during that time. Normal indices will not account for all changes in individual material costs, wages, productivity changes and margin fluctuations.

Standard labor and material index tables will not address the inflection points in this unusual time period, nor will standard labor and material inflation factors address productivity or margin fluctuation. Figure 29, Escalation Growth vs. Actual Margin Cost, illustrates this unusual period and provides a means to properly account for these unusual occurrences.

In Figure 29, the blue line indicates ENR-BCI actual values through August 2015 and predicted escalation near 3% thereafter. The plotted values are three-month moving averages to smooth out the line. The red (thicker) line indicates Contractor Bid Price Movement or Adjusted Margin Cost representative of as-built cost.

Very low margin cost in mid-2010 reflects contractor bids at low cost to secure a portion of a dramatically reduced amount of available work. Predicted future cost shows long-term cost growth, which accounts for both normal labor/material escalation equal to the escalation outlined above, and a very slow but steady 0.5% per quarter recovery of margins.

FIGURE 29:
Escalation Growth vs. Actual Margin Cost 2005-2017



How to Use the Above Graph:

If your project is not previously indexed using ENR-BCI, reference only the Margin index (red line).

Pick the date for midpoint of the historical reference project.

At that date, draw a vertical line so it passes through both curves. Now pick today's date.

At that date, draw a vertical line so it passes through both curves. Record the ENR Index at the historical reference date and today.

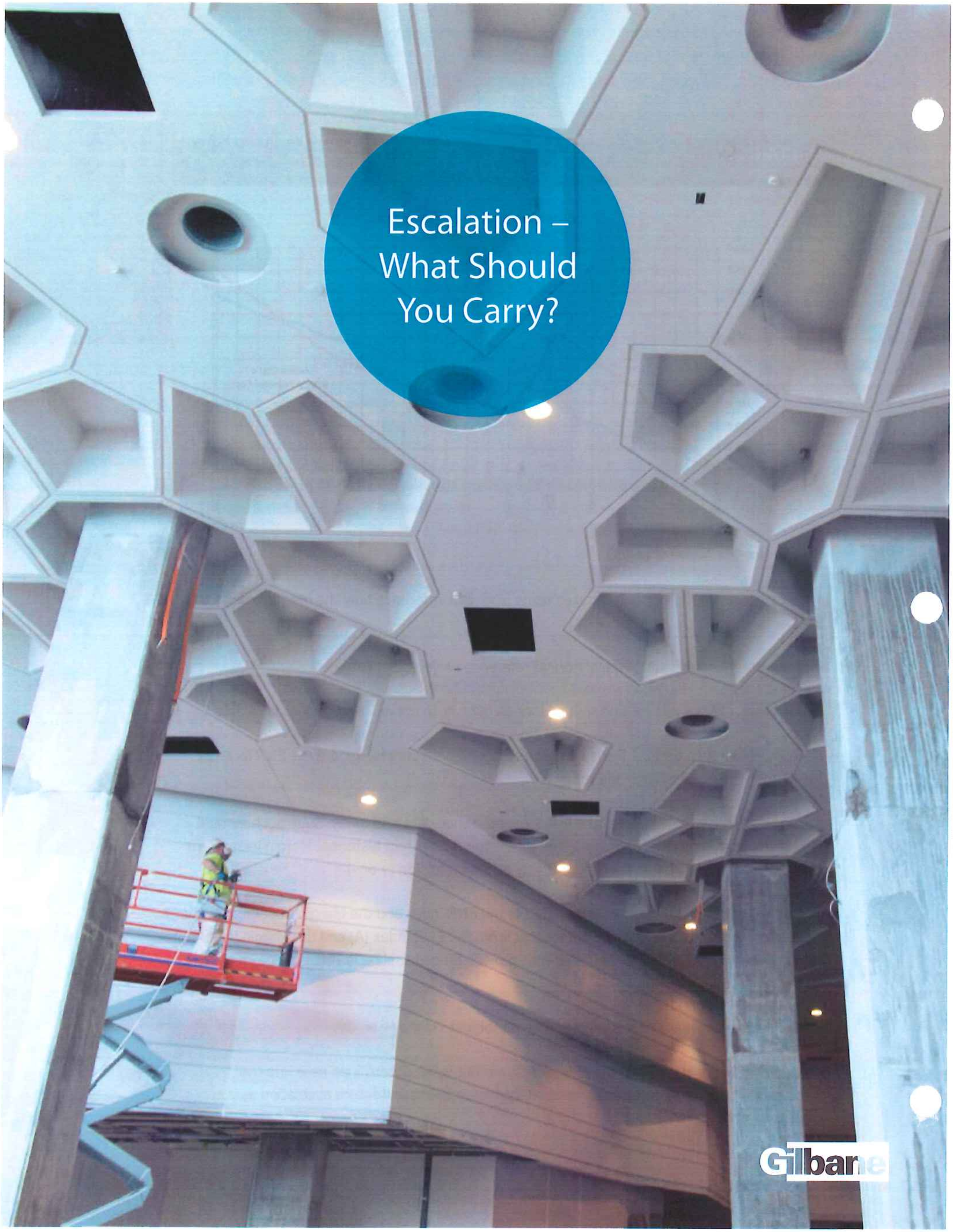
Record the Margin Cost Index at the historical reference date and today. Subtract historical ENR index from today's ENR index. Label that value A. Subtract historical Margin index from today's Margin index. Label that value B. Pay attention to sign (+ or -).

The difference between the movement due to the ENR index and the Margin Cost Index is the needed correction factor. Use the differences from the ENR Index (A) and the Margin Index (B) to develop an adjustment factor for your project. Since baseline is 100, all factors are the same as percentages.

B minus A = Margin Adjustment factor. Pay attention to signs (+ or -).

CostAdvisor users can record the Margin Adjustment value determined here into the Similarity Adjustment factor field. Treat all system indexing and future escalation as you would normally.

Escalation – What Should You Carry?



Escalation – What Should You Carry?

Escalation is typically thought of as one simple value. An estimator typically prepares a budget in today's dollars, but then must escalate the total estimate to the midpoint of the project construction schedule. As explained in prior sections, when determining escalation, the value must account for several factors.

Escalation must account for all anticipated differences from today's cost to expected future cost.

TO MOVE COSTS FROM TODAY'S DOLLARS TO FUTURE DOLLARS, WE MUST ACCOUNT FOR THE CUMULATIVE EFFECT OF:

- Market activity
- Labor wage rate changes
- Productivity changes
- Materials cost changes
- Equipment cost changes
- Margins fluctuations

The following escalation recommendations are based on the previous analysis of anticipated market activity, labor and material cost movement, productivity expectations and anticipated margin movement.

- Looking back at Q4 2014, it is expected construction activity growth in most major sectors. Healthcare and infrastructure heavy engineering declined, but manufacturing buildings began to expand rapidly.
- For both 2015 and 2016, the general consensus across several construction economic reports is growth in spending of 8% to 11%.
- Residential construction expanded, although at a somewhat slower rate than 2012-2013.
- Nonresidential buildings activity in 2015 will post the largest percentage gains ever recorded.
- Spending could reach 20%+ growth above 2014. Two-thirds of that will come from starts recorded in 2014.
- In 2015, office construction is expected to register 20%+ growth for the second year in a row.
- Manufacturing will post a 50%+ gain in 2015, a percent gain never before seen in any market.
- The Architectural Billings Index for Institutional building hit an all-time high in June. The institutional sector is the last to recover after a downturn. The institutional ABI has been positive for 13 consecutive months and just reached a new high. This is an indicator that the rate of spending activity will increase 9 to 12 months from now.
- Inflationary pressures may push the rate of material cost increases higher. All material cost increases from the manufacturer through the supplier may be passed along to the owner.

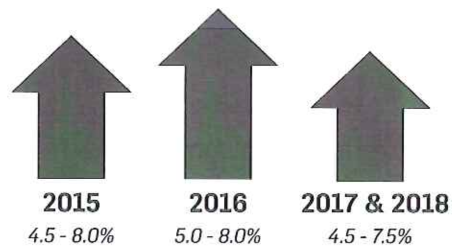
- Labor shortages may be significant resulting in higher labor retention costs.
- Growing work volume will have the effect of reducing productivity, driving up labor cost.
- Contractors may increase margins 1% to 2% per year.
- Any assumption of low escalation (3%-3.5%) requires that market activity does not experience strong growth. All signs indicate otherwise.

Historical labor and material index growth is 75% in 20 years. That is 3.75% simple index growth per year or 2.85% compounded inflation cost growth for 20 years.

Historical as-sold building cost growth is 89% for 20 years. That is 4.45% simple index growth per year or 3.25% compounded inflation cost growth for the last 20 years.

Historical average spending growth is 7% per year (not including 2008 to 2011 when spending declined 35%).

TOTAL ESCALATION



Since the U.S. Census began keeping construction spending records in 1993, it has recorded a rate of spending growth over 10% per year only twice and only three other years have exceeded 9% per year growth. In 2015, we will have 10%+ growth.

FOR NONRESIDENTIAL BUILDINGS

In years when nonresidential spending growth exceeded 10%, as-sold cost escalation was 9% to 11%.

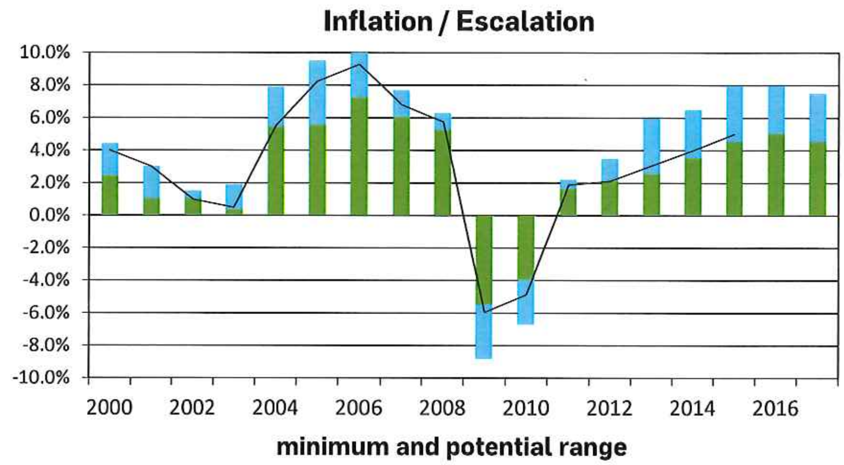
Potentially, there may be escalation similar to the growth years of 2004 through 2008 when (for nonresidential buildings) spending grew 53%, and escalation averaged 8% per year for five years. All leading indicators point to continued growth for the next few years.

For each year above, consider your market. If you are in a market area or sector that has expectations of a huge volume of work that may start within a narrow window of time, then market pricing can turn rapidly for you.

FIGURE 30:
Inflation / Escalation Minimum and Potential 2000-2017

Prior to economic expansion and then downturn, long-term escalation averaged 3.5% for 20 years. There does not seem to be a scenario which returns the industry to escalation as low as that long-term average at least for several years beyond the above noted predictions.

Potential inflationary periods, declining productivity and even slight continued margin growth for several years lead to a recommendation of a minimum long-term escalation beyond 2016 of no less than 4%.



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The information in this report is not specific to any one region. The information is limited to the United States and does not address international economic conditions.

Author Ed Zarenski, a 42-year construction veteran and a member of the Gilbane team for 35 years, managed multi-million dollar project budgeting, owner capital plan cost control, value engineering and life cycle cost analysis. As a construction economics analyst, he compiles economic information and provides data analysis and opinion for this quarterly report.

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Data Sources

Along with countless news articles, these sources are used for data in this report:

- American Institute of Architects – www.aia.org/practicing/economics/index.htm
- American Iron and Steel Institute - steel.org
- American Recycler - americanrecycler.com
- Associated Builders and Contractors - abc.org
- Associated General Contractors of America - agc.org
- Bloomberg L.P. Financial News - Bloomberg.com
- Bureau of Labor Statistics - Stats.BLS.gov
- Construction Industry Round Table – cirt.org
- CMD - CMDGroup.com (formerly Reed Construction Data)
- Data Digest – DataDigest
- Dodge Data & Analytics - construction.com/about-us/press
- Economic Cycle Research Institute - businesscycle.com
- Engineering News-Record - ENR.com
- Financial Trend Forecaster - Fintrend.com
- FMI Management Consulting - FMINET.com
- IHS Global Insight - ihs.com
- Institute for Supply Management - ism.ws
- Metal Prices – metalprices.com
- Producer Price Indexes - bls.gov/ppi
- Random Lengths - randomlengths.com
- U.S. Census Bureau - census.gov

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2013 Market Forecast

KileyAdvisors
Leadership & Strategy

2013 Market Forecast

Kiley Advisors LLC

AGC/CEFPI

January 22, 2013

Looking Back

2012 Market Begins to Transform

- Employment Growth (95,000)
- Net Positive Absorption
- McGraw Hill Contracts $3.7B - $3.9B
- Surge Felt by All Parties

Looking Back

- Architectural Firms
  - Hiring
  - ABI Southern Region 51.1
  - ABI Commercial/Industrial 52.0 (12/12 nat’l)
  - Some record years

Looking Back

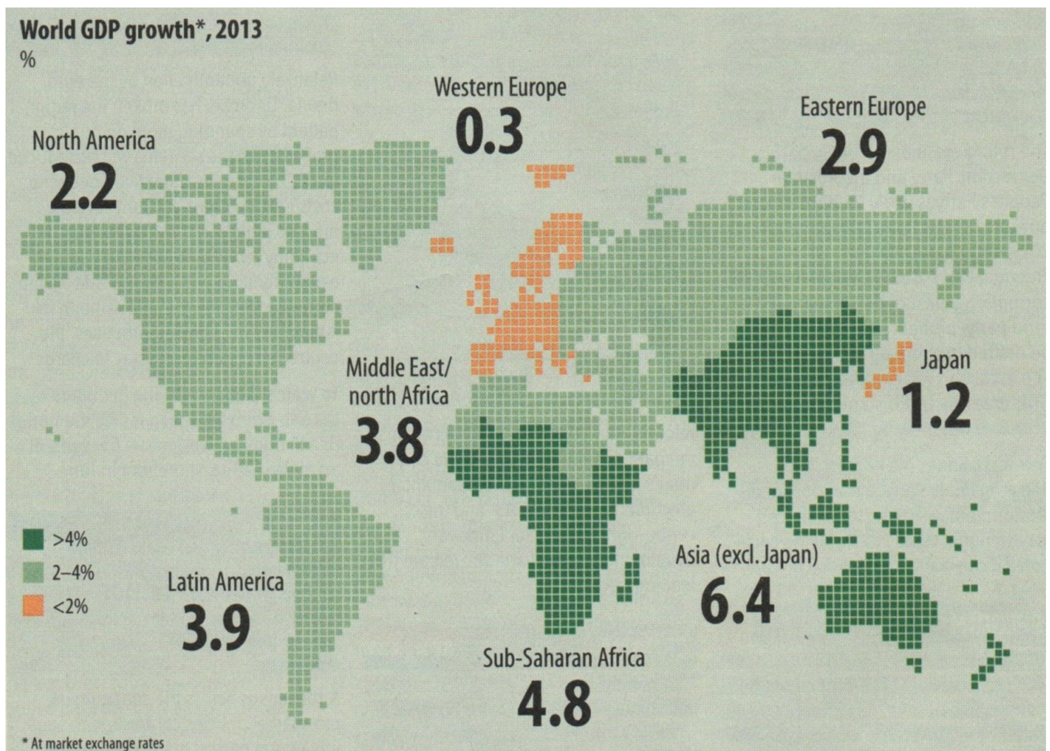
CBRE	(Q4) SF Under Construction	Net Absorption (YOY)
Office (Q4)	8.5 msf	4.3 msf
Industrial (Q4)	4.9 msf	6.4 msf
Retail (Q3)	1.4 msf	225k sf
Multifamily (Q3)	12,000	3,195 units

- Office
  - Houston recovered all square footage lost during recession by the end of 2011, so 4.3 msf is true growth
  - Houston had the most absorption in a single year since 2006.
  - Overall rates have increased by almost $1 and Class A rates have risen $2.25 over the year
- Industrial
  - 59 builders were delivered in 2012 totaling 4.7 msf
  - Rates are expected to climb as vacancy continues to drop

Looking Ahead

International Picture

- Positive Growth – All Regions



A Deeper Look

International Picture

- China 8.6%; India 6.5%
- Western Europe, Greece and Spain
- Mongolia, Macau and Libya – The Stars

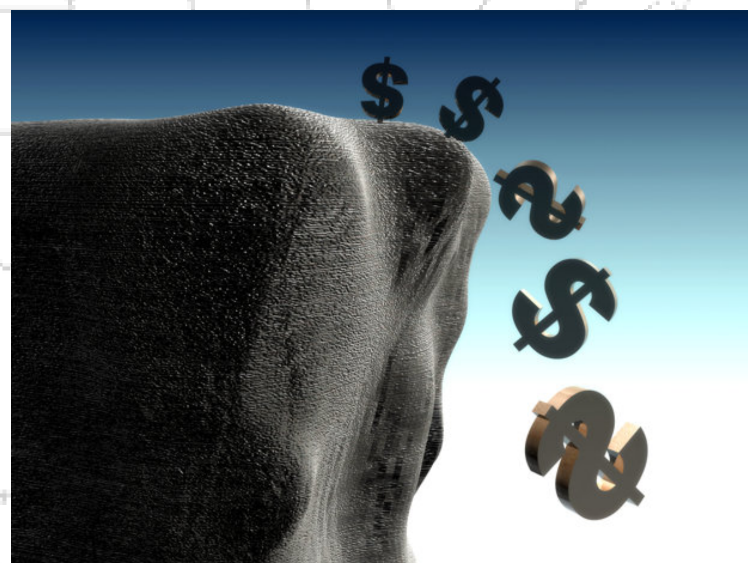
Major International Concerns

- Syria
- Afghanistan/Pakistan
- Somalia
- Mali

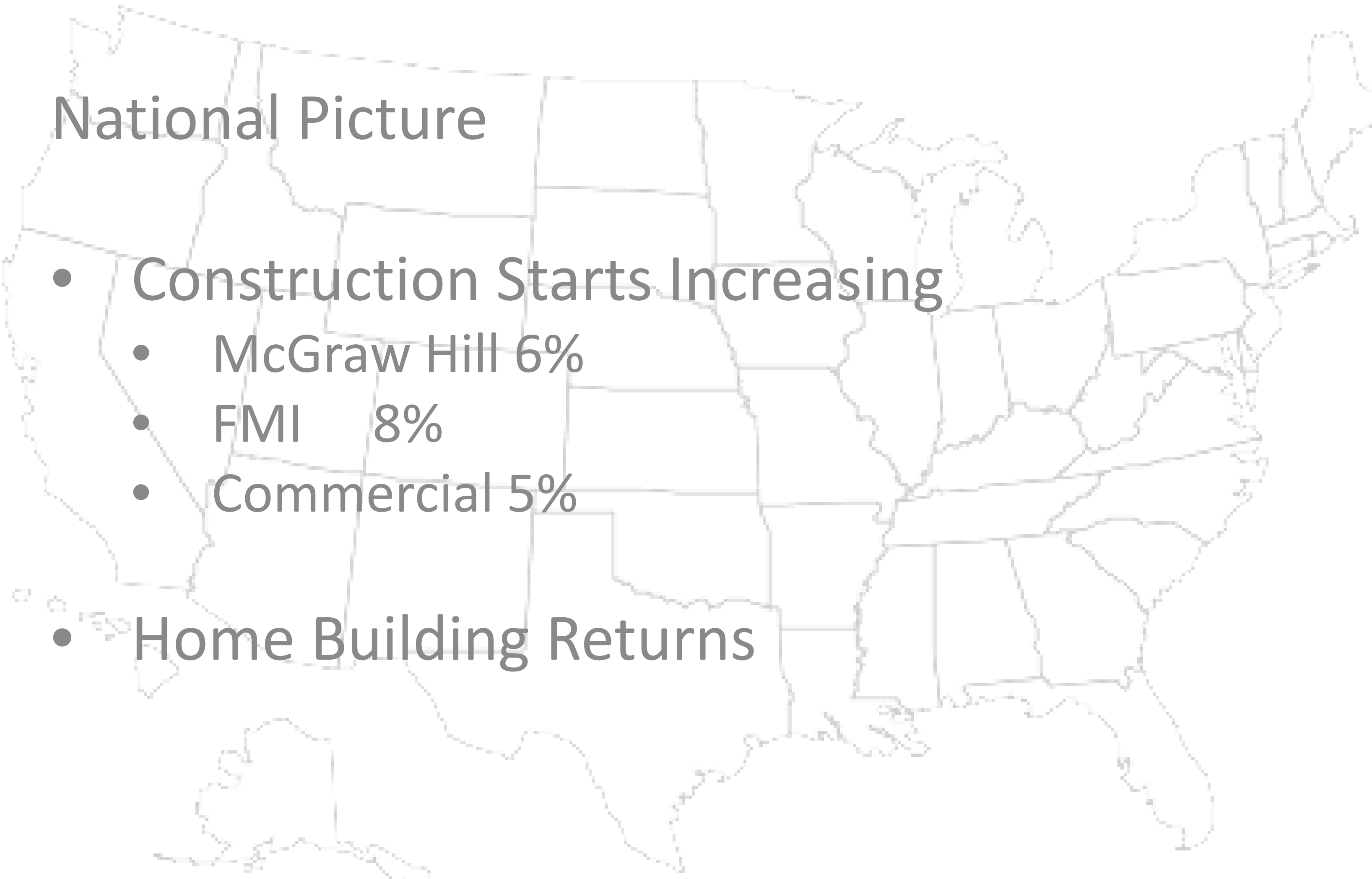
Looking Ahead

National Picture

- Fiscal Cliff Averted
- GDP Growth 2 – 2.5%
- 2M Jobs
- 7.5% Unemployment



Looking Ahead



National Picture

- Construction Starts Increasing
  - McGraw Hill 6%
  - FMI 8%
  - Commercial 5%
- Home Building Returns

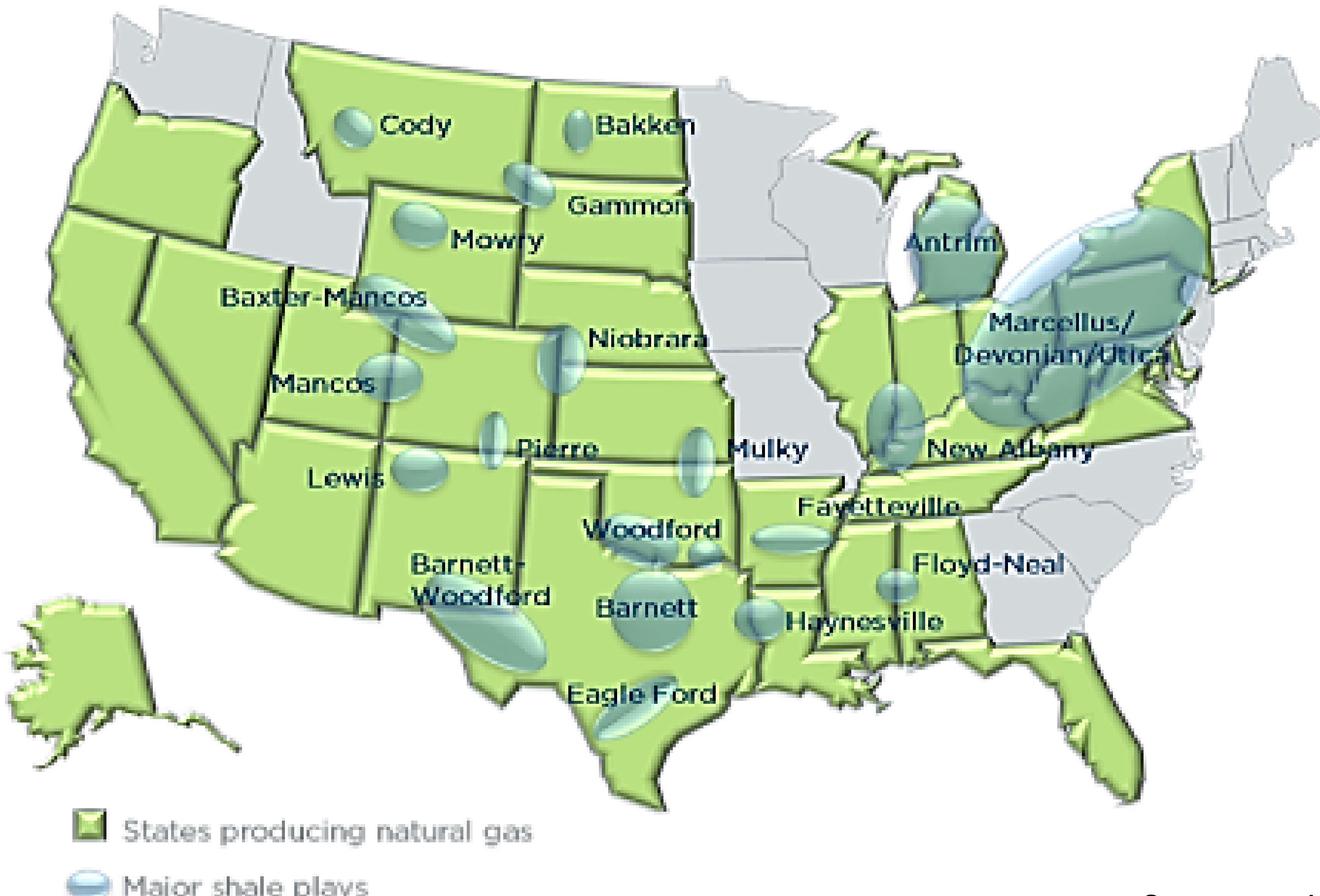
Looking Ahead

Texas and Houston

- Population and Employment Growing
- Shale Boom
- Cost of living remains reasonable
- Regulatory Environment
- All markets increasing

Shale Plays

North America's New Source of Abundance



Source: www.Angus.us

Other Positive Indicators

- Home Sales
  - Up 16.1% in 2012
- Auto Sales
- Commercial Real Estate

What Will Drive Construction?

- Job and Population Growth
  - 85,000 jobs; 115,000 people
  - Construction adding 16,200
- Oil and Gas Prices remain favorable
- Vacancy levels low
- Quick delivery/value building
- Financing available but tight parameters
  - 35% Equity; 50%+ pre-lease
  - Personal/Entity Guarantees
- Panama Canal Expansion

What Will Drive Construction?

CBRE	Vacancy (Total)
Office (Q4)	12.9%
Industrial (Q4)	5.1%
Retail (Q3)	7.8%
Multifamily (Q3)	89.6% occupancy

- EIA Projections
  - WTI $88.29 per barrel average
  - Henry Hub $3.49 average

Sector and Segment Highlights




Residential

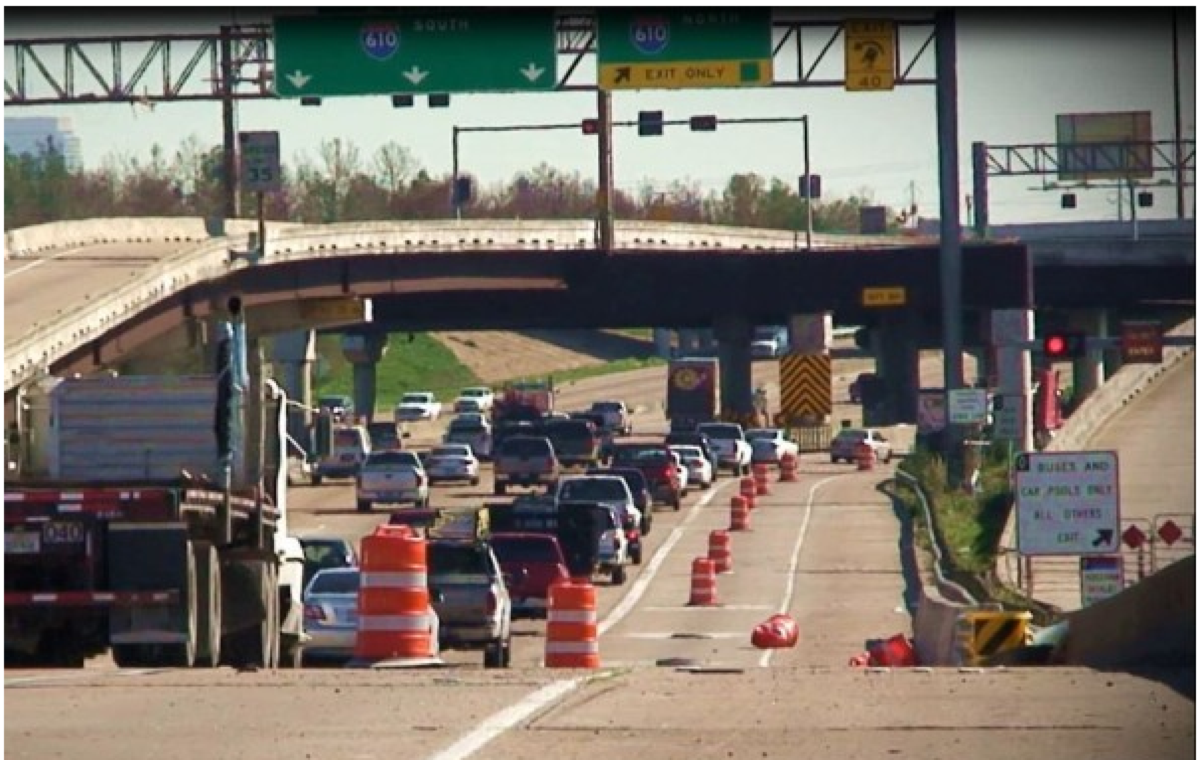
- 27,500 new single family dwellings
- 10,000 new multi-family units
- Lot supply scarce?

The Industrial Picture

- 10 billion in Houston Area
- 56 billion from Corpus to Baton Rouge
- Significant for our workforce picture

Civil

- Increases at TxDOT
- Other markets are flat or slightly down



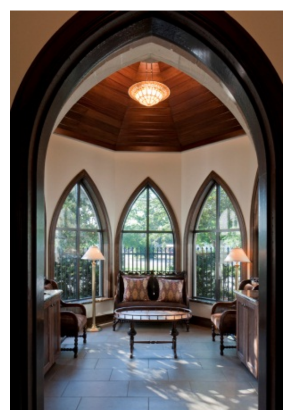
Commercial and Light Industrial Segments
Private Work

Markets on Fire

- Office
- Light Industrial
- Retail
- Multifamily

Stable Markets

- Higher Education
- Religious
- Hotels


Markets Lagging

- Healthcare
- K-12

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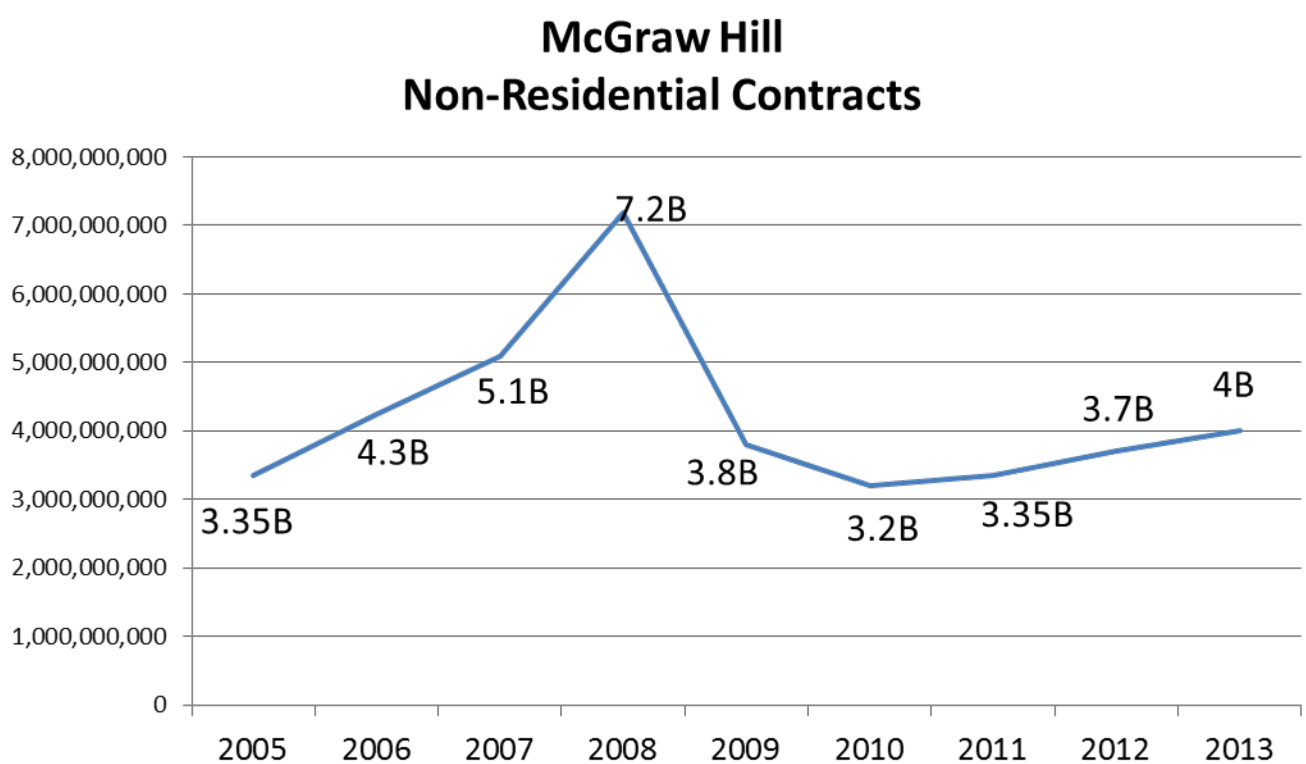
Leadership & Strategy

2013 Forecast

- New Contracts Awards
  - $4 Billion total expected in 2013



Longer Range?

- Perryman Population Projection
  - 10.25M by 2040
- Scenario 2040
  - 8-12M

Industry Issues

- Immigration Reform
- Margins and Fees remain low
- Bonding lines being cut
- Skilled craft worker shortage
- Talent management remains critical

Sources

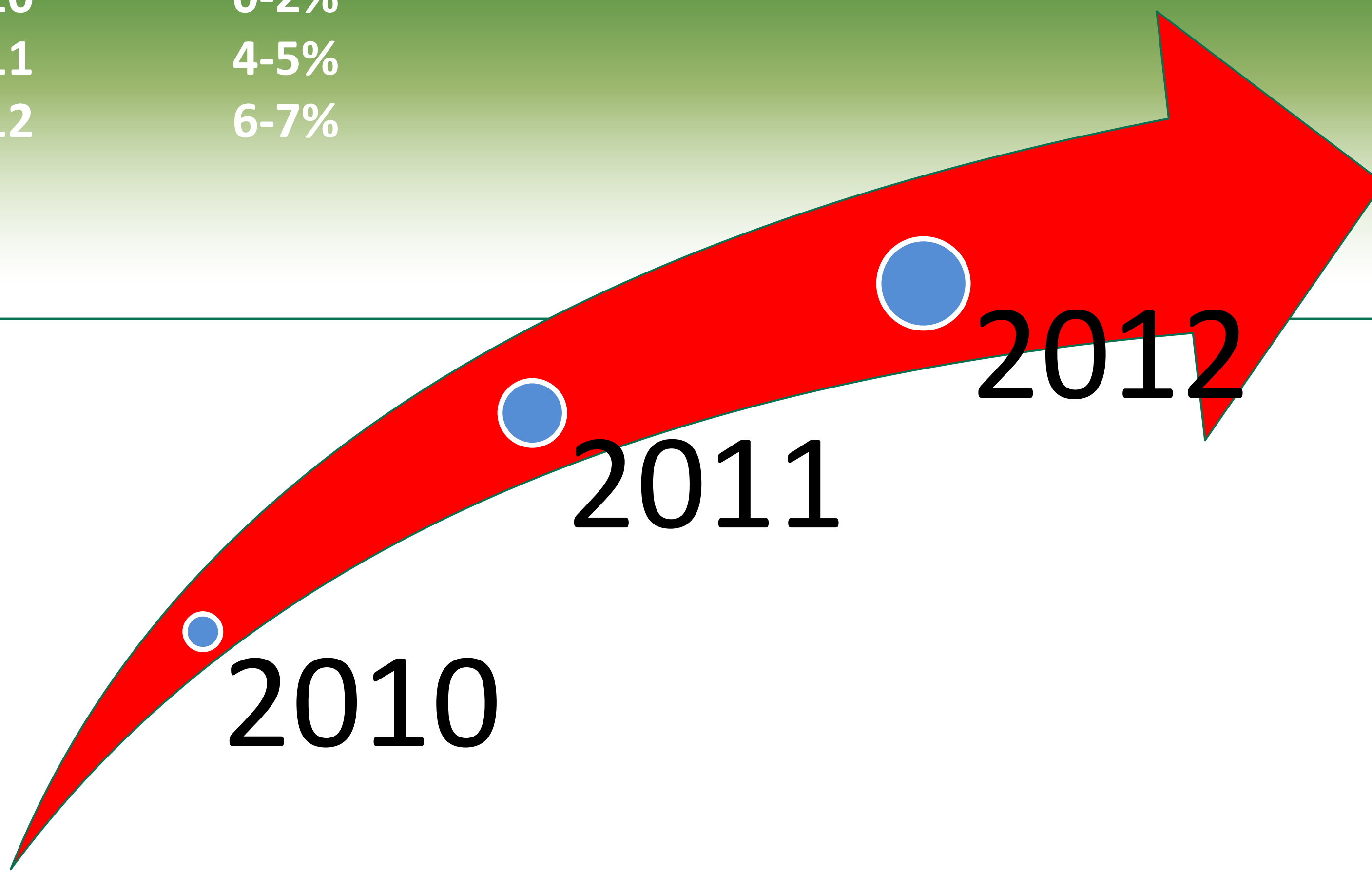
The information contained in this report was obtained from various publications and sources. Special thanks to CB Richard Ellis, American Metro Studies, O'Connor & Associates, Grubb & Ellis, Greater Houston Partnership, Ken Simonson - National AGC economist, Industrial Info Resources, University of Houston Institute for Regional Forecasting, Reed Construction Data, McGraw-Hill, PKF Consulting, Google, the Houston Chronicle, and other sources mentioned who supplied information and assistance for this forecast.

Projected Escalation

DUROTECH
BUILDERS OF INTEGRITY

Projected Escalation for K-12 School Market

a.	2010	0-2%
b.	2011	4-5%
c.	2012	6-7%



DUROTECH
BUILDERS OF INTEGRITY

Cost Per Square Foot

School Type	2009 SF Cost	2012(Projected Escalation from 2009)	Surveyed SF Cost
Elementary	124 / s.f.	139 / s.f.	144 / s.f.
Middle / Junior High	128 / s.f.	144 / s.f.	135 / s.f.
High School	160 / s.f.	179 / s.f.	175 / s.f.

DUROTECH
BUILDERS OF INTEGRITY

Cost Per Square Foot

5 PROFILE OF NEW SCHOOLS CURRENTLY UNDERWAY

National Medians	$/Sq. Ft.	$/Per Student	Sq. Ft./ Per Student	No. of Students	Building Size (Sq. Ft.)	Building Cost ($000's)
Elementary Schools	$190.48	$25,500	125.0	600	75,000	$14,800
Middle School	$215.14	$29,959	149.0	936	140,000	$30,000
High Schools	$188.68	$30,833	156.3	1,600	260,000	$54,900
Low Quartile	**$/Sq. Ft.**	**$/Per Student**	**Sq. Ft./ Per Student**	**No. of Students**	**Building Size (Sq. Ft.)**	**Building Cost ($000's)**
Elementary Schools	$156.72	$18,962	106.7	500	64,000	$11,600
Middle School	$172.41	$23,774	124.0	750	101,000	$21,000
High Schools	$164.46	$25,769	125.0	1,200	150,000	$32,000
High Quartile	**$/Sq. Ft.**	**$/Per Student**	**Sq. Ft./ Per Student**	**No. of Students**	**Building Size (Sq. Ft.)**	**Building Cost ($000's)**
Elementary Schools	$268.24	$36,667	140.0	800	95,000	$22,755
Middle School	$248.65	$36,667	162.2	1,200	170,000	$41,000
High Schools	$252.50	$42,037	187.5	2,064	342,000	$75,534
Top 10 Percent	**$/Sq. Ft.**	**$/Per Student**	**Sq. Ft./ Per Student**	**No. of Students**	**Building Size (Sq. Ft.)**	**Building Cost ($000's)**
Elementary Schools	$548.51	$49,000	166.7	1,000	120,000	$34,511
Middle School	$294.12	$50,000	176.3	1,300	190,000	$47,000
High Schools	$500.57	$56,442	225.0	2,400	400,000	$113,356

To read this table: The national median cost per square foot for construction of an elementary school completed in 2010 was $190.48. Cost per student was $25,500 and the median school provides 125 square feet per student. One quarter of all school districts (the low 25 percent) is spending $156.72 per square feet or less for its elementary school construction while one quarter of all districts spent $268.24 per square feet or more. One in 10 school districts estimated cost for a new elementary school at almost $550 per square feet. *Based on data from 201 elementary schools; 68 middle schools; 91 high schools.*

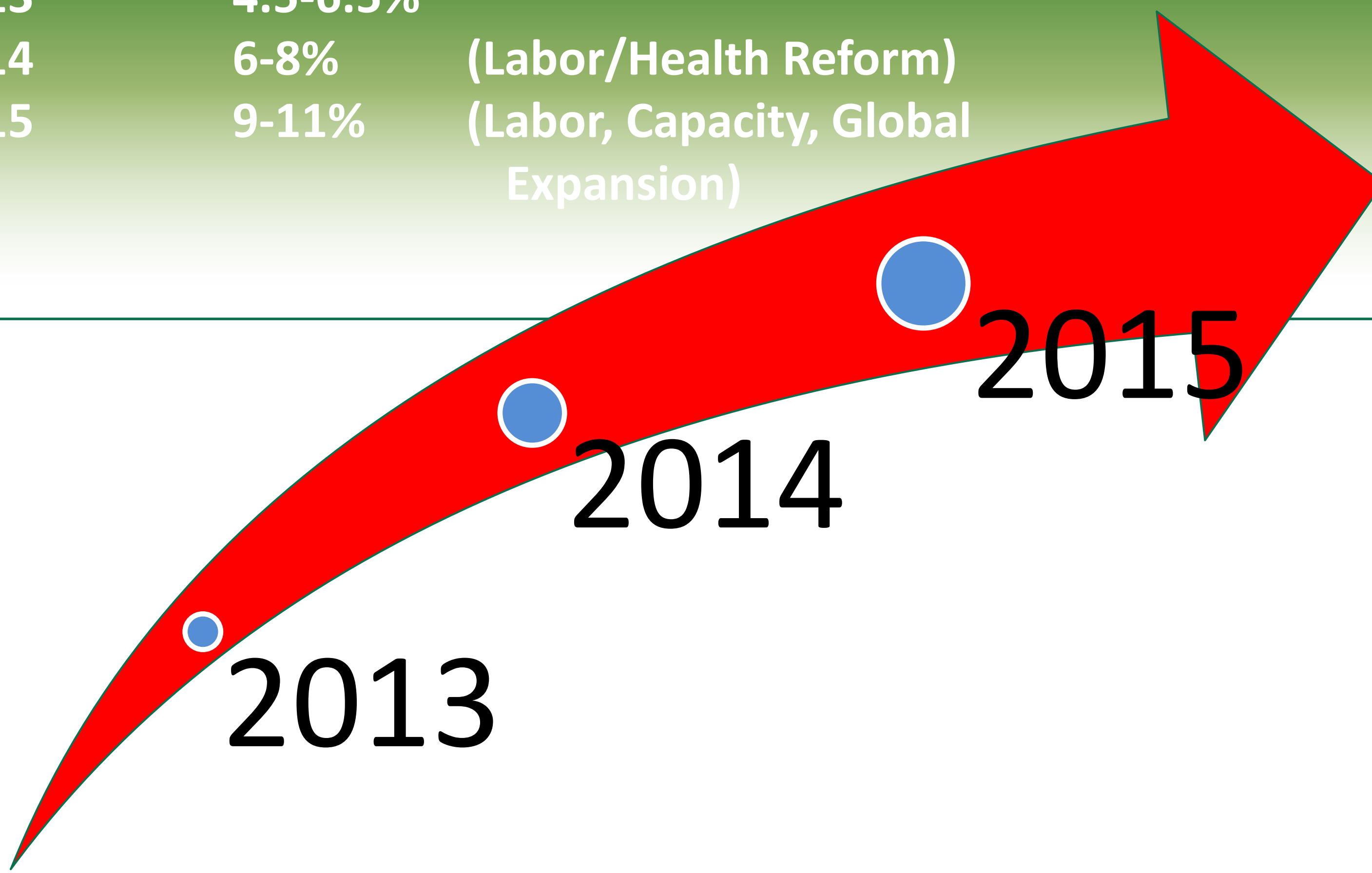
Source: School Planning & Management / MDR

DUROTECH
BUILDERS OF INTEGRITY

Projected Escalation

Projected Escalation for K-12 School Market

a. 2013 — 4.5-6.5%
b. 2014 — 6-8% (Labor/Health Reform)
c. 2015 — 9-11% (Labor, Capacity, Global Expansion)



2015 Market Forecast

2015 Market Forecast

Kiley Advisors LLC

CEFPI/AGC

March 3, 2015

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Houston – The Energy Capital of the World

- 70% of Employment Base
- Average Energy Compensation $185,000
- All Others Average $64,500

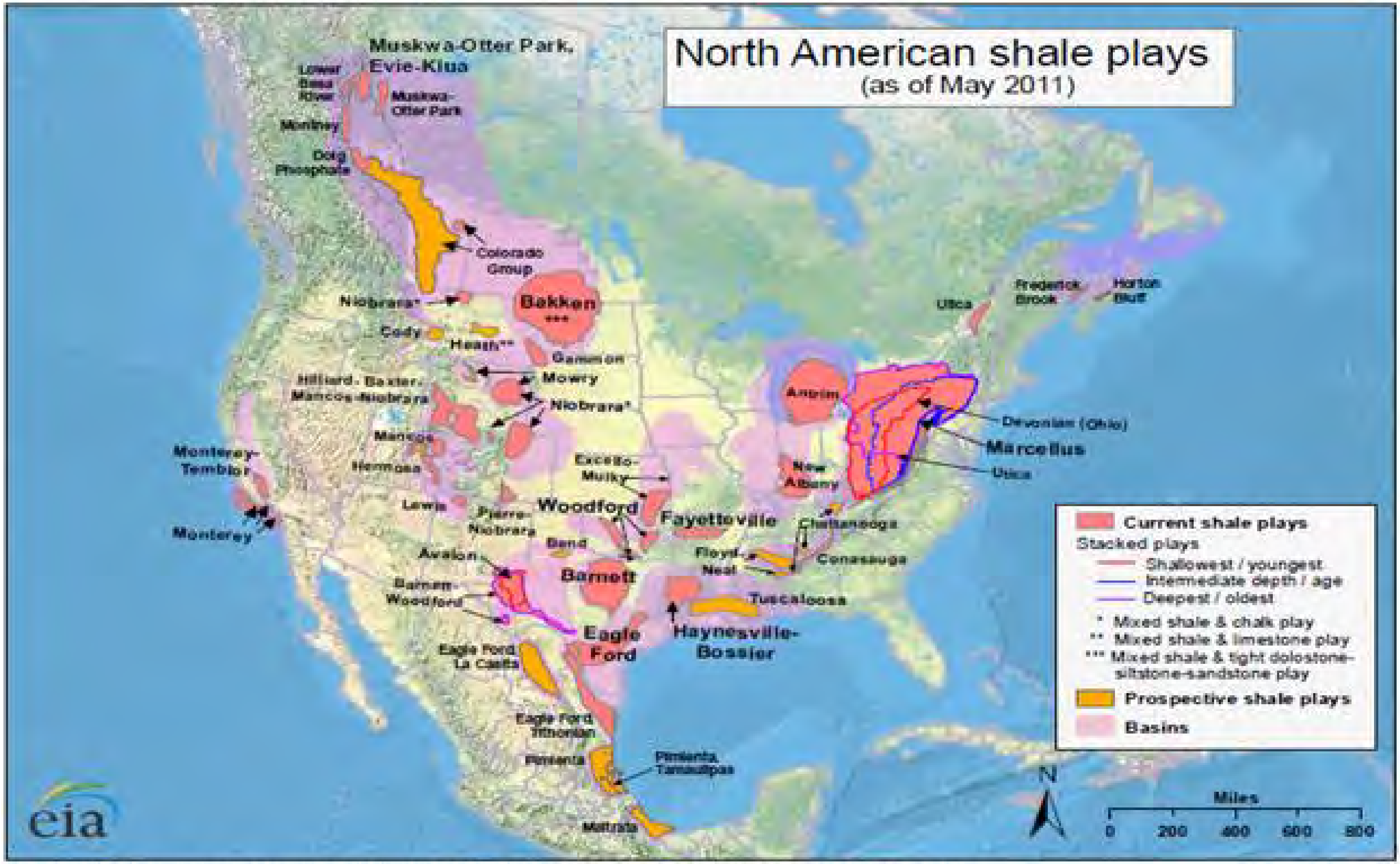
Sources: GHP; Sikich

US Shale Plays

Source: Energy Information Administration based on data from various published studies.
Updated: May 9, 2011

Source: EIA

Upstream



Source: U.S. Energy Information Administration based on data from various published studies. Canada and Mexico plays from ARI.
Updated: May 9, 2011

Sources: Adam Purdue, IRF; EIA

The Current Challenge

- Demand is Dropping
  - Slow down in Europe and Emerging Markets
- Production is Increasing
  - Prices are dropping – and significantly
- Need 93.1 Million BPD
- Producing 93.7 Million BPD
  - US: 9.3 Million BPD
  - TX: 3+ Million BPD

Source: GHP; EIA

The Negative Impact of Oil Prices

Price of Oil

- "From '09 to '13, the industry outspent its cash flow by $272B"
- 3M barrels/day in Texas - $50 per barrel of cash flow = $150M/day lost

Sources: HIS Herold Research; EIA; CNN.com

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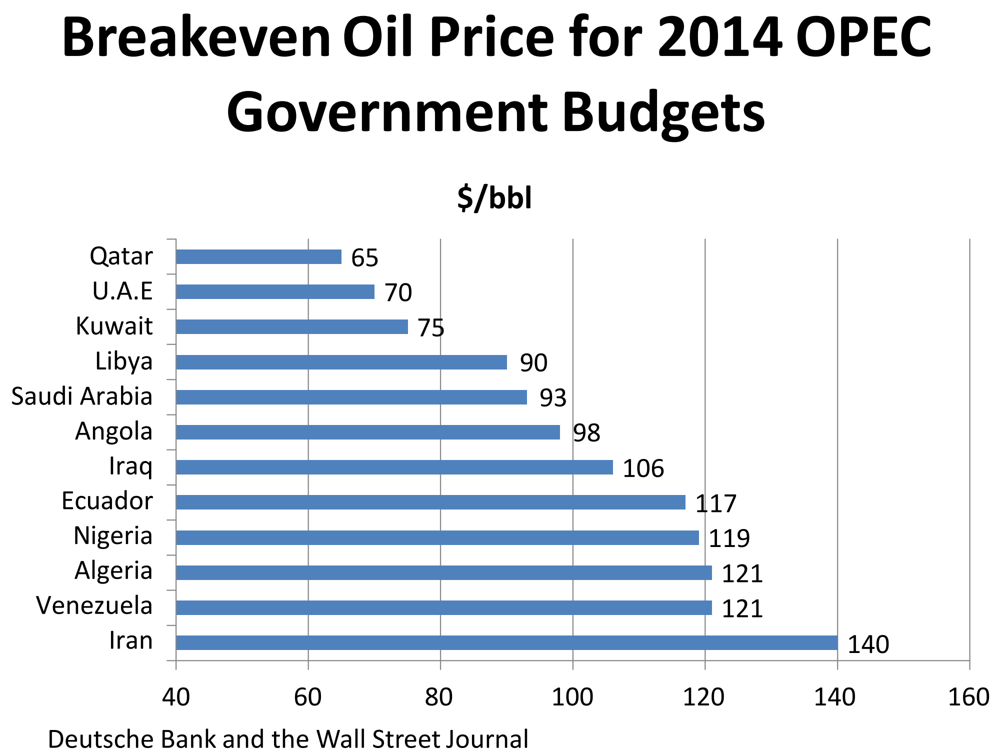
What is Mitigating Against Prices Staying Down?

1. Consumers Have More Money to Spend
2. So Do Businesses with Fleets, Planes, Trains, and Energy Consuming Machines



Sources: GHP, Bill Gilmer, IRF

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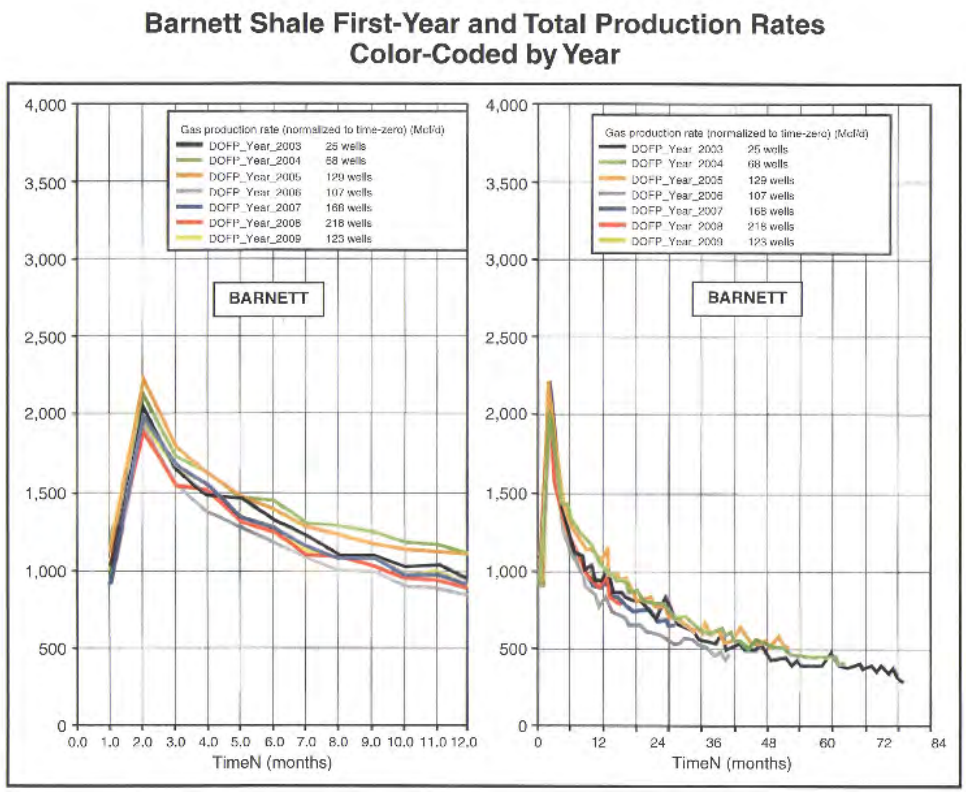
Automatic Slowdown in Production

As Drilling New Wells is Curtailed, The Current Well Production Drops in Shale Wells Rather Substantially in a Year to 18 Months



Sources: The American Oil & Gas Reporter, May 2011

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Here Though is THE Concern

Four of the OPEC Countries:

- Saudi Arabia
- Qatar
- Kuwait
- United Arab Emirates (UAE)

Have **2.3 Trillion** in Surplus Funds!!

Is There Excess Capacity?

- Enable Saudi Arabia to Increase Supply (Beyond their Current 10 Million BPD and Keep Forcing US Cutbacks)
- According to Tudor Pickering Holt

1986	2014
25% Excess Capacity	**5% Excess Capacity**

The Impact

- Exploration Budget Cuts
  - 20% - Moody Investor Services
  - 30% - Tudor Pickering Holt
  - Maybe More?
- Rig Count Drop To 1,000 Rigs By Year End
- Job Loss in Houston
  - Oil Field Services 7,900
  - Exploration 1,300

The Impact

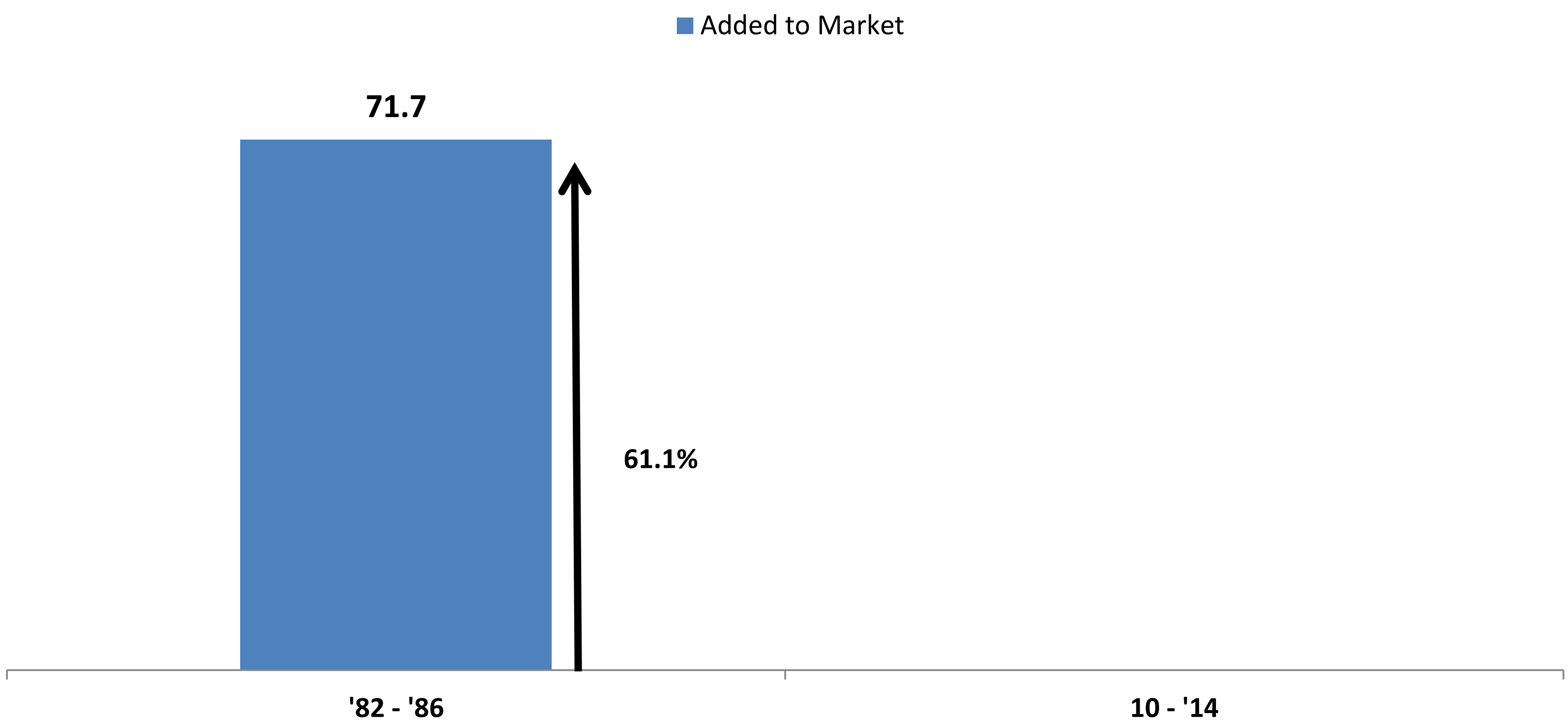
- Consolidation
  - Bankruptcies
  - M&A
  - Private Equity Plays (KBR/Linn)
- Some Project Delays/Cancellations
- Some Space Coming Back on the Market
  - M&A Activity
  - Downsizing

Offset by Consolidation of Remote Offices

Source: GHP

Not the 80's

Metro Office Construction – Million Sq. Ft.



Source: *Houston Facts, '82 – '87* and JLL Houston

Source: GHP

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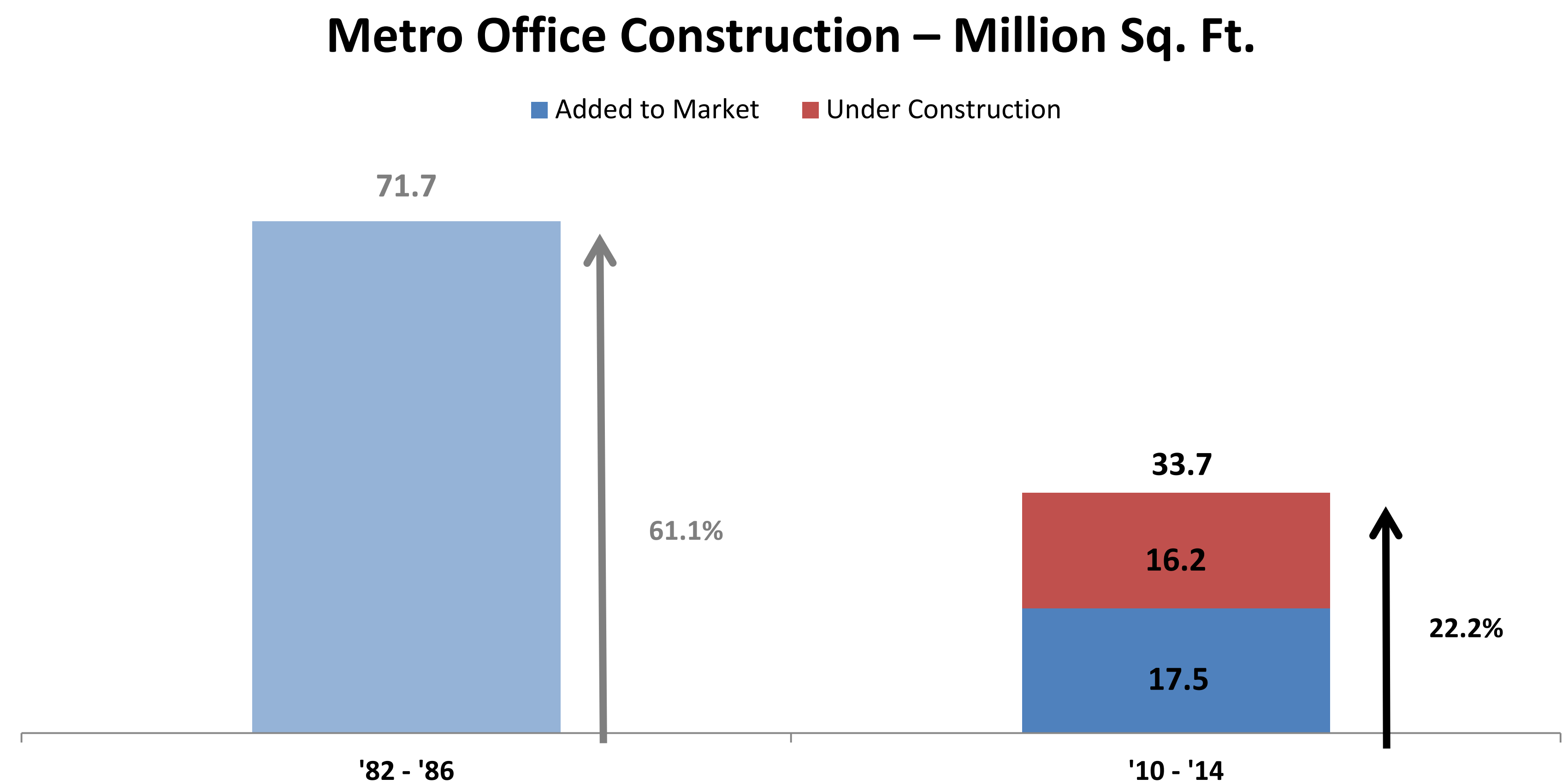
Not the 80's

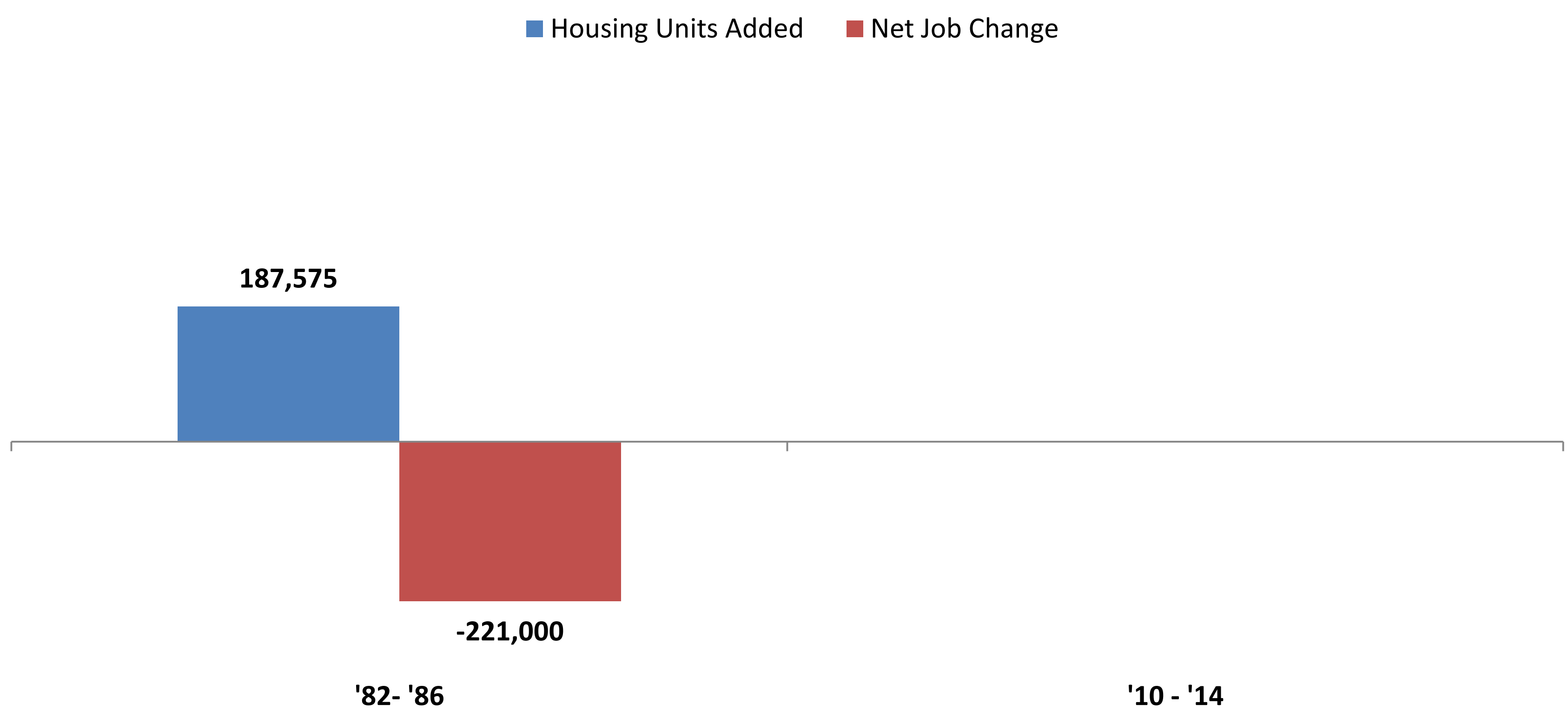


Source: *Houston Facts, '82 – '87* and JLL Houston

Source: GHP

Not the 80’s

Metro Home Construction and Employment



Source: *Houston Facts ’82 – ’87 and* Texas Workforce Commission

Source: GHP

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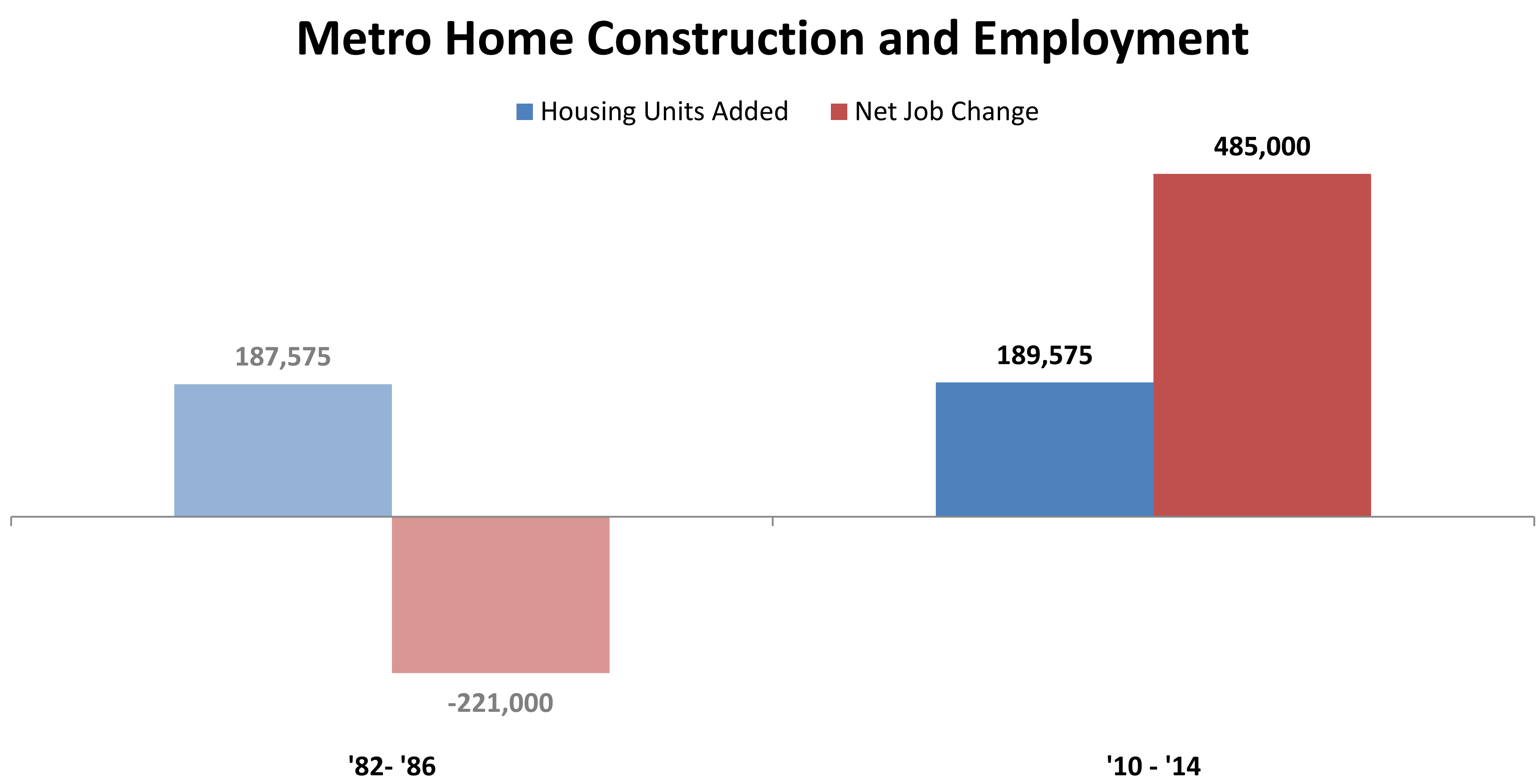
Not the 80’s



Source: *Houston Facts ’82 – ’87 and* Texas Workforce Commission

Source: GHP

ANDANTE
“At a Walking Pace”

Last Year

- Record in Total Commercial Construction Estimated Annual $21.4 Billion
- Non-Residential Near Record $7 Billion
- Construction Employment

2013	2014 (YE)	2015 (YE est)	Previous Peak
185,000	203,800	212,000	210,100 (Nov. ‘07)

Sources: McGraw-Hill Construction; Workforce Solutions; GHP

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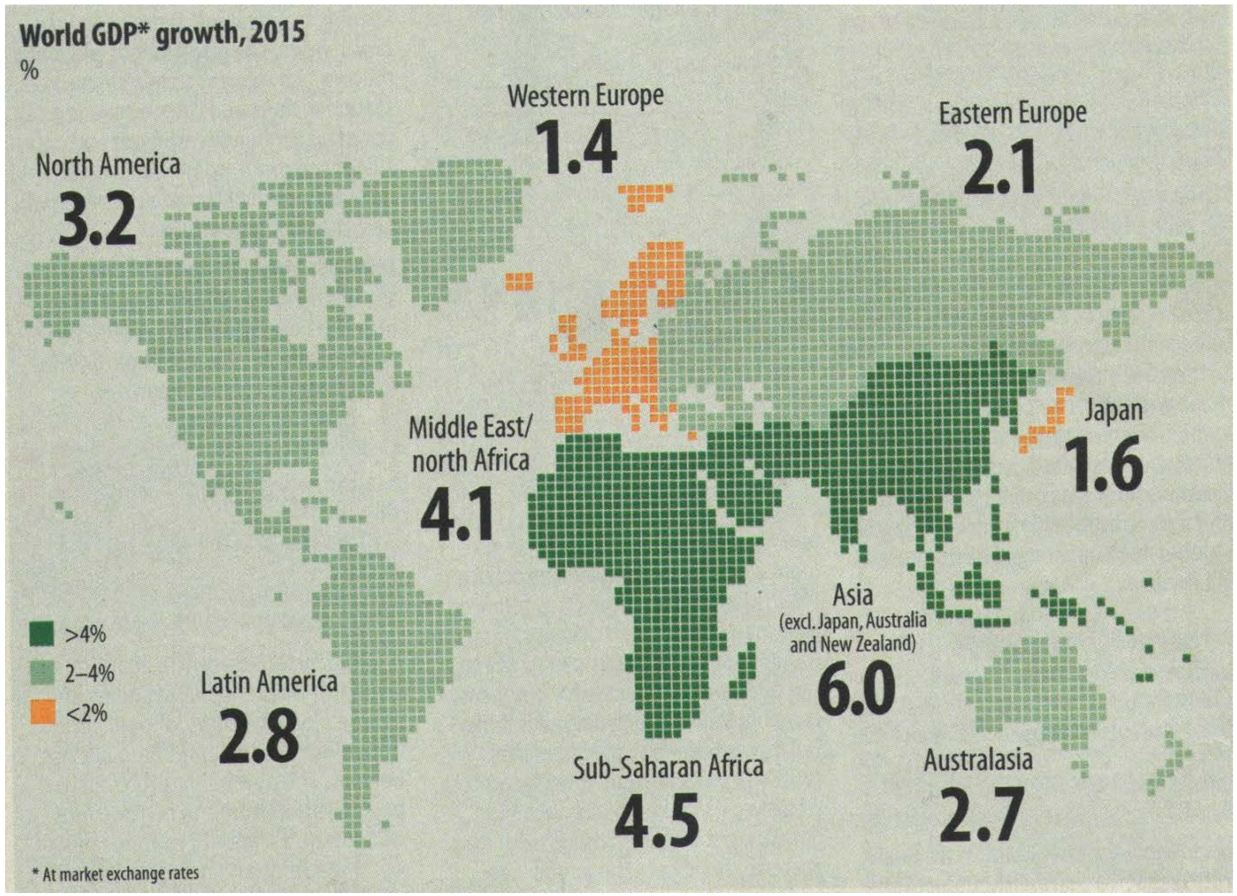
Looking at 2015

The Global Picture 3%



Source: The Economist Magazine

The Major Concerns

- BRICs Slowing
  - Brazil (1.8%)
  - Russia (1.0%)
  - India (6.5%)
  - China (7.0%)
- Tepid European Union Growth 1.4 – 2.1%

Source: The Economist Magazine

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The Only Hot Spots

2014

TOP GROWERS

Rank	Country	GDP growth, %
1	South Sudan	35.0
2	Mongolia	15.3
3	Macau	13.5
4	Sierra Leone	11.2
5	Turkmenistan	9.2
6=	Bhutan	8.8
6=	Libya	8.8
8=	Iraq	8.5
8=	Laos	8.5
8=	Timor-Leste	8.5
11	Eritrea	8.0
12	Zambia	7.9

2015

TOP GROWERS

Rank	Country	GDP growth, %
1	Papua New Guinea	14.8
2	Macau	9.0
3	Congo (Dem. Rep.)	8.6
4	Turkmenistan	8.5
5	Eritrea	8.3
6	Mongolia	8.0
7	Laos	7.7
8	Mozambique	7.6
9	Congo (Brazzaville)	7.4
10=	Bhutan	7.3
10=	Cambodia	7.3
10=	Tanzania	7.3

Source: The Economist Magazine

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The US Drivers

- GDP Growth 3 – 3.2%
  - First time since 2005 growth at 3%
- Falling Unemployment
  - Projected by Year End 2015: 5.2 – 5.3%
  - Issues – People Leaving the Workforce
- The Gas Price Effect
  - Consumers
  - Businesses
    - Those That Have Fleets

The only assumption made is that dysfunctional Washington will not make it worse.

Source: Federal Reserve

Corporate Picture Improved

US Corporate Fundamental Improvements
Stronger than Global Peers

	US		EAFE		Emerging Markets	
	Oct 31, 2007	Dec 31, 2014	Oct 31, 2007	Dec 31, 2014	Oct 31, 2007	Dec 31, 2014
Cash Flow per Share	$77.86	$178.86	$155.51	$181.16	$96.64	$120.94
Net Debt/Equity	156%	41%	79%	56%	48%	50%
Return on Equity	22%	24%	21%	15%	25%	18%
Free-Cash-Flow Yield	3.5%	3.5%	4.2%	4.2%	2.9%	3.0%
Price to Forward Earnings	15.6×	16.3×	13.7×	13.7×	14.5×	10.8×

Better   Largely Unchanged   Worse

Source: Joseph Paul, AB Blog

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Sir Martin Sorrell’s Grey Swans “Known Unknowns”

- Russia – Energy – Ukraine – What Next?
- The Middle East/ISIS
- The China Slowdown – Impact on Other Countries
- Tepid Growth in the Developing Countries

Employment & Population Forecast

2015 Projected Texas Job Growth and by Major Metro

- Texas: +289,168
- Houston: +75,452 (IRF's forecast is 50,000. Perryman published their forecast before oil prices plummeted.)
- Dallas: +83,292
- Austin: +23,947
- San Antonio: +22,183

2015 Projected Texas Population Growth and by Major Metro

- Texas: +445,548
- Houston: +113,652
- Dallas: +118,509
- Austin: +42,037
- San Antonio: +41,414

Sources: GHP; The Perryman Group

America’s Fastest Growing Cities

America's Fastest-Growing Cities 2015

1. Houston, Texas

MSA: Houston-Sugar Land-Baytown, TX

2014 Population growth rate: 1.81%

2015 (Projected) pop. growth rate: 1.74%

Sources: GHP; Forbes

Houston Drivers in 2015

- Jobs: 40 – 50 – 62,900 – 70 - 80
- Population: 115 – 120K
- Metrics
- Availability and Cost of Money – Quality Sponsors; Equity
- Architect Outlook – Cautious But Still Hiring Selectively
- War for Talent – Will Not Go Away; Space is a Major Tool

Sources: Bill Gilmer, IRF; GHP; Cadence Bank

Sector and Segment Highlights

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Our Neighboring Markets

Residential

- Another 30-32,000 homes
- Lot Shortage Will Ease a Bit
- Starter Homes are Driving the Market Right Now
  - $250M and below vs. $400M+
- 4 New Master Planned Communities off Grand Parkway
  - Elyson, Cane Island, Woodson's Reserve, Harvest Green + 1 more?
  - Replacing the MPC build outs (Cinco/Woodlands)
- Suburban Housing
  - Minimal Effect from Oil Prices as White Collar Jobs Last to Go
- Residential will Finally Catch Up with Demand This Year

Multi-Family

- Occupancy 91.1%
- Rents At All-Time Highs – Above $1 per sf
- Overly 17,600 units delivered year end with over 16,000 units absorbed
- Another 26,630 units under construction
  - Roughly 75% to be Delivered in 2015
- 1 Apartment for Every 5-7 Jobs
  - 2014: 122K jobs = 17,500 – 24,500
  - 2015: 50K jobs = 7,200 – 10,000
- At Risk of Overbuilding?
  - 8,000 vacant drops occupancy 1-2%

Sources: GHP; CBRE; Colliers International; Metrostudy

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Heavy Industrial

Ethylene Projects Proposed or Under Construction In or Near Houston

Company	Scale (thousand m tons/yr)	Location	Completion
ChevronPhillips	1,500	Baytown	2017
ExxonMobil	1,500	Baytown	2017
Dow	1,500	Freeport	2017
Sasol	1,500	Lake Charles	2018
Occidental	500	Ingleside	2017
Formosa Plastic	1,200	Point Comfort	2017
LyondellBasell	450	La Porte and Channelview	2016
Total S.A.	900	Port Arthur	Proposed

Source: Bill Gilmer, IRF

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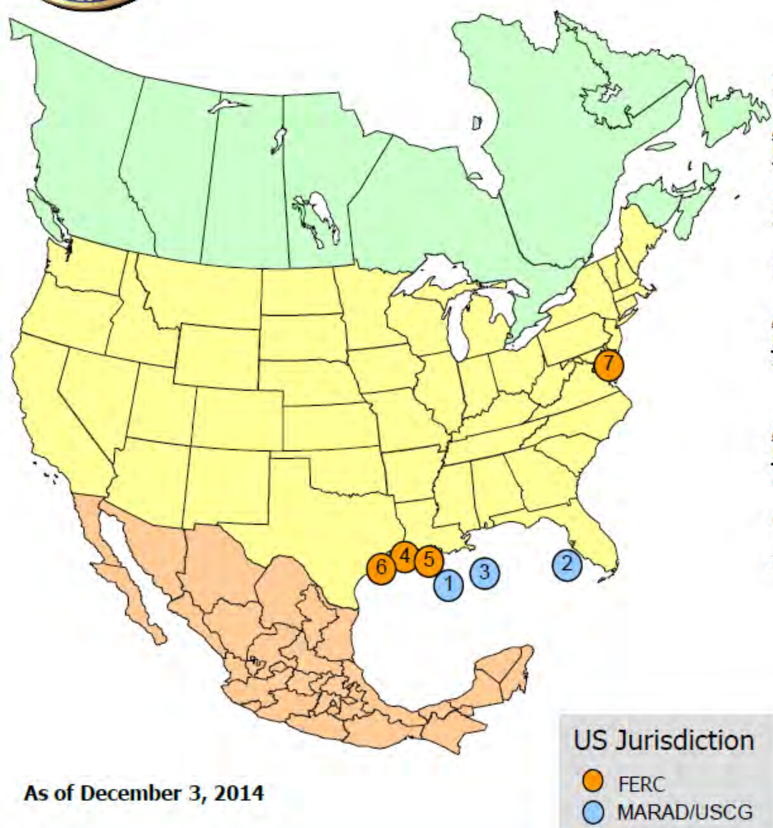
LNG Plants/Terminals

North American LNG Import /Export Terminals
Approved



Import Terminal

APPROVED - NOT UNDER CONSTRUCTION
U.S. - MARAD/Coast Guard
1. **Gulf of Mexico:** 1.0 Bcfd (Main Pass McMoRan Exp.)
2. **Offshore Florida:** 1.2 Bcfd (Hoëgh LNG - Port Dolphin Energy)
3. **Gulf of Mexico:** 1.4 Bcfd (TORP Technology-Bienville LNG)

Export Terminal

APPROVED - UNDER CONSTRUCTION
U.S. - FERC
4. **Sabine, LA:** 2.76 Bcfd (Cheniere/Sabine Pass LNG) (CP11-72 & CP14-12)

APPROVED – NOT UNDER CONSTRUCTION
U.S. - FERC
5. **Hackberry, LA:** 1.7 Bcfd (Sempra – Cameron LNG) (CP13-25)
6. **Freeport, TX:** 1.8 Bcfd (Freeport LNG Dev/Freeport LNG Expansion/FLNG Liquefaction) (CP12-509)
7. **Cove Point, MD:** 0.82 Bcfd (Dominion – Cove Point LNG) (CP13-113)

As of December 3, 2014

Office of Energy Projects

Source: Federal Energy Regulatory Commission

Highway/Civil

- TxDOT - $496 Million
  - 290 continues to be majority of work
- Rainy Day Fund Puts 1.74B in Texas
  - $278 Million in Houston
- Metro has $172.7 Million in Metro Rail Expansion
- Harris County - $188 Million

Sources: TxDOT; Metro; Texas Condemnation

Highway/Civil

- City of Houston - up 20% YOY
- AGC of Texas Survey Shows 2.2 Billion in Houston across all agencies

Department	Amount
Storm Drainage System	89.2 M
Street & Traffic Control	$146.4 M
Wastewater Treatment Facilities	$155.5 M
Water Utility System Facilities	$219.3 M
Total	**$610.4 Million**

Sources: City of Houston; Harris County

Commercial and Light Industrial

Public Work

Commercial Public Work Up

- City of Houston flat YOY
- Metro – $186.8M
- Harris County - $10.5 Million
- Port of Houston - $200 Million

COH Departments	Amount
Aviation Facilities	$132.7 M
Fire Protection Facilities	$8.8 M
General Government Facilities	$3.7 M
Homeless & Housing Facilities	$36.7 M
Library Facilities	$9.5 M
Parks and Recreation Facilities	$57.3 M
Police Facilities	$58.1 M
Public Health Facilities	$3.7 M
Solid Waste Management Facilities	$1.1 M
Total	**311.6 M**

Sources: City of Houston, Metro, Harris County and Port of Houston

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School Market

Alief	$9,150,000	Humble	$29,000,000
Alvin	$21,000,000	**Katy**	**$335,500,000**
Barbers Hill	$9,000,000	**Klein**	**$189,000,000**
Conroe	$6,000,000	**La Porte**	**$181,000,000**
Cy-Fair	**$192,500,000**	Pasadena	$6,500,000
Damon	$1,000,000	Royal	$3,500,000
Dayton	$30,000,000	Spring Branch	$50,000,000
Hardin	$16,000,000	Sweeny	$17,000,000
Houston	**$267,200,000**	Texas City	$250,000
Huffman	$1,500,000		

Total **$1.365 Billion** (29 Districts)

- 21 districts reported $549M last year
- Fort Bend, Brazosport, and Lamar still getting budgets. ($170M/4 years)
- Channelview, Deer Park, Dickinson, East Chambers, Goose Creek, Hull-Daisetta, Pearland, Santa Fe, Sheldon and Waller all report no work in 2015.

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School Backlog & Future

School	Bond (2014)
Brazosport	175M
Cypress-Fairbanks	1.2B
Dayton	87.8M
Fort Bend	484.5M
Katy	748M
Dickinson	56M
La Porte	260M
Pasadena	175.5M
Sweeny	26M
Total	**3.2 Billion**

Bond in 2015?
Alief - $341M
Alvin
Conroe
Klein
Santa Fe
Spring Branch
Waller

Other Districts are still working off their backlogs from previous years' bonds (HISD 2012 1.89B)

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Higher Education

University of Houston - $286 M

Sam Houston - $134.5M

Baylor University - $7M

Houston Community College - $250M

Texas Southern University – $1.5M

St. Thomas - $600K

Lone Star System – $130M* ($485M Bond)

Texas A&M - $367M

Pent Up Demand but Contingent on State Budget and Revenue Bonds ($3.6B)

Sources: Texas Building Branch AGC

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Churches

- Historically $200M market
- Archdiocese of Galveston-Houston has $25M in projects

Commercial and Light Industrial
Private Work

Office Buildings

- Positive Metrics
  - Absorption: 5.5 Million Square Feet (Best since ‘97)
  - Vacancies: Overall 11.6%; Katy – 1.2%; CBD - 6.4%
  - Average Rental Rates: $25.79 - Up YOY
  - 17.6 msf under construction (64% preleased)
    - National Leader in Office Construction
- Slow Down in 2015
  - Unsustainable Levels
  - Sublease Space and M&A
    - Over 1 msf since December
  - Long Term Outlook of O&G Companies

Mixed Use

- 3 Large Mixed Use Projects Planned Along Grand Parkway
  - Grand Crossing
  - Verde Parc
  - Riley Fuzzel

Source: Houston Business Journal

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Light Industrial

- The Metrics are Favorable
  - Absorption: Over 8.1 msf – **HUGE!** (NR)
  - Nearly 12 msf Delivered (2008 - -12.3 msf)
  - Vacancy Rate: 5%
  - Average Asking Rates: $0.67 - Up YOY
  - 8.4 msf under construction (85 projects)
- Panama Canal Expansion Completed Next Year
  - Houston Becoming a Distribution Hub
    (Silver Eagle - 400K sf, Aldi – 650K sf)
- Grand Parkway Offers Affordable Opportunities
  - Chevron – 103 acres for research and development facilities
- 3,500 jobs forecast in 2015
- Oil Price Impact

Sources: CBRE; GHP

Retail

- More Favorable Metrics
  - Absorption: 2.1 msf– up YOY (Highest since ‘03)
  - Vacancy Rate: 6.6% (NR)
  - Rental Rates: Avg. $22.15 –up YOY
  - 2.7 msf under construction
- Over 2 msf to be delivered in first half of 2015
- Population and Job Growth are Drivers
  - Increased spending money of consumer
- Subdivision Activities (Springwoods, Wrights Landing, Stonebrook Estates, Laurel Park North)
- In-Fill Around Grand Parkway
- Additional 6,600 jobs in 2015

Sources: CBRE; GHP; Houston Business Journal

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Hospitality

- Metrics Favorable
  - Occupancy/RevPAR/Rates
- Flat in 2015
- Slow Growth in 2016
  - Final Preparations for Super Bowl
- Stronger Convention Activity Expected This Year
- Additional Cruise Lines Out of Galveston
- Additional 6,000 Rooms Between Now and the Super Bowl
- Additional 1,000 jobs in 2015

Sources: PKF Consulting; GHP

Medical

- $2B+ in Pipeline
- ObamaCare a "known"
- Accountable Care
  - Electronic Records, Integrated Providers
  - Premium Provided to Systems
- Research Park Initiative
- Projects
  - Memorial Hermann TMC Expansion - $533M
  - Methodist North Tower - $540M
  - Texas Children's Expansion - $506M
  - CHI St. Luke's at Springwoods - $110M
  - Memorial Hermann in Cypress - $168M
  - UTMB Galveston Expansion - $42M
  - MDA Cancer Center - $9.5M
- 9,600 additional jobs anticipated in 2015

Sources: Houston Business Journal; GHP; Healthcare Design Magazine; Houston Chronicle

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The Second Energy Corridor

Source: Houston Business Journal

Issues

- Talent
  - Craftsman – C3
  - Industrial Tug
  - Millennials
    - Culture/Engagement
- Concrete Shortage
  - Price Escalations
- Prefabrication and Modularization – Cost Segregation
- Immigration Reform – A Must
- Margins Remain Low – Too Low

Infrastructure Challenges

- HGAC Plan – 2035
    - Add 4,000 Miles
        - Freeways
        - Tollways
        - HOV Lanes
    - 76% of all travel in Houston is by car with a single occupant
- Plus
    - 89 Miles of Light Rail
    - 84 Miles of Commuter Rail
    - 40 Miles of Signature Express Bus Service
    - Bullet Train - Houston/Dallas

Let's Stay Optimistic

- Exxon Forecast 2040
  - Demand will Grow 35%
  - 2 Billion More People
  - Energy Hungry Middle Class in Developing Countries

<u>Disciplined People</u>

<u>Disciplined Thought</u>

<u>Disciplined Action</u>

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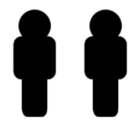
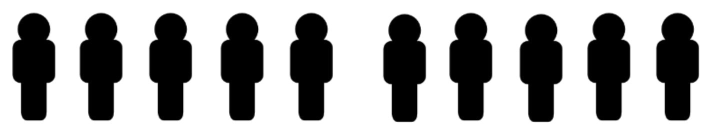
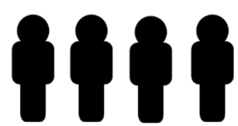
Let’s Stay Optimistic

- Car Metrics
  -  =  (USA)
  -  =  (Europe)
  -  =  (Emerging)
- By 2025:
  -  =  -  (Emerging Probable)

Source: Bloomberg

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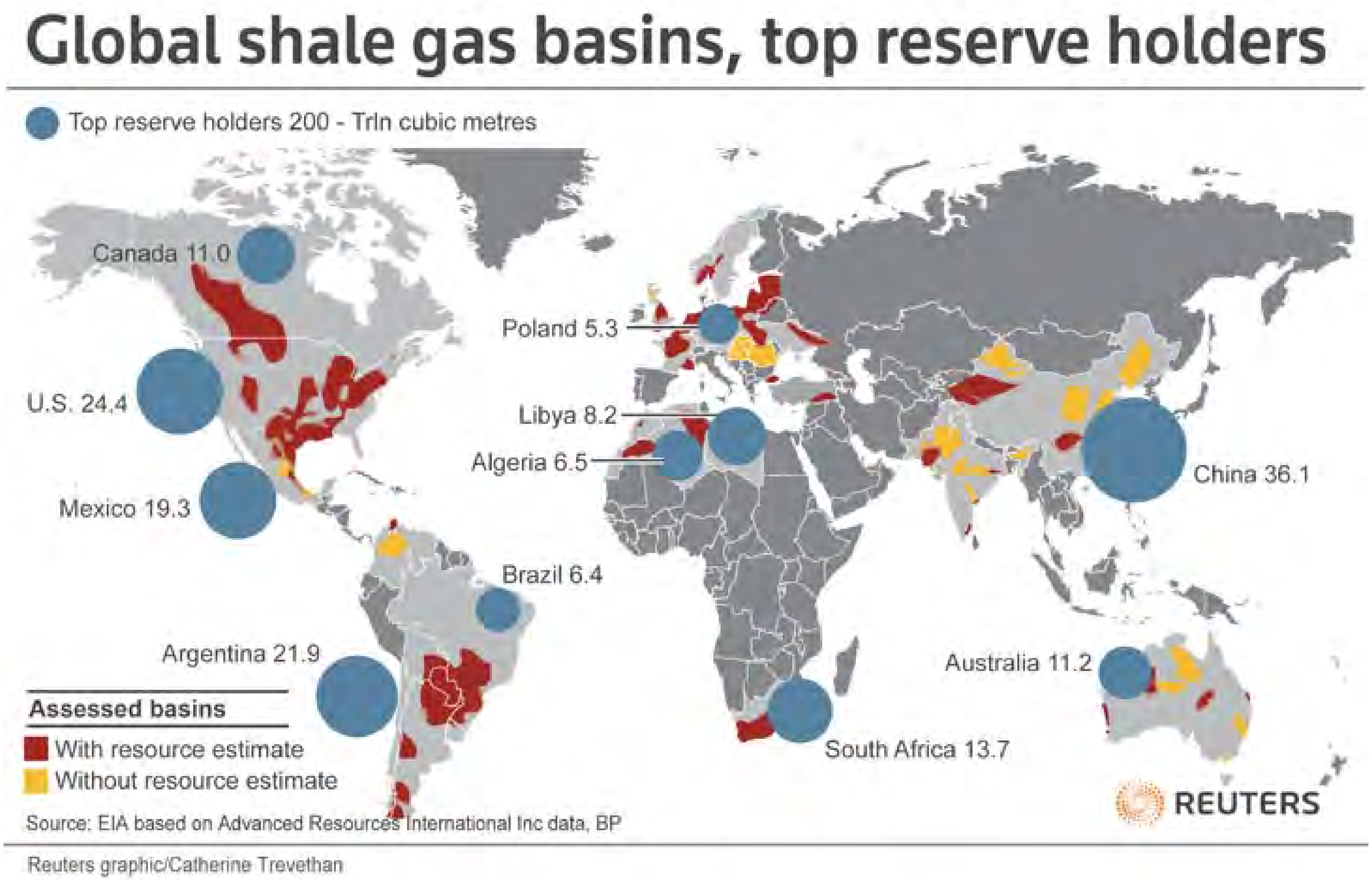
Global Shale Plays



Source: Reuters

What Is the Tempo of The Market?

6 Billion+

Leaders Will Need to Drive Their Companies

Andres Orozco Estrada

Thank You

Anyone wanting a copy of today's presentation, please contact our office:

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Sources

The information contained in this report was obtained from various publications and sources. Special thanks to CB Richard Ellis, American Metro Studies, Greater Houston Partnership, Ken Simonson - National AGC economist, Industrial Info Resources, EIA, University of Houston Institute for Regional Forecasting, Dodge Data & Analytics, PKF Consulting, Houston Chronicle, Houston Business Journal, The Economist Magazine, Bloomberg, Gensler, Cadence Bank, various architecture firms, school districts, and other sources mentioned who supplied information and assistance for this forecast.

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Additional Information

The Houston Picture in 2014

Looking Back

- Houston was a major job creator once more in 2013, adding 86,000 new jobs.
- Houston again had population growth of approximately 125,000 people.
- There was positive absorption in all major commercial market segments (office, light industrial, retail and multifamily) again, with the vacancy rate for Class A office space remaining well under 10%. Rental rates continued to increase in all segments as well. Single family new home contracts increased by 20+ percent; spec houses were selling at custom prices.
- Non-residential new contract awards should exceed $4 Billion, (as they did in 2012) when McGraw- Hill adjusts their numbers.
- The K-12 and medical markets began to awaken as the year ended.

Looking Ahead

The International Picture – Changes are brewing

- Global GDP growth is projected to be 3.6%. Asia will be the leading region (5.7%).
- BRIC (Brazil (2.5%), Russia (3.3%), India (6.1%) and China (7.3%)) will experience slower growth in 2014.
- Western Europe will be better (1.1%), above 1% for the first time in years, but still rather anemic.
- Double digit GDP growth will occur in South Sudan (35%); Mongolia (15.3%); Macau (13.6%) and Sierra Leone (11.2 %).

The National Picture- The modest rate of recovery will continue

- US GDP growth is projected to be 2.6%, although some forecasters project as high as 3.5%.
- The unemployment rate will continue easing down from the year-end 7% to 6.3% (per the Federal Reserve)
- Political battles loom on key financial issues, but hopefully the pending mid-term elections and recent bite-size compromise on the budget will help avoid any disruptive economic impact.
- It will be the end of the first quarter before the trajectory of the plague-ridden Affordable Care Act is known further.

Texas and Houston- all metrics are positive

- Most Texas cities are experiencing both population and employment growth. Time magazine say four of the top seven job creating cities in the US in 2014 are in Texas (McAllen, Austin, Houston and Fort Worth. Unemployment rates in Texas are well below the US rate (Texas 5.8%, Houston 5.6%, Dallas 5.6% and Austin 4.7%).

- The shale boom, while moderating because of more efficient drilling and production methods, will continue for several more years. This is driving office, light industrial, infrastructure, and power plant and manufacturing facility construction. Shale exploration, anywhere in the world benefits Houston companies.

- The Port's continuing expansion, the exciting plans at the Texas Medical Center and its member institutions and the expanding residential developments' needs for retail and educational facilities all portend construction, too.

What Will Drive Construction in Houston in 2014

- The Greater Houston Partnership (GHP) is forecasting another 125,000 residents and the creation of 69,800 new jobs this year. Additionally, the GHP feels the "new normal" for Houston going forward is 125,000 new people and 65,000 jobs per year!

- Favorable metrics (vacancy, occupancy, rental rates, absorption) in all markets segments and a measureable pulse-beat again in K-12 and medical.
- Financing is available at favorable rates for the right project. Equity requirements are in the 30-35% range (down slightly); personal guarantees or corporate loans with heavy covenants as to balance sheet minimums or pre-leasing are still required. The interest is in the LIBOR plus 2.75 - 3.5% range. Experienced, quality project sponsors are the most determining factor.
- The Energy Information Agency (EIA) pricing forecasts are favorable to continuing high levels of exploration and drilling. West Texas Intermediate (WTI) crude is projected to average $95 per barrel in 2014, and the natural gas (Henry Hub) price is expected to average $3.78 per MMBtu in 2014.
- The war for talent, specifically the need to attract the Science Technology, Engineering, Arts and Math (STEAM) millennial generation graduates, will drive both new facilities and revisions to existing facilities. They want top-flight space with smaller individual offices and larger collaborative areas and many amenities (gyms, food options, yoga classes and childcare).
- Architects, serving all market segments, are continuing to hire.

Sector and Segment Highlights

- Residential will be a very strong sector again this year - an additional 30,000 single family dwellings and 12,000 multi-family units are projected.
- The heavy industrial sector will also be extremely strong. This is the market place that is benefiting from the cheaper energy provided by shale gas. There will be new construction, expansion and conversion projects in the chemical, power and manufacturing segments in particular. This sector is estimated at $200 Billion over the next 3-5 years from Corpus Christi, Texas to Pensacola, Florida $ 70 Billion in Texas in 2014. This surge is projected to require additional 35-50,000 craft workers in Louisiana, alone.
- The highway/civil sector will once again be driven by TXDOT, which will have over $900 million in the 6 counties around Houston. When you add in all the city and county budgets, this will be a healthy marketplace again in 2014.
- The commercial and light industrial sectors will experience growth in all segments with the rate moderating slightly in some. Office may ease from its torrid pace of the past two years, but the metrics are positive - vacancy for Class A space is 7.3% and rental rates are rising. Light commercial may see only a slightly slower pace as the vacancy rate is 5.3% and rental rates continue to rise, and the Port continues to grow as do the oilfield service companies. Retail has a vacancy of 7.4%, which ought to promote construction at the 2013 level (2 million sf) or greater. Higher education, hospitality and entertainment, churches and public building works will all see similar or expanded growth to 2014. Two market segments, medical and K-12, will begin to thrive again. All major health care systems have significant work, and the Texas Medical Center has some exciting plans for future years. The K-12 market will climb steadily in 2014, with 2015 and 2016 looking even stronger.
- New non-residential construction contract awards should be in the $4.3 -$4.7 billion range again in 2014.

Industry Issues Remain

- The looming shortage of skilled craft workers trumps every other issue. It is critical that we get immigration reform and the Career Construction Collaborative (C-3) principles specified on as many jobs as possible.
- The war for talent is escalating. Competent people in all positions are in great demand.
- Labor shortages will lead to innovation and modularization.
- Margins remain unrealistically low. Working capital issues can still cause job problems and losses. “Know your project partners” remains a wise mantra.

UBS

UBS Access: Expert Access

UBS: The Houston/Texas non-residential construction outlook

Host:
Steven Fisher, UBS US Machinery, Engineering & Construction, Industrial analyst

Guests:
Mr. Pat Kiley, Co-founder, Kiley Advisors
Ms. Candace Hernandez, Co-founder, Kiley Advisors

About: Mr. Pat Kiley
Pat Kiley co-founded Kiley Advisors in 2004 to serve construction firms and associations. He conducts strategic planning and leadership retreats for executive teams and boards, and contributes to the annual publication of the Houston Commercial Construction Market Forecast. Pat served for 21 years with the Houston Chapter, Associated General Contractors (AGC), a large trade association serving general contractors, specialty contractors, suppliers and service firms in the commercial construction industry.

About: Ms. Candace Hernandez
Candace Hernandez co-founded Kiley Advisors in 2004. She assists in conducting strategic planning and leadership retreats for executive teams and boards, and contributes to the annual publication of the Houston Commercial Construction Market Forecast. Candace served for 4 years with the Houston Chapter, Associated General Contractors (AGC).

Topics of Discussion:

- What trends have we seen in the Houston commercial construction market in the last few years?
- How are lower oil prices impacting Houston and greater Texas construction markets?
- What are the areas of strength and weakness heading into 2016?
- To what extent has labor availability and inflation been an issue?
- What are the upside and downside risks to the 2016 outlook?

Date & Time: Tuesday, October, 13th @ 2:00 PM ET

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