economics

THE ECONOMICS OF INNOVATION

BY JOHN CROSS, P.E., LEED AP

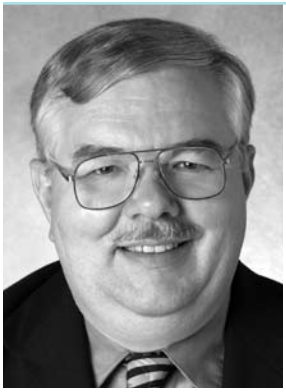
Consider an active approach to driving down construction costs, rather than passively waiting for demand to increase.

OVER THE PAST SEVERAL YEARS the U.S. economy has been subject to a variety of innovative economic interventions. Regretfully those interventions have had little long-term impact in generating a recovery in the building construction sector. Many explanations have been given as to the lack of a rebound in building construction, but the bottom line is actually quite straightforward—the required investment is not justified by the financial return that the building will generate.

The lack of a satisfactory rate of return is not just an issue with respect to spec or rental buildings. It applies to all building construction. Even when organizations are considering new facilities for their own internal use project costs must be weighed against rental rates in the vicinity of the proposed project. In many areas of the country rental rates for office, warehouse, retail and industrial space are depressed as a result of oversupply. At the same time, the general uncertainty relative to the economy pushes up the level of the required rate of return as a means of accounting for the external economic risk of the project.

The flip side of this scenario can currently be found in apartment construction. Demand for apartments has been increasing as a result of foreclosure displacement and a current preference for renting over buying. This increase in demand has resulted in increasing rental rates as noted in the January 5, 2012, *Wall Street Journal*.

- The nation's apartment-vacancy rate in the fourth quarter fell to its lowest level since late 2001 [and rents climbed], according to data firm Reis Inc.
- The vacancy rate fell to 5.2% from 6.6% a year earlier and 5.6% at the end of the third quarter, according to Reis.
- Nationwide, landlords raised asking rents an average of 0.4% in the fourth quarter.
- Just 8,865 units were delivered in the quarter, the second-lowest quarterly figure since Reis began publishing quarterly data in 1999. The strength of the market hasn't been lost on developers who are racing to move plans off the drawing boards. More than 173,000 units were likely started in 2011 and some 225,000 and 280,000 starts are expected nationwide in 2012 and 2013, according to Zelman & Associates.



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These higher rental rates provide the required rate of return to justify the construction of new apartment facilities. None of this should be surprising as the construction market is simply behaving according to basic laws of supply and demand.

Does that mean other types of building construction will remain in the doldrums until there is an increase in demand for space? Clearly demand for office space will not increase until office employment returns to pre-recession levels. Demand for retail and warehouse space will not rebound until consumer spending accelerates. Industrial space demand is dependent on the balance between imports, exports and domestic production. So the answer is yes, building construction activity is dependent on the vitality of the overall economy.

But that doesn't mean construction activity is completely captive to the overall economy and the hope that innovative economic intervention might accelerate a recovery. It is not innovative economics that will provide an impetus to construction, but rather it is the economics of innovation that can help move construction forward.

The financial justification of a project is not based solely on the actual or equivalent income that a building will generate. Income is only half of the equation. The other half is construction cost. As construction costs are reduced, lower levels of pro forma income are required to justify the project.

According to the U.S. Bureau of Labor Statistics, the cost of new construction dropped from a 2008 peak to a trough in 2009 and then began to again increase to a current level above that of 2008. This drop and recovery in construction costs was a function of the decrease in, or elimination of, overhead and profit margins triggered by a drop in demand and then an ultimate re-stabilization of supportable costs on the part of general and specialty contractors. It is important to note that the actual cost of construction probably did not change; rather, the level

of compensation received by construction firms was artificially depressed.

The actual reduction of the costs associated with building construction can come in one of two ways. The project designer can investigate innovative new systems that can reduce the traditional cost of construction or innovative approaches for project delivery can be implemented to improve construction productivity thereby lowering construction costs. The economics of innovation result in lower project costs, which means that more projects will meet the required levels of return.

Various innovative structural steel based systems are currently available in the marketplace. Girder-Slab, Peikko, ConXTech, SidePlate, Smartbeams and VersaFloor along with many others regularly highlighted in *Modern Steel Construction* are all proprietary systems with a demonstrated record of significantly reducing project costs. Other systems, such as the TTG One Story High Rise system, are on the verge of their initial projects moving forward. The proprietary nature of these systems should not deter designers or owners from exploring and pricing them. Licensing costs are the justifiable return on the investments made by these organizations to develop these systems and are easily identified in the economic assessment of the project.

Other innovative approaches that can reduce project costs, such as steel plate shear walls, staggered truss applications for multi-story residential projects and replaceable steel elements in seismic designs, are not proprietary and can be easily evaluated by designers. New approaches including a greater reliance on modular construction techniques should also be considered as a means of improving productivity and reducing project costs.

Such systems are only half of the innovative solutions that can reduce project costs. Much has been written about how the implementation of building information modeling (BIM) and the various forms of integrated project delivery that also can significantly reduce the final project cost. Numerous case studies exist documenting project cost savings in the range of 10% or more when technology and collaboration are allowed to improve design and construction project productivity. A 10% change in construction costs can swing a project from failing to meet its required financial return to being a viable project.

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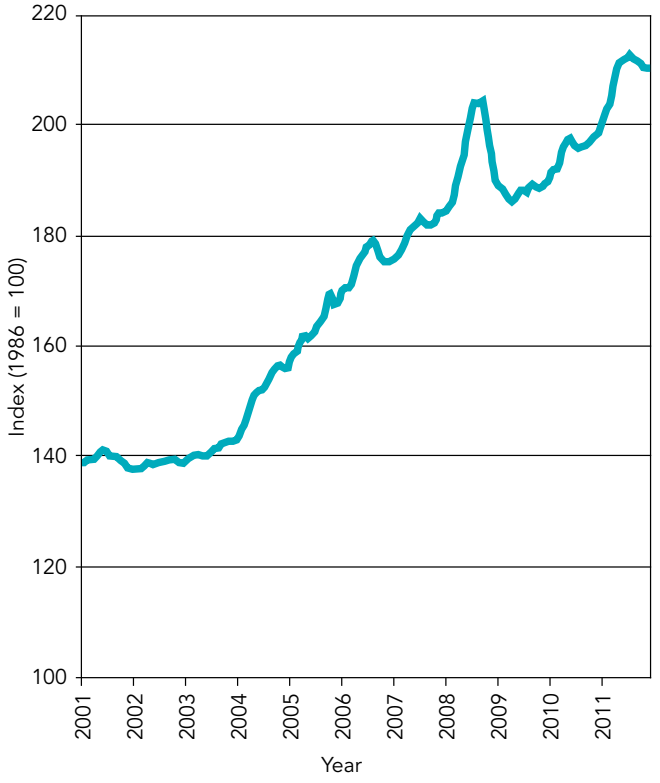
Even on projects not implementing BIM or still being delivered on a design-bid-build basis, costs for the structural steel portion of the project can be reduced by simply engaging the structural steel fabricator early in the design process.

The bottom line is that the economics of innovation can serve to drive down construction costs while still allowing construction firms and specialty contractors to generate a necessary level of return on their efforts. When construction costs decrease, additional projects become viable and overall construction activity can increase. MSC

BLS Index for New Construction Costs



Although the actual cost of constructing things probably did not change between its 2008 peak and 2009 trough shown on this graph of BLS statistics, owners saw a substantial drop in costs that reflected the decrease in, or elimination of, overhead and profit margins triggered by a drop in demand.