In this issue:
Making Sense of the Affordable Housing Crisis

Multi-Family Case Studies
Industry Statistical Summaries
Tremco’s complete line of sealants, adhesives, tapes and weather barriers help maximize productivity for modular builders — meeting demanding performance requirements through durable, weatherproof seals for joints and seams; protection against stress and vibration; and heat and UV resistance. With Tremco’s product portfolio, we are able to provide solutions for your every-day in-plant or on-site modular applications.

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As single-source provider, Tremco helps simplify the material selection and ordering processes, saving you time and reducing costs.

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Solutions for Modular Construction

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Hello Readers,

If it seems like you are hearing more about modular construction in the press these days, you are right. Construction-related publications and blogs are frequently writing about how modular construction can solve a variety of issues from low productivity to affordable housing.

Without a doubt, there is a great deal of interest in our industry. In this issue of Modular Advantage, we examine how modular construction can be another resource in addressing the affordable housing issue. We not only look at how major North American cities are considering modular construction, but also how major metro areas around the globe are addressing housing needs.

Demand for credible information on this industry is also at an all-time high. With the recent news of Williams Scotsman’s billion-dollar acquisition of its competitor Modspace, many people are wondering what’s next.

As the nonprofit trade association serving the industry, our goal is for you to view the Modular Building Institute as a reliable and credible source of industry information, as well as voice of the industry in North America.

As a commitment to that goal, we have compiled the most comprehensive and detailed information about the industry in North America. A summary of those reports can be found in this edition of Modular Advantage.

As construction industry professionals and users, we hope that you find this publication both informative and thought-provoking.

Sincerely,

Devin Duvak

Indicom Buildings, Inc.
Chair, MBI Board of Directors
Thank you to our 2018 MBI Corporate Sponsors

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Williams Scotsman to Acquire Modspace

Baltimore, June 22, 2018 (GLOBE NEWSWIRE) -- WillScot Corporation (NASDAQ:WSC) ("Williams Scotsman") announced that it has entered into a definitive agreement to acquire Modular Space Holdings, Inc. ("MS Holdings"), the parent holding company of Modular Space Corporation (d/b/a "ModSpace"), for an enterprise value of approximately $1.1 billion. Williams Scotsman will indirectly acquire MS Holdings for a purchase price comprising $1,063,750,000 of cash consideration, 6,458,500 shares of WSC Class A common stock and warrants to purchase 10,000,000 shares of WSC Class A common stock at an exercise price of $15.50 per share, subject to customary adjustments. The transaction, which is subject to customary closing conditions, is expected to close in the third quarter of 2018.

ModSpace, a privately-owned provider of office trailers, portable storage units and modular buildings, had approximately $1.1 billion of total assets as of March 31, 2018. ModSpace generated $453 million of total revenue, $18 million of net income and $106 million of Adjusted EBITDA for the twelve months ended March 31, 2018.

Once combined, Williams Scotsman will have over 160,000 modular space and portable storage units serving a diverse customer base from approximately 120 locations across the United States, Canada and Mexico.
Zekelman Industries Acquires Hayes Modular

CHICAGO, July 26, 2018 /PRNewswire/ -- Zekelman Industries announced it has acquired Hayes Modular Group, based in Austin, Texas. Through this acquisition, Zekelman Industries has expanded its presence in the modular construction industry.

Founded in 1986, Hayes Modular Group specializes in the installation of large-scale modular projects across North America. Its next project, scheduled for installation in 2019, will be Cheatham Street Flats, a student-housing complex in San Marcos, Texas.

Mickey McNamara, president of Zekelman Industries’ modular construction division, said, “With the new investment in Hayes Modular Group, we are now able to supply owners and developers with a complete package of modular services. From design and engineering of a project to a complete fit-out of each module with Z Modular, and with the delivery and installation expertise of Hayes Modular Group, Zekelman Industries is a one-stop shop for your next modular construction project.”

“We are very happy to be joining the Zekelman Industries family,” said Rick Tavern, who will serve as general manager of Hayes Modular Group. “Our wealth of experience in the modular construction industry and connections with key owners and developers across North America will open doors to future projects for the modular division at Zekelman Industries.”
MBI was recently asked to participate in an international conference organized by Hong Kong University and hosted by the Construction Industry Council of Hong Kong. The conference centered around Hong Kong’s planned use of “Modular Integrated Construction” (MIC) to address their housing issues.

Hong Kong has one of the highest development costs in the world, coupled with low land availability, low skilled labor availability, and a large population. Hong Kong is one of the most densely populated countries in the world (ranking fourth behind Singapore) with over 17,348 people per square mile. For comparison, the US ranks 188th with 86 people per square mile and Canada ranks 235th with 10 people per square mile. As a result, Hong Kong ranks as the second most expensive area globally for construction development, behind only New York City.
Hong Kong has virtually no modular industry today, yet government officials are considering steel modular construction for high-rise buildings to house residents. This is not unprecedented as several presentations during the conference documented progress in other parts of the world. For example, Singapore had no modular industry five years ago, and today four modular public housing projects, each topping 30 stories, have been completed. Five years ago, Australia’s modular industry largely consisted of relocatable buildings and workforce housing. Hickory Group has completed a 43-story building, with a 44-story building about to be complete. While more of a panelized system, this progress towards alternative construction techniques is stunning.

In the U.K. it is estimated that new housing construction needs to double to reach the government’s goal of 300,000 new units annually by the middle of the next decade. The U.K. modular market is much more mature than most other regions, with tall modular structures dating back more than a decade. MBI organized a tour in 2008 to visit U.K. factories as well as a 17-story and 24-story modular student housing projects. Today, 20+ story modular structures are occurring with much more regularity in the U.K.

While there are obviously many differences in overseas markets, there were some striking similarities.

MBI Director Tom Hardiman (center) speaking on a panel addressing affordable housing in Hong Kong, with Tim Hall of Buildoffsite UK (left) and Michael Hough of MJH Structural Engineers of Ireland (right).
Key differences

- Hong Kong, Singapore, and the U.K. are smaller geographic areas with limited land availability. As a result, these regions have been forced to adopt high rise construction years ago because they have nowhere to go but “up.”

- Hong Kong, Singapore, U.K., and Australian markets are largely being driven by government agencies to address housing needs.

- There is no modular market whatsoever in Hong Kong now, so there are no preconceived notions about its limitations.

Similarities

- Extremely high housing costs
- Low or limited construction labor availability
- Lack of understanding of modular construction from code officials and policy makers

While it would be erroneous to take the lessons learned from these regions and apply them to the North American market, comparisons can certainly be made to large urban markets within North America. The North American construction industry has not expanded into high rise modular in because it has not yet been FORCED to do so. In many areas, land is plentiful and low-cost labor is available. The exception is in large urban areas. The chart below shows the population density of the largest US and Canadian cities.

It should come as no surprise then, that New York City, San Francisco, Los Angeles, and Vancouver are all considering modular construction as an option to help address their chronic housing problems. While there are certainly obstacles for these cities to successfully implement a modular plan, most are self-imposed such as local labor requirements. MBI feels that the time is now for housing authorities and agencies to consider ALL available options to address chronic housing shortages.

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<td>Calgary</td>
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</table>
Making sense of the affordable housing crisis:

Can Modular Construction Help?
According to a recent report called “The State of the Nation’s Housing 2018” issued by the Joint Center for Housing Studies of Harvard University (JCHS):

Homeownership rates among young adults are even lower than in 1988, and the share of cost-burdened renters is significantly higher, with almost half of all renters paying more than 30 percent of their income for housing. Soaring housing costs are largely to blame. The national median rent rose 20 percent faster than overall inflation between 1990 and 2016 and the median home price rose 41 percent faster. While better housing quality accounts for some of the increased costs, higher costs for building materials and labor, limited productivity gains, increased land costs, new regulatory barriers, and growing income inequality all played major roles as well. (jchs.harvard.edu/state-nations-housing-2018)

And there doesn’t appear to be any relief in sight. In California alone, about 180,000 housing units are needed annually to keep pace with population needs, yet only about 80,000 housing units come online annually. In a recent New York Times article, it was reported that the federal government now classifies a family of four earning up to $117,400 as low-income around San Francisco’s Bay Area. To address affordable housing in the area, tech giant Google recently contracted with modular manufacturer Factory_OS to deliver 300 housing units to be used by Google employees.
So how big is this problem?

John Romanin of The Renter’s Lobby believes the nation has reached as crisis point. The Renter’s Lobby focuses on policies and legislation aimed at bringing a constructive new perspective to the housing policy debate. According to Romanin, “For the two decades between 1960 and 1980, 10 million apartments were built in the United States. Volume supply met demand at rental rates affordable to most American renters. By contrast, between 2000 and 2020 less than five million multifamily units will be built; with only 20% (or one million units) considered affordable. At the same time, renter household formation exceeded seven million new renters creating a shortfall of six million affordable housing units.”

So, what caused this supply shortfall and why aren’t more affordable housing units being built?

Romanin continued, “There are two reasons for the shortfall: The first relates to outdated, ineffective and terribly counter-productive National Affordable Housing and Housing Finance Policy. The second is the long-held private-sector misperception that affordable housing and management is not profitable nor sustainable without government subsidy.

Romanin is part of a newly formed group called the “Housing Crisis Solutions Coalition” (HCSC) which believes that advocacy and education programs can solve both problems by leading efforts to change policy and to demonstrate that Affordable Housing can be very profitable and rewarding.

The Coalition has set a goal of 10 million “affordable” units through 2038, or half a million units per year. “Only Modern Methods of Construction (MMC) can meet the technical demands of a scaled growth path on a cost-basis that can support this unique market,” Romanin said. “Unsubsidized Affordable Housing development hinges on volume delivery of turnkey product-lines, community designs, and integration of production time efficiencies in all elements of the development and construction process.”

The same story is playing out across North America. Chicago-based general contractor Skender Construction is going “all in” with modular construction by recently announcing they will be building a factory on Chicago’s southwest side.

Officials from New York City are also considering modular solutions to help address their needs. According to an article published by “the Real Deal,” the Department of Housing Preservation and Development will seek partners to build low-income and senior housing using modular construction, and that the city hopes to “crack the code” when it comes to prefab. The move to modular is part of Mayor De Blasio administration’s larger Housing New York 2.0 plan, which was unveiled at the end of 2017. Per the plan, the city believes that modular construction can “significantly reduce development time and cost,” thus making it easier to build affordable housing faster and cheaper. The city has plans to develop 300,000 new or preserved units of housing by 2026.

In Vancouver, British Columbia, city officials have already approved about 500 temporary modular housing units, primarily to address homeless population. Modular multi-family facilities are also becoming more common in places like Boston, Philadelphia, and Seattle.

What’s driving developers to modular construction now?

According to a recent article in Building Design and Construction Magazine, the number of residential construction workers is down 23% from 2006. Skilled trades like plumbers, carpenters, and electricians are down close to 17%. As a result, labor costs have risen about five percent a year for the past three years. Prefabrication, which is a more efficient way to build, may be the best hope to quickly build affordable housing, some industry insiders believe.
Chris Waters, Director of Business Development for Champion Commercial Structures offers several factors including labor shortages, cost increases, schedule pushes, and quality. He adds “truly, the largest underlying factor may be predictability. In today’s environment, developers can predict very little or nothing in the way of cost control, the securing of labor, forcing schedule adherence, and ensuring a quality product. Either one, two, three or even all four can impact most every project today. With the modular scheme, as relates to a large portion of the project being built off-site, there is a sense of predictability for all four elements of cost, labor, schedule, and quality. The frontend planning process creates and ensures cost certainty very early in the stages, and well in advance of production. From the plant production side, the labor is ensured. Workers show up each day in climate controlled conditions to perform the same build tasks, day-in and day-out.”

MBI asked, given these advantages, and based on the 25 or so multi-family projects your company has completed, why aren’t more developers seeking this solution? Waters stated, “It’s change. Not all people like change and, often, that is viewed as risk instead of progressive reward. We’ve been building the same way forever, and modular construction is a bit of a paradigm shift for many. It moves the planning process up and every stakeholder must understand that.

Kent T. Campbell, Vice President of Core Development in Nashville, Tennessee has completed over 30 multi-family projects but only recently started utilizing modular construction, having completed two projects in this manner. He echoed some of the same factors cited by Waters. “Nashville is currently experiencing unprecedented growth. Trade and labor availability are stretched, and that’s resulting in rising costs, longer
construction schedules, and reduced quality of the finished product. We look to modular for greater control in all three areas” Campbell stated. He added, “Finding qualified general contractors and subs who understand the modular process and scope of work has been the biggest challenge.

Brice Leconte, developer and founder of Colorado-based IUnit says the main drivers for his company are better quality, a more predictable schedule and the environmental benefits. Leconte’s company has completed three modular multi-family units including Eliot Flats, a 40-unit complex consisting of 350 square foot apartments. He went on to say that his biggest challenge now is finding the right GC and architect who are willing to get behind it (modular construction) and see it through.

For its part, HCSC is putting money behind their words. Modular industry building initiatives have begun with a first formal effort to demonstrate “Economical Housing by Design.” A Modular Affordable Home Living Community in Arizona, in its first phase, aims to build 550+ units to demonstrate the value of modular off-site construction for delivering unsubsidized affordable housing.

None of this is to suggest that modular construction by itself can address this massive shortage of housing. However, MBI sees no possible way to close the gap without greater adoption of industrialized processes such as modular construction.

MBI and Clemson University introduce a NEW book for modular building professionals:

**Introduction to Commercial Modular Construction**

The Modular Building Institute (MBI) along with Clemson University developed Introduction to Commercial Modular Construction over two years with the goal of introducing the reader to an innovative and exciting construction method. This book discusses the modular building process compared to traditional site-built construction and is designed to help the reader understand terminology and concepts of modular building including client needs, design, fabrication, transportation, and installation.

ORDER YOUR COPY THROUGH MODULAR.ORG TODAY!
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Edition: 1
Publisher/Printer: Bison Printing
In response to an immediate need to address the City of Vancouver’s housing affordability challenges as quickly as possible, Horizon North was selected by the Vancouver Affordable Housing Agency (VAHA) to complete the city’s first-ever temporary modular housing development. The innovative, three-story 14,785 square foot (sq. ft.) transitional housing building provides interim homes for residents on low and fixed-income. The building features 40, 250 sq. ft. single occupancy suites with self-contained bathrooms and kitchens, individual climate control and a private living space. Four of the suites have been designed to accommodate people with accessibility requirements and feature customized layouts and user-friendly adaptive design. The central building features include communal indoor and outdoor amenity space, while the exterior façade features two murals by a local artist of the Wuikinuxv and Klahoose Nations, which reflect the history of the area.
The Jarrett Street Condo project is a three-story, 12 unit condominium building located in Portland, Oregon. Designed by award winning Portland based architect Brian Cavanaugh, this project has units ranging from 387 to 556 sq ft, and is located along a mass transit line for ease of transport within the city.

Each unit features large windows to maximize natural daylight in the living spaces. Due to the nature of modular design, each living space has the ceiling framed separate from the next level’s floor framing which helps minimize occupant noise vertically. Other specifications included Quartz solid surface kitchen countertops, stainless steel appliances, engineered wood flooring, subway tile, and smooth gypsum wall and ceiling cover. The simple color scheme of the exterior cladding makes this project a welcome addition to the neighborhood. The micro living spaces fill the need comfortably in an area faced with a housing crisis.

COMPANY
Blazer Industries, Inc.

AFFILIATE
Lloyd Development

LOCATION
Portland, Oregon

BUILDING USE
Low income condominiums

NUMBER OF MODULES
15

TOTAL SQUARE FEET
11340 sq. ft.

DAYS TO COMPLETE
232
Summary of Permanent Modular Construction for Year-End 2017
MBI estimates that there are approximately 252 North American modular manufacturers engaged in the commercial building market. This includes companies that are primarily engaged in single-family modular home production but also do some percent of multi-family and light commercial work. This also includes container modification or fabrication manufacturers, which were not included in last year’s report. MBI obtained revenue and production data from 45 of these companies for this report, seven of which were classified as container fabricators.

Key Markets

Permanent modular buildings are considered real property, built to the same building codes and requirements as site-built structures, and are depreciated in a similar manner. As such, the markets for permanent modular construction are like the markets for site-built contractors, with few exceptions. MBI has identified the following key markets for PMC in North America:

**Multi-family Housing** - Modular construction offers the ability to provide condominiums, apartments, student dorms, and workforce accommodations in about half the time as traditional, site-built construction methods. More cities like New York City and San Francisco, as well as countries like England, Singapore, and Hong Kong are turning to modular construction to address chronic housing shortages as costs continue to soar to unattainable levels and reliable labor remains scarce.

**Hospitality/Hotels** - A shorter construction schedule means quicker occupancy for owners, and that means guests checking in months earlier than with convention construction methods. It should come as no surprise that companies like Marriott Corporation have made modular construction part of their strategic plan.
Education - From single classrooms to complete campuses, modular construction offers public, private, and charter schools what other construction methods cannot: accelerated project timelines, more economical pricing, and less site disruption. Permanent modular schools are indistinguishable from other schools and can be constructed to any architectural and customer specifications. MBI members design and build schools of all types and sizes using traditional building materials such as wood, steel, and concrete. Virtually any size permanent school can be built, installed, and ready for occupancy in as little as 90 days. Perhaps most importantly, using off-site technology, open construction sites are eliminated while school is in session. Students are safer, and teachers can compete with less disruption.

Office and Administrative - Permanent modular buildings serve as corporate headquarters, satellite bureaus, institutional and administrative buildings, and offices for all business types. Modern single- and multi-story buildings can be configured in several ways to include independent offices, conference rooms, elegant lobbies, kitchens, restrooms, and large open spaces for cubicles or other partition systems. MBI members have architectural and engineering designs for workspace planning, storm water management, landscaping, parking, and zoned heating and air conditioning. If it is time to capitalize on company growth, modular construction offers a fast, economical approach.

Healthcare - Many hospitals and healthcare facility contractors are turning to modular, primarily for building components such as bathroom pods and headwalls. However, entire hospitals have been constructed utilizing modular construction techniques. Modular construction offers quiet, safe, and clean applications for medical, surgical, clinical and dental use.

The insight MBI contractors have from designing and building thousands of medical facilities has resulted in satisfied healthcare professionals the world over. If an organization or community needs a new rehabilitation clinic, emergency room, operating room, hospital extension, laboratory, diagnostic center, or other medical facility, remember that modular construction can be used for custom-built facilities with the tightest budgets while maintaining strict medical and aesthetic specifications.
Commercial & Retail - Simply put, quicker occupancy equals quicker return on investment. Modular construction is accelerated construction. Why is this so important to banks, restaurants, convenience stores, childcare centers, and other retail establishments? Because earlier occupancy means a customer generates revenue faster. In fact, it’s not uncommon for many modular buildings to be up and running in as little as 24 hours—an important consideration for retailers of all types.

Typical retail applications include restaurants and diners, banks, golf pro shops, convenience stores, gas stations, car washes, and concession stands, to name a few. MBI contractors provide a full array of services including site, mechanical, and electrical work. Customers can accommodate their emerging business with modular buildings customized to their financial needs, space requirements, and deadlines.

Institutional & Assembly - This market includes police and fire stations, prisons, and facilities used for assembly such as churches. While not a large market overall, some modular companies specialize in these markets.

Statistics

MBI obtained revenue data from 45 modular manufacturers including seven companies primarily engaged in modifying shipping containers into buildings. The average revenue among all manufacturers in 2017
was $14.2 million, down from the $15.5 million in the prior year. Among the seven container companies, average revenue was $2.3 million, while the average of the 38 remaining commercial modular manufacturers in this dataset was $18.3 million. The industry generated nearly four billion dollars in revenue and drove over seven billion dollars in construction activity for year-end 2017.

MBI further analyzed 41 permanent modular construction (PMC) projects completed in 2017 in key markets (six in institutional, 13 in education, three in office, six in retail, three in healthcare, and 10 in housing/hospitality which included three hotels).

The average size of these projects was 24,087 sq ft across all markets with an average of 169 days to complete from the start of factory production until occupancy. For the hospitality market, the average size project was 68,210 sq ft. with an average of 207 days to complete.

Of the 41 projects reviewed, no project exceeded a one-year construction schedule from start to occupancy.

While the retail projects were on the lower end of square footage completed per day ratio, the projects were completed in about three months from start to finish.

**Summary**

Without a doubt, the interest level for modular construction has increased over the past year, driven largely by a lack of skilled labor and high housing costs. MBI has compiled comprehensive data and analysis on the North American commercial modular market including regional production and capacity, market share by segments, design considerations, market drivers, the approval process, and definitions.

Overall market share for commercial modular construction increased slightly from 3.18% for 2016 to 3.27% in 2017.

Additional information about the North American commercial modular construction industry, including regional analysis, can be obtained in MBI’s PMC Annual Report available at modular.org.

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<tr>
<th>Market</th>
<th>Average Size</th>
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HOW DOES THE UL H501™ SYSTEM INCREASE PROJECT EFFICIENCY?

The UL Design H501™ has less materials, which allows it to be easily constructed using fewer specialized tradesmen and saves on resources and labor costs. Instead of using standard drywall, concrete and fire-proofing structural steel, this system incorporates a 3/4-inch thick USG Structural Panel on top as the subfloor and only a single layer of 5/8-inch USG Sheetrock® Brand Firecode® C Gypsum Panel on the bottom of the ceiling joints. Fewer parts to assemble means faster assembly times, plus the fact that you no longer need to wait for concrete to cure on the job, equals more efficient projects.

[UL Design H501™ system] allows for much more flexibility in the design without compromising the fire-rating.

HOW DOES THE UL H501™ SYSTEM DECREASE DESIGN TIME?

While other fire-rated structural products restrict architects and owners, this system is engineered to be adaptable. There are several innovative features of the UL Design H501™ that are particularly useful when designing a structure:

• The UL H501™ system is the only two-hour fire-certified design without an insulated floor covering, giving designers full flexibility to select the floor covering that best fits their vision, without impacting the floor/ceiling rating.
• Unlike other designs, the UL H501™ system includes encapsulations of steel structures, allowing architects to pursue more open space plans through modular manufacturing and speeding up the design and decision process.
• With a design that is at least a foot thinner per floor than traditional permanent modular assemblies, the UL H501™ system can be used to fit a greater variety of designs, including fitting extra floors in tight zoning restrictions.

HOW DOES UL H501™ DECREASE BUILDING APPROVAL TIME?

Previously, modular manufacturers had to do testing themselves, to create an assembly that they could submit for review. The all-in-one assembly of the UL Design H501™ is tested and certified with a two-hour fire-rating, so building departments are more likely to accept the fire protection plans. The assemblies have been basically pre-approved.

GREATER DESIGN FLEXIBILITY. FEWER HOURS SPENT. THAT’S THE UL H501™ ADVANTAGE.

By saving both time and cost in the design, building, and approval stages, this innovative assembly is the next step in modular manufacturing.

Learn how modular manufacturing can bring your design to life at usg.com/modular

A qualified architect or engineer should review and approve calculations, framing and fastener spacing for all projects.
Summary of the North American Relocatable Buildings Industry for Year-End 2017
Markets Served

Education - Relocatable buildings have become a critical factor in managing student demographics and increasing enrollments. Relocatable classrooms are also ideal for swing space during new construction or renovation. Convenient, flexible, cost-effective temporary buildings can be delivered and operational in as little as 24 hours. These classrooms are measured for quality and code compliance by state or third-party agencies through routine and random inspections, testing and certification services.

School districts across North America are collectively the largest owners of relocatable classrooms. California schools own close to 90,000 units; Texas schools own about 20,000; and Florida owns about 17,000. Typically, larger school districts with high growth are more likely to own the units. States like Georgia, North Carolina, Virginia and Maryland own and operate about 3,000 each.

Construction-Site - Relocatable buildings have their roots in construction site trailers, where speed, temporary space and relocatability are important. Used as standard field offices, construction site and in-plant buildings are available for immediate delivery. Standard construction is wood, but steel units are available to meet noncombustible requirements. In-plant buildings are available as single- or two-story units for industrial environments with noise-reducing insulation and are typically moveable by forklift and include electrical and communications wiring, heating, air conditioning and even plumbing.

Healthcare - Relocatable buildings for healthcare applications are designed and constructed to uncompromising standards of quality. A customer’s new clinic, hospital extension, laboratory, diagnostic center, MRI unit, dentist office or other medical facility can be open for business and serving communities in as little as a few days. Is your interest in serving patients as quickly
as possible in the most-safe and aesthetically pleasing environments available? These facilities offer quick, quiet, safe and clean buildings with an unlimited choice of interior décor and furniture and equipment leasing.

General Administrative & Sales Office - When production demands increase, relocatable buildings can temporarily enlarge a current facility without permanent alterations to the site. Because the space is not permanent, many companies are able to expand without the budget approval process necessary for traditional capital expenses. Relocatable offices can be single- and multi-story buildings configured to include independent offices, conference rooms and large open spaces for cubicles or other partition systems. Large and small businesses, as well as local and state governments, are typical users of relocatable office space.

Commercial/Retail - Earlier occupancy means quicker return on investment. For retail occupancies, this can mean significant cash flow advantages. Standard floor plans are available for immediate delivery while custom buildings are built to specifications in weeks, not months. Unique to the modular process is concurrent construction: site work occurs while buildings are being put together in a quality-controlled factory.

Typical retail applications include new home sales centers, banks, golf pro shops, automobile fleet ownerships, college bookstores, and concession stands. If a client's emerging business needs are short term, temporary space will accommodate their financial situation, space requirements and deadlines.

Security - Relocatable buildings can be custom built for a variety of access and control situations. Toll booths, tickets sales offices, guard stands and weigh stations are common applications. One- and two-story wood and steel buildings have straight walls or walls that are tilted to improve views and reduce glare. MBI members supply a full line of portable storage containers for either short- or long-term. Heavy-duty storage units feature ground-level entry with double-swing doors for easy accessibility and are ideal for construction-site storage, equipment storage, warehousing, recordkeeping, industrial manufacturers, retailers, and others.

MBI obtained revenue and fleet data from 25 companies engaged in the sale and lease of relocatable buildings in North America. This represents about 35% of all companies in the market, but a vast majority of the revenue and units owned.

The data in this report represents approximately 91 of the industry owned assets and revenue of the relocatable buildings industry in North America. While we have made every effort to glean relevant data from all available sources and to make appropriate currency conversions when necessary, we caution that this report is based on the best available data and may not be representative of specific company activities. The data obtained by companies for this report is only accurate to the extent that the data provided by the member companies is accurate.

The data in this report represents approximately 91 of the industry owned assets and revenue of the relocatable buildings industry in North America. It is important to note that not all data collected from each company was used in every statistical calculation. This report represents the most comprehensive single source of data on a diverse industry over a broad geographic region and within multiple markets and is based on the best available data.

Revenue from fleet operations reported from these sources totaled just over two billion in 2017. However, six of these companies had revenues in excess of $100 million, while eleven had revenues of $10 million or less. The median revenue for this data set was $8,750,000 while the mean average was $80,295,990, indicating a wide disparity among the size of companies in the data set. All financial information is in U.S. dollars unless specified otherwise.
Size of the Market

MBI estimates that there are about 530,000 code-compliant relocatable buildings in use in North America today. Public school districts across North America collectively own and operate about 200,000 relocatable classrooms, with the industry owning and leasing about 330,000 buildings. Additionally, many construction companies own a fleet of construction offices that move from site to site. These figures do not include non-coded units such as personal storage units, although these units typically make up about 15 percent of a provider’s fleet.

The five largest fleet owners control approximately 84% of all industry owned units in North America. Those companies include Modspace, Williams Scotsman, Mobile Modular Management Corporation (McGrath Rentcorp), Pac Van, and Mobile Mini (steel ground level offices).

Across all sizes, the average (mean) fleet size for North American fleet owners in 2017 was 13,146. However, the median number of units from this data set was just 1,500. A more accurate breakdown of North American fleet ownership is as follows:

<table>
<thead>
<tr>
<th># of companies</th>
<th>% of fleet owned</th>
<th># of units owned</th>
<th>Average fleet size</th>
</tr>
</thead>
<tbody>
<tr>
<td>5*</td>
<td>83.6%</td>
<td>276,000</td>
<td>55,188</td>
</tr>
<tr>
<td>7</td>
<td>10.4%</td>
<td>34,500</td>
<td>4,928</td>
</tr>
<tr>
<td>8</td>
<td>3%</td>
<td>9,500</td>
<td>1,188</td>
</tr>
<tr>
<td>Approx. 50</td>
<td>3%</td>
<td>10,000</td>
<td>200</td>
</tr>
<tr>
<td>100%</td>
<td>330,000</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The percent of units owned varies greatly by region as some of the larger players are more heavily concentrated in certain regions and less in other regions, while some of the mid-sized companies are more state or region focused. For example, a company with 1,000 units in a smaller region may have a greater local market share than a large fleet owner that is less active in that same region.

*As of the writing of this report, William Scotsman had acquired Modspace Corporation combining the lease fleet of the two largest providers of relocatable buildings. Williams Scotsman will now have about 140,000 relocatable units plus additional storage container units not included in this report. Since the last report, Williams Scotsman also acquired Acton Mobile Industries and Tyson Onsite. The largest companies own a great percent of the North American lease fleet with an average fleet size of 55,188 up from 50,000 in the prior year.

Sources of Revenue by Market
Regional markets

Despite the growing control of the industry fleet by a handful of larger companies, the day to day operations of the industry are still very much regional in nature. Typical clients include general contractors and school districts, seeking temporary and cost-effective solutions for space needs. In any given market, the larger companies must still compete with several smaller fleet owners serving the region. Drivers of relocatable buildings often include availability and quality of the product, price, and service.

The differences in state building codes also prevent a larger player from “flooding the market” and shipping in excess product from another region. Given that all relocatable buildings must meet the wind, snow, and seismic conditions where they are to be located, it isn’t practical for any company to build one type of building that will meet every possible local condition. For example, a relocatable building that meets the wind zone requirements in Florida may not be suitable for the seismic conditions in California, or the snow loads in New York.

Utilization

Industry utilization is defined two ways:

1. Dividing the total number of units on lease by the total number of units available to be leased

2. Dividing the cost of the units on rent by the total cost of the equipment available

For purposes of this report, MBI calculates utilization by number of units on lease divided by total number of units on a given date. Industry data obtained directly by MBI from twenty-three companies separate from the data above show an overall utilization rate at 12/31/17 of 77.3%, across all markets, up significantly from 71% reported in the prior year.
Relocatable Building Sector Summary

Demand for relocatable buildings increased in 2017, as demonstrated by the 77.3% overall utilization rate, up from 70% in 2016.

Revenue mix was generated from roughly the same market segments with about two-thirds of the industry revenues coming from relocatable classrooms and construction site offices.

Customers in all these markets will continue to utilize relocatable buildings for their speed, flexibility, practicality, and cost.

To obtain more detailed information about the relocatable building sector, including regional analysis, business operations, depreciation, building code requirements, and fleet values, contact the Modular Building Institute.
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IBS 2019 arcitell.com
Overview of the Relocatable Buildings Industry

ROBERT GAUDIOSI, DIRECTOR
HERITAGE GLOBAL, INC.
According to the Modular Building Institute ("MBI") there are approximately 600,000 buildings in the domestic mobile/modular fleet. Commercial modular units are generally non-residential factory-built units that are capable of being transported from one location to another and are built to meet federal, state, and local codes. There are basically three types of modular units as defined by the MBI: mobile offices, relocatable classrooms, and modular buildings. Mobile offices, also referred to as trailers, are single- or double-wide factory-built temporary units that are generally leased on a short-term basis. Relocatable classrooms are generally single or double wide units built to serve the educational market. Modular buildings, on the other hand, are multi-unit (three or more) factory-built complexes typically leased for longer periods of time.

Mobile offices are utilized in a variety of industries for construction site, government, corporate, educational, in-plant, workforce housing, and general commercial purposes. Mobile offices are often built based on a standard floor plan with standard features. Section modulars differ from mobile offices in that they can be designed and built specifically for the initial end-user. Historically, section modulars have been used as hospital and diagnostic healthcare facilities, banks, commercial office buildings, educational facilities, daycare centers, and correctional facilities, as well as in a variety of high-tech, fast-growing industries. The major markets served by the industry are primarily general office, healthcare, workforce housing, and retail/commercial.

One of the key drivers to industry growth over past years has been the workforce accommodations market. This market centers on energy extraction activities prevalent in certain regions in North America, specifically Northern Alberta, Alaska, North Dakota, and Texas. Due to a decline in oil prices over the last few years, this market a significantly depressed but has seen some growth over the past year as oil prices have begun to rebound.

Another key driver to industry growth has been the healthcare industry. This market has grown significantly over the past few years and accounted for approximately two percent of industry revenues in 2017. The units used in this segment are a bit more specialized given their application.

Due to the mobile nature of the assets and their durability and in some cases flexibility, the modular industry is able to target a number of different end-user markets. As economic slowdowns occur within various industry segments, however, there is some ability to redeploy assets to more active and viable regions and/or applications as alternative opportunities arise. As units become larger, more fixed in their installation, and/or more specialized in their design and construction, some
of this flexibility is lost. Competition typically occurs on a local or regional level due to the need to respond quickly to customer requirements. The cost of transporting and installing units as well as variations in state, regional or local building codes are other factors affecting value.

According to the MBI, in 2017, the average equipment age was approximately 12 years, with units selling for approximately 110% of original cost. Over the period from 1997 to 2017, the 21-year average equipment age was 8.5 years, with a mean average selling price of 107% of original cost. Profitability within the industry is primarily driven by leasing economics rather than unit sales.

The industry traditionally attempts to recoup the initial capital investment of a new unit within four years. Average lease terms have been approximately 24-28 months. Historically, units remain in the lease fleet for approximately seven to 10 years and have subsequently sold for approximately the original cost of the unit. Due to tighter economic conditions, fleets are aging and more refurbishing/rebuilding of units is being done. This is due in part to slower of industry growth.

Industry growth is driven by a confluence of macroeconomic factors. General population shifts and demographic trends generate the need for temporary space. Local and state government regulations regarding classroom space and capacity, as well as the increasing acceptance of modular classrooms and buildings as flexible and cost-saving space solutions, are among the factors driving the growth of the industry. Class size reduction initiatives tend to bode well for the modular industry.

Industry utilization, while currently at one of its lowest levels in the last 21 years, has begun to increase modestly as dealers curtail capital expenditures and reduce fleets of older, less desirable units. Utilization in 2017 exhibited an increase of approximately 2.3% as compared to 2016. Some companies have reported utilization rates in the high 80% range, while others report rates below 50%. The local economy, geographic markets served, and equipment composition play major roles in equipment utilization.
According to the MBI, the U.S. market for relocatable buildings exhibited mixed results in 2017. Some regions and markets appeared to do very well while others continue to struggle. The educational market appears to have lost some traction while support structures for various energy developments exhibited a decline as a prominent part of the overall industry in 2017.

As the cost to construct new relocatable units increases, due to higher material and labor costs and increased building code requirements, some companies have opted to refurbish older units rather than purchase new units.

The following figure illustrates the 21-year utilization rate trend of the mobile and modular industry. As can be seen from the following figure, the growth in utilization has been minimal over the past five years.

According to the MBI, with nearly one-third of industry owned assets "on the sideline," construction of new units is not anticipated to be material in the near future. Additionally, more stringent code requirements will add to the cost of newly constructed units, without a corresponding increase in rental rates. This will encourage owners to spend more on refurbishing, which can be a frame up restoration or variations of upgrades or replacements of components; or more extensive repairs to extend the useful lives of existing assets, and to continue to challenge regulations that unduly limit revenue generation on their assets. These factors have resulted in some cases in higher resale values of the more desirable units. These values are at approximately 107% of original cost in 2017, which is up slightly from 2016.

Overall, the industry is in a period of modest to limited growth, the average fleet age is increasing, capital is being conserved, and demand for idle units is limited. Recent observations by HGV have been that some companies are experiencing increases in utilization and average rental rate as demand continues to increase due to a growing U.S. economy and infrastructure spending. Some companies with mixed fleets of modular units and container units seem to be experiencing more growth on the container side of their fleet. The improvement in the price of oil is creating activity in that sector, but its long-term stability is still in question, with the global supply of oil exceeding current levels of demand.

Two recent acquisitions by Williams Scotsman, a leader in the industry, have highlighted the renewed demand for fleet units. In December 2017, Williams Scotsman announced the acquisition of Acton Mobile for $235 million and subsequently, in June 2018 announced the acquisition of Modular Space Corporation for $1.12 billion. Both of these acquisitions represent significant multiples and reflect a positive outlook for the industry.

Robert “Bob” Gaudiosi wrote the article “Overview of Relocatable Buildings” (included in this edition) shortly before he passed away in late August. Bob was a tremendous resource for the industry and assisted MBI in our annual industry reports for the past several years.

This past March, I had the opportunity to co-present a session at World of Modular with Bob, and more recently we worked together on the reports summarized in this magazine. He was always willing to help, and always a pro. The staff at MBI was shocked and saddened to hear of Bob’s passing and ask that you keep his family in your thoughts and prayers. Bob’s family asked that if anyone is so inclined, to donate to the American Heart Association.
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