The Green Office Move

Carting away waste and pollution

by David L. King, AIA, CFM


A proper relocation can have a substantial positive impact if properly planned.

For today's real estate developer, the environmental buzzwords are green technology and LEED certification. LEED (Leadership in Energy and Environmental Design) is a third-party certification program and nationally accepted benchmark for the design, construction and operation of high-performance "green buildings." LEED gives building owners and operators the tools they need to have an immediate and measurable impact on their buildings' performance.

Far-thinking architects and developers are integrating green building techniques into their designs to try to obtain the much-desired LEED certification. But just because a building earns it doesn't mean the work to stay green stops. In fact, this article explains how even an office relocation can be LEED-certified and green-friendly. It also shows how a green office move can mean huge cost savings.

Relocation, whether floor-to-floor or building-to-building, is often overlooked as a way to reduce a company's carbon 'footprint' on the environment.

Typically, the facility manager hires the lowest bid move consultant, who then hires the lowest price moving company to get everyone moved in as quickly as possible. None of them gives much thought to the move's environmental impact.

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IT'S ALL ABOUT THE CRATES

A variety of mobile handling carts and crates made of plastic, wood or metal are available. These carts have served movers very well for many years—but they have environmental drawbacks.

For example, the Potlatch Corporation, maker of plywood, estimates 150 board feet of plywood is made per tree. That's 18 sheets, or 560 square feet of plywood per tree. In other words, that's 3.57 million trees used for plywood each year.

A typical 48" four-shelf plywood cart contains 2.5 sheets of plywood, one gallon of paint, screws and glue. If we use

Cardboard boxes are a major contributor of municipal solid waste.

the 2001 U.S. Census numbers, there are almost 13,000 locations operated by moving companies in the United States. Conservatively estimating a typical mover buys an average of five plywood carts per year, that's 162,500 sheets of plywood—or 1.3 million board feet—or 8,667 trees (roughly seven plywood carts is equivalent to one tree).

What does that mean for the environment? One tree absorbs 700 pounds of carbon dioxide from the atmosphere. That's approximately 3,033 tons of carbon dioxide left in the air each year as a result of tree reduction (lost carbon sequestration) for plywood use in moving carts. That does not include the carbon introduced into the atmosphere during the life-cycle of producing the plywood, nor the methane and greenhouse gases emitted at the end-of-life in landfills.

To produce 1.0 m3 (or to produce 1.0 MSF) of plywood in the Pacific Northwest, the mills needed 1,788 pounds of wood in the form of logs, and 20.6 pounds of purchased veneer, for a total wood need of 1,809 pounds. These inputs yielded 916 pounds of oven-dry plywood (wood only).

A BRIEF WORD ON IMPORTED WOOD

Wood dollies come in a variety of configurations for relocation uses and even region-specific preferences. They are used to move furniture and cardboard moving boxes, and even as bases for plywood carts. But that's where the benefit ends. For the most part, sheets of plywood can usually be traced to the Pacific Northwest or the Southeast regions of the United States—but wood dollies frequently are made overseas. The imported dollies largely come from Asia and occasionally Eastern Europe. The problem lies in the origin of the wood used: sustainable forestry and certified wood use has not taken root yet in Asia so the potential for mass uncontrolled deforestation and reduced carbon sequestration is dramatically increased in a region where industrialization is growing at breakneck speed.

DIESEL EMISSIONS

Typically, a mover brings plywood carts to a facility in a diesel truck. If it's in a metropolitan area with traffic congestion and there's a typical wait time at the facility dock to unload the carts, the combination can mean more idling than necessary and create a significant impact on air quality.

Many substances in diesel exhaust are listed by the California EPA as toxic air contaminants. California Health and

Safety Code section 39655 defines a "toxic air contaminant" as "an air pollutant which may cause or contribute to an increase in mortality or in serious illness, or which may pose a present or potential hazard to human health."

Diesel exhaust from heavy-duty diesel engines contains between 100 and 200 times more small particles than gasoline engine exhaust.

Moving companies, facility managers and building tenants who want to use green products and save money in the office move process do have choices.

As a result, diesel engines account for an estimated 26 percent of the total hazardous particulate pollution from fuel combustion sources in our air, and 66 percent of the particulate pollution from onroad sources.

Diesel engines also produce nearly 20 percent of the total nitrogen oxides (NOx) in outdoor air and 26 percent of the total NOx from onroad sources.

Nitrogen oxides are a major contributor to ozone production and smog.

How much pollution is generated by an idling truck? According to the Illinois Sierra Club, each of the 500,000 trucks operating in the United States emits about 169 pounds of particulate matter per year while idling, resulting in 42,250 tons of particulate matter ejected into the air per year.

Ozone exposure causes a range of human pulmonary and respiratory health problems, including chest pain, coughing, and shortness of breath. In addition to ground-level ozone, the secondary impacts of NOx include the formation of nitrate PM, acid rain and the eutrophication of coastal waters. Therefore, reductions in NOx emissions would have considerable benefits to both public health and the environment. Reusable carts can help, however, because they take up less space and therefore require fewer trucks to transport them.

THE ECONOMICS OF CARDBOARD BOXES

Most office items are placed in cardboard boxes during a move. There ar many choices and the costs vary. There is the standard banker box typically used fc records storage. The mover will usually sell a 1.5-cubic-foot box; the size is most widely accepted as the safest weight capacity cardboard box. They may be recycled, but are often discarded.

Cardboard is possibly the largest single constituent of municipal solid waste, according to the U.S. EPA, which estimated that approximately 30.2 million tons of cardboard waste was generated in 2000, representing 13 percent of the nation's solid waste.

So a typical office move can be a strong contributor to air and land pollution. Is the equipment described here the best the market has to offer? Are there alternatives to plywood carts, diesel

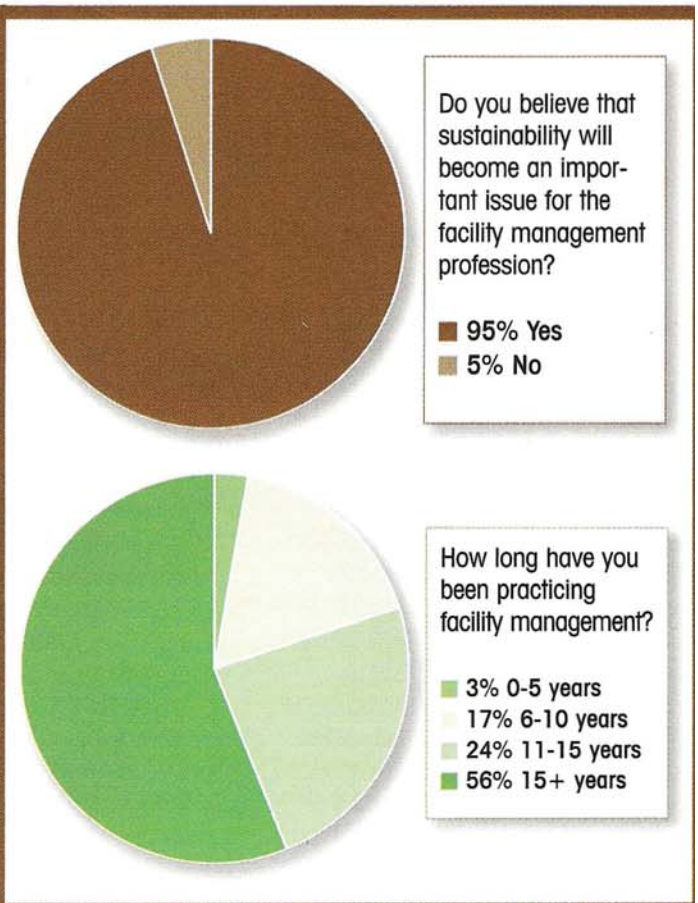
SUSTAINABILITY STUDY

The majority of respondents, International Facility Management Association (IFMA) members, have implemented a variety of sustainable practices. The majority do not have a master plan in implementation but rather selectively choose different sustainable practices. Many are familiar with the term "green design," but are not as familiar with the LEED rating system or environmentally preferable purchasing.

The facility managers in this study consider projects to be sustainable if they:

- Have a lower total environmental impact
- Have fewer harmful emissions
- Use a minimal level of energy to operate
- Contain products that are easily recycled
- Use products manufactured in an environmentally friendly way
- Have products made from recycled products

This study was conducted by IFMA with support from DuPont CommercialFlooring.



emissions, cardboard boxes and adding to the waste stream? Alternatives that are not only more environmentally friendly, but more cost-efficient?

REUSABLE CARTS— AN ECONOMICAL, GREENER ALTERNATIVE

Moving companies, facility managers and building tenants who want to use green products and save money in the office move process do have choices. There are viable alternatives to having cardboard boxes and plywood carts take up valuable landfill space.

Reusable carts are ideal for transporting large quantities of materials such as books, equipment and other packages. They can fold neatly into a movable cabinet that can be stored in small places (one cart transforms from 25" wide to less than 13"). Even the cart manufacturing process is an environmentally friendly alternative to plywood. Utilizing natural gas, the plastic manufacturing process is so energy-efficient that it

Reusable carts are an economical, greener alternative to cardboard boxes.

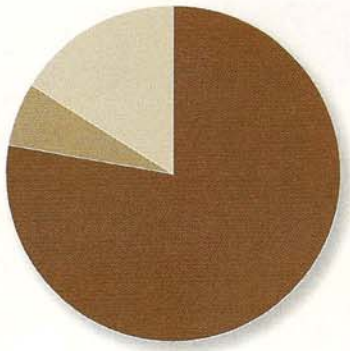
actually uses less fossil fuel per pound and emits significantly less airborne pollutants than laminated wood production.

Carts can also significantly lower diesel fuel emissions by reducing the number of trucks on the road when used by moving companies, or when used as part of a returnable shipping container program.

Reusable carts typically have an estimated life span of more than 15 years, during which one cart can potentially eliminate 12 plywood carts and trolleys from landfill waste. For facility managers who have been told to "think outside of the box," using carts is not only environmentally sound, but also shows appreciable savings.

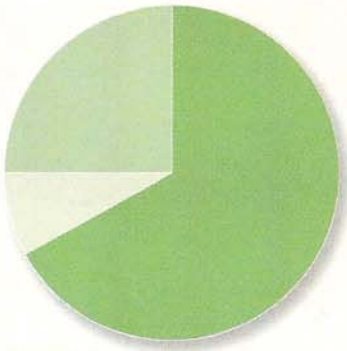
The following financial analysis illustrates a real project and the hard cost savings of a more strategic approach—using CrateXpress' Samson Carts—for equipment rental *(Editor's note: the author is president of CrateXpress and developed Samson Carts. Direction does not endorse any specific product over another).*

SUSTAINABILITY STUDY



Plan to implement use of natural daylight in the next two years.

- 78% Now in Place
- 6% Plan to do
- 16% No plan at this time



Plan to purchase recycled office products in the next two years.

- 67% Now in Place
- 14% Plan to do
- 19% No plan at this time

The customer is a Fortune 150 law firm in downtown Chicago. The firm is relocating 425 employees and a 900 linear foot library to a new building. The move schedule begins on November 11 and runs through December 26, with anticipated business operations up and running for January 2. There will be six moves in this time period, several occurring weeknights as well as weekends.

Diesel exhaust from heavy-duty diesel engines contains between 100 to 200 times more small particles than gasoline engine exhaust.

PROJECT ANALYSIS KEY POINTS

- Due to the building dock configuration, a standard 24' straight truck is required for pickups and deliveries of the equipment.
- The equipment rental contract is separate from the mover contract.
- There is only one freight elevator available at each site.
- One person to load the elevator, one person to unload the elevator at destination, and the elevator is shared with other vendors.
- Mover rate of $48/hr.; a driver and a truck are $98/hr.
- Average wait time for the elevator is 10 min. per load.
- Travel time to jobsite is 1 hr. each way.

CRATEXPRESS METHODOLOGY

CrateXpress relied on its internal facility management experience to:

- Perform an outbound and inbound time study
- Anticipate physical limitations of the facilities, the one being left and the new location
- Minimize business disruption/ downtime
- Predict potential facility-related issues (i.e. freight elevator bottlenecks)
- Maximize efficiencies to reduce project time and labor costs

By simply using a complete selection of recyclable moving containers and carts this project would have reduced its carbon footprint by 31 tons of carbon dioxide.

CrateXpress' recommended solution focuses on preserving the milestone dates of the relocation, which were identified as business critical, by aligning the move dates to relieve congestion in the workplace and reduce the amount of time to perform the move, while reducing the number of containers needed overall for the project and reducing the environmental impact.

POTENTIAL SAVINGS

- Less handling equals less labor costs
- Less damage in transit equals cost savings through the use of reuseable plastic products.
- Reduction of space needs
- Reduced cardboard waste equates to

reduced disposal costs and less landfill; a more environmentally friendly alternative

CUSTOMER BENEFITS

- Facility management knowledge base provides a second tier of experience to the project process to further drive costs down for the customer, creating a value-add relationship for the long-term.add relationship for the long-term.
- Market tested new product introduction to the facility manager, keeping the manager in touch with new trends.

WHAT ABOUT THE WASTE STREAM?

In 1994, the U.S. Environmental Protection Agency (EPA) estimated that 50 Tg (1 Tg is equal to 1 million metric tons) of paper and 18.6 Tg of wood were discarded in the United States in municipal solid waste. Approximately 16 percent of all discarded waste is incinerated (EPA, 1994); the remainder is disposed of in landfills. It has been estimated that 30–40 percent of U.S. landfill volume is taken up by paper; 13 percent by newspaper alone (Barlaz et al., 1990; EPA, 1994; Rathje & Murphy, 1992a; Barlaz et al., 1990; EPA, 1994). This represents a tremendous amount of carbon that is being buried every year.

The amount of paper and wood stored in U.S. landfills in 1993 alone has the potential of ultimately releasing 5 Tg of carbon into the atmosphere as methane and carbon dioxide.*

Landfill gas (LFG) is typically 40 to 60 percent methane, with the balance being mostly carbon dioxide.Various trace gases such as hydrogen sulfide, water vapor, ammonia, and a variety of volatile organic compounds (VOCs) are also found in LFG. Usually, gas production begins within a year of waste placement and may continue for as long as 50 years after landfill closure.

CONCLUSION

The environmental movement is not a fad. It's here to stay, and the demand for green products will only grow stronger over the years.

Forward-thinking property managers and facility managers will do well to examine every possible way to make their properties green, including how they move.

It's not just being green, it's the advantages of being green and saving money. ◆

David L. King, AIA, CFM, is president of ICB, LLC—parent company of Samson Carts and CrateXpress. He is a facility management and real estate executive with over 25 years of facility experience in a myriad of corporate cultures and environments.

* Source: The Decomposition of Forest Products in Landfills, J. A. Micales & K. E. Skog, USDA Forest Service, Forest Products Laboratory, One Gifford Pinchot Drive, Madison, WI 53705, USA

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