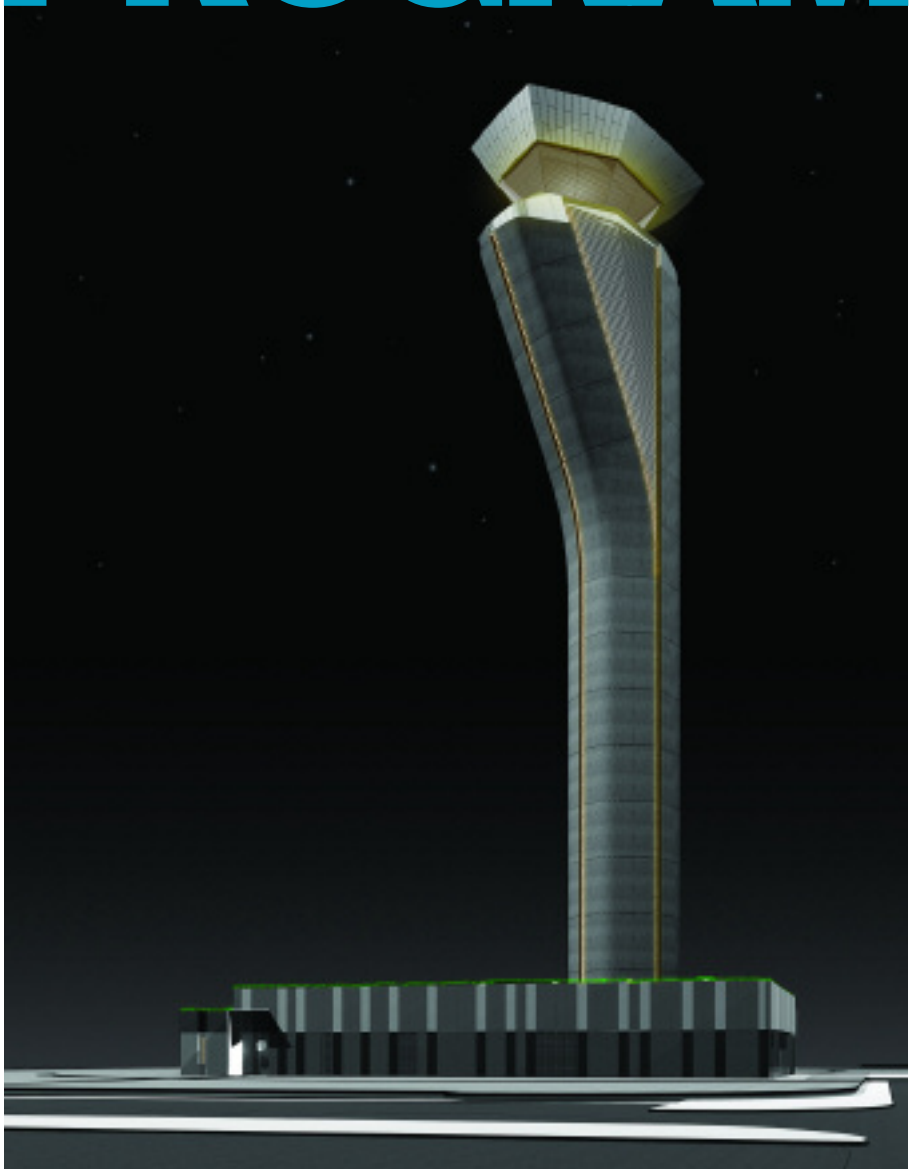
# O'HARE MODERNIZATION PROGRAM

BY JEFF STEPHENS AND CHRISTINA KOCH

## A SUSTAINABLE EXPANSION EXPECTS TO REDUCE AIRPORT DELAYS AND INCREASE CAPACITY

Although some may question the sustainability of air travel because of greenhouse-gas emissions, travel is inevitable. O'Hare International Airport in Chicago is one of the world's busiest airports and is ranked worst among major U.S. airports for on-time departures according to the U.S. Department of Transportation, Washington, D.C. However, the new $6.6 billion O'Hare Modernization Program will reconfigure the airport's intersecting runways into a modern, parallel layout; add a new western terminal facility; and substantially reduce delays and increase capacity.

This ambitious project is guided by a sustainable design program patterned after the Washington-based U.S. Green Building Council's LEED Rating System. The program applies to all improvements, including civil projects and unoccupied buildings, and is setting an example for other airports throughout the country. Mayor Richard M. Daley's reputation for environmental and sustainable innovation continues to take off with this airport modernization program.



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## OMP

OMP—one of the country's largest construction projects—is taking place in phases to minimize disruption to the traveling public locally and nationwide. Unlike airport replacement projects where a new greenfield airport is constructed without the burden of managing existing travelers, all O'Hare construction projects must not interfere with existing service levels. The total project includes the following:

- Building one new runway
- Relocating three existing runways
- Extending two other existing runways
- Constructing a 1.5 million-square-foot (139355-$m^2$) terminal complex with up to 60 gates and an automated people mover
- Creating a new western entrance to O'Hare

According to planning documents, OMP is expected to reduce overall delays at the airport from today's average of nearly 24 minutes to less than six minutes per flight.

"Currently, all of our runways converge, intersect or both. During good weather we're fine," says Rosemarie Andolino, OMP's executive director. "During foul weather, air traffic controllers remove one of our arrival runways, reducing our capacity by one-third. Unfortunately, the delays and congestion do not only impact O'Hare; there's an impact from coast to coast."

In 2003, OMP reached an agreement with the airlines to fund Phase 1 ($2.9 billion) of the program, which included planning and preliminary engineering for all OMP projects, detailed engineering and construction of three runway projects, wetlands-mitigation projects, land acquisition and more. Phase 1 is scheduled to be complete in 2011. OMP will be completed in 2015 to accommodate the influx of visitors expected for the 2016

OMP contractors are required by contract to use **ULTRA-LOW SULFUR DIESEL FUEL**, ahead of federally mandated standards for off-road vehicles. To date, the project has used more than 2.3 million gallons (3.8 million L) of ultra-low sulfur fuel resulting in a significant reduction of sulfur-compound emissions.

Olympic and Paralympic Games. (To read about Chicago's plan to host a green Olympics, see page 32.) During the five years leading up to groundbreaking, 16 state and federal agencies approved the program, and the OMP team created an 84-page *Sustainable Design Manual* that guides green initiatives on the project.

## SUSTAINABLE DESIGN EFFORTS

Andolino, who was appointed by Mayor Daley to head OMP, has worked for the city for 17 years, most recently in its Department of Planning and Development. She witnessed Daley's aspiration for green development firsthand and believed it was important for OMP, as well.

"It was a constant message the mayor conveyed whenever we'd bring a development to him," Andolino remembers. "One of the things he talks about all the time is leading by example. You can't just ask private developers to be sustainable; you have to be sustainable on city developments, as well."

One of the most unique elements of OMP's sustainability program is its application to all projects; it includes countless civil projects, such as



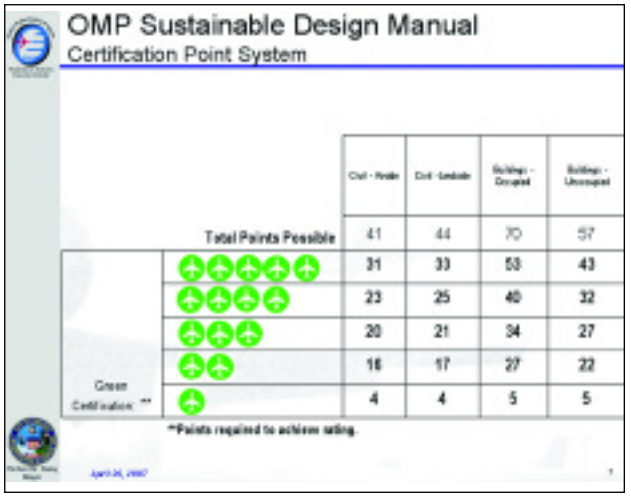
roads, bridges, runways, taxiways, utilities, drainage and cargo facilities. It sets goals, evaluates, rates and encourages achievements in sustainable design across four general project categories: Civil-Landside, Civil-Airside, Occupied Buildings and Unoccupied Buildings. The *Sustainable Design Manual* actually is written with the organizational structure developed by USGBC, including Sustainable Sites and Energy and Atmosphere, and applies the LEED rating system's concepts to the project. In some respects, it's "LEED for Airports."

For each project at O'Hare, a design team must identify current practices that meet sustainable-design goals and create recommendations expected to have no cost or schedule impacts. Strategies and practices that will enhance the environmental-design efforts of the project but are anticipated to have cost or schedule impacts must be thoroughly evaluated and documented by the designer or contractor through studies, calculations and material data. To simplify review by OMP management, teams are encouraged to use the compliance and submittal requirements already developed by USGBC for LEED. OMP also developed a project ranking and evaluation process that issues Green Airplane Certification awards to its design and construction teams for sustainability achievements.

## EARLY PROJECTS SHOW POTENTIAL

In the early stages of OMP, many projects were largely about moving dirt—and a lot of dirt. Roughly 8.3 million cubic yards (6 million $m^3$) of dirt have been relocated. To reduce construction emissions, congestion in local neighborhoods and minimize trucking costs, the grading program was designed to keep as much dirt on-site as possible.

Construction waste recycling, including crushing concrete and using it for aggregate material, also played an important role. To date approximately 90 percent of all materials from


OMP Sustainable Design Manual
Certification Point System

| | | Civil - Airside | Civil - Landside | Buildings - Occupied | Buildings - Unoccupied |
|---|---|---|---|---|---|
| Total Points Possible | | 41 | 44 | 70 | 57 |
| Green Certification ** | | 31 | 33 | 53 | 43 |
| | | 23 | 25 | 40 | 32 |
| | | 20 | 21 | 34 | 27 |
| | | 16 | 17 | 27 | 22 |
| | | 4 | 4 | 5 | 5 |

**Points required to achieve rating.

properties demolished to enable OMP construction has been diverted from landfills, resulting in the recycling or salvaging of approximately 30,000 tons (27216 metric tons) of steel, brick, concrete and other materials. In addition, OMP has used surplus reclaimed materials from other projects. The city of Chicago had a 55,000-cubic-yard (42051-$m^3$) surplus of asphalt grindings from repaving projects. OMP was able to use all of that material for perimeter roads and the like.

OMP contractors are required by contract to use ultra-low sulfur diesel fuel, ahead of federally mandated standards for off-road vehicles. To date, the project has used more than 2.3 million gallons (3.8 million L) of ultra-low sulfur fuel resulting in a significant reduction of sulfur-compound emissions, which are blamed for acid rain, compared to commonly used diesel fuel. In addition, all but the newest of construction equipment is required to be retrofit with oxidation catalysts or particulate filters to improve air-quality emissions.

OMP also has implemented several strategies to reduce storm-water runoff on the site. For example, the project will incorporate several green roofs into building designs, including the first at a Federal Aviation Administration Air Traffic Control administration building. During the expansion, 153 acres (62 hectares) of low-quality wetlands are being removed, but OMP is required to build 450 acres (182 hectares) of passive recreation space in neighboring communities within the Des Plaines River Watershed. The watershed extends to Wisconsin to the north and to Peotone, Ill., to the south.

## Check Out O'Hare

The O'Hare Modernization Program and Alexandria, Va.-based American Association of Airport Executives are co-sponsoring a Green Airport Construction Conference Nov. 8-9 in Chicago. The conference will showcase all the sustainable initiatives being incorporated in OMP. For more information about the conference and OMP or to view OMP's *Sustainable Design Manual*, visit www.oharemodernization.org.

"The village of Bensenville, the Salt Creek and other areas in the Des Plaines River Watershed are notorious for flooding," Andolino says. "Building these wetlands will help with that issue, and it's incredible to bring that kind of passive recreation space to these communities. These spaces will allow residents to canoe or bird watch."

In addition, OMP has constructed several detention basins on-site that hold storm water until the Metropolitan Water Reclamation District is ready to treat it.

"There's an extremely intricate drainage system at the airport that allows every runway and taxiway to flow to these basins," says Ted Woosley, vice president of Chicago-based Landrum & Brown and an OMP environmental consultant. "Every one of them has a series of oil-water separators associated with the pump stations, so if there is an oil or fuel spill, oil-water separators would separate the two fluids. All of the more remote areas that wouldn't have that fluid anywhere near them have a separate drainage system."

## ENJOY YOUR FLIGHT

With more than 76.5 million passengers and 1.7 million tons (1.5 metric tons) of freight and mail passing through annually, it's no surprise that O'Hare is stretched to capacity. Those heading to Chicago to attend the GreenBuild International Conference & Expo in November can be confident OMP is employing the best possible environmental practices while building an efficient airport for the 21st century.

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