

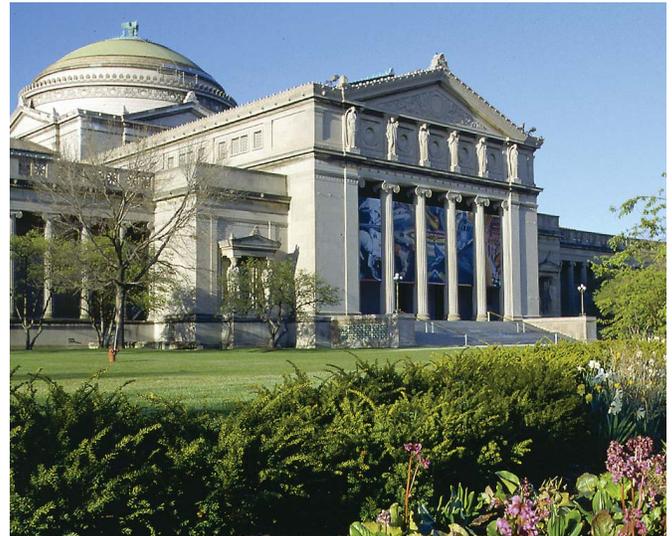
## Museum of Science and Industry, Chicago

### An inspiring renovation

The Museum of Science and Industry, Chicago (MSI) is housed in the only remaining building from the 1893 World's Columbian Exposition. Built as the Fair's Palace of Fine Arts, it's now the largest science museum in the Western Hemisphere, with more than 35,000 artifacts, 400,000 square-feet of exhibit space and 1.6 million visitors in 2009 alone.

"When it comes to the Museum's facilities, we are always thinking of how we can create a great guest experience, while still maintaining efficiency and an eco-friendly environment," said the Museum Director of Facilities J. Jeffery Johnson. "These new restrooms were created to meet all those criteria."

Considering the large number of restrooms and the age of the facility, this renovation was no small undertaking. In 2008, MSI partnered with Sloan Valve Company, a manufacturer of water-efficient solutions, to design and to install inventive, sustainable restrooms. Sloan incorporated its proprietary Sloan Monitoring System into the design to correlate foot traffic with the use of all restroom water, including automated dispensers. Specifically, the system monitors the volume of water used by a commode or sink. By tracking how much water it saves, MSI can support its sustainability and green practices.

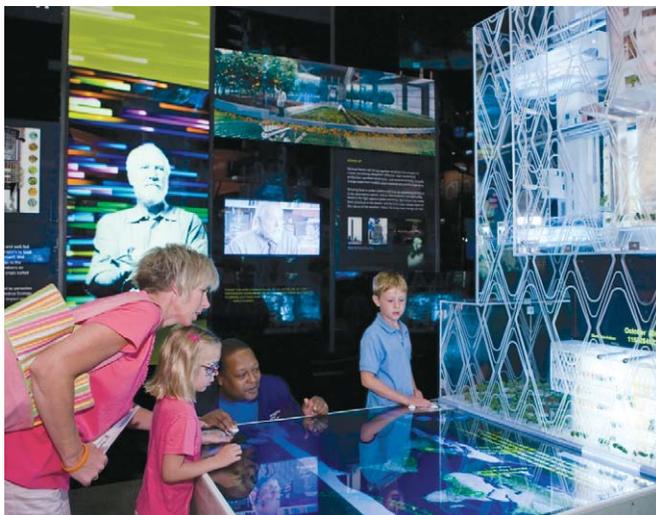


Restroom odors and vapors are the result of airborne volatile organic compounds (VOCs) from sources such as human bio-effluents and cleaning supplies. VOCs, which can make indoor air smell unpleasant and can also be harmful to an occupant's health, are not detected by air monitors that record the level of CO<sub>2</sub> in indoor air. By alerting maintenance personnel to the presence of unpleasant odors immediately after they occur, instead of waiting to have the situation discovered by maintenance during routine checks or until a patron complains, MSI patrons are guaranteed a pleasant restroom environment. Indoor Air Quality Modules can also alert ventilation systems to the presence of offensive odors and dangerous vapors as soon as the gases are released into the room's air.

### Monitoring air quality reduces facilities costs

Each Indoor Air Quality Module monitors the air quality and sends a signal to the museum's control room when air quality changes. Spikes in odor are indicated by color changes on a computer dashboard display. Green indicates healthy air quality; yellow indicates a slight change and red signals unpleasantly high levels of VOCs.

This information has enabled MSI to reduce facilities costs by optimizing restroom servicing when needed instead of only on a preset schedule. By correlating information on foot traffic with data gathered on odor detection, MSI can more accurately estimate future facilities maintenance requirements and plan accordingly. In addition, by ensuring that air quality remains high, MSI gives its guests the best experience possible during their visit to the museum.



### Ensuring high-quality restroom air

In addition to being environmentally friendly and visually attractive, MSI wanted the new restrooms to smell pleasant. To ensure the highest quality air, Sloan installed AppliedSensor's Indoor Air Quality Modules in the ceiling of each of restroom and integrated the modules with the Monitoring System.

# SLOAN SMS



Museum of Science and Industry

ALL Restrooms

Main Floor

First Floor Balcony

Ground Floor Womens

Ground Floor Mens

Reporting

System Configuration

Alert

Overview Alarm Fixtures

Restroom	Fixture Name	Date/Time	Type	Message	Action
Main Floor	Men Soap 2	03-27 23:59	Housekeeping	Soap refill needed	●
Main Floor	Men Soap 4	03-23 07:00	Housekeeping	Soap refill needed	●
Main Floor	Women Soap 1	04-17 11:50	Housekeeping	Soap refill needed	●
Main Floor	Women Soap 2	04-11 15:58	Housekeeping	Soap refill needed	●
Main Floor	Women Soap 4	04-03 10:43	Housekeeping	Soap refill needed	●
Main Floor	Women Soap 5	03-06 15:31	Housekeeping	Soap refill needed	●
First Floor Balcony	Men Soap 5	03-14 13:04	Housekeeping	Soap refill needed	●
Ground Floor Womens	Women Soap 1	04-07 12:45	Housekeeping	Soap refill needed	●
Ground Floor Womens	Women Soap 2	04-06 17:38	Housekeeping	Soap refill needed	●
Ground Floor Womens	Women Soap 11	04-14 14:09	Housekeeping	Soap refill needed	●
Ground Floor Womens	Women Soap 12	04-09 12:44	Housekeeping	Soap refill needed	●
Ground Floor Womens	Women Soap 14	04-03 12:15	Housekeeping	Soap refill needed	●
Ground Floor Womens	Family Soap 1	04-06 14:18	Housekeeping	Soap refill needed	●
Ground Floor Womens	GrayMonitor 1	04-08 12:54	WaterFlow	Bag Filter Clear	●
Ground Floor Womens	GrayMonitor 1	04-16 07:59	WaterFlow	Bag Filter Clear	●
Ground Floor Womens	GrayMonitor 1	04-07 09:58	WaterFlow	Bag Filter Clear	●
Ground Floor Womens	GrayMonitor 1	04-10 14:17	WaterFlow	Bag Filter Clear	●
Ground Floor Womens	GravMonitor 1	04-13 07:56	WaterFlow	Bag Filter Clear	●

Daily Weekly Monthly Quarterly Yearly Total

## Facility Performance

All Restrooms

### Facility Water Use (in gallons)



### Facility Activations



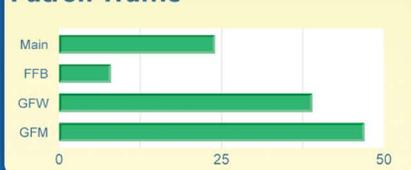
Daily Weekly Monthly Quarterly Yearly Total

## Occupancy



Daily Weekly Monthly Quarterly Yearly Total

## Patron Traffic



Daily Weekly Monthly Quarterly Yearly Total

## Air Quality



Screen shot from control room monitor



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