



How to Design a Functional Maintenance Facility

A well-designed maintenance facility is key to efficient fleet management.

But designing a facility does not begin with design. Following are some useful suggestions that can help guide fleet administrators through the often-confusing process of building or remodeling a maintenance facility.

Gaining understanding and building consensus

"Initiating the design should not be the first step in constructing your facility," cautions Don Leidy, principal of Maintenance Design Group (MDG). "The planning phase should be one of the most important steps in the entire process."

Understanding the your needs is crucial in designing a maintenance facility. This understanding begins with asking questions and doing research.

Why is the facility being built or updated?

The reasons for new construction or remodeling are as varied as the individual maintenance facilities. Maintenance departments commonly outgrow facilities that worked well 20 years ago but are now outdated. Downsizing or increasing services, the passage of new laws and regulations, and the introduction of alternative fuels can all necessitate change.

What impact does planned fleet growth have on the facility?

"If fleet administrators expect their fleets to grow by 20 percent in the next decade, the major impact is on parking," Leidy says. "As a rule, 50 percent of an entire site will be used for parking and circulating 'company' vehicles. Twenty-five percent of the site will be used for employee parking, while the remaining 25 percent will be required for the buildings. Adding ten large vehicles for parking has a bigger impact on the site than adding five feet to a repair bay or doubling the size of an office."

The client's expectations for a new or remodeled facility are key.

Your vision of the new facility will shape the final design. Do you want more office space, different equipment, better lighting, greater clearance, or improved ventilation? A facility in southern California will have different needs than a facility in upstate New York, so each shop ends up being highly personalized. No two facilities will work the same way.

Fleet administrators need to do their homework.

Fleet administrators are some of the most important people on the design team and must be able to see the big picture. Visiting other facilities and talking to other fleet administrators is encouraged. They also should keep staff members and any other concerned parties informed and find out what their expectations are for the facility.

The second step—building consensus—can make or break a project. The fleet administrator should get everyone who has an interest in the project involved in the planning and design process, whether it's the staff, board of supervisors, county commissioners, council members, or the public. Including everyone in the planning meetings not only educates key players about the process, but encourages "buy-in" or acceptance of the new facility.

"In Aspen, Colorado, the neighborhood surrounding the project site consisted of multi-million-dollar homes, and the home owners were very concerned about the aesthetics of the project," Leidy says. "To put their concerns at ease, we invited the public to attend all design review meetings. They were included in the entire planning process.

"When we began planning this project, construction prices were flat. However, it took over two years to get the project designed and the bond referendum passed. When we were ready to break ground, Aspen was enjoying a building boom, and construction costs had risen 40 percent-so had our budget. Because we had included elected officials and the public in the process, everyone felt like they had a vested interest in the project. They came together to help scale back the building design while still meeting everyone's expectations."

Planning - the key to success

Planning early is key to any successful project that comes in on budget. Equipment selection, layout, utility requirements, and finishes need to be considered early on in the process. The earlier in the design process needs are identified, the more likely they will be approved and the less they will cost.

"After construction has begun," Leidy says, "additions will require a change order, and change orders are expensive. A compressed air line included as an integral part of design may cost \$200. During construction, the same line could cost as much as \$1,000."

Common mistakes in planning

Planning and attention to the smallest detail can prevent mistakes that can hinder the efficiency of a maintenance facility. What are some of the most common mistakes that create problems for fleet managers down the road?

- Lighting. It's important to choose lighting fixtures that offer a full spectrum of light. Lighting has ramifications on the efficiency, functionality, and safety of the facility, as well as on the general atmosphere of the workplace. For example, high pressure sodium lights work well outdoors but aren't suited for a maintenance shop. Inside a building, the light's orange-yellow cast creates poor color rendition, making different colored wires look the same and blood indistinguishable from grease.
- Overhead clearance. Ductwork, plumbing, and cranes installed too low can encroach on necessary overhead space and interfere with the required unobstructed vertical clearance in the repair bay, rendering cranes and lifts useless.
- Door size. Measure each vehicle's width and height (including mirrors and vertical extensions). You might think that ten-foot-wide "garage" doors can accommodate a truck that's eight feet wide. Most trucks usually have mirrors that protrude up to a foot on each side, which shrinks clearance from two feet to only a few inches.
- Building finishes/ aesthetics. The bottom four to six feet of the shop walls should be durable (concrete or masonry) to withstand the abuse in a shop environment. Make sure the entire inside of the building (walls and structure) is painted to allow proper building maintenance to extend the useful life of the facility. Designing the facility's exterior to complement the surrounding environment and adding native landscaping can help gain public approval of the project.
- Expandability. The building should not only handle the shop's current work load, but also should be adaptable and able to accommodate demands 20 years from now. For example, if additional bays aren't built during initial construction, room should be left on the

site to accommodate the expansion. Also, load bearing walls should be avoided to maximize flexibility for future modifications.

- Public involvement. Everyone who has an interest in the project needs to be informed. The best-designed project won't get built if it's not approved because an elected official or the public doesn't understand the importance of the facility.
- Appearance. Form follows function. It's always possible to make a functional building look good, but it isn't always possible to make a good looking building functional.

The design process-the charrette approach.

"Our approach to design is somewhat unique," Leidy says. "Using the design charrette approach (an intensive, on-site planning and design session) accomplishes in one week what can take months if done by traditional methods. The design charrette builds consensus and harmony while a standard design approach can lead to misunderstanding and disagreement. We've proven that this strategy works again and again."

In the design charrette, a typical week might include:

- *Day One.* MDG presents six or eight site layouts to its client's work group to review. The sketches are put up on the wall, and everyone discusses what they like and don't like about each. Once MDG has everyone's comments, they take the sketches back to the drawing board for the initial fine tuning.
- *Day Two.* The design team narrows the six to eight site layouts down to two or three. These new designs incorporate everyone's comments and begin to show parking details and rough landscaping features.
- *Days Three to Five.* Another review session and more refinements occur before MDG combines these last choices down to one final site layout. With the preliminary master plan in hand, MDG turns its focus on the inside of the buildings. For the next two days, MDG and the planning team review building interior options and discuss equipment needs in the same open forum until a conceptual design is agreed upon.

During the initial design phase, Leidy encourages fleet administrators to hold a peer review session and invites other fleet administrators to a day-long informal review session to ask them to critique the design. During this session, the peers can contribute great ideas and validate the design for the fleet administrator.

"In the project we did in Aspen, one peer administrator pointed out there was no place to push the snow. We already knew this was a problem because we were working with such a small site. As a result of the discussions from that meeting, we decided to install snow melt into the pavement, which solved our problem," he says.

Designing a maintenance facility is a complex process. Asking the right questions and planning carefully in advance means the fleet administrator will experience a smooth design and construction process that results in a safe, efficient, and positive work environment that will last the life of the facility.

Don Leidy has worked on more than 400 maintenance facility projects since 1976.