

# BUILDING THE INVISIBLE GARAGE

By K. Vance Kelley, AIA

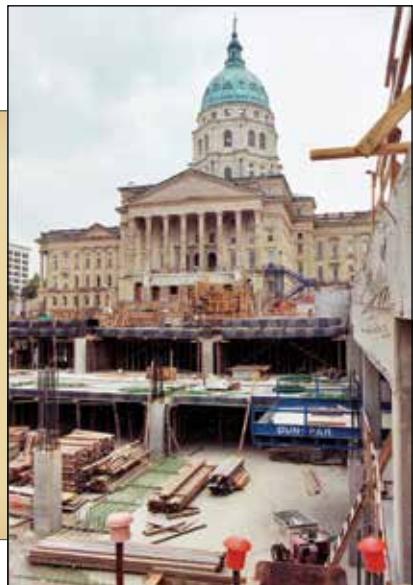
**T**radition and modernity come together seamlessly at the Kansas Statehouse, where a 550-space underground parking garage has transformed the visitor and staff experience, while solving a host of logistical and practical parking concerns for the 140-year-old capitol.

"The most noticeable thing about this garage is that it's not noticeable," says Jim Rinner, vice president at JE Dunn Construction, Topeka, Kan., construction manager for the Kansas Statehouse preservation and restoration. "The entrance and exit ramps are visible, but otherwise, it's buried underground, and the design is really integrated into the site. That was always the goal."

In fact, it's possible that a citizen driving along adjacent Eighth Street might not even notice the garage unless he was looking for a place to park. What drivers see is the prominent historic building, its ceremonial drive, and the attractive, tree-lined plaza. That's how the Legislature wanted it to be, says Statehouse Architect Barry Greis.

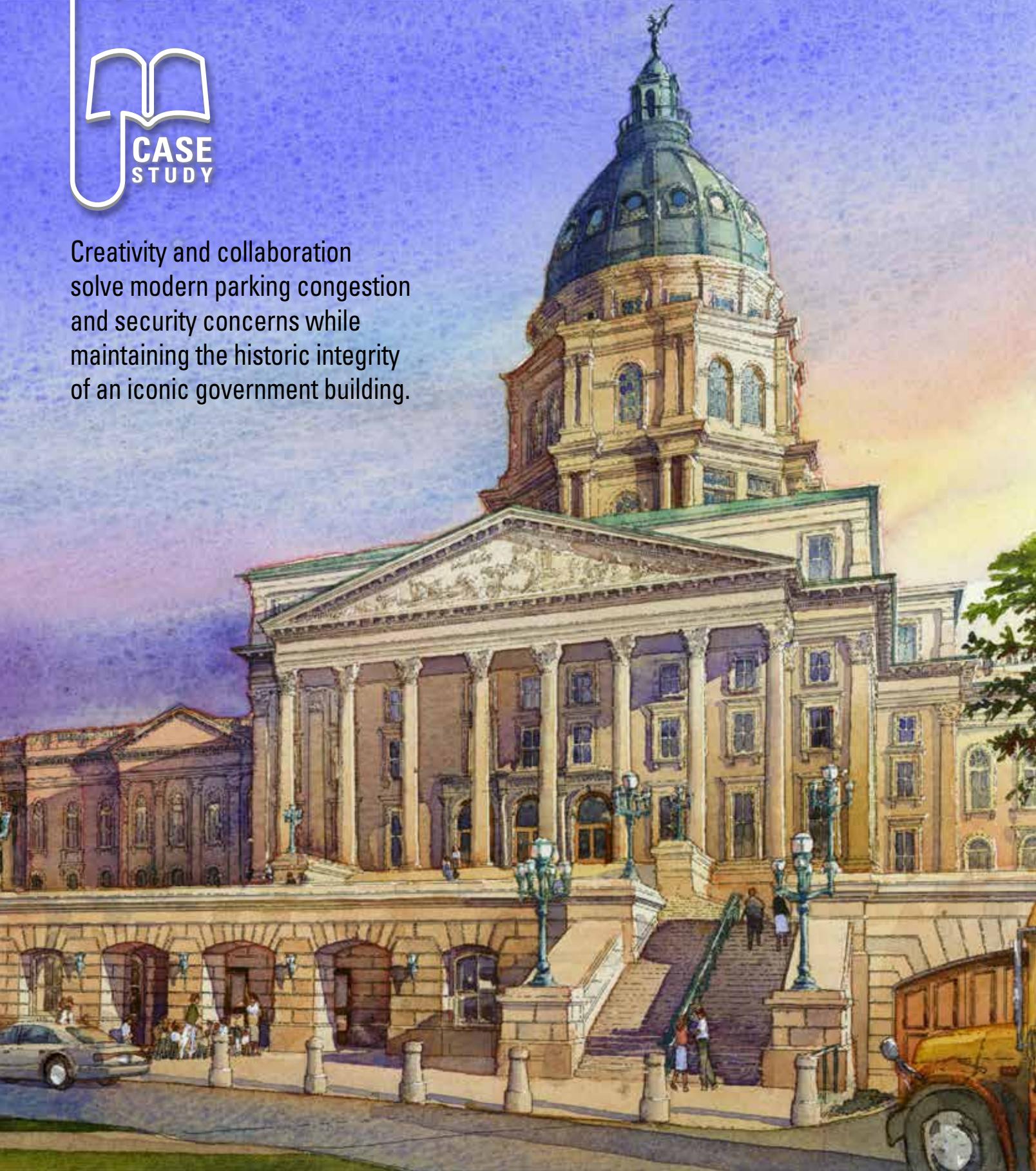
Yet, the parking garage, designed by Treanor Architects, changed how the people of Kansas access their state capitol. Not only is it easier and safer to park, but visitors now approach the building via an attached central visitor's center located underneath the building's exterior grand staircase. It's restored the building's traditional north front door by funneling visitors into the reclaimed ground floor.

When master planning and design concepts for the renovation and restoration of the statehouse began in the early 2000s, a parking garage was not part of the plan. But with traffic congestion and parking at a premium during the legislative session, and a desire to more easily accommodate visitors to Topeka's main tourist attraction, a solution needed to be found—a solution that could be achieved on a site that posed historic, logistic, and technical challenges. And because this was a public building, the state wanted a structure that was highly functional but not elaborate.





Creativity and collaboration solve modern parking congestion and security concerns while maintaining the historic integrity of an iconic government building.



## Historic Problems

Historically, a ceremonial drive has surrounded the statehouse. It was not unusual to see cars parked on the grass nearby. Parking was at a premium for decades, requiring the state to bag meters on surrounding streets and rent a nearby parking lot during the legislative session. Cars left parked alongside the building also posed potential safety and security concerns.

Research showed that in the 1950s, large surface parking lots were proposed. In 1973, it was proposed that parking be moved below grade; that was the option that this design team chose to build upon.

The underground garage addition more than doubled the number of parking spaces available to statehouse staff and visitors. Parking is also now clearly delineated. The lowest level of the garage, which is reserved for 165 elected officials and their staff, is secured with key card access and barrier arms. The upper level offers 100 visitor spaces, additional nonsecured spaces for legislative staff, and 14 parking spaces for drivers with disabilities.

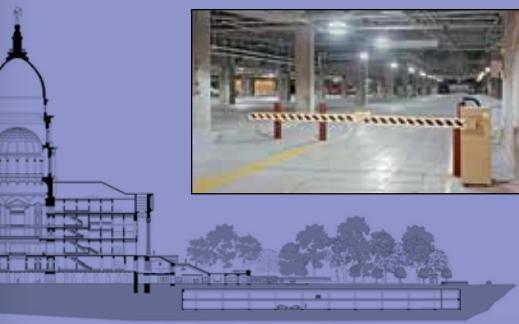
Inside the garage, a glass lobby with a concrete bas-relief impression of the statehouse dome is more than an artistic feature. As the most recognized and

limestone ledge and investigating rumors of an underground river, (No river was found, though construction did reveal a manageable amount of underground water running horizontally as it hit the ledges.)

Site parameters limited the physical space available. Bordered by the statehouse on the south and Eighth Street on the north, the garage had a finite footprint and needed to be just two stories to preserve the historic integrity of the area and keep costs under control. The entire structure also had to be designed to squeeze between a thick layer of ledge and the existing staircase entrance to the building.

The effect on the statehouse and the nearby buildings and streets was a major concern during excavation, says Jeff Combes, general superintendent of JE Dunn Construction. With vibration monitors inside and out, weekly checks on existing cracks within the building, and regular consults with the design team, the historic nature of the construction site was never far from mind.

Building underground also brought water concerns. During construction, core samples allowed the team to continually watch water levels, and pumps ran 24/7 to control any potential underground water situations. All equipment had to be removed when not in use. Banks of



commented on portion of the project, it's intentionally designed to grab attention, orient drivers to the space, and direct them to the elevator and stairs leading to the ground floor visitor center. Spanning both levels, the drum of the dome is visible on the lower level, and the dome itself is visible on the upper level. From the time a driver enters, it's obvious where to go, where to park, and how to find the building entrance.

To create entrance and exit ramps that are visible from the street but still feel appropriate to the historic surrounds, concrete structures were faced with native Kansas cottonwood limestone from Chase County to echo the statehouse itself.

## An Historic Site

Achieving a below-grade parking structure solved a lot of problems but also came with a host of significant site challenges, including breaking through three layers of

the excavation—just 20 feet from a major street—had to be stabilized and secured throughout to prevent collapse.

Locating the visitor center required the statehouse's grand staircase to be disassembled, a concrete shell added underneath, and pieces reassembled around the new structure. A full five feet of soil was placed on top to create the street-level plaza—in essence, installing a giant green roof on the underground garage.

The Eighth Street site entrance was the only way in or out, whether for deliveries, removing debris, or any other access. From coordinating the building's main electrical service to having limited space to stage work and store equipment, efficient scheduling became critical to ensure that work was perfectly synchronized.

The structure itself was equally challenging, using several thousand pounds of rebar and requiring special concrete forms to be built to achieve 12-inch wide exterior walls in a single pour. Architectural concrete in the

design and necessary security measures added technical challenges, and unlike an above-grade garage, this one required full waterproofing inside and out.

## Safety and Security

Security was a high priority in the garage design. The structure incorporated flexible assigned parking for elected officials, staff, and administrators as well as 100 public visitor spaces. The garage also needed to be fully compliant with the Americans with Disabilities Act (ADA). To achieve both the security needed and the number of spaces desired, the garage uses a flat floor layout that provides access to the levels via speed ramps. There is no parking on the ramps. With this layout, the key code access and barrier arms controls that limit entrance to secure areas, and security systems within the garage, the facility can both restrict access as necessary and easily be closed for heightened security during special events or security alerts, says Jim Graveel of Walker Parking Consultants, the parking functional designer for the project.



"The parking footprint was limited by the selected site," says Graveel. "Our target was 550 spaces underground. We were really working hard to get that done in two levels."

As a public building, security and ease for visitors and staff are just as important as protecting elected officials, says Greis. "People here in Kansas aren't used to parking underground, so lighting and security were important," he says. "This was about reassuring people that they would be safe." Along with plenty of lighting, ADA-compliant 8-foot-2-inch ceiling clearances that provide clear sight lines, and visible exit signage, the garage offers emergency call stations and security cameras monitored by Capitol Police. Clean air was also addressed through the addition of multiple-level fans with sensors that automatically regulate fan speeds to maintain safe carbon monoxide levels. A fire sprinkler system was installed throughout.

## Collaboration

Such a complex project required an extraordinary amount of planning. Construction was completed in two phases beginning with the garage and future visitor center structure, which allowed the construction manager to pour concrete as soon as the excavation was completed. The second phase included the finish of the garage shell and mechanical system connections.

The garage was a complex, innovative solution to a number of site challenges, and the design-assist approach to construction management was key to its success because the process allowed for design solutions to be thoroughly thought out and discussed from the start, with all of their cost and building ramifications. "Integrated project management is a buzzword today in construction. This is the process we were using then," says Rinner.

The design team had its work cut out for it, with the goal to blend a modern garage into a well-used, public historic site with limited space. Construction managers also had much to accomplish, from safe excavation and sequencing the work to addressing the technical challenges of various mechanical systems and working with unique concrete structures. The 100+-year-old urban property



also meant troubleshooting problems, such as rerouting and upgrading old electrical systems running through the site and repairing a leaky sanitary sewer system.

The results have been worth it. The underground garage has been well-received by the public and those who work or do business onsite. Not only has the long-time parking challenge been solved, but the solution fit perfectly into the state's master plan for preserving and restoring the iconic capitol, and became the first phase of that effort. The addition also offered a few bonuses, such as additional operations space, loading/delivery areas for housekeeping and maintenance operations, and a new visitor center.

While there may still be a hunt for parking on busy days, the garage has vastly improved access to the Kansas Statehouse, says Greis. With tours of the restored copper dome slated to re-open in 2014, the statehouse expects to see 60,000 visitors in the next year. P



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