

**A**s new and emerging technologies demonstrate increasing potential to impact the way correctional facilities evolve, architects and engineers must identify and evaluate the effects those technologies will have on traditional concepts of correctional design at various levels. Then, that personnel must provide the proper solutions during the design process to most effectively integrate the new technologies into the overall operational plan and physical plant. Design considerations that technological improvements influence in correctional planning can be categorized into two main groups: the systems whose functions enhance the operation of the facility; and the materials and equipment whose properties improve its physical environment. New technologies developed for either category are most likely to be implemented to benefit one or more traditional objectives of a correctional facility. Those objectives are: to provide security for the public from its convicted offenders; provide safety for the staff and offenders inside the facility; and ensure the community that the facility will operate as efficiently as possible.

Recent innovations in systems technologies, such as inmate tracking, biometric identification, and video surveillance and recording, have provided more security through better recognition of location and proximity of inmates, more safety by sharing and disseminating information effectively, and better efficiency through less reliance on physical escorts. Recent innovations in materials

and equipment technologies, such as enhanced perimeter deterrent systems, improved glazing systems, and sophisticated metal, drug and explosives scanners, have provided better security by reducing the risk of escape, more safety through effective observation of inmates, and more efficiency by keeping the flow of contraband in and out of the facility in check with less direct staff involvement.

And, if handled properly, integrating new technologies into the design of a correctional facility can also promote less traditional objectives such as creating a more humane environment, addressing social and psychological rehabilitation, and providing a better program of reform through vocational and academic education. To achieve success in these ways, the design team along with the facility operators must be able to evaluate the way the architecture and operations of the facility can evolve from their traditional responses to security, safety and efficiency objectives. Simply put, the design team should determine not only what needs to be added for the new technology in order to enhance safety, security and efficiency, but also what can be modified with the new technology in order to promote reform, rehabilitation and a more humane setting.

## MAN-DOWN TECHNOLOGY

An example of this notion is the man-down technology. This system is a form of duress alarm worn by staff and, upon activation, reports their location and condition to an annunciation device in a secure location. To integrate this system into the design of a facility, the architect and engineers must consider such design issues as properly locating and spacing the signal receivers/transmitters, eliminating interference caused by conflicts with building mass or materials, and properly interfacing the reporting device with other components of the security system if the

# DESIGN CONSIDERATIONS FOR NEW FACILITIES: INTEGRATING NEW AND EMERGING TECHNOLOGIES

BY WILLIAM BOX AND NOLIN RENFROW

man-down system is not stand-alone. When used as intended, the man-down technology enhances staff safety (a traditional objective) when members of that staff must have direct contact with the inmate population. However, the system can have equally beneficial if unintended consequences.

By implementing this technology, the operator has the option to intentionally place staff in more direct contact with inmates, thus affording more opportunity for staff to interact personally with inmates, cultivating positive social relationships and, therefore, providing early intervention when conflicts occur. The architectural design would place staff workstations within inmate living units, thus removing the barriers present in a more traditional design where the main focus of inmate control comes from within a secure housing control room with one-way security glazing. In this way, two less traditional objectives are also promoted as a result of a more complete use of this technology: a more humane setting is realized through elimination of harsh barriers, and rehabilitation is enhanced through more direct contact between staff and inmates. For the man-down technology, the “added” components include receivers, signal paths and annunciating devices, while the “modified” component is with the philosophy that traditionally separates the observed from the observer.

## COMPUTER TECHNOLOGY

A more complex example of a technology in which integration should be considered on different levels of design is the use of computing systems. Computer technology has been adapted effectively to the correctional environment, either through development of unique functions or through application of existing concepts. Whether it is used for information storage and retrieval, control and monitoring, video communication and recording, or for identification purposes, the use of computing systems has aided in improving the traditional objectives of a correctional facility.

Operators will often work with the design team early in the planning phase to determine which computing technologies are appropriate for the safety, security and operational efficiency of a new facility. Once the design goals are identified, the design team will determine such parameters as what information is to be gathered; from where information is to be gathered; to whom it is to be distributed; what devices are to be controlled and where that control will originate; what areas need to be covered by video imaging and where the images need to be viewed; where identity needs to be verified and what types of identification are appropriate; and what response the identity will initiate, such as opening a door. Once the parameters are set, the design considerations, from an architecture and engineering perspective, would include determining the appropriate data input and outlet locations, routing the proper pathways from these locations for connectivity, interfacing the equipment and devices at either end, and housing the support equipment adequately.

In addition, design integration would also consider access to the pathways for service and repair, size of the pathways for future additions, the environmental needs of the support equipment, and location of the equipment for maintenance and replacement. Finally, design integration would consider how a new computing technology interfaces with other computing technologies, such as a fire alarm system linked to the security controls system, or a biometric identification system linked to the inmate database. Thus, at one level, integrating new computing technologies can be viewed as initially providing adequate spaces, pathways and environmental conditions plus considerations for future growth and periodic maintenance. It also could involve interfacing with similar informational, control, communication or identification systems in order to take advantage of their combined benefits to the safety, security or efficiency of the facility.

On a different level, computing technologies can potentially encourage the evolution of the architecture and the operational philosophy of a

new facility. When integrating a computer technology for storage and retrieval of information, for instance, the architect and operator should consider reallocating some of the space traditionally needed for paper storage to program space. When using new technologies for control and monitoring, the design team should investigate ways to use that technology to challenge the traditional notions of severely restricting inmate movement or explicitly observing every aspect of an inmate’s daily routine. Video communication opportunities can extend into the cell with delivery of educational, religious or social skills programming. With proper management, video communications can also provide extended visitation, teleconferencing and telemedicine opportunities, all beneficial to the inmate but not as easily achieved without the new technology. These simple yet effective design solutions can be realized when a new technology is fully integrated into the planning of a new facility by considering the humane, reform and rehabilitation benefits of that technology as well as its benefits to the safety, security and efficiency of the facility.

## INMATE TRACKING SYSTEMS

Some new and emerging technologies require simple, physical integration but involve much more thought for their integration into the operational philosophy of a facility. A good example of this is the inmate tracking system. Similar to the man-down system, but on a much larger scale, the inmate tracking system requires each inmate to wear an identification device, usually a wristband or ankle bracelet, that sends constant information about the inmate’s location to a central annunciating device. The identification device can also provide such information as special medical conditions, risk level and privileges allowed. Like man-down technology, to integrate this system into the design, the architect and engineers must consider location of the signal receivers/transmitters, eliminating interference, and properly interfacing this system within the larger security

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network, if desired. And, like man-down technology, its benefits address the traditional objectives of correctional facility design. The technology provides more safety by reducing the likelihood of specific inmate-on-inmate assaults, better security by alerting staff when an inmate is too close to the perimeter, and increased operational efficiency by giving the operator the option of reducing traditional required movement for headcounts.

The system, however, can also allow for changes to the operation of the facility that could promote the less traditional objectives previously identified. By reducing movement time for headcounts, more time and staff are available for other, more life-skill building functions such as educational opportunities, visiting, recreation and hobbies. Less emphasis on direct visual observation by staff from secure locations can mean reduced reliance on the need for long, straight corridors extending from strategically placed control centers. An inmate-accessible computer network, coordinated with the inmate tracking system, could allow an inmate to request clearance for otherwise restricted movement from a computer terminal in his or her cell or dayroom. Once access is granted, either a one-time access code or a window of time could be assigned to the inmate, allowing the inmate some control and responsibility over his or her own movement. These and other examples either exist or should be explored as ways the inmate tracking system can be integrated into the design of a new correctional facility to effect change in the operations of a facility to encourage reform, rehabilitation and a more humane setting.

### MATERIALS AND EQUIPMENT

Technological improvements in the materials and equipment used to construct correctional facilities can be evaluated on different levels for

their impact on the facility as well. The "bricks and mortar" component of a facility has always been an important part of promoting the safety and security of correctional design and, after these considerations, materials and equipment are continually being refined both for their initial and life-cycle costs. Once this data is incorporated into the design for these objectives, a new material or equipment technology should always be evaluated for its ability to expand on the limitations of the technology it is replacing.

For example, stronger, more durable glazing, traditionally integrated into the design for the safety of staff and inmates through better direct observation, can also be integrated into the design to allow for more natural light and exterior viewing opportunities, thus creating a more humane environment. More contact visiting opportunities are possible because better scanning capabilities used to enhance security through contraband control are being developed, promoting continued social relations during the incarceration period. The use of materials and finishes to create more natural and contemporary surroundings while maintaining the required levels of security, durability and sound quality, afford the opportunity to add variations to form, color and texture, encouraging an atmosphere where occupants may be more receptive to participating in educational and vocational programming. Like its systems technology counterpart, many examples exist for the use of new materials and equipment innovations to stretch beyond their intended benefits, and more applications are possible if adequately explored.

### IMPLEMENTATION CONSIDERATIONS

New and emerging technologies have a significant role to play in the evolution of correctional facility design. However, implementing these

technologies to achieve a more humane setting or for rehabilitation of inmates will likely never occur at the expense of the safety of staff and inmates, the security of the community or the efficiency of the operation; nor should it. Correctional facilities are, after all, places of incarceration. Departments need to ensure the safety of staff in order to attract and retain employees. Departments also have the responsibility to provide safety for the inmates as a condition of their confinement. In addition, society wants to be safe from those who have broken the law and, to some degree, want the security of knowing those individuals will remain imprisoned to complete their sentences. Finally, the pressure for funding is always a factor, and a correctional facility must always demonstrate the most efficient use of the limited funds it receives, both in its initial design and through the life of its operation.

However, in the course of evaluating and integrating new and emerging technologies for their application in the field of correctional planning, designers and operators, after accepting those technologies for their traditional application, should challenge the traditional architectural and operational constraints embodied in the limitations of the obsolete technologies they replace. The benefits of any new technology to mitigate the negative aspects traditional objectives bring to correctional design may not seem as tangible as those for safety, security and efficiency on the surface, but could ultimately prove more valuable when the cost of incarceration to society is fully weighed.

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*William Box, AIA, is principal of CSNA Architects in Colorado Springs, Colo. Nolin Renfrow is director of prisons for the Colorado Department of Corrections. The authors would like to thank John J. Clancy for contributing to the article.*