

The Architectural Layout of Jails and Its Influence on Inmate Experience and Well-Being

Introduction

Prison architecture visually represents a society's correctional philosophy, directly shaping how people who are imprisoned experience safety, control, and rehabilitation (1, 2). Jail layouts actively establish the physical conditions that determine a jail's social climate and inmate behaviors (2, 3, 4). The traditional jail design with its poor sight lines where control is maintained through physical barriers and visual surveillance, however, has often generated efficiency, safety, and staffing problems for officers, requiring them to walk hallways and peer into inmates' cells. (5) There was little contact with inmates other than enforcement and routine wellness checks.

In the early 1970s, architects with the Federal Bureau of Prisons designed "new generation" jails according to a "direct supervision" model that incorporated small, decentralized living units divided into triangular or rectangular pods and noninstitutional or "normalized" environments like dayrooms with televisions for inmates to socialize (6). This design also took officers out of control rooms and placed them in inmates' living areas to interact directly with inmates (6). In this model, control is established through personal contact and communication (6). Direct interaction allows officers to quickly interact with inmates, decreasing incidence risk and building trust (6).

Recent research efforts in carceral geography¹ and environmental psychology² have found that prison architecture that creates overcrowded conditions causes significant stress to incarcerated individuals (6). These perspectives have produced the "ethical prison architecture" framework that focuses on how the jail's physical environment impacts the well-being of incarcerated individuals and staff (1). This framework defines well-being comprehensively to encompass mental, physical, social health, and safety (1, 8). It is anchored upon three theoretical constructs:

- 1) humane treatment (habitable spaces, safety, and dignity);
- 2) autonomy (the capacity to make choices and customize one's environment); and
- 3) stimuli (the management of negative environmental stressors and provision of positive, therapeutic engagements) (1).

Sociological and environmental research reveals critical trade-offs between centralized and decentralized jail layouts.

¹ Carceral geography is the study of confinement spaces and practices, how incarceration and surveillance affect life inside detention spaces such as prisons, detention centers, immigration facilities, incorporating the work of scholars such as Michel Foucault, Erving Goffman, and Giorgio Agamben.

² Environmental psychology is the study of how environments both natural and non-natural shape human behavior, well-being, and cognitive processes (and vice-versa).

In general, single-level campus and podular designs foster positive social climates, bolster staff-inmate relationships, and lower violent victimization rates (1, 3, 9) but are linked to higher rates of property-related misconduct (1, 4). Conversely, multi-level linear cellblocks restrict property crimes but exhibit higher rates of physical violence due to corridor blind spots (8).

Ultimately, providing cell-level environmental autonomy, acoustic normalization, and perimeter greenspaces helps to protect against psychiatric crises, self-harm, decrease rates of staff sick leave, and lower risks of inmate suicide (1, 10).

I. Structural Layout Definitions

There have been several prominent carceral architectural layouts, reflecting distinct historical eras and shifting penal philosophies (1, 3). These can be divided into single-level/low-rise or multi-level/high-rise configurations.

Interestingly, scholarly literature has not focused on single-level versus multi-level jail design absent context; rather, researchers have studied jail populations to identify the factors that affect inmates' experiences and have identified jail layouts as a central determinant in that respect.

A. Single-Level / Low-Rise Decentralized Layouts

The campus layout features multiple single-story clusters arranged across a large, open perimeter (3, 4). It typically incorporates small living units (often called housing pods) that operate semi-autonomously around a central dayroom (3, 11).

B. Multi-Level / Centralized Layouts

There are several types of multi-level or centralized layouts, including the Panopticon, Radial, Telephone Pole, and High-Rise models.

- Panopticon Layout: Jeremy Bentham designed this circular model featuring multiple tiers of cells around a central "inspection house" stacked vertically under a domed roof (1, 3). The panopticon model was historically designed to heighten surveillance and increase inmates' moral reform through physical distance and "seeing without being seen" (1, 3).
- Radial Layout: This model features multiple multistory wings of cells radiating outward from a central inspection hub, designed under the nineteenth-century Pennsylvania system of solitary confinement to maximize visual monitoring from a single vantage point (1, 3).

- Telephone Pole Layout: Rows of parallel multistory cellblocks (resembling rungs on a telephone pole) connected by long, restricted central corridors that serve as the main spine of the facility (1, 4).
- High-Rise Layout: Multiple small, stacked housing pavilions configured vertically within a multistory urban building, designed to optimize space in metropolitan environments (3).

These layouts transition historically from one to the other. The oldest modern facilities were rectangular in shape (such as London's Newgate Prison, opened in 1769), reflecting little concern for inmate or staff safety, separation, or well-being (1). This model was superseded by the nineteenth-century focus on panoptic and radial layouts that used physical layout to emphasize and facilitate surveillance, isolation, and moral reform (1, 3). In the mid-to-late twentieth century, the system shifted toward telephone pole and early campus layouts designed to increase rehabilitation and enhance opportunities for programmatic activities (1, 4). However, the late twentieth and early twenty-first centuries saw a massive expansion of standard high-security linear cellblocks designed for incapacitation, standardized risk containment, and cost-efficiency (1, 2, 4).

II. Social Climate and Staff-Inmate Relationships

Interpersonal relationships between correctional officers and inmates are a key factor of a facility's "moral performance" and are critical to institutional order and inmate adaptation (2, 3). Empirical research demonstrates that prison layout directly influences these social dynamics.

Single-level campus and podular designs have an advantage; inmates housed in campus-style layouts evaluate their relationships with staff most positively (3). Decentralized structures featuring smaller, semi-autonomous living units encourage regular, face-to-face, and informal communication between inmates and staff (1, 3). This spatial organization facilitates "dynamic security," a security model built on mutual trust, active communication, and human contact instead of physical barriers (3, 12).

In contrast, inmates housed in panopticon layouts evaluate their relationships with staff least positively, followed closely by those in radial designs (3). The multistory, circular panoptic configuration enforces a rigid physical and psychological distance (1, 3). Staff stationed in central towers or closed control booths are perceived as detached "guards" rather than professionals, fostering an adversarial, detached "us vs. them" prison culture (1, 2, 3, 12).

Beijersbergen found that, although high-rise layouts initially showed positive evaluations of staff-prisoner relations, this effect was entirely a product of staffing ratios rather than architectural layout (3). High-rise facilities are typically operated with significantly higher

staff-to-inmate ratios, offsetting the inherent social barriers of their vertical, stacked design (3).

Environmental stressors also have a pervasive impact on carceral social climate. Individual architectural variables can greatly degrade social relations. Chronic, uncontrollable noise, poorly ventilated air quality, high temperatures, and highly restrictive facilities (such as strictly rationed shower access or controlled cell temperatures) can become psychological “irritants” (1, 8). These environmental stressors elevate stress, anxiety, and irritability among both staff and inmates, degrading communications, breeding hostility, and increasing staff sick leave (1, 8).

III. Environment, Inmate Misconduct and Victimization

The choice between single-level campus layouts and multi-level cell corridors creates distinct “opportunity structures” that influence both officially recorded rule violations and actual inmate victimization.

One large-scale multilevel assessment of Texas prisons showed that overall architectural design had no direct impact on violent misconduct but was significantly associated with non-violent misconduct (4).

Campus layouts provide greater freedom of movement than other models and frequently utilize open dormitory housing, which increases physical proximity and access to other inmates and their personal belongings (3, 4). Campus layouts with dormitories exhibited higher rates of property theft but lower rates of physical assault victimization (9). The high visual exposure of open spaces deters physical violence but leaves personal property vulnerable when inmates are away (9).

When examining actual victimization experiences (as opposed to administrative disciplinary write-ups), researchers found that multi-level telephone pole designs with cells were associated with higher rates of physical assault victimization (9). These outcomes were driven by poor visibility, acoustic isolation, and corridor “blind spots” that obstruct direct staff observation, delay response times, and reduce effective guardianship over vulnerable inmates (9, 11). When a jail design had good “sight lines” that give officers a view of a unit (with limited amounts of space out of sight and hearing), the distance between staff and inmates was decreased and interactions increase so that staff had better knowledge of what is going on in each living unit (3).

In terms of jail facilities, traditional centralized jails incorporate “hard” architecture (concrete walls, steel doors, steel toilets, bolted iron furniture) under the assumption that inmates are destructive (1, 10, 11). Environmental psychology studies have found that indestructible, “vandal-proof” fixtures communicate negative behavioral expectations to inmates, effectively signaling that they are expected to be and act as criminals, actually provoking destructive, testing behaviors (1, 10). In contrast,

incorporating "soft" materials like carpets, acoustic tile, wooden furniture, and cushioned seating can humanize carceral space, counteract monotony, and effectively deter the motivation for property destruction (8).

Recent macroanalyses also reveal a powerful relationship between vegetation and carceral safety (1). The mere presence of vegetated greenspace within prison perimeter walls, even if it is not directly accessible or viewable by the inmates, is significantly associated with lower rates of self-harm, reduced inmate-on-inmate and inmate-on-staff violence, and lower staff sick leave (1).

IV. Inmate Well-Being, Environmental Stressors, and Suicide Risk

Extreme environmental stressors in traditional multi-level, cellblock-style facilities, including sensory deprivation, severe noise, and lack of privacy, can severely damage psychological well-being and exacerbate suicide risk (1, 8, 10).

Certain jail environments can cause acoustic stress and illness, and traditional centralized jails constructed with hard, reflective materials produce loud, constant, and uncontrollable noise (8, 11). Chronic exposure to noise pollution is a significant stressor that interferes with sleep, impairs concentration, and directly contributes to illnesses exacerbated by chronic stress, such as hypertension, cardiovascular disorders, and asthma (1).

The social density and lack of privacy in jails are also correlated with stress and poor well-being. Open dormitories with high social density (many individuals sharing a single room) are associated with elevated stress hormones, sleep disruption, social withdrawal, and high rates of illness complaints (1). Campus layouts (or "new generation" jails) with small units and a direct line of sight can have a positive impact on staff-prisoner relationships (3).

Cell environments and the degree of autonomy also can decrease the risk of psychiatric crises (1, 10). In a national assessment of suicides in direct supervision jails, facilities scoring high on a jail environmental score were about half as likely to experience an inmate suicide (odds ratio of 0.510) (10). This protective score is calculated on three key variables: allowing inmates to control the lights in their own rooms or cells (10); allowing inmates to freely enter and exit their cells into the dayroom during most of the day (10); and utilizing rubber bumpers and other sound-reduction materials to reduce echoes (10).

Giving inmates a measure of choice over lighting and movement can provide a vital sense of agency and privacy control, mitigating the critical feelings of helplessness and desperation that frequently trigger suicidal crises (1, 10). Denying environmental control fosters helplessness and doubles the likelihood of inmate suicide (10).

Finally, in environments where residents are severely deprived of nature (such as administrative segregation or solitary confinement), exposure to simulated natural environments can be highly therapeutic (1). Segregated inmates who were provided with regular exposure to nature videos for one year experienced 26% fewer disciplinary referrals and self-reported lower levels of stress, anxiety, and aggression (1).

V. Why Single-Level Architectural Designs are Superior Where Feasible

Based on the synthesized sociology, environmental, and spatial literature, single-level/low-rise architectural designs are superior for the following reasons:

1. Single-Level Designs Facilitate Podular Construction: Podular construction has a number of advantages (see above). Pods work best when housing, supervision, services, and movement are organized horizontally around discrete living units, instead of being stacked vertically and imposing dependency on stairs, elevators, secure shafts, and more complicated circulation. Podular construction allows for enhanced sight lines throughout the entire facility without having to transition from floor to floor. Podular design also facilitates inmates' direct control over mobility and autonomy and are usually constructed in units where inmates can be granted maximum daytime access to move freely between their cells and communal dayrooms (1, 10).
2. Single-Level Design Increases Efficiency: In a multi-level jail, staff and inmate movements between housing, booking, medical, recreation, visitation, transport, laundry, and programming require control points, which necessitates more doors, cameras, security posts, escorts, and delay opportunities. A single-level (podular) jail can shorten movement paths, reducing staffing burdens because pods can connect to shared services through controlled horizontal corridors.
3. Single-Level Facilities Facilitates Inexpensive Modular Construction: Multi-level jails are more expensive to construct because they must support heavy detention loads above other detention loads (concrete, steel cells, secure walls, plumbing, mechanical systems, etc.). According to the National Institute of Corrections' *Jail Design Guide*, vertical expansion raises construction costs because columns, beams, stairs, elevators, and mechanical systems must be engineered to support upper-level capacity (13). These systems are more expensive to build for jails because they must be hardened and cannot be the same versions of systems incorporated into other public buildings. Often, these systems must be custom-designed for multi-level facilities. Extra space is wasted on corridors, stairs, elevators, secure vestibules, and movement routes.

But in a single-level podular building, plumbing, HVAC, electrical, cameras, locks, intercoms, etc. can be run directly from pod to pod, eliminating the complex

vertical coordination between floors. Podular construction also uses repeated housing units (similar cells, dayrooms, showers, doors, fixtures, etc.) which allows details to be standardized instead of customized. Direct-supervision podular systems designed around staff presence, visibility, and not remote surveillance and physical barriers can also reduce the need for extra hardening. Space is saved by placing housing units around shorter controlled circulation paths so that more of the building's square footage is useful jail space.

4. Single-Level Designs Facilitate the "Greening" of Carceral Perimeters: The well-being of inmates and staff is increased when designers maximize the percentage of vegetated green open space within prison perimeter walls (1). Even when security regulations prohibit direct inmate access to these spaces, the passive presence of vegetation acts as a powerful structural buffer that significantly reduces self-harm, inmate violence, and staff absenteeism (1).
5. Single-Level Design Facilitates Acoustic Normalization: Overreliance on cold, reflective concrete and steel diminishes inmate and staff well-being (1). Incorporating sound-absorbing materials (such as rubber door bumpers, carpets, and acoustic ceiling tiles) humanizes the carceral environment, lowers ambient noise stress, and deters property destruction (1, 11).
6. Single-Level Facilities More Easily Incorporate Universal Design and Age-Friendly Accessibility: Jails must be designed with universal accessibility to accommodate aging populations and those with physical or cognitive disabilities (1, 11). Design plans must include ramps, grab bars, railings, proper signage, and non-restrictive plumbing utilities to preserve basic human dignity and reduce institutional strain (1).

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