CREATING A SAFER SPACE REVIEW OF ENVIRONMENTAL CRIME PREVENTION TECHNIQUES IN PANDESARA

Strategies for Preventing Crime

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Abstract: Techniques for Preventing Crime Numerous factors, including social, political, and economic ones in addition to environmental ones, have an impact on crime. Humans have a basic need for security and safety. The rate of crime in India's cities has been steadily rising, and efforts to lower it are working. People are drawn to dwell in this neighborhood by its cosmopolitan lifestyle, spacious roadways, cutting-edge amenities, and serene surroundings, yet these same attributes also make it susceptible to criminal activity. Because the police do not respond to crimes in a timely manner, many of them go unreported and ignored. Criminologist C. Ray Jeffery developed the idea of crime prevention through environmental design (CPTED) in 1971. Other notable criminologists who supported the idea included Timothy D. Crow, C. Ray Jeffery, architect Oscar Newman, Jane Jacobs, and Schlomo Angel.

First proposed by criminologist C. Ray Jeffery in 1971, the idea of crime prevention through environmental design (CPTED) was further developed by renowned criminologists Timothy D. Crow, C. Ray Jeffery, architect Oscar Newman, Jane Jacobs, and Schlomo Angel. The main factors that determine safety and security in an urban setting are (i) surveillance will someone committing a crime be seen by anyone? (ii) access how easy is it to enter and exit a place? and (iii) territoriality does anyone care about what goes on around them, or is there a sense of belonging to the space among the users? Building layouts, street designs, public spaces, and public facilities can all be addressed at the urban design level to influence both the likelihood of crime and the fear of it. The authors do, however, recognize several commendable initiatives in Indian places such as Ahmedabad, Bangalore, and Surat, where improved surveillance techniques combined with community involvement have transformed the urban landscape and significantly increased public safety.

In order to address security concerns in Indian cities, this paper aims to identify the factors that lead to criminal activity within an urban area. It also emphasizes the importance of crime prevention strategies and the applicability of environmental criminology to Pandesara city planning and management practices.

KeyWord - Environmental Criminology, Crime Prevention Strategies, Urban Design, Pandesara.

I. INTRODUCTION

The provision of public safety has become a crucial duty for governments everywhere. It alludes to the state's obligation and role to guarantee the security of its people, institutions, and institutions from dangers to their security. Given that over half of the world's population now resides in cities, city safety is becoming more and more important for maintaining wealth and safe living conditions. In order to reduce and prevent ongoing problems with crime and insecurity, every strategy for urban safety must directly apply the fundamentals of good governance (Clarke R. V., 1980).

Because of the interaction of factors including the globalization, fast urbanization, population growth, and environmental deterioration, many modern cities are now more susceptible to criminal activity. Crime frequently results from societal tensions and anonymity undermining modern cities' security. It is essential that a city's security and safety infrastructure respond to the citizen, who is the primary stakeholder, by providing a safe, sustainable, and prosperous environment (Coles, 1996).

II. ENVIRONMENTAL DESIGN AND CRIME PREVENTION

Through an examination of the time, place, space, behavioral patterns, targets of crimes, and offenders themselves, research on environmental criminology and psychology has developed a number of ideas, concepts, and approaches to crime prevention (Communities, 1992). Defensible Space, "Crime Prevention through Environmental Design", "Routine Activity", "Rational Choice Model", "Environmental Criminology", "Prospect and Refuge", "Hot Spots", "Crime Displacement", and "Crime Mapping". All of these theories agree that security and safety are essential components of the environment that well-designed urban places provide, and that they can significantly contribute to reducing crime and enhancing community safety (Atkins, 1991).

The need of the criminal, the victim's susceptibility, and the environment that affects a person's perception and reaction determine the pattern of crime. Both offenders and victims create mental models or comprehensive representations of their surroundings, from which they interpret or react to risks and possibilities (Brantingham, Environmental Criminology, 1981). According to McDonald and Gifford (1989), criminals create templates of sites and use them to choose targets, locations, and times (Eck, 1995). The victims also construct a logical template that links every type of object, location, and circumstance to either danger or reward depending on their past exposure, personality traits, and experiences (Brantingham, Paths and Edges: Considerations on Environmental Criminology, 1993). The degree of permeability and visibility is shaped by the surrounding environment, which establishes "how much can be seen" and "how far can one move." The surroundings provide indications regarding the features and form of the nearby backdrop. According to Crowe (2000), it is clear that while positive cues elicit desirable behaviours and responses, negative cues cause fear and avoidance behaviours (Clarke R. V., 1976). Macro factors that impact crime patterns and incidents include specific land use, street layout, disorder and deterioration, physical entrapments, and block visibility (Crowe, 2000). Buildings, block faces, and street segments are examples of micro units of analysis that can generate, attract, or arrest crime. Therefore, altering the built environment can lessen the likelihood of crime (Hannah, 2013).

2.1 CRIME PREVENTION THEORIES

Defensible Space Theory: Oscar Newman identified poor access control, project size, and layout as the main causes of high crime rates after studying more than a hundred public housing developments in America. According to the Defensible Space Model, organized physical spaces can support social systems and prevent crime. In order to deter crime, Newman proposed four essential components: territoriality, natural surveillance, image, and milieu. Additionally, he distinguished between legal and illegitimate users by defining four different sorts of zones: (i) public space; (ii) semi-public space; (iii) semi-private space; and (iv) private space (Hillier, 2000). It was said that this approach ignored the social aspects of renters (Jeffery, 1977). This theory, which was skewed somewhat in favour of environmental determinism, addressed the possibility of outside dangers but disregarded the possibility of crimes being committed by authorized users of the area. Despite its contentious nature, this study provided guidance for subsequent investigations that supported the significance of lighting, street activity, accessibility, land use, and closeness to transit routes in reducing crime (Schneider, 1996).

Prospect-Refuge Theory: According to this idea, people's perceptions of how safe a physical environment appears to be are influenced by its provision of Prospect (long lines of sight, wide angle of view) and Refuge (many evacuation points nearby). It was further revealed that targets' vulnerability is increased by entrapment and concealment. Consequently, a secure location is one that permits full view of the surroundings

without putting the person in danger. A place's potential and refuge are said to be impacted by a number of factors, including lighting, accessibility, openness, novelty, complexity, and order (Wilson, 1982).

2.2 CRIME PREVENTION STRATEGIES

According to Hannah et al. (2015), the following tactics seek to organize the physical environment to deter crime and lessen public fear of it.

The British Government's Criminal Research Department created Situational Crime Prevention (SCP) in the 1970s to lessen the likelihood of any type of crime happening in any kind of environment. It prevents crime in four categories: by raising perceived effort, raising perceived dangers, lowering expected rewards, and eliminating justifications (Sherman, 1995).

The criminologist C. Ray Jeffrey first used the term CPTED in 1971. He maintained that the overemphasis placed on social reasons of crime meant that biological and environmental factors were ignored. According to CPTED, human space serves three purposes: (i) "Designation," which refers to the space's intended use; (ii) "Definition," which covers the space's social, cultural, legal, and psychological definitions; and (iii) "Design." The following categories are used by CPTED to explain this concept (Ramsay, 1991).

i. The technique known as "territorial reinforcement" involves utilizing physical architecture to establish a boundary that clearly distinguishes between public and private areas. The feeling of possession over this area makes one more accountable for keeping an eye on it and deters invaders. After being presented by Newman in 1972, territoriality as a strategy was proven to be a useful idea that complemented defensible space. Thus, territoriality promotes natural defensibility, natural congregation, and natural guardianship. The elements that aid in defining boundaries are property lines, fences, driveway treatments, pavement patterns, and landscaping plantings.

ii. The concept of "access control" in design deters people from entering specific areas by making it more difficult and dangerous for criminals to get there. The primary architectural aspects that are modified to produce a naturally defended space are legibility, permeability, exposure, and enclosure. Access control elements include things like bollards, gates and fences; hardware such as locks, chains, burglar bars, alarms; roadways, sidewalks and building entrances; vertical movement indications such as staircases; and horizontal movement indicators such as exterior balconies and terraces. Setback details and building connectivity both make significant contributions. Conflict within methods include regulated entry and exit points that impede the movement of authorized users and permeable street designs that reduce the chance of trapping yet facilitate escape.

iii. The goal of "surveillance design" is to maximize visibility through the layout and positioning of activity areas and building façades in relation to the public domain. Enhancement of surveillance can be achieved through mechanical surveillance, police patrol, lighting, and controlled traffic. Strong situational deterrents can also be achieved with clear sightlines. It is stated that two factors that predict surveillance are street activity and population density. Because of their robust inter-visibility and extensive movement, integrated and connected areas are regarded as safe. Research has also emphasized the significance of lighting. According to Clarke et al. (1991), electronic surveillance also lowers crime. The urban setup's geometry and arrangement have a significant impact on visibility. Visible permeability and felt ambience are influenced by building heights, street widths, edge building designs and colors, urban square syntax, tree canopies and night lighting.

iv. One method of "designing out crime" is "target hardening," which aims to limit opportunities and make crime more difficult and costly. Importantly, installing mechanical surveillance equipment like CCTV cameras and door alarms, as well as installing glass in windows, are clear answers that raise the danger level for criminals without interfering with other crime prevention tactics. Target hardening solutions that just rely on physical barriers block access, create concealed spaces, and limit sightlines. By reducing permeability and surveillance, it upsets the equilibrium while fortifying territoriality.

v. One aspect that presents structures or an urban area as either crime-generating, crime-attracting, or crime-neutralizing is "maintenance." Physically dejected expressions and inattention frequently invite more accidents. It claims that even in cases where crimes are not committed there, these sites make people more vulnerable by taking away their feeling of territorial domain.

III. RESEARCH METHODOLOGY

Vulnerability is defined by the UN Safer Cities programme as the likelihood that a person, a household, or a community will fall below a minimum welfare level (such as the poverty line) or that they will experience physical and socioeconomic consequences (such as homelessness or physical harm) as a result of risky events and processes (such as forced eviction, crime, or flood). It is possible to lower the likelihood of crime and provide a safe and secure urban environment by paying close attention to urban vulnerabilities and violence.

3.1 Detroit:

The community was abandoned and nearly abandoned when the three automotive behemoths left Detroit. The individuals who remained behind were unemployed, but there were still other sectors of the economy. The once-developed districts, which included stores, hospitals, and all the amenities a person could want, were now abandoned and high-crime areas. The community decided to implement the following measures to bring life back to the neighbourhood:

- Locals launched communal garden projects on abandoned, underutilised property and began growing vegetables and orchards on these plots.
- Bringing the community together to construct the community centre and to understand the neighborhood's problems. By giving people a chance to get to know their neighbours, this promoted a sense of community and increased neighbourhood safety.

3.2 Colombia

It is ranked as the fifth most violent nation in the world, with over 15,000 killings documented in 2010. In recent years, Colombian Red Cross has been working with the Norwegian Red Cross to execute violence prevention and mitigation programmes in eight Colombian cities. These projects include the following strategies:

- Holding workshops to impart musical expertise and various art forms so that young people in the area can express themselves and have their neighbourhood serve as a platform for their artwork.
- Assisting kids and young people in fostering the social skill development that leads to the peaceful resolution of conflicts and the development of leadership abilities.
- Building community centres that involve the local population in order to in still a sense of ownership and community involvement.
- Creating designated areas for them to do graffiti art, which keeps the young people busy.
- Encouraging young people to attend school, receive a better education, and acquire abilities like song writing.

3.3 Surat, India:

Surat has experienced a significant influx, and it often receives a large number of tourists and cars. It claims to have extremely congested textile and gem markets. Because security posed a long-term risk to Diamond City, the safe city project was started in order to mitigate it. A Homeland Security Project was designed to install about 5000 CCTV cameras throughout the city gradually with the support of Police Commissioner Surat and well-known citizens. The project would cover the railway station, bus stand, diamond and textile markets, all residential areas, city main roads, city borders, the Hazira Industrial Area, sensitive areas, and other industrial establishments. The goal was to achieve efficient city surveillance using highly scalable technology, a cutting-edge command and control center with 100% fiber connectivity for all locations, the newest, upgradeable IP video management software, servers, and recording devices with massive capacities and carefully controlled redundancy standards. The components listed below guarantee the project's success:

- comprehensive coverage of video security operations incorporating a variety of hardware and software surveillance technologies.

- Important decision to choose more effective motion-controlled PTZ (Pan, Tilt, Zoom) cameras and better static cameras for capturing images.

- The control room's design takes into account the installation of a number of interconnected systems for a seamless, expandable surveillance system that can perform special security activities. A surveillance network is set up to allow data and video from distant sites to converge and reach the control room.

- Large screen displays that are especially made to withstand the worst control room conditions are called display solutions, and they are becoming an essential tool for group decision-making and collaborative monitoring.

- A well-designed data center with power availability, sufficient redundancy, sufficient cooling, stringent security measures, and a suitable cabling media type.

- An effective video management system solution with strong, fully integrated video management features, such as interactive facility maps, software-based virtual matrix, automated system health monitoring and event responses, investigation management, powerful and user-friendly video viewing interface, ultra-thin client for remote users, and more.

IV. SAFETY CONCERN IN INDIAN CITIES

A carefully planned data center with adequate cooling, power availability, redundancy, and security features as well as the right kind of cabling media. An efficient video management system solution that includes robust, fully integrated video management features like virtual matrix software, interactive facility maps, automated event responses and system health monitoring, investigation management, an ultra-thin client for remote users, and more. Monitoring and analytics to protect vital public infrastructure and create a safe urban environment. In India, law and order administrators have historically been the only ones with a thorough understanding of environmental criminology. There is very little reason to apply the same principle more broadly to constructed space design. Therefore, to provide crime prevention in an urban context, spatial design and management must be integrated with traditional security methods.

V. IMPORTANCE OF LIVING IN SAFE CITIES

People can stroll the streets with confidence at any moment when they live in a safe city since it guarantees calm. It has a big impact on someone's lifestyle, encourages wellbeing, and lowers stress levels. The choice of city for employment and residence is influenced by safety. India, a country with many cities, offers a lot of secure areas to live. In addition to providing a safe environment, these cities also have higher living and employment standards.

5.1 Factors that make these cities safe

The safety of these Indian cities has been improved mainly by the following considerations.

i. Effective law enforcement: India's safest cities are mostly shaped by effective policing. As a consequence, living and working conditions are secure. The degree of safety in these cities is greatly influenced by the efficiency of the law enforcement agencies. India's safest cities are thought to have effective law enforcement.

ii. Strong involvement with the community: Effective community involvement is essential to creating safe cities. Mutual trust is strengthened when community members actively participate in events. Second, by encouraging candid communication and a sense of shared accountability among participants, it supports strategies for preventing crime. Thirdly, this kind of involvement promotes more inclusive decision-making, guaranteeing that security issues are appropriately addressed.

iii. Minimal Rates of crime: Discover the peace and safety of India's best cities, which are renowned for having low crime rates. These cities provide a safe, tranquil atmosphere in which to live and work. These cities have done a good job of keeping the peace. Low crime rates are a result of strict laws, good policing, and informed residents.

iv. Getting in touch with nature: There are many opportunities to experience the tranquilly of nature whilst living in India. The safest cities offer the perfect blend of urban comforts and scenic nature surroundings. Urban areas such as Chandigarh and Thiruvananthapuram are renowned for their immaculate surroundings and verdant landscapes, which facilitate regular interaction with the natural world.

5.2 Challenges in ensuring safety in Indian cities

Indian cities confront several obstacles in guaranteeing the safety and welfare of their inhabitants, even with their best efforts to improve security. Among the principal difficulties are:

i. Urbanization Pressure: In many Indian cities, overcrowding, poor infrastructure, and limited resources are the results of rapid urbanization. This may make it harder to maintain public safety and lead to higher crime rates.

ii. Road safety and traffic congestion: In Indian cities, traffic congestion is a frequent problem that contributes to accidents and raises questions about pedestrian safety. These issues are made worse by shoddy road infrastructure design and lax enforcement of traffic laws.

iii. Crime and law enforcement: Stealing, vandalism, and violent offences are just a few of the crimes that Indian cities have to deal with. Effective law enforcement and crime prevention can be hampered by corruption, outmoded policing techniques, and an inadequate police presence.

iv. Gender safety: With frequent incidences of harassment, assault, and gender-based violence, women's safety is still a major problem in Indian cities. This problem is exacerbated by social attitudes, cultural norms, and insufficient support networks.

v. Infrastructure Vulnerabilities: When natural disasters like floods, earthquakes, and fires strike, there is a risk to public safety due to poorly maintained structures, insufficient drainage systems, and shoddy emergency response methods.

vi. Cybersecurity risks: Indian cities are vulnerable to cyber dangers such as hacking, data breaches, and online fraud due to the country's growing digitization and reliance on technology. Inadequate cybersecurity protocols and insufficient knowledge heighten these hazards.

To tackle these issues, all-encompassing approaches incorporating government initiatives, community involvement, and cooperation among many parties are necessary.

5.3 safest cities in India

The National Crime Records Bureau (NCRB) published a study early in December 2023 that described safety trends in Indian cities. According to this research, the safest cities in the nation are listed below.

1. Kolkata

For the third consecutive year, Kolkata, the capital and largest metropolis of West Bengal, has been named #1 on NCRB's list of the safest cities in India. Among metropolises, it recorded the fewest number of cognizable offences per lakh people. Kolkata recorded 86.5 incidents of crimes that could be prosecuted per lakh residents in 2022. Additionally, this city has made a name for itself as one of the safest for women in all of India. Under the Nirbhaya Fund, the government launched the Safe City Project for women and children. Called the "City of Joy" for good reason, Kolkata is a safe and thriving cultural hub.

2. Chennai

Chennai, the second safest city in India, is one of two Tamil Nadu cities that made it onto this list. Chennai recorded 173.5 incidents of crimes that could be prosecuted per lakh residents in 2022. Chennai provides a secure environment for both residents and visitors with its well-planned infrastructure, effective law enforcement, and proactive safety measures. The city is renowned for its efficient policing and monitoring systems and for having a low crime rate. Additionally, Chennai prioritises women's protection and has put in place policies like women's police stations and dedicated helplines.

3. Coimbatore

The second Tamil Nadu city on this list, according to NCRB, is Coimbatore. With 211.2 incidents of cognizable offences reported per lakh residents, the city is well-known for its efficiency, cleanliness, and safety regulations. Coimbatore is a prime example of a safe and peaceful urban area in India because of its dedication to safety, progressive mindset, and community involvement.

4. Surat

Surat, which ranks as the fourth safest city in India and the safest city in Gujarat, has recorded 215.3 cases of crimes that are punishable by law per lakh residents. The city's effective law enforcement departments and attentive community policing programmes are responsible for its low crime rate. Modern monitoring technologies combined with Surat Police's proactive approach to crime prevention guarantee prompt emergency response and efficient public safety management.

5. Pune

Pune, the safest city in Maharashtra, is ranked fifth among India's safest cities by the NCRB, with 215.3 reported cases of cognizable offences per lakh population. Pune's Women Safety Cell puts forth a lot of effort to combat gender-based violence and raise knowledge of women's rights, resulting in a city where it is safe for women to live and work.

6. Hyderabad

The "City of Pearls," Hyderabad, is thought to be among the safest places to live and work in India, with 215.3 cases of crimes that are considered crimes against the law reported for every lakh resident. It offers fantastic prospects for job seekers and entrepreneurs, embodying a blend of old-world charm and contemporary development. The community is well-known for its low crime rate and amiable residents. It is a centre of culture with a thriving lifestyle and a long history. Hyderabad also has a lower cost of living than the majority of other major Indian cities, which makes it a more desirable travel destination.

7. Bangalore

Bangalore, known as the Silicon Valley of India, is one of the safest places to work and live in the nation, with 337.3 documented cases of crimes against the law per lakh residents. The city is known for its expanding technical landscape, beautiful weather, and multicultural culture. Here, security and safety are of utmost importance, with frequent patrols by the city police. The city creates an atmosphere that is favourable for both students and professionals. In addition, Bangalore welcomes people from all walks of life due to its diversified population and tolerance for other cultures. Many people choose it because of its wide variety of work options and quickly expanding economy.

8. Ahmedabad

Ahmedabad, which ranks eighth on the NCRB's list with 360.1 cases of cognizable offences reported per lakh population, is the safest city in Gujarat after Surat. The city's proactive citizen involvement, effective law enforcement departments, and well-organized urban planning all demonstrate its dedication to public safety. Ahmedabad provides an exceptional atmosphere for living and working, distinguished by its harmonious fusion of contemporary conveniences and rich cultural legacy. Furthermore, the city's welcoming culture and international ambiance help its diverse inhabitants feel a feeling of community and belonging.

9. Mumbai

Mumbai, a thriving city on India's west coast, is well-known for its vibrancy, variety, and unmatched opportunities. Mumbai, the nation's centre for business, finance, and entertainment, draws millions of visitors each year with its dynamic living and working environment. As icing on the cake, it has been listed as one of India's top 10 safest cities, with 376.3 incidents of cognizable offences registered per lakh residents.

10. Kozhikode

Kozhikode, the only city in Kerala to make it to this list, Kozhikode has emerged as one of the safest cities in the country to live and work with 397.5 cases of cognizable offences reported per lakh people. Kozhikode's tranquil coastal setting, coupled with its rich cultural heritage and economic vitality, makes it a charming destination for those seeking a peaceful and fulfilling lifestyle amidst nature's embrace.

VI. RESULTS AND DISCUSSION

6.1 Design Recommendations for Safer City Pandesara

Traditionally, two theories have been offered to explain the relationship between crime and the built environment: (i) the "hardware rationale," which emphasizes target-hardening features such compound walls and locks (ii) the "community building rationale," which is predicated on the idea that better lighting, restricted access, and clearly defined boundaries deter crime; and (iii) the "social surveillance rationale," which is predicated on the idea that the physical layout of an area can act as a guardianship and deter crime.

In Gujarat and India, Surat ranks second and eighth in terms of popularity. It, along with eight other sizable cities around the nation, attained metropolis status in 1991 after surpassing the million-person mark. The population of Surat has been growing rather consistently during the past 20 years. This rapid increase in a brief period of time is indicative of Surat's demographic trends.

A centre for shanty towns in Surat, Pandesara is a zonal town inside the metropolis. Due to the consolidation of the town panchayats of Dindoli and Kharavasa as well as the municipalities of Godadara and Parvat, Pandesara has increased in both area and population. Due to the increased number of migrants in the region, the neighbourhood is also renowned for its chaotic construction. With a population of 41878, Pandesara is a hamlet in Gujarat's Surat district. There are 18036 females and 23842 males, respectively. The region is around 3.1 square kilometers in size.

6.1.1   Crime prevention through Urban Planning and Environmental Design

i.   Surveillance:

In urban settings, the following strategies can be used to accomplish passive or "natural" monitoring:

- Developing, planning, and maintaining public spaces and structures to maximize their conformity with other acceptable objectives that facilitate the possibility of passive observation.

- Strategically placing active public and private uses inside the precinct to optimize their ability to contribute to the surveillance of significant locations.

- Finding potentially "difficult" applications, such as nightclubs or bars, with less demanding ones nearby to make sure a variety of people are present.

- Creating public areas that support and promote acceptable private and public activity.

- Creating designs that allow unhindered sightlines to important locations, such as keeping view corridors above low shrubs or walls and beneath trees or shade structures.

- Avoiding "blind spots" where there is a reduced opportunity to see and be seen

ii. Legibility:

If an urban environment is planned so that people can easily navigate it and know where they are and how to get there, then it is considered legible. They would become more aware of their surroundings, more self-assured, and less anxious as a result. In an emergency, this would also facilitate the victim's rescuers' arrival. To guarantee readable text, one can:

- Placing key service locations in easily accessible and sensible locations.

- Creating communities and locations that make the most of already-existing man-made or natural features, such as public squares, major buildings, hills, rivers, and seafronts; these elements serve as landmarks and improve legibility.

- Promoting sensible variation in the building and space architecture and landscape design to produce more recognisable urban surroundings.

- Encouraging wayfinding with enough signs and maps in a clever, imaginative, and well-balanced manner that doesn't go so far as to undercut the very attributes that would ideally draw people to this location in the first place.

- Placing signage in sensible locations, such as next to building entrances, at bus stops, at crosswalks, and at other decision-making points.

iii. Territoriality:

People's sense of control depends on others not invading or intruding upon "their territory" without permission. Establishing acceptable boundaries between private, semiprivate, community group, and public spaces is crucial. Territoriality needs to be provided without causing a major reduction in monitoring.

- Creating and maintaining structures and areas that establish and communicate appropriate boundaries without constantly relying on formal tools like high fences, walls, "keep out" signs, locks, and guards.

- Ingeniously defining desired movement areas and drawing borders by utilizing constructed and landscape elements such as planting, material and texture variations, pedestrian shelters, level changes, artwork, signage, low walls, seats, and the like.

- Realizing the value of having a direct line of communication with and monitoring over structures and outdoor regions that are physically reachable from nearby public spaces.

- Making sure that the requirement for monitoring into and out of shared or private areas is balanced with the design of territorial features.

- Steer clear of taking too many routes to approach or enter private spaces or structures in case they cause confusion or ambiguity or impede proper privacy or security.

iv. Vulnerability:

Certain locations and circumstances put persons and property at risk because they increase the potential incentives for criminal activity. These increased levels of risk or vulnerability should therefore be carefully considered in the planning and management of the urban environment.

- Constructing and maintaining an environment that minimizes or reduces the danger of assault by including pathways and systems for bicyclists and pedestrians that lead to key locations as well as well-lit, busy, and overlooked areas.

- Avoiding the construction of blind spots, concealed spaces, or bends that provide areas of concealment, which hinder surveillance and restrict options, particularly near pedestrian and bicycle routes in public areas.

6.1.2 Technology driven measures

According to a network of surveillance cameras that collects the images and videos required to recognise threats and manage emergency situations, first responders may now be more aware.

i. Surveillance system and equipment: This makes it possible for first responders to be more aware thanks to a network of surveillance cameras that gathers the photos and videos needed to identify threats and handle emergency situations.

ii. IP cameras: An IP camera is a single item that houses both a camera and image processing, which includes network connectivity, video compression and digitization. Switches are used to move the video over an IP-based network, and video management software is used to record it to a common digital storage device.

iii. Video analytics (VA): The efficacy and efficiency of a surveillance system are contingent upon its capacity for video analytics. VA, sometimes known as intelligent video surveillance, is a technology that employs software to automatically recognize particular objects, behaviors, or attitudes. Examples of this technology include motion detection, trip wires, object removal or abandonment, facial recognition, license plate recognition, and others. This makes video surveillance a proactive monitoring tool that alerts authorities to the need for quick action, such as sending guard or other security personnel.

iv. Network connectivity: The foundation of the system is network connectivity, which carries data from the surveillance systems to the data centers and control viewing centers. It is crucial to confirm that the connectivity that has been provided is dependable, secure, and free from issues with latency, jitter, packet loss, and performance.

v. Data center: The core of surveillance-based safe city initiatives are data centers, which serve as repositories for real-time data gathered from surveillance sensors and supply it to command viewing centers for smooth, effective, and efficient operations. To ensure that activities continue even in the event of a primary data center failure, secondary data centers are typically created in addition to primary data centers. All of the programmes needed by the agencies to run systems, such as the automatic vehicle classification system, the automated number plate recognition application (ANPR), and the video management software and analytics application (VMS, VA), are hosted by this center. Enough room must be set aside for the digital data that the system has collected to be processed, stored, and retrieved.

vi. Command viewing centers: An apparatus known as a command viewing center (CVC) is one that gathers information, analyses data to facilitate speedier decision-making, and gets integrated information from the data center, including incident video streams. In order to guarantee integrated data visualization, real-time collaboration, and deep analytics that may assist the agencies in anticipating issues, organizing and managing reaction activities, and improving the continuous effectiveness of municipal operations, CVCs must be outfitted with intelligent operations capabilities.

vii. Collaborative monitoring: It is crucial that the information acquired by these agencies is shared with other government and commercial establishments in Indian cities where every establishment has understood the need to secure its infrastructure and set up surveillance, monitoring, and incident response systems. Government organizations including the aviation and transportation departments have already started using onboard surveillance systems, offering CCTV-based monitoring on public transportation, bus stops, metro stations, and airports. Under collaborative monitoring, these systems can easily exchange their data in real time with the city's security services. Similar to this, the city's CVC can receive live feeds from CCTV systems installed by private businesses including shopping centers, business parks, and entertainment venues so that the security organization can utilize the information.

viii. Change management: All stakeholders will be informed about changes to the information management and process flow through change management. This will introduce the proposed system to the stakeholders and explain the procedures that go along with it. It will also inspire, prepare, and enable security agency employees to embrace new ways of working and recognize the advantages that follow. It will give the authorities the abilities and mindset they need to enable them to carry out their responsibilities more successfully.

ix.   Capacity building: Developing the knowledge and abilities of departmental officials involved in operations and decision-making is a wise move towards ensuring the seamless execution of the planned procedures.

VII. CONCLUSION

Although the idea of a secure city has been adopted globally, India is just now embracing it. This study has emphasized the significance of utilizing both natural and intelligent approaches to create a safe urban environment, in order to tackle the intricate problem of security and formulate a decision-making framework. The authors believe that in order to reduce crime and the fear of crime, a variety of approaches, including design initiatives, community action, and law enforcement, are necessary. Following an extensive analysis of the theories and methods for creating safe cities, this study emphasizes the following tactics:

- To design accessible locations with clearly marked paths, areas, and entrances that allow for easy access without sacrificing security.
- Should make sure that no area that is open to the public is missed, either by using cameras or by keeping good lighting and sightlines.
- To encourage a well-balanced range of activities that are suitable for the area, lower the likelihood of crime, and foster a constant sense of safety.
- To establish environments that foster a feeling of community, respect, ownership, and territorial responsibility.
- To design spaces that are simple to administer, either through technology or manual labour. This would increase neighborhood safety and deter crime.
- To guarantee thorough coverage of video security operations through the integration of a variety of hardware and software surveillance technologies.

This document duly acknowledges the significance of the original CPTED model, a "stimulus-response model" that focused more on the interaction between humans and their environment. It also acknowledges the use of technology in the process of creating safer cities. A particular crime prevention strategy for Indian cities has been proposed by the authors, and it may have to do with design, management, planning, or alteration of the immediate urban environment.

VIII. ACKNOWLEDGMENT

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