

# PHYSICAL SECURITY PRACTICES ON INTERNATIONAL BORDER MANAGEMENT

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**ABSTRACT:** *Physical security protects people, data, systems, and equipment of a country. It also secures international borders. political interference and violation of border agreements can create border security issues. Technological advancements in physical security reduce the burden of border security personnel. If the border of a country is not well-protected, then it would face a flow of illegal immigration. Borders can be strongly protected by using physical barriers, surveillance, bio-metrics, illumination, security personnel, alarm systems, sensors, radars, access control systems, identification systems, and computer architecture. This paper discusses some challenges and their potential solutions using various physical security elements at international borders. This paper also hints the potential changes in physical security which countries can consider for their borders management in a better way.*

**Keywords:** Bio-metrics, Borders, Immigration, Radars, Security, Sensors, Surveillance.

## 1. INTRODUCTION

Physical security elements cannot be overlooked at any given point of time since its vital importance is known to the world. The burden of border security personnel can be reduced drastically by using high technology. Countries would face many problems like illegal immigration if their borders are not strongly protected. Physical elements like physical barriers, surveillance, biometrics, illumination, security personnel, alarm systems/sensors, radars, access control systems or identification systems and computer system architecture help countries to strongly protect their borders. Physical security protects the different assets of the country e.g., people, data, systems, and equipment. An international border can be defined as a line that separates a country's geographical area from the others to which both the countries have agreed upon [1]. International borders are strongly secured by using physical security. Political interference and violating border agreements are creating border security issues. Combination of physical security, as well as technological security, can provide the highest level of security.

This paper addresses some challenges and their solutions using physical security elements at the USA-Mexico international border. It hints the challenges and conflicts at the international borders of India-China and India-Pakistan. It also points out the essential features of border management, used for the possible changes in physical security, which a country can consider for border protection in a better way.

The rest of the paper is organized as: Section 2. illustrates existing problems at the USA-Mexico international border and their potential solutions by using elements of physical security. Section 3. points to India-China international border and their challenges; Section 4. hints India-Pakistan international border and their conflicts; Section 5. gives the essential features of physical security for border management; Section 6. concludes the paper.

## 2. USA-MEXICO BORDER

### 2.1 Border region

The USA-Mexico international border extends from the Pacific Ocean in the west to the Gulf of Mexico in the east with a total length of 1954 miles. This border is considered as the busiest international border in the world with around 350 million documented annual crossings [2]. The USA shares the border from west to east are California, Arizona,

New Mexico, and Texas. The contemporary history of the USA fringe security arrangement recommends that the remarkable quality of partisanship and belief system to outskirts security approach was at a high point amid the 2016 presidential decisions [3].

### 2.2 Challenges of USA-Mexico Border

Following are the challenges across at the USA-Mexico international border.

#### 2.2.1 Illegal immigrants

According to 2018 statistics, around 400000 illegal immigrants, who tried to cross the USA-Mexico border, were caught by the border patrol force [4]. Illegal immigrants make a security threat to the country. They alter employment dynamics by overcrowding and abuse miscellaneous government programs.

#### 2.2.2 Drug trafficking

Around 99.9% of the total seized marijuana with 99.8% of the total seized methamphetamine by border patrols were transported through the USA-Mexico international border [5]. Mexico does not produce any cocaine. But cocaine cartels are transported through South and Central America into the USA via Mexico. Nearly 38.3% of the total seized cocaine was transported through USA-Mexico border. There would be a steep increase in crime rate, corruption, racial tension if drug trafficking is not controlled completely [5].

#### 2.2.3 Human trafficking

Human trafficking is defined by the U.S. State Department as "a crime involving the exploitation of an individual for the purposes of compelled labor or a commercial sex act through the use of force, fraud, or coercion." [6]. A huge number of human trafficking victims enter through the USA-Mexico border. Most of those victims are from Central America, South America, and Mexico. Human trafficking is considered as a global epidemic and it will have a very harmful impact on the economy, society, and health of women as well as children.

#### 2.2.4 Weapons trafficking

Nearly 2000 illegal weapons cross the USA-Mexico border every day [7]. Between 2010 and 2012, approximately 212887 firearms that were purchased by people in the USA intended to smuggle them to Mexico through the USA-Mexico border. The number of weapons seized by border patrol agents has been increasing steeply over the years.

#### 2.2.5 Corrupted government officials

Some officials are directly involving in corruptions. Those corrupted officials allow the illegal immigrants to cross the border and also help to transport the drug cartels safely. This will, in turn, increase the crime rate in the society and reduce economic stability.

### 2.3 Overcome existing challenges

Aforementioned problems can be solved by using elements of physical security.

#### 2.3.1 Physical Barriers/Signage

To deter the drug traffickers from building underground tunnels and also to restrict illegal immigrants from crossing the borders, a concrete wall or iron-fenced wall would be constructed across the 2000-mile long USA-Mexico border [8]. The wall would be around 30 feet in height and as deep as 6 feet to effectively control the illegal immigrants and various types of trafficking. Integrated Fixed Towers (IFT) with mounted cameras, radar, and laser helps to monitor the border from a local USA border patrol sector facility.

#### 2.3.2 Bio-Metrics

All the offices of the United States Border Patrol Agency [9] would have installed biometrics. This will not let the unauthorized personnel enter into the office who tends to steal the confidential data. The facial recognition technology, which is used at the USA-Mexico border digitally, scans the faces of the drivers and passengers. This technology will help to identify refugees and suspects who intend to involve in terrorism. The new advancements of bio-informatic outskirts security and remote observation that have developed as key frameworks of reconfigured portability routines rely upon different sorts of work to create the impact of circumscribing [10].

#### 2.3.3 Illumination

Floodlights along the border will help the border patrol agents to track the movement of any illegal immigrant or any unauthorized vehicles or cartels crossing the border during the night.

#### 2.3.4 Surveillance

A closed-circuit television camera (CCTV camera) can produce images or recordings for surveillance or other private purposes. The installed CCTV cameras across the border help to track if any unauthorized personnel or vehicle tries to cross the border. The Border Patrol Security (BPS) agents do aerial surveillance with the use of Unmanned Aerial Vehicles (UAVs) or drones, helicopters, and spy planes.

#### 2.3.5 Security Forces

The BPS agents who are armed guard the border 24 hours and 7 days. They use All-Terrain Vehicles (ATVs), jeeps, cars, and bikes to monitor the border. Currently, the southwest border or USA-Mexico border is being patrolled by nearly 16605 border patrol agents [11]. Every year, these BPS agents help in catching thousands of illegal immigrants and drug cartels.

#### 2.3.6 Alarms Systems/Sensors

The BPS with Cross Border Tunnel Threat (CBTT) program monitors and detects if an intruder passes through the tunnels. If any suspicious activity inside it is identified, it alarms the nearby station and BPS agents come to the incident to respond. The United States CBP (Customs and Border Protection) uses the National Intrusion Sensor Infrastructure (NiSI) to detect the intruders on the ground [12].

#### 2.3.7. Radars

Department of Homeland Security and Border Protection Agency use different radars e.g., simple pulse radars, moving-target indication (MTI) radars (detect moving objects like an aircraft but filter out unmoving ones like hills or trees), high-range resolution radars, imaging radars, tracking radars, electronically scanned phased-array radars, precipitation radars, cloud profile radars, scatterometers, naval with airborne surveillance and fire control radars and military air traffic control and ranging radars [13].

#### 2.3.8. Access Control Systems systems

The CBP officers near the border use several access control systems (e.g., Iris ID Icam D100 iris-face capture systems) to cross-check the identity of passengers and once everything is checked and verified, they will let the person to cross it [14].

#### 2.3.9. Computer Systems Architecture

Nowadays high-performance computing architectures are designed to resolve assorted sophisticated problems [15]. Since computers, laptops, and devices are used by the CBP officers contain vital data of the citizens, all of them must be locked when they are not in usage and passwords should be changed once an employee leaves the CBP. To protect the data from intruders like hackers, strong passwords, and multi-factor authentications are used within all the systems.

### 3. INDIA-CHINA BORDER

The India-China limit had never been formally delimited on the ground or by any commonly acknowledged arrangement. Generally, the limit was separated into three segments - the western, central, and eastern parts. The western segment included the zone of Askai Chin [16], which India guaranteed was a piece of Ladakh [17] (it is currently part of the Khotan region in the Xinjiang Autonomous Region [18]). The center division included the territory at the intersection of the Tibet-Kashmir-Punjab fringes and the Nepal-Tibet-Uttar Pradesh outskirts. The eastern area incorporates the debated McMahon line [19], which is presently in Arunachal Pradesh, regulated by India. The eastern segment is available from the Indian side and out of reach from the Chinese side, though the western division is just reachable from the Chinese side. Aksai Chin is one of the two huge questioned fringe regions among India and China. India claims Aksai Chin as the easternmost piece of the Jammu and Kashmir state. China asserts that Aksai Chin is a piece of the Xinjiang Uyghur autonomous region. The line that isolates Indian-managed regions of Jammu and Kashmir from Aksai Chin is known as the Line of Actual Control (LAC) [20] and is simultaneous with the Chinese Aksai Chin guarantee line. Aksai Chin covers a zone of around 37244 square kilometers. The zone is generally a tremendous high-elevation desert with a depressed spot (on the Karakash River) at around 4300 meters above ocean level. In the southwest, mountains up to 7000 meters expanding southeast from the Dapsang Plains structure the true outskirts (LAC) between Aksai Chin and Indian-controlled Kashmir. The South of the McMahon line was once in the past alluded to as the North-East Frontier Agency (a political division in British India) and is presently called Arunachal Pradesh. The McMahon Line was a piece of the Shimla Convention [21] between British India and Tibet, an assertion dismissed by China. Since the foundation of diplomatic relations on 1 January 1950, China and India have experienced different phases of collaboration and animosity. Today both China and India are Asian

mammoths, with the second and eleventh biggest GDPs on the planet, separately. The two nations are developing forces with tremendous potential and interests [22]. The Sino-Indian outskirts debate has its birthplaces in the season of British and Russian development when Tibet was partitioned into a cradle zone. The fringe debates disturbed relations and prompted a war in 1962, which came about a time of antagonistic vibes. Indeed, even today, with changed respective relations toward down to earth collaboration, the two nations still feel the outcomes of the war as far as a trust deficiency and advancement of shared relations [23].

#### 4. INDIA-PAKISTAN BORDER

The Indo-Pak fringe was made in 1947 dependent on the Radcliffe line [24], covering a length of 3323 kilometers along with the conditions of Jammu and Kashmir, Gujarat, Punjab, and Rajasthan. This is a standout amongst the most dynamic outskirts and faces key challenges. This fringe has likewise seen a few conflicts of Indo-Pakistan, with the significant ones being in 1947, 1965, 1971, and 1999. The unforgiving and fluctuated climatic conditions along 3323 kilometers long fringe intensify the difficulties to keep watch the India-Pakistan border. An expansion in penetration endeavors has been seen amid the pre-winter season when watchfulness turns out to be incredibly intense because of snowfall along with the bumpy territory. Cross-fringe psychological oppression emerges as one of the significant reasons of disaccord among India and Pakistan. As a control measure, India began fencing its outskirts during the 1990s and effectively finished fencing Jammu and Kashmir, Punjab, Rajasthan, and Gujarat by 2011. Nowadays illegally border crossings between Pakistan and Indian states of Punjab, Rajasthan, Jammu & Kashmir are extremely difficult due to high voltage electric fence line [25].

#### 4. ESSENTIAL FEATURES

##### 5.1. Mobility of mechanisms

Upgraded individual-to-individual contact and exchange and travel through the assigned section and leave focuses are a successful path in lessening pressures. Point by point review and outline are basic so as to diminish constrain levels [26]. This would definitely lessen consumption and spare valuable lives. Fencing has conveyed the marvel leveled out to a substantial degree. Development of streets along the fence would likewise improve the response-ability of fringe guarding powers.

##### 5.2. Usage of high-tech gadgets

The world is moving towards innovatively propelled military and safeguard frameworks. High technological gadgets can be broadly utilized to improve the productivity and adequacy of outskirts tasks. Flying reconnaissance gadgets e.g., helicopters, drones and observation aero-states with day and night observation abilities are basic. These gadgets would likewise be helpful in completing reconnaissance in the zone [27]. Order and control systems should likewise be fortified to incorporate all observation frameworks and components in a way that empowers the making of a circumstance shows progressively for activity at various dimensions. Fringe outposts would along these lines have the capacity to work as an accessible and profoundly portable quick reaction and support constraint.

##### 5.3. Usage of IoT

The IoT (Internet of Things) based border protection model can be used. This model provides 24 hours and 7 days monitoring at the border without the security personnel. In the IoT model, sensors have RFID (radio frequency identification) tags and are deployed on the border in the form of subnets to detect the intrusions [28].

##### 5.4. Smart identity management

The utilization of biometrics (e.g., photos, fingerprints, and face) for recognizable proof is a key method [29]. It is savvy in light of the fact that these methods character dependably stay with the individual and cannot be changed or manufactured effectively. It additionally decreases preparing time impressively.

##### 5.5. Smart inspection system

To check authentic cross-outskirts vehicle or individual stream is likewise at some point troublesome. Total outskirts crossing numbers are in some cases misleading, as a similar vehicle and a driver go through the fringe and are recorded as various elements. Generally, vehicles include in unlawful practice have adequate motivator rehash the demonstration inferable from absence of fringe controls. In the wake of experiencing a pre-screening application and assessment process, vehicles can be furnished with an electronic transponder and the driver can be furnished with an automated-teller-machine (ATM) style personality card with an encoded imprint or retina data to check their character.

##### 5.6. Improve other physical security

The floodlight along the fence line on the border might reduce the number of prohibited outcomes who especially carry illegal drug (e.g., drug mafia). Such people do not flexible to face border security. It is important to use modern access control equipment to detect visitors who may cross the border through checkpoints. For security reason, it is a must to verify their identification with all past history (e.g., criminal record and duty liabilities if applicable). The visitor will be authorized by border guard security officers, otherwise, violators will be punished including jail, deported, and financially charged.

#### 6. CONCLUSION

We discussed the challenges and their solutions using different physical security elements at three different international borders. Physical security plays a prominent role in protecting the borders. Combination of physical and technology-oriented security countermeasures would provide the highest level of security to any organization or a country but ignoring one of them makes them vulnerable.

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