



## New Rocket Launchport in Tamilnadu

**For Prelims:** New Rocket Launchport in Tamilnadu, [Indian Space Research Organisation \(ISRO\)](#), Satish Dhawan Space Centre (SDSC) SHAR (Sriharikota Range), [Small Satellite Launch Vehicle \(SSLV\)](#).

**For Mains:** New Rocket Launchport in Tamilnadu, Achievements of Indians in science & technology.

[Source: IE](#)

### Why in News?

Recently, the Indian Prime Minister laid the foundation stone of the second rocket launchport of the [Indian Space Research Organisation \(ISRO\)](#) at Kulasekarapattinam in Tamil Nadu.

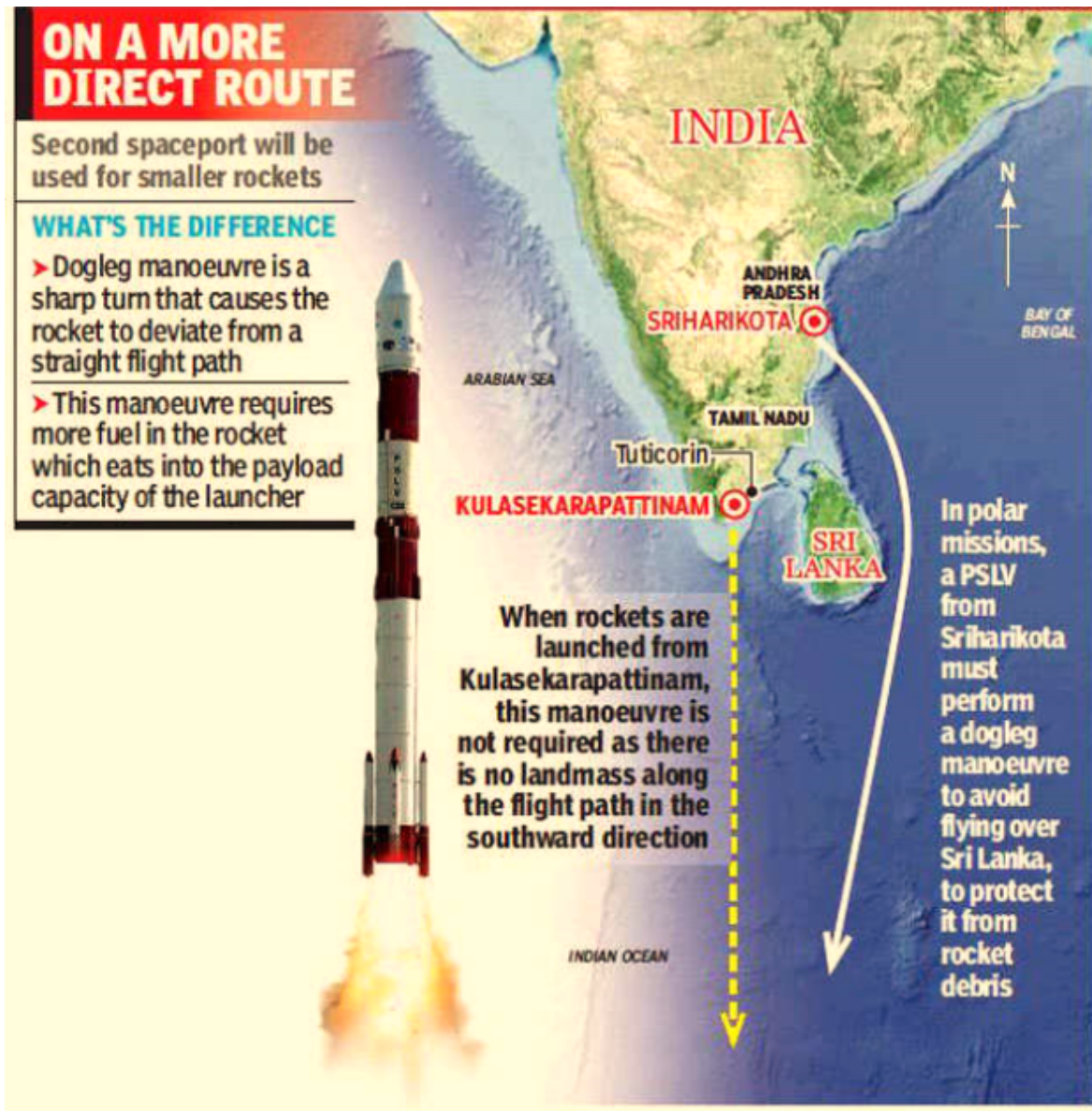
### What is the Need for a New Launchport?

- **Capacity and Overburdening:**
  - The opening of the space sector to private players is expected to lead to a significant increase in commercial launches.
  - This surge in demand could potentially overwhelm existing launch facilities, such as the **Satish Dhawan Space Centre (SDSC) SHAR (Sriharikota Range)** in Sriharikota.
  - Therefore, establishing a new launch port ensures that there is sufficient capacity to accommodate the increased number of launches without overburdening existing facilities.
- **Diversification of Launch Services:**
  - By dedicating the SDSC SHAR primarily for **bigger and heavy-lift-off missions**, and creating the Kulasekarapattinam launchport for smaller payloads, the ISRO can **diversify its launch services**.
  - This specialisation allows for **more efficient utilization of resources** and infrastructure tailored to specific mission requirements.
- **Support for Private Players:**
  - The establishment of a new launchport provides **private players with dedicated infrastructure** to develop space-qualified subsystems, build satellites, and launch vehicles.
  - This encourages private investment and participation in the space sector, fostering innovation and competition.

### What is the Significance of Kulasekarapattinam Launchport?

- **Geographical Advantage:**
  - Geographically, scientifically, and strategically, the Kulasekarapattinam launchport provides a **natural advantage to ISRO's future launches** pertaining to the [Small Satellite Launch Vehicle \(SSLV\)](#).
  - Allowing a **direct southward and smaller launch trajectory** for the lightweight SSLVs carrying less fuel, the Kulasekarapattinam facility will boost **ISRO's attempts to enhance payload capacities**.
- **Optimised Trajectory:**

- Launches from Kulasekarapattinam can follow a **straight southward flight path**, as opposed to the **longer trajectory followed by launches** from the Satish Dhawan Space Centre (SDSC) SHAR, which necessitates skirting eastwards around Sri Lanka (**dogleg manoeuvring**).
- This optimised trajectory **minimises fuel consumption**, particularly crucial for SSLVs with limited onboard fuel capacity.
- **Equatorial Location:**
  - Like the SDSC SHAR, Kulasekarapattinam is **also situated near the equator**.
  - Launch sites near the equator benefit from the **Earth's rotation, which imparts a significant velocity boost** to rockets during liftoff.
  - This boost in **velocity allows for increased payload capacity**, particularly advantageous for missions aiming for geostationary orbit.



## What is a Small Satellite Launch Vehicle?

- **About:**
  - **Small Satellite Launch Vehicle (SSLV)** is a three stage Launch Vehicle configured with three Solid Propulsion Stages and a liquid propulsion-based Velocity Trimming Module (VTM) as a terminal stage.
    - SSLV is capable of launching 500kg satellites in 500km planar orbit from Satish Dhawan Space Centre (SDSC).
      - A **planar orbit, also known as a low Earth orbit (LEO)**, is an orbit

around the Earth that lies close to the Earth's equatorial plane. In this type of orbit, the satellite's path forms a **relatively flat plane around the Earth..**

▪ **Key Features:**

- Low cost,
- Low turn-around time,
- Flexibility in accommodating multiple satellites,
- Launch demand feasibility,
- Minimal launch infrastructure requirements, etc.

▪ **Significance:**

◦ **The Era of small satellites:**

- Earlier, the bigger satellite payloads were given importance, but as the sector grew many players emerged like Businesses, government agencies, universities, and laboratories began to send satellites.
  - Mostly all of them fall in the category of small satellites.

◦ **The Rise in Demand:**

- The demand for the launch of small satellites has increased at a rapid pace in the last eight to ten years, due to the ever-growing need for space-based data, communication, surveillance, and commerce.

◦ **Saves cost:**

- Satellite manufacturers and operators do not have the luxury of waiting months for space on a rocket or paying exorbitant trip charges.
  - Therefore, Organizations are increasingly developing a constellation of satellites in space.
  - Projects like [SpaceX's Starlink and One Web](#) are assembling a constellation of hundreds of satellites.

• **Business Opportunity:**

- With the rise in demand, the rockets could be launched frequently with less cost, this provides a business opportunity for space agencies like ISRO **to tap the potential of the sector** as most of the demand comes from companies that are launching satellites for commercial purposes.

▪ **Journey of SSLV:**

- In August 2022, the first SSLV mission (SSLV-D1) encountered failure when it attempted to **deliver two satellites, EOS-02 and [AzaadiSat](#)**.
- However, six months later, in February 2023, ISRO succeeded with its second attempt, SSLV-D2.
  - The rocket effectively placed **three satellites into a 450 km circular** orbit after a 15-minute journey. Both launches **took place from SHAR.**

# ISRO LAUNCH VEHICLES

## BACKGROUND

◆ First rocket developed by ISRO - SLV (Satellite Launch Vehicle)

◆ Successor of SLV - Augmented Satellite Launch Vehicle (ASLV)

## Polar Satellite Launch Vehicle (PSLV)

### ◆ About

- The **Workhorse of ISRO**
- 3<sup>rd</sup> gen, 4-Stage launch vehicle (1<sup>st</sup>, 3<sup>rd</sup> stages - solid fuel; 2<sup>nd</sup>, 4<sup>th</sup> stages - liquid fuel)

### ◆ Capacity

- Delivers **earth-observation/remote-sensing satellites**
- Used to launch satellites of **lower mass (~1400 Kg)**

### ◆ 4 Variants:

- PSLV-CA ● PSLV-QL ● PSLV-DL ● PSLV-XL

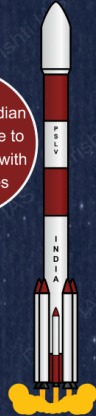
### ◆ Launches Satellites in

- Low inclination LEO ● Sub-GTO ● GTO

### ◆ Important Launches

- First successful launch - October 1994
- Chandrayaan-1 (2008)
- Mars Orbiter Spacecraft (2013)

PSLV is 1<sup>st</sup> Indian launch vehicle to be equipped with liquid stages



## Geosynchronous Satellite Launch Vehicle (GSLV)

### ◆ About

- 4<sup>th</sup> Gen, 3-staged launched vehicle
- Much more powerful rocket, carries satellites much deeper into space
- Has an **indigenous Cryogenic Upper Stage**

### ◆ Capacity

- Delivers **communication-satellites**
- Carries heavier satellites (~2200 kg to GTO)
- Carries 10,000-kg satellites to LEO

### ◆ Launches Satellites in

- Primarily Geosynchronous Transfer Orbit (GTO) (~36000 Km altitude)

### ◆ Important Launches:

- Chandrayaan-2 ● Upcoming Gaganyaan



## Launch Vehicle Mark-III

### ◆ About

- Aka **GSLV Mk-III**
- 3-stage launch vehicle (2 solid propellant and 1 core stage comprising liquid and cryogenic stages)

### ◆ Capacity

- 4,000-kg of satellites into **GTO**
- 8,000 kg of payloads into **LEO**

### ◆ Launches Satellites in

- GTO ● Medium Earth orbit (MEO)
- LEO ● Missions to moon, sun

Mk-III versions have made ISRO entirely self-sufficient in launching its satellites



## Small Satellite Launch Vehicle (SSLV)

### ◆ About

- Developed specifically for **small and micro-satellites**

### ◆ Capacity

- Satellites up to 500 kg

### ◆ Launch Limit

- 500 km **planar orbit (LEO)** from Satish Dhawan Space Centre



## What are the Features of SHAR?

- SHAR is situated along the **east coast of Andhra Pradesh** and is located 80 km off Chennai.
  - It currently provides launch **infrastructure to all ISRO missions**.
- It is equipped with a **solid propellant processing setup**, static testing, and launch vehicle integration facilities, telemetry services, tracking and command network to oversee the launch, and a mission control centre.
- SHAR has two launch complexes that are **routinely used to launch the [Polar Satellite Launch Vehicle \(PSLV\)](#), the [Geosynchronous Space Launch Vehicle \(GSLV\)](#) and the Geosynchronous Satellite [Launch Vehicle Mk-III \(renamed as LVM3\)](#).**
- The maiden launch of the First Launch Pad, built in the early 1990s, was in September 1993.
- Operational since 2005, the **Second Launch Pad saw its maiden launch in May 2005**.

## UPSC Civil Services Examination Previous Year Question (PYQ)

### Prelims

Q. With reference to India's satellite launch vehicles, consider the following statements: (2018)

1. PSLVs launch the satellites useful for Earth resources monitoring whereas GSLVs are designed

- mainly to launch communication satellites.
2. Satellites launched by PSLV appear to remain permanently fixed in the same position in the sky, as viewed from a particular location on Earth.
  3. GSLV Mk III is a four-staged launch vehicle with the first and third stages using solid rocket motors; and the second and fourth stages using liquid rocket engines.

**Which of the statements given above is/are correct?**

- (a) 1 only  
(b) 2 and 3  
(c) 1 and 2  
(d) 3 only

**Ans: (a)**

### **Mains**

**Q.** What is India's plan to have its own space station and how will it benefit our space programme? **(2019)**

## **Dispute over the Shanan Hydropower Project**

**For Prelims:** [Shanan hydropower project](#), [Supreme Court](#), [Hydropower project](#), [Punjab Reorganization Act, 1966](#)

**For Mains:** Importance of hydropower projects in advancing India's development.

**Source:** [IE](#)

### **Why in News?**

Recently, the central government ordered that the **status quo** be maintained on the [Shanan hydropower project](#), over which **Punjab** and **Himachal Pradesh** have made competing claims.

- Punjab has moved the [Supreme Court](#) over this issue.

### **What is the Shanan Project and the Claims of Different Parties over it?**

- **Historical Background:**
  - During the British era in **1925**, **Punjab** was granted a lease for the **110-MW [hydropower project](#)** situated in **Jogindernagar, Mandi district of Himachal Pradesh** on river Uhl, a tributary of the **Beas River**.
  - **Lease Agreement:**
    - The lease agreement was formalised between **Raja Joginder Bahadur**, the **ruler of Mandi** at the time, and **Col BC Batty**, who represented the **British government** and served as the **Chief Engineer of Punjab**.
  - **Project Utility:**
    - The hydropower project served the energy needs of the **undivided Punjab** and **Delhi** before India gained independence.
      - Following the partition, the supply to Lahore was halted, and the

transmission line was terminated at **Verka village in Amritsar.**

- **Legal Control under Punjab Reorganisation Act, 1966:**
  - During the reorganisation of states in 1966, the hydropower project was transferred to Punjab, as **Himachal Pradesh was then** designated as a **Union Territory.**
    - Punjab was officially allocated the project through a **central notification issued on 1<sup>st</sup> May 1967**, by the Union Ministry of Irrigation and Power.
  - The notification specified that Punjab's legal control over the project was governed by the provisions outlined in the **Punjab Reorganisation Act, 1966.**
- **Claim of Himachal Pradesh:**
  - **Before the lease of 1925**, which granted the project to Punjab, **Himachal Pradesh had both ownership and operational rights over the project.**
    - The **1925 lease only granted operational rights to Punjab for a specific period** and not ownership rights.
  - In the past few years, **Himachal Pradesh** has contended that the **project should stay with it once the lease ends.**
  - The Himachal Pradesh government has raised concerns, alleging that the project is in a deteriorating condition due to a **lack of repair and maintenance by Punjab.**
  - The Chief Minister of Himachal Pradesh had stated that they would not allow Punjab to stake claim on the project after the lease period and wrote to his Punjab counterpart last year and also took up the issue with the Union Ministry of Power.
- **Claims of Punjab:**
  - **Ownership and Possession Claim:**
    - Punjab has presented its case in the Supreme Court, asserting that it is the rightful owner and in lawful possession of the **Shanan Power House Project under the central notification of 1967.**
    - The state government, through the Punjab State Power Corporation Ltd (PSPCL), currently exercises control over all assets associated with the project.
  - **Legal Action Requested:**
    - Under **Article 131** the government of Punjab has requested a "**permanent Prohibitory Injunction**" from the [Supreme Court](#).
    - This injunction is sought to prevent the Himachal Pradesh government from interfering with the "**lawful peaceful possession and smooth functioning**" of the **Project.**
- **Interim Measure Ordered by the Centre:**
  - A day before the conclusion of the **99-year-old lease agreement**, the Central government intervened by issuing an order to maintain the status quo on the **Project.** This measure was implemented to ensure the continuous operation of the project.
  - The directive was issued by the **Ministry of Power.** It invoked the powers vested under **Sections 67 and 96** of the [Punjab Reorganisation Act, 1966](#), in conjunction with **Section 21** of the **General Clause Act, 1887.**

## Inter-State River Water Disputes:

- **Inter-State Water Dispute (ISWD) Act, 1956:** In case, a particular state or states approach the Centre for the constitution of the tribunal, the Central Government should try to resolve the matter by consultation among the aggrieved states. In case, if it does not work, then it may constitute the tribunal.
  - The **Inter-State Water Dispute Act, 1956** was amended in **2002**, to include the major recommendations of the [Sarkaria Commission](#).
  - The amendments mandated a one-year time frame to set up the water disputes tribunal and also a **3-year time frame** to give a decision.

**UPSC Civil Services Examination Previous Year Questions (PYQs)**

**Prelims**

**Q. Consider the following rivers: (2014)**

1. Barak
2. Lohit
3. Subansiri

**Which of the above flows/flow through Arunachal Pradesh?**

- (a) 1 only  
(b) 2 and 3 only  
(c) 1 and 3 only  
(d) 1, 2 and 3

**Ans: (b)**

### **Mains**

**Q.** Constitutional mechanisms to resolve the inter-state water disputes have failed to address and solve the problems. Is the failure due to structural or process inadequacy or both? Discuss. **(2013)**

## **Reforming India's Undertrial Bail System**

**For Prelims:** [Supreme Court of India](#), [Bail](#), [Types of Bail](#)

**For Mains:** Protection of Fundamental Rights in Criminal Justice Process, Judiciary, Constitutional Protection, Types of Bail, Undertrial incarceration

**Source:** [TH](#)

### **Why in News?**

The [Supreme Court of India's](#) acknowledgement in the case of **Satender Kumar Antil vs Central Bureau Of Investigation, 2022**, highlights the **inefficacy of [India's bail system](#)** and its role in **exacerbating the crisis of [undertrial incarceration](#)**.

- This recognition underscores the pressing need for **reforming bail laws** to address systemic challenges within the [criminal justice system](#).

### **What are the Concerns Regarding India's Bail System?**

- **High Undertrial Population:**
  - Over **75% of India's prison population comprises undertrials**, indicating a significant problem with the bail system.
    - An undertrial prisoner is someone who is accused of a crime but has **not been convicted**. They are kept in judicial custody, while their **case is being heard in court**.
  - The **overcrowding rate** in Indian **prisons is at 118%**, reflecting systemic issues within the criminal justice system.
- **Bail Adjudication:**

- Bail adjudication relies heavily on court discretion, considering the specifics of each case.
- The Supreme Court provides guidelines for this discretion, emphasising the **need for granting bail but also allowing denial** based on factors like the gravity of the offence and the likelihood of absconding.
  - Courts often **lean towards denying bail or imposing strict conditions**, despite the guidelines advocating for bail release.
  - Courts frequently do **not provide reasons for denying bail**, leaving the rationale behind decisions unclear.
- **Marginalised individuals** are disproportionately affected by these broad exceptions, facing either bail denial or stringent conditions.
- **Challenges in Bail Compliance:**
  - Many undertrials stay in prison even after receiving bail due to difficulties in meeting bail conditions.
    - **Lack of resources to arrange money or property** and find local sureties are major obstacles to compliance.
    - Other factors such as lacking residence and identity proof, being abandoned by family, and struggling to navigate the court system also hinder compliance.
  - Supporting undertrials in meeting bail conditions and ensuring court appearances is crucial, especially for those facing structural disadvantages.
  - Existing bail laws fail to address these challenges adequately.
  - Data from the **Fair Trial Programme (FTP)** in Yerwada and Nagpur shows that Existing bail laws fail to address these challenges adequately.
    - In **14% of cases, undertrials couldn't comply with bail conditions**, resulting in continued imprisonment.
    - In almost 35% of cases, it took over a month after bail was granted for undertrials to meet bail conditions and secure release.
- **Lack of Safeguards:**
  - The Supreme Court emphasises the **importance of safeguards against arbitrary arrest** to reduce the need for seeking bail.
    - Arbitrary arrest and detention is the arrest or detention of a person without evidence of a crime or proper due process.
  - However, these safeguards often exclude many individuals from **disadvantaged backgrounds**, who make up the **majority of undertrial prisoners**.
  - Data from the **FTP** highlights this issue: of the undertrials (2,313) represented by the FTP, **18.50% were migrants, 93.48% did not own any assets, 62.22%** did not have any contact with family, and 10% had a history of previous incarceration.
    - This data indicates a significant portion unjustifiably excluded from arrest protections, contributing to the high number of undertrials in prisons.
- **Flawed Assumptions:**
  - Current bail system assumes **all arrested individuals can afford bail** or have influential social connections.
    - It believes financial risk is necessary to ensure the accused appears in court.
  - This contradicts the principle of "**bail not jail**," which aims to release individuals awaiting trial.
  - Thus there is a need for reforming the bail system, however, reforms should be based on understanding the problem through empirical evidence.

## Note

- The Fair Trial Programme (FTP) is a criminal justice initiative based at the **National Law University in Delhi**. The FTP's goal is to **ensure fair trials for undertrial prisoners**.
  - The FTP trains and mentors young professionals, such as lawyers and social workers, to collaborate with the State Legal Services Authority.



# BAIL AND RELATED PROVISIONS IN INDIA

*"The issue of bail is one of liberty, justice, public safety, and burden of the public treasury, all of which insist that a developed jurisprudence of bail is integral to a socially sensitised judicial process."*

—Justice V.R. Krishna Iyer

## Constitutional Provision for Arrest - Article 22:

Grants protection to individuals arrested or detained, with detention classified into two types:

- ➔ **Punitive detention:** To punish a person for an offence committed by him after trial and conviction in a court
- ➔ **Preventive detention:** Detention of a person without trial and conviction by a court

**Criminal Procedure Code, 1973:** Doesn't define bail, but defines bailable and non-bailable offences:

Type of Offence	Bailable	Non-Bailable
<b>Defined under CrPC as:</b>	An offence mentioned in Schedule 1, or An offence made bailable by any other law	Any offence other than bailable
<b>Power to Grant Bail</b>	Bail as a right	Court/Police discretion based on the facts

## Bail vs Parole vs Probation

Bail	Parole	Probation
<b>Temporary release</b> of defendant awaiting trial or appeal, secured by deposit to guarantee their appearance in court	When person gets <b>some time off from jail sentence</b> , for instance, to fulfil some requirements	<b>Suspension of sentence</b> of an offender, allowing to stay in community under supervision of an officer
<b>Granted by Judge</b>	By Parole Board	By Judge

## Types of Bails in India

- Regular Bail:** Court's order to release person under arrest in police custody
- Interim Bail:** Court grants temporary relief until application for Anticipatory Bail or Regular Bail is decided
- Anticipatory Bail:** Bail granted preemptively to prevent arrest
- Default Bail:** When police fail to complete investigation within specified period
- Medical Bail:** Solely on medical grounds

## Cancellation of Bail - Certain Grounds

- Misuses his liberty by indulging in criminal activity
- Interferes with course of investigation
- Tampering of evidence
- Threatens witnesses, etc



## Police Custody And Judicial Custody

- Police custody** means the accused is **held by the police in a lock-up** to prevent tampering with evidence or influencing witnesses after an FIR is filed for a cognizable offence.
- Judicial Custody** means an accused is in the **custody of the concerned Magistrate**. It is for **serious offences**, where the court may detain the accused to prevent tampering with evidence or witnesses after the police custody period ends.

Aspect	Police Custody	Judicial Custody
<b>Custody Location</b>	Lock-up of a police station or with investigating agency	Jail under custody of Magistrate
<b>Appearance before Court</b>	Within 24 hours before the concerned Magistrate	Until there is an order from the Court for bail
<b>Commencement</b>	At the time of arrest by a police officer after receiving a complaint or filing an FIR	After public prosecutor satisfies the court that the custody of the accused is necessary for investigation

<b>Maximum Duration</b>	24 hours (extendable to 15 days by the appropriate Magistrate)	90 days for offences punishable with life imprisonment, death, or imprisonment for not less than ten years; 60 days for other offences
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## Way Forward

- Revise bail laws to ensure they are **fair and equitable for all individuals, regardless of socio-economic status**. Consider amendments to address systemic issues contributing to the high undertrial population.
- The Supreme Court recommends the enactment of special **bail legislation akin to the Bail Act of the UK**.
  - This legislation would establish a general right to bail and define clear criteria for bail decisions. It aims to reduce reliance on monetary bonds and sureties.
- Legal aid and support should be provided to undertrial prisoners for bail compliance and court appearances.
- Ensure **safeguards against arbitrary arrest are inclusive** and accessible to all individuals, particularly those from disadvantaged backgrounds.
- Establish **support programs to assist undertrials** in meeting bail conditions, including access to legal aid, financial assistance, and social support services.
- Foster collaboration among government agencies, legal institutions, civil society organisations, and community groups to develop holistic approaches to bail reform.
- Establish mechanisms for ongoing monitoring and evaluation of bail reform initiatives to assess their effectiveness and identify areas for improvement.

**Legal Insights:** [Satender Kumar Antil Case](#)

<https://www.drishtijudiciary.com/en>