



CONCEPT NOTE

Asset Monetization Framework for Haryana – HariNidhi

Submitted by



SDGCAC

SUSTAINABLE DEVELOPMENT GOALS
COORDINATION AND ACCELERATION CENTRE

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Asset Monetization Framework for Haryana HARINIDHI (Haryana Asset Resource Integration for New Infrastructure Development and to Harness Investments)



SDGCAC

SUSTAINABLE DEVELOPMENT GOALS
COORDINATION AND ACCELERATION CENTRE

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Executive Summary

The Government of Haryana is at a critical juncture in its development trajectory, with increasing demand for infrastructure financing, sustainable investments, and efficient utilization of public assets. In this context, the present report on the Asset Monetization Framework for Haryana provides a structured and strategic approach to unlocking value from underutilized and brownfield public assets, while ensuring fiscal sustainability and long-term economic growth.

The report begins with an overview of Haryana's macroeconomic and fiscal landscape, highlighting the need to diversify financing sources beyond traditional budgetary allocations and borrowings. In alignment with the vision of Viksit Bharat @2047, the state faces a critical fiscal imperative, with rising revenue deficits and high committed expenditures currently accounting for nearly 58% of total revenue receipts, underscoring the urgency for innovative and sustainable financing solutions.¹

It further examines the existing asset base across sectors such as transport, urban infrastructure, energy, and land parcels, identifying their monetization potential based on revenue-generating

capacity and market attractiveness.

Subsequently, the report outlines various monetization instruments and models, including Public-Private Partnerships (PPP), Infrastructure Investment Trusts (InvITs), Real Estate Investment Trusts (REITs), Toll-Operate-Transfer (TOT) models, and long-term leasing frameworks. Drawing on national and global best practices, the framework emphasizes the importance of asset selection, risk allocation, investor appetite, and regulatory readiness in structuring successful transactions.

A key component of the report is the development of a comprehensive asset repository and digital prototype platform (such as the proposed HariNidhi Platform), which enables geo-tagging, valuation, and transparent listing of state assets. This enhances data-driven decision-making, improves inter-departmental coordination, and increases investor confidence through improved visibility and accessibility of assets.

The report also proposes institutional mechanisms, policy enablers, and capacity-building measures required to operationalize asset monetization at scale. This includes the establishment of

¹ Hon'ble Chief Minister Haryana Republic Day speech, January 26th, 2026
<https://indianexpress.com/article/cities/chandigarh/rs-3-53-lakh-per-capita-income-and-3-7-gdp-share-nayab-singh-saini-highlights-haryanas-achievements-republic-day-10495693/#:~:text=Despite%20accounting%20for%20only%201.34,within%2012%20days%2C%20he%20noted>

dedicated cell, standardized processes, and stakeholder engagement frameworks to facilitate efficient execution.

Overall, the framework provides Haryana with a clear roadmap to unlock capital from existing public assets without outright privatization, attract private and institutional investment into infrastructure and development projects, improve efficiency in asset utilization and lifecycle management, and strengthen fiscal resilience by reducing dependence on conventional financing.

It also supports the state's long-term vision of sustainable and inclusive economic growth. By adopting this structured approach to asset monetization, Haryana can accelerate infrastructure development, mobilize significant financial resources, and position itself as a leading state in innovative public asset management and investment facilitation.

*The need for systematic mobilisation of the State's assets has also prominently emerged during the Pre-Budget Consultations for the Haryana Budget 2026–27 under the Finance and Security (Theme–1) category

Abbreviations

AAI	Airports Authority of India
AM	Alternative Mechanism
CCEA	Cabinet Committee on Economic Affairs
CGAM	Core Group of Secretaries on Asset Monetization
CPSEs	Central Public Sector Enterprises
DHBVN	Dakshin Haryana Bijli Vitran Nigam
DIPAM	Department of Investment and Public Asset Management
DSS	Decision Support System
EMDEs	Emerging Market and Developing Economies
EPC	Engineering, Procurement and Construction
FRBM	Fiscal Responsibility and Budget Management
GDP	Gross Domestic Product
GSDP	Gross State Domestic Product
HMRTC	Haryana Mass Rapid Transport Corporation
HSAMB	Haryana State Agricultural Marketing Board
HSIIDC	Haryana State Industrial and Infrastructure Development Corporation
IMG	Inter-ministerial Group
IMTs	Industrial Model Townships
InvITs	Infrastructure Investment Trusts
NCR	National Capital Region
NDCF	Net Distributable Cash Flows
NHAI	National Highways Authority of India
NMP	National Monetisation Pipeline
O&M	Operation and Maintenance
OGD	Open Government Data
OMDA	Operation, Management, and Development Agreement
OPAMS	Odisha Public Asset Management System
OTR	Own Tax Revenue
PHED	Public Health Engineering Department
PWD	Public Works Department
REITs	Real Estate Investment Trusts
HSVP	Haryana Shahari Vikas Pradhikaran

Introduction & Context

Asset monetisation aligns closely with Haryana's Vision 2047 – Viksit Haryana agenda by serving as a strategic enabler of sustainable growth, fiscal resilience, and infrastructure expansion. By unlocking value from underutilised and brownfield public assets, the State can mobilise long-term capital without increasing debt burdens or taxation, thereby maintaining fiscal prudence. The proceeds from monetisation can be reinvested into high-impact greenfield infrastructure, industrial corridors, logistics parks, urban redevelopment, and social infrastructure accelerating economic growth and employment generation.

Asset Monetisation Pipeline 2.0 “Building on the success of the first Asset Monetisation Plan announced in 2021, the second Plan for 2025-30 will be launched to plough back capital of Rs 10 lakh crore in new projects. Regulatory and fiscal measures will be finetuned to support the Plan.” – Union Budget 2025-26, Government of India

Additionally, structured monetisation through transparent digital platforms strengthens governance, enhances investor confidence, and attracts institutional capital, positioning infrastructure as a scalable asset class. When strategically earmarked for green and technology-driven projects, asset monetisation also supports Haryana's sustainability and Net-Zero commitments, making it a core financing pillar for achieving the Vision 2047 objectives.

Despite accounting for only 1.34% of India's geographical area and 2.09% of its population, Haryana contributes approximately 3.7% to the national GDP, reflecting its strong economic productivity and industrial base. The State's Gross Domestic Product is driven by a diversified sectoral composition, with significant contributions from agriculture and allied activities, a robust manufacturing sector, and a rapidly expanding services sector, including trade, logistics, IT/ITES, real estate, and financial services.¹

Haryana records a per capita income of ₹3,25,759 (Advance Estimates 2023–24), which is nearly 1.8 times the national average. This high-income level underscores the State's strong economic performance and positions it as a leading contributor to India's aspiration

of achieving higher middle-income status.²

As per the Revised Estimates (RE) for 2025–26, Haryana's outstanding debt is projected at approximately ₹3,52,818 crore, representing about 26.2% of the State's Gross State Domestic Product (GSDP). This fiscal position highlights the importance of prudent debt management and sustainable revenue strategies to maintain macroeconomic stability.³

The Dead Assets Problem: Thousands of acres of land under the Haryana State Industrial and Infrastructure Development Corporation (HSIIDC) and Haryana Shahari Vikas Pradhikaran (HSVP), along with aging departmental buildings, currently yield sub-optimal returns.⁴

Infrastructure assets such as roads, power networks, industrial estates, and logistics facilities represent stable, revenue-generating sectors that are attractive to private investors due to their predictable returns and relatively lower risk profiles. Monetising or recycling mature public assets enables the State to unlock capital tied up in existing infrastructure and redeploy the

proceeds into new infrastructure development. This approach facilitates expansion without imposing additional tax burdens on citizens.

An asset recycling strategy integrates two established activities –monetising existing assets through structured private participation and reinvesting the realised capital into new infrastructure projects. However, its strategic strength lies in adopting a long-term and comprehensive perspective. This involves assessing the capital value embedded in public infrastructure assets, evaluating the economic and fiscal benefits of monetisation and reinvestment, and managing risks associated with new asset development, including political, construction, and demand risks. Once newly developed assets mature and stabilise, they can again be monetised or recycled to private investors, thereby creating a sustainable cycle of infrastructure creation, capital unlocking, and reinvestment that supports continuous economic growth.

This process recycles previous taxpayer's funds that have been locked up in older assets to pay for new or renewed assets to meet the demand of

² Estimates of State Domestic Product of Haryana 2011-12 to 2023-24, Department of Economic and Statistical Affairs, Government of Haryana
<https://cdnbbsr.s3waas.gov.in/s32b0f658cbffd284984fb1d90254081f/uploads/2024/10/20241028827687465.pdf>

³ Haryana Budget Analysis, 2025-26 PRS Legislative Research
<https://prsindia.org/budgets/states/haryana-budget-analysis-2025-26>

⁴ Comptroller and Auditor General of India (CAG) Compliance Audit Report, Government of Haryana 2022
https://cag.gov.in/uploads/download_audit_report/2022/Report%20No.%207%20of%202022_Compliance%20Audit_English_GoHR-062f3aa13c838b0.19839844.pdf

⁵ Asset Recycling Handbook, The World Bank, 2025
<https://ppp.worldbank.org/sites/default/files/2025-05/Asset%20Recycling%20Handbook.pdf>

future generations. This avoids the need to continually raise taxes or increase borrowing and debt levels. The population retains access to the public services and benefits provided by the older assets, but now also gains from additional or improved services and benefits provided from re-investment in new and/or improved infrastructure.

Objectives of Asset Monetization

The core objective is the "Creation through Monetization" philosophy, ensuring that public assets are utilized to their maximum economic potential without losing sovereign ownership.

- **Sustainable Resource Mobilisation:** Generate Significant amount annually through upfront premiums, long-term lease models, and structured instruments such as REITs and InvITs, thereby creating predictable non-tax revenue streams for the State.
- **Infrastructure Recycling for Growth:** Monetise mature brownfield assets and strategically reinvest proceeds into priority greenfield projects, including the development of new Industrial Model Townships (IMTs) and other growth-enabling infrastructure.
- **Fiscal Prudence and Off-Budget**

Development: Enable infrastructure expansion without increasing state debt or tax burdens by leveraging asset recycling and private capital, thereby maintaining fiscal neutrality while accelerating development.

- **Operational Optimisation through Private Participation:** Enhance efficiency and service delivery by transferring operation and maintenance (O&M) responsibilities of utilities, roads, and other infrastructure to specialised private entities, with potential annual maintenance cost reductions.
- **Institutional Transparency and Digital Governance:** Establish a centralized digital asset repository platform 'HariNidhi' (Haryana Asset Resource Integration for New Infrastructure Development and to Harness Investments) to provide real-time information on land banks, infrastructure assets, and monetisation opportunities, ensuring transparency and investor confidence.
- **Capital Reinvestment for Public Value Creation:** Systematically recycle government-owned assets by granting concessions or securitising cash flows, and channel the proceeds into infrastructure and community-focused assets aligned with Haryana's long-term development priorities.

- **Market Deepening and Institutional Capital Mobilisation:** Position infrastructure as a structured asset class in Haryana by attracting a diversified investor base including sovereign wealth funds, pension

funds, insurance companies, and asset managers while offering diversified investment opportunities through direct participation or specialised infrastructure platforms.

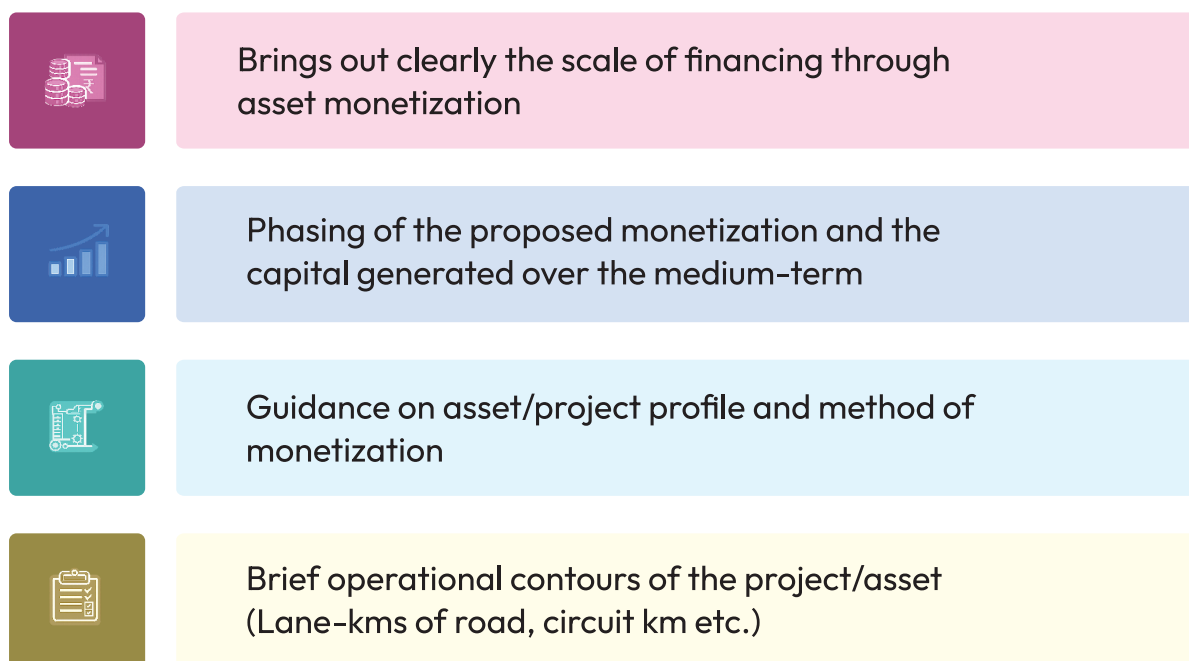


Figure 1 Key Objective of Asset Monetization of Haryana

Fiscal Landscape

Haryana projects total revenue receipts of ₹1,27,817 crore, reflecting a 13% increase over the previous year's revised estimates (FY 2025-26). The State demonstrates strong fiscal autonomy, with nearly 80% (₹1,02,478 crore) generated from its own resources and only 20% (₹25,339 crore) coming from central transfers. Of the central share, 12% is from tax devolution and 8% from grants, with grants expected to rebound by 25% following last year's shortfall

driven by reduced CSS funding.³

On the domestic front, State Own Tax Revenue (OTR) is projected to grow by 12% to ₹92,144 crore, maintaining a stable OTR-to-GSDP ratio of 6.8%. SGST remains the key contributor, accounting for 46% of OTR, while Stamp Duty and Registration (18% growth) and State Excise (11% growth) indicate a diversified and resilient revenue base.

Over the last three fiscal years, Haryana's financial trajectory has been marked by a robust expansion of its Gross State Domestic Product (GSDP),

which has grown from ₹10.85 lakh crore in FY 2023-24 to a projected ₹13.47 lakh crore for FY 2025-26, reflecting a steady annual growth rate of approximately 11%.³

Throughout this period, the state has maintained commendable fiscal discipline, keeping its fiscal deficit

consistently below the 3% FRBM threshold, with targets narrowing from 2.9% in 2023-24 to an estimated 2.67 % in the 2025-26 budget cycle. This stability is supported by a manageable Debt-to-GSDP ratio of 26.2%, which remains well within the 32.5% limit set by the 15th Finance Commission.⁶

Metric	2023-24 (Actual)	2024-25 (Revised)	2025-26 (Budgeted)	Interpretation
GSDP (Current Prices)	₹11,35,441 Cr	₹12,13,951 Cr	₹13,47,486 Cr	Robust 11% growth projected for FY26.
Fiscal Deficit (% of GSDP)	2.9%	2.68%	2.67%	Consistently below the 3% FRBM limit.
Revenue Deficit (% of GSDP)	1.2%	1.47%	1.53%	Rising trend due to increased social welfare spending.
Debt-to-GSDP Ratio	26.2%	25.8%	26.18%	Well within the 32.5% limit set by the 15th FC.
Capital Outlay	₹15,921 Cr	₹12,753 Cr	₹16,164 Cr	A 27% hike in FY26 to boost asset creation.

Table 1 Interpretation from recent financial years

However, the state's revenue structure faces significant hurdles, most notably a persistent and rising revenue deficit, which has climbed from 1.1% to 1.53% of GSDP over the last three years. This trend is largely driven by a heavy reliance on "committed expenditure" salaries, pensions, and interest payments which now consumes nearly 58% of total revenue receipts.³ While revenue receipts have seen a healthy 17%

growth in the latest projections, the cessation of GST compensation and a relatively stagnant non-tax revenue base from mining and user charges have tightened the fiscal space. The state's own tax revenue, while strong at roughly ₹92,144 crore, is heavily geared towards SGST and Excise, making the budget sensitive to fluctuations in industrial consumption.³

⁶ Chief Minister Office Haryana, Press release 17 march, 2025
<https://haryanacmooffice.gov.in/17-march-2025#:~:text=By%20the%20year%202024%2D25,1.01%20percent%20in%202024%2D25>

Challenges in Achieving the USD 1.5 Trillion Goal

The various challenges in achieving the USD 1.5 trillion goal are outlined below-

- **High Debt and Deficit:** Debt stands at 26.2% of GSDP and revenue deficit at 1.5%, putting pressure on fiscal sustainability.³
- **High Committed Expenditure:** A large share of revenue goes toward salaries, pensions, and interest payments, leaving little for development.
- **Slow Tax Revenue Growth:** Post-GST compensation withdrawal has weakened tax buoyancy and reduced flexibility.
- **Dependence on Central Transfers:** Heavy reliance on central grants and schemes limits fiscal autonomy.
- **Underutilized State Assets:** Public land and infrastructure assets remain unmapped and under monetized.
- **Limited Access to Green and Innovative Finance:** The state lacks

sustainable finance instruments to attract ESG and climate-linked investments.

- **Uneven Regional Development:** Investment and growth are concentrated in southern districts, leaving other regions underfunded.

To bridge the gaps and achieve the ambitious "Haryana-2047" VISION goal of a \$1+ trillion economy, the state has pivoted toward a massive infrastructure push, with the capital outlay for FY 2025-26 increasing by 27% to ₹16,164 crore. This investment is directed toward high-impact projects such as the development of 10 new Industrial Model Townships (IMTs), smart city modernization in the NCR belt, and the Haryana AI Mission to train 50,000 professionals. Given that traditional borrowing is constrained, there is an urgent need for innovative financing mechanisms, including Asset Monetization of brownfield roads, the issuance of Municipal Bonds for Gurugram and Faridabad, and the establishment of a ₹2,000 crore Fund of Funds to leverage private capital for long-term urban and tech-led development.⁷

⁷ Directorate of Information and Public relation and Languages, Government of Haryana
<https://www.prharyana.gov.in/en/press-notes-135#:~:text=A%20Budget%20that%20Carries%20Heritage,vision%20of%20E2%80%9CViksit%20Bharat%E2%80%9D.>

What is Asset Recycling?

Asset recycling is a strategic financing mechanism adopted by governments to monetise operational, revenue-generating infrastructure assets (brownfield assets) in order to unlock embedded capital and reinvest the proceeds into the development of new infrastructure projects. These new projects may include assets with higher economic and social returns, even if they carry greater construction, demand, or commercial risks. By leveraging the value of mature assets, governments can accelerate infrastructure expansion without waiting for additional budgetary allocations.⁵

Beyond capital mobilisation, asset recycling also enables governments to harness private sector efficiencies in operations and maintenance, resulting in improved service delivery and performance standards. Public sector entities that own and operate infrastructure assets increasingly view asset recycling as a sustainable funding alternative to raising taxes or increasing public debt, thereby meeting growing infrastructure demands while maintaining fiscal discipline and long-term financial stability. Through the recycling of capital and the strategic reinvestment of proceeds into new infrastructure projects, the public derives dual benefits. First, existing

assets operated by private sector partners often experience improved efficiency, service quality, and operational standards. Second, the capital unlocked from these assets enables the development of additional infrastructure, expanding service delivery and enhancing overall public welfare. In this way, asset recycling strengthens both current and future infrastructure outcomes for citizens.⁵

Need for Asset Recycling

Globally, infrastructure investment plays a pivotal role in driving economic growth and achieving the 2030 Sustainable Development Goals (SDGs), particularly in Emerging Market and Developing Economies (EMDEs). These economies already face significant infrastructure gaps, and the challenge has intensified due to the urgent need to address climate change and transition toward low-carbon and climate-resilient development pathways.

It is estimated that new infrastructure investments in EMDEs will require annual spending of approximately 2–8 percent of GDP until 2030 to meet infrastructure-related SDG targets. Evidence suggests that, with appropriate policy frameworks and institutional support, an average annual investment of around 4.5 percent of GDP would enable these economies not only to achieve the SDGs but also to remain aligned with the global objective of limiting temperature rise to below 2°C.⁵

Electricity	Transport	Water Supply/ Sanitation	Irrigation
Investment in renewable energy	Utilizing rail, road, and electric mobility	Provision of safe water and sanitation	Subsidizing irrigation infrastructure
US\$778 billion (2.2% of GDP)	US\$417 billion (1.3% of GDP)	US\$198 billion (0.55% of GDP)	US\$50 billion (0.13% of GDP)

Table 2 Average annual cost to develop new infrastructure (billion USD) in EMDEs

In addition to financing new infrastructure, substantial resources are required for the operation and maintenance (O&M) of existing assets to ensure their sustainability, efficiency, and longevity across the full lifecycle. For Emerging Market and Developing Economies (EMDEs), these maintenance requirements account for an additional estimated 2.7 percent of GDP annually, underscoring that infrastructure sustainability is as critical as new asset creation.⁵

In the context of Haryana, the need for asset recycling emerges from a critical fiscal juncture. The State must balance expanding social welfare commitments with the significant infrastructure investments required to achieve its Vision 2047 objectives. A large proportion of Haryana's revenue receipts approximately 58 percent is absorbed by committed expenditures such as salaries, pensions, and interest payments, thereby constraining fiscal flexibility. With capital outlay declining to below 9 percent of total expenditure, reliance solely on traditional budgetary

allocations is insufficient to finance transformative projects such as the Haryana Orbital Rail Corridor and the proposed 10 Industrial Model Townships (IMTs). In this scenario, asset recycling offers a strategic pathway to unlock capital, sustain infrastructure expansion, and maintain fiscal prudence without increasing debt or taxation pressures.

The National Monetisation Pipeline (NMP) 2.0 provides a consolidated and structured framework outlining sector-wise asset classes along with their corresponding monetisation targets. It presents a comprehensive roadmap for unlocking value from public infrastructure assets across key sectors. The framework includes detailed descriptions of asset categories and the methodologies adopted for estimating monetisation potential within each sector.

The monetisation estimates are based on multiple components, including (i) upfront proceeds accruing to government entities, (ii) the present value of projected future cash flows from the assets, and (iii) the expected

private sector investment mobilised through these transactions. Sectoral assessment highlights comparatively higher monetisation potential in highways, power, railways, ports, and coal. However, it is important to

emphasise that these projections are indicative in nature and remain subject to variation at the time of transaction structuring, bidding, award, and actual project implementation.⁸

Sl.	Sectors	Total Monetisation Value (in INR Cr)	Percentage of total
1	Highways, MMLPs, Ropeways	442000	26%
2	Railways	262300	16%
3	Power	276500	17%
4	Petroleum and natural gas	16300	1%
5	Civil aviation	27500	2%
6	Ports	263700	16%
7	Warehousing and storage	10000	1%
8	Urban infrastructure	52000	3%
9	Coal	216000	13%
10	Mines	100000	6%
11	Telecom	4800	0%
12	Tourism	1200	0%
	Total	1672300	100%

Table 3 Summary of estimated Total Monetisation Value (TMV) NMP 2.0 award target⁸

Asset recycling bridges this gap by transforming "dead capital" locked in mature, revenue-generating brownfield assets such as the KMP Expressway, power transmission lines, and state-owned warehouses into immediate liquidity.

By leasing these operational assets to private investors through models like Toll-Operate-Transfer (TOT) or Infrastructure Investment Trusts (InvITs), Haryana can generate upfront funds to finance "greenfield" (new) projects

without breaching its debt-to-GSDP ceiling, which currently hovers between 26% and 30%. This methodology not only de-risks the state's balance sheet by avoiding high-interest commercial loans but also introduces private-sector efficiency and advanced technology into the management of existing infrastructure. Ultimately, asset recycling serves as a self-sustaining "virtuous cycle," providing the financial engine required to achieve a \$1 Trillion GSDP and support high-tech initiatives

⁸ National Monetisation Pipeline 2.0, NITI Aayog, Government of India, 2026
<https://niti.gov.in/sites/default/files/2026-02/National-Monetisation-Pipeline.pdf>

like the Haryana AI Mission while maintaining fiscal discipline under the FRBM framework.

There are three key reasons for implementing an asset recycling program; namely to: (i) meet

infrastructure investment needs and gaps (ii) alleviate constraints in raising financing and funding (iii) leverage private sector efficiencies for better service delivery of existing infrastructure assets.⁵

Infrastructure Investment Needs and Gap	To meet significant investment required in infrastructure in Emerging Market and Developing Economies (EMDEs) to: • Build new (green field) infrastructure • Meet the operations and maintenance expenses of existing infrastructure • Build climate resilience in, and rehabilitate, existing infrastructure
Constraints in Funding and Financing	To alleviate existing constraints in raising financing and funding due to: • High level of government debt • High proportion of tax revenues utilized to service existing debt • Exacerbating impact of global macroeconomic shocks on government budgets
Private Sector Efficiencies in Existing Infrastructure	To leverage private sector and gain benefits such as: • Optimal asset utilization and risk allocation • Innovation and efficiencies in the operations of the asset through well-defined service standards • Access to private sector knowledge and skills to operate the assets and provide services
Other Considerations	• Political economy considerations such as strategic control of public assets and public concern around privatization • Mitigate the impact of economic downturns and recessions • Promote infrastructure as an asset class to an investor base that includes both domestic and foreign institutional investors, and develop local currency financing⁹ • Climate change and resilience considerations

Table 4 Need for Asset Monetization

⁹ Asset Monetization-Fueling the future growth, Government of Karnataka
<https://planning.karnataka.gov.in/storage/pdf-files/Economic%20Survey/Chapter%20Eng%202022.pdf>

Asset Identification & Classification

Monetizable Assets

Asset monetisation refers to the process of unlocking economic value from existing public or private assets by converting them into revenue streams through limited-term rights transfers, leases, concession arrangements or other structured mechanisms, without transferring ownership of the underlying asset. It enables governments to generate funds from under-utilised or revenue-generating assets and reinvest them into new development needs. In the context of the National Monetisation Pipeline, monetisation focuses on granting operational rights to private partners for a set period while retaining ownership with the public authority.

Core vs Non-Core Assets

Core Assets: These assets are fundamental to an organization's core

service delivery mandate, particularly those that directly enable infrastructure services for citizens and end users. They typically include transport networks, power generation and transmission systems, ports, railways, and warehousing facilities. Given their strategic importance and revenue-generating potential, only such critical infrastructure assets are generally considered suitable for inclusion in core monetisation pipelines.¹⁰

Non-Core Assets: These assets are not integral to the organization's primary service delivery mandate and may include surplus land parcels, buildings, or other real estate holdings that do not directly contribute to core infrastructure services. Since they are not critical to operational objectives, such assets are generally excluded from core infrastructure monetisation pipelines and are instead monetised through alternative mechanisms, such as strategic disinvestment, long-term leasing, or other disposal routes.

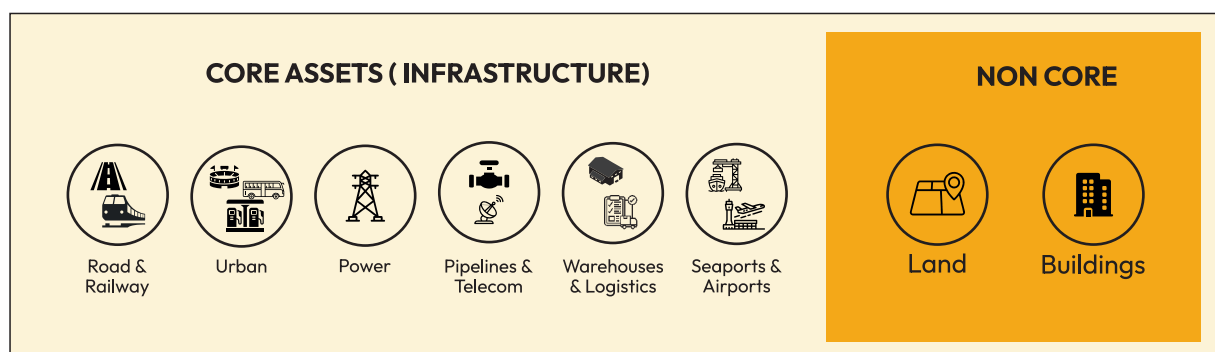


Figure 2 Classification of Assets as per NMP, NITI Aayog

¹⁰ National Monetization Pipeline, NITI Aayog, Government of India
<https://www.niti.gov.in/sites/default/files/2023-03/Asset%20Monetization%20Pipeline.pdf>

Brownfield vs Greenfield Assets

Brownfield Assets: These are existing and operational infrastructure facilities that have already been developed and are generating revenue. While they may require upgrades, efficiency improvements, or enhanced maintenance, they are generally considered lower risk due to their established cash flows and usage history. For this reason, monetisation strategies typically prioritise brownfield assets, as their stable revenue streams and reduced uncertainty make them more attractive to private investors.

Greenfield Assets: It refers to new or undeveloped projects where no prior infrastructure exists. These projects involve developing infrastructure from the ground up and require significant upfront capital investment, detailed planning, regulatory clearances, and longer implementation timelines. Although greenfield projects carry higher construction and demand risks, they play a crucial role in expanding infrastructure capacity and supporting long-term economic growth.¹¹

Revenue-Generating vs Underutilized Assets

Revenue-Generating Assets are infrastructure assets that produce

steady and predictable cash flows through their ongoing operations, such as toll roads collecting user fees or operational power transmission lines earning tariff revenues. Due to their established revenue streams and financial visibility, these assets are generally considered strong candidates for monetisation, as they can reliably support investor returns and structured financing models.¹¹

Underutilised (or Unutilised) Assets on the other hand, are assets that are not operating at their full economic potential and therefore generate suboptimal returns. In the public sector context, this may include infrastructure with excess capacity, dormant facilities, or assets that are not commercially leveraged or efficiently maintained. By unlocking value from such underutilised assets through better management or structured monetisation, governments can release capital for reinvestment into priority development projects.

Asset Inventory & Digital Repository System

Asset Inventory: An asset inventory is a comprehensive, organised catalogue of all physical (and often digital) assets owned by a government or entity. In infrastructure or public monetisation frameworks, this inventory lists assets by type, location, condition, utilisation,

¹¹ Investopedia article, June 17, 2025 https://www.investopedia.com/ask/answers/O43015/what-difference-between-green-field-and-brown-field-investment.asp?utm_...com

valuation, and ownership status to facilitate planning and monetisation decision-making. A robust asset inventory is foundational for transparent analysis, tracking, and optimisation of asset value.¹²

Digital Asset Repository / Digital Asset Management System: The term “digital asset repository” originates in digital file management, in an infrastructure context this concept extends to a centralized digital system that stores structured data on all assets, including

metadata, valuation, utilisation status, legal and technical documentation. This repository supports transparent access, retrieval, and analysis of asset information for monetisation planning, monitoring, and investor due diligence. While bibliographic examples illustrate digital repositories for information assets, the core principle of centralised, searchable, metadata-tagged storage of asset data is analogous for public physical assets in a digital inventory system.¹³

Sector-Wise Asset Mapping of Haryana

Haryana holds a diverse portfolio of public assets across multiple departments and agencies. These assets

can be systematically classified based on the Category of department, the respective department and Type of asset owned given below-

¹² FMX Portal article https://www.gofmx.com/blog/asset-inventory-management/?utm_com

¹³ IBM Portal article https://www.ibm.com/think/topics/digital-asset-management?utm_com

Table 5 Sector-wise Asset Mapping of Haryana

Categories of Department	Department/Agencies	Type of Asset Own
Urban Development & Municipal Infrastructure	- Urban Local Bodies (ULBs) - Haryana Shahari Vikas Pradhikaran (HSVP) - Town & Country Planning (TCP) - Housing Board Haryana - Haryana Mass Rapid Transport Corporation (HMRTC) - Haryana Tourism Corporation	Urban land banks, commercial markets, residential sectors, municipal buildings, parking facilities, hotels/resorts, metro infrastructure, transit corridors, public utilities, heritage sites
Industrial & Economic Infrastructure	- Haryana State Industrial & Infrastructure Development Corporation (HSIIDC) - Haryana State Warehousing Corporation (HSWC) - Agricultural Marketing Board (HSAMB) - Transport Department / Bus Depots	Industrial estates, industrial plots, logistics hubs, IT parks, warehousing, mandis, market yards, cold storage, bus stands, transport terminals.
Core Public Infrastructure (Roads, Water, Power)	- Public Works Department (PWD – B&R) - Public Health Engineering Department (PHED) - Irrigation & Water Resources Department - HVPNL / UHBVN / DHBVN (Power Utilities)	State highways, bridges, water supply systems, sewage networks, canals, dams, transmission lines, substations, power grids, pumping stations
Social Infrastructure (Education, Health & Safety)	- Education Department (Schools, Colleges, Universities) - Health Department (Hospitals, CHCs, PHCs) - Medical Education & Research Institutions - Police Department - Fire & Emergency Services - Animal Husbandry & Dairy	Schools, colleges, hospitals, medical colleges, police stations, police housing, fire stations, training centers, veterinary hospitals, animal farms
Rural, Environmental & Natural Assets	- Rural Development & Panchayati Raj - Forest & Wildlife Department - Agriculture Department - Horticulture Department	Panchayat lands, village ponds, community centers, rural roads, forest lands, wildlife sanctuaries, nurseries, research farms, and agri-extension centers

What is the roadmap for Asset Recycling?

The following section outlines a structured roadmap for designing and effectively implementing an asset recycling programme. The roadmap comprises six sequential steps. First, the government must clearly define the programme by establishing its goals, objectives, scope, and scale. Second, it is essential to create an enabling institutional and governance framework

to support implementation. Third, momentum must be built through active engagement with both public and private sector stakeholders to ensure alignment and investor confidence. Fourth, the identified assets are monetised through a transparent and well-structured transaction process. Fifth, the proceeds generated are strategically reinvested into new infrastructure or priority development projects.⁵ Finally, the programme must be continuously monitored and evaluated to ensure accountability, performance efficiency, and long-term sustainability.⁵

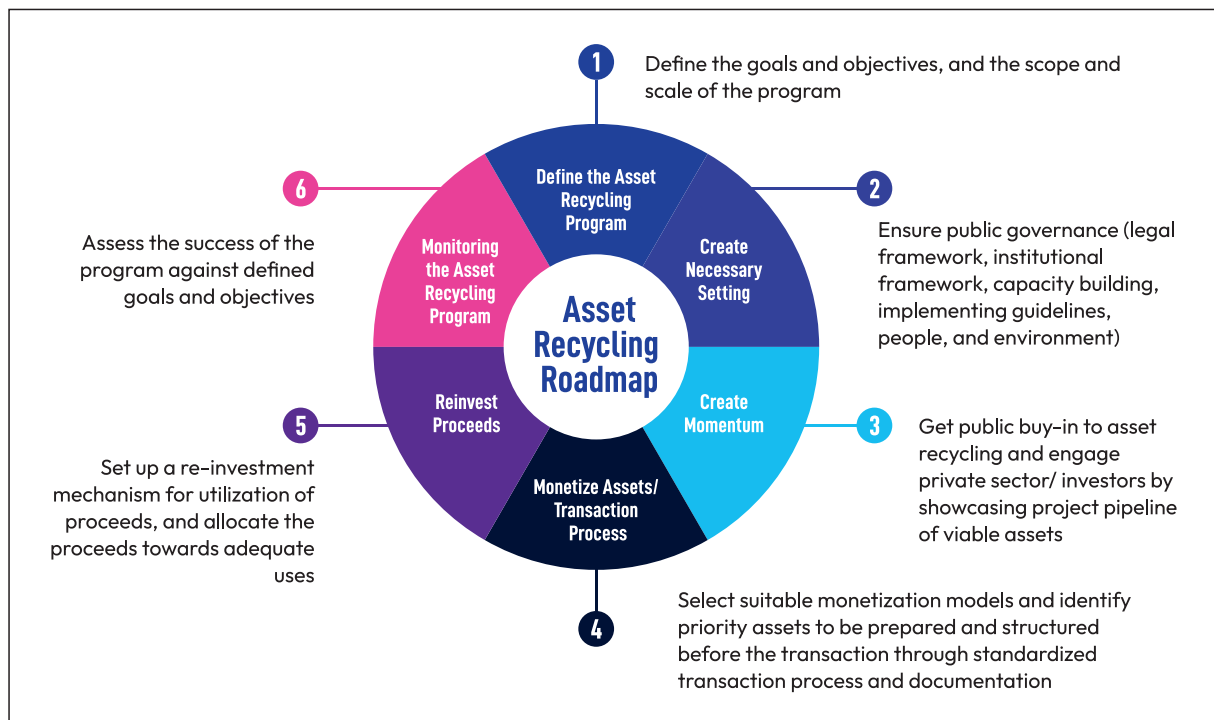


Figure 3 Stepwise roadmap for Asset Recycling

Asset Recycling Programme

The first step in initiating an asset recycling programme is for the government to clearly define its goals, objectives, scope, and scale in alignment with national or state-level strategic priorities. This requires adopting a long-term perspective that focuses on two core outcomes: reducing funding constraints for future infrastructure investment by monetising existing operational assets, and stimulating economic growth, employment generation, and improved living standards through the development of new infrastructure projects.

It is considered good governance practice to establish clarity regarding the utilisation of proceeds generated from asset recycling. Governments should clearly articulate the nature, scale, and priority areas of the proposed reinvestment programme, along with the proportion of funds to be redeployed into new infrastructure. Such clarity helps in identifying priority sectors and assets for reinvestment, improving visibility in bridging infrastructure funding gaps, and ensuring transparency and accountability in the use of monetisation proceeds.

Defining goals and objectives of an asset recycling program

Based on their strategic priorities and underlying motivations, several countries have articulated the goals and objectives of asset recycling programme as shown in Figure 3 follows:⁵

- Monetising mature government assets through long-term concessions, divestment, or structured financing models in order to unlock capital for reinvestment into priority infrastructure and community-focused projects.
- Enabling the development of new infrastructure without increasing public debt, raising taxes, or diverting funds from essential public service programmes.
- Leveraging private sector expertise to improve operational efficiency, service quality, innovation, and overall performance of existing infrastructure assets.
- Promoting infrastructure as a distinct asset class by expanding the investor base to include institutional investors such as sovereign wealth funds, pension funds, insurance companies, and asset managers.
- Creating opportunities for citizen participation in infrastructure investment, either directly or through pension and pooled investment vehicles, thereby supporting portfolio diversification.

- Optimising the allocation of public capital by redirecting funds from mature, commercially viable assets to projects that are economically beneficial but less commercially attractive, ensuring balanced and sustainable development.

Defining scope and scale of the asset recycling program

The scope and scale of an asset recycling programme should be formulated through a comprehensive aggregation of inputs from key stakeholders, including line ministries, departments, statutory bodies, and public sector enterprises as shown in Figure 3. This process should also incorporate an assessment of secondary data related to existing operational infrastructure assets as well as planned priority projects across sectors.

A structured bottom-up approach is recommended, wherein the current infrastructure asset base under government management is systematically identified and mapped alongside future infrastructure projects earmarked for development.⁵ For each sector, relevant ministries, departments, statutory authorities, and public undertakings should actively contribute to this mapping exercise to ensure completeness and accuracy. The defined scope and scale of the programme should therefore be grounded in a consolidated inventory of existing assets, future infrastructure priorities,

and sector-wise strategic considerations, forming the foundation for informed decision-making and phased implementation.⁵

- **Identification of Potential Asset Base:** The programme should begin with identifying sizeable, operational (or near-operational) brownfield infrastructure assets under relevant ministries or government agencies that are suitable for structured private participation. The focus should be on assets with stable revenue streams and monetisation feasibility, after consulting ministries and public enterprises to confirm availability, especially where revenues may already be earmarked for debt servicing or operational commitments.
- **Selection and Multi-Dimensional Assessment of Assets:** From the broader asset pool, a refined subset should be shortlisted based on revenue stability, commercial viability, investor appetite, and potential for private-sector efficiency gains. Environmental, social, governance, legal, and accounting considerations must also be evaluated to ensure sustainability, compliance with standards, and smooth balance sheet transition.
- **Valuation and Indicative Transaction Structuring:** A robust valuation exercise should be undertaken to determine an indicative transaction value using

appropriate methodologies such as the market approach, capex approach, book value method, enterprise value method, or a combination thereof, depending on asset characteristics.

➤ **Identification of Priority**

Reinvestment Projects: In parallel, governments should identify priority greenfield infrastructure projects aligned with national or state vision plans for reinvestment of proceeds. These projects should be assessed for risk profile, socio-economic impact, and financing suitability, supported by a structured internal consultation mechanism to ensure transparency, stakeholder alignment, and efficient capital redeployment.

Create the Necessary Setting (Public Sector Governance of Asset Recycling)

Good governance is fundamental to the successful implementation of an asset recycling programme. It requires the establishment of a strong enabling environment supported by clear laws, institutional mechanisms, and transparent processes across the entire lifecycle of the programme. The principles of participation, transparency, accountability, fairness, and efficiency commonly applied in public-private partnership (PPP) frameworks should equally guide asset recycling initiatives to ensure credibility, public trust, and long-term sustainability.

A sound governance framework should include the following key components:

- **Legal and Regulatory Framework:** Establishing clear laws, policies, and regulatory provisions to enable and facilitate structured monetisation transactions.
- **Institutional Architecture:** Creating or designating appropriate institutions and oversight bodies to ensure coordination, accountability, and effective programme management.
- **Capacity Building:** Implementing structured training and knowledge-development programmes to equip public officials with expertise in asset valuation, transaction structuring, and risk management.
- **Standardised Processes and Guidelines:** Developing transparent procedures, operational manuals, and transaction guidelines to ensure consistency and efficiency in execution.
- **Stakeholder and Public Engagement:** Actively engaging citizens, investors, and other stakeholders to build confidence, address concerns, and secure broad-based support for the programme.

Ensure all laws and regulations are in place

- Existing legal and regulatory frameworks in many jurisdictions may not provide adequate certainty for investors under traditional

infrastructure procurement models, necessitating reforms to support scalable asset recycling.

- Governments must establish a secure, predictable, stable, and commercially oriented legal and regulatory environment to enhance investor confidence and reduce transaction risk.
- Laws and regulations governing asset recycling should be clearly defined, transparent, and enforceable to ensure credibility and smooth implementation.
- Existing statutory and regulatory provisions should be reviewed and rationalised to eliminate overlaps, inconsistencies, or conflicting outcomes.
- Investors require legal predictability and policy stability, supported by streamlined, coherent, and well-articulated rules that ensure contract enforceability and effective dispute resolution mechanisms.⁵

Maintain key institutional roles and responsibilities

A successful asset recycling programme requires a clear, predictable, and legitimate institutional framework backed by competent and adequately resourced authorities. Strong institutional arrangements ensure effective coordination, transparent decision-making, and accountability throughout the programme lifecycle.

Key roles and responsibilities must be clearly defined across all participating entities. Central line ministries particularly the Ministry of Finance state-owned enterprises (SOEs) that own and operate infrastructure assets, procuring authorities, dedicated transaction units, and sector regulators should each be assigned well-articulated mandates to establish clear lines of accountability and avoid overlaps.⁵

Furthermore, monetisation and reinvestment initiatives should be prioritised at the highest levels of government to ensure alignment with broader strategic objectives. Given the presence of multiple competing investment demands, it is essential for the government to define and pursue clear strategic goals. Institutional, procedural, or accounting frameworks should remain neutral, avoiding any inherent bias either in favour of or against asset recycling, thereby enabling objective and value-driven decision-making.

Build necessary capacity holistically

Asset recycling demands a specialised skill set that differs from those typically required for traditional infrastructure procurement or public investment programmes. It involves complex transaction structuring, valuation, risk allocation, and stakeholder coordination, all of which require enhanced technical and institutional

capabilities within government.

To build these capacities, governments should adopt a blended approach—Establishing dedicated institutional mechanisms, strengthening in-house expertise through targeted training of public officials, and leveraging external professional support where necessary. For countries or states that are new to asset recycling, engaging experienced consultants and transaction advisers is particularly critical. Qualified advisers can provide structured guidance across key areas, including technical assessments, legal structuring, financial modelling and valuation, project monitoring and due diligence, accounting and tax implications, as well as environmental and social safeguards. This combined capacity-building strategy helps ensure that asset recycling transactions are well-designed, transparent, and aligned with international best practices.

Implementation guidelines (for monetization and re-investment)

Comprehensive, step-by-step implementation guidelines should be developed to govern both the monetisation of assets and the reinvestment of proceeds across all levels of government, including central ministries, state authorities, and state-owned enterprises (SOEs). These guidelines should clearly outline the processes for pipeline development,

transaction structuring and execution, and the systematic redeployment of capital into priority infrastructure projects.⁵

Each stage of the asset recycling lifecycle must be conducted through a transparent, neutral, and non-discriminatory process to ensure fairness, credibility, and alignment with the programme's strategic objectives. Well-defined procedures and standardised frameworks help minimise discretion, enhance accountability, and promote investor confidence while ensuring that the overall goals of the asset recycling programme are effectively achieved.

Public engagement is a critical component of a successful asset recycling programme. The programme should adopt a people-centric approach, emphasising accountability and transparency to ensure that projects ultimately enhance public welfare and improve livelihoods, particularly for vulnerable and underserved communities.

By proactively communicating objectives, processes, and expected outcomes, governments can build trust and secure broad-based support for asset recycling initiatives. Effective public engagement also strengthens social legitimacy and reinforces the programme's commitment to inclusive and equitable development—a theme further explored in the discussion on creating momentum.

Ensure environmental and social sustainability

An asset recycling programme should embed the principles of sustainable development at every stage of project design and execution. This requires integrating Environmental, Social, and Governance (ESG) considerations into the core objectives of each transaction and ensuring that these priorities are clearly reflected in contractual terms and performance standards.

Contracts should include well-defined specifications aligned with sustainability goals, and project awards should favour bidders who demonstrate proven capacity to manage environmental and social risks in accordance with Good International Industry Practice. By institutionalising ESG criteria within the asset recycling framework, governments can promote responsible investment, safeguard community interests, and ensure long-term, sustainable infrastructure outcomes.⁵

Monetisation Models

The state is shifting from traditional debt-based financing to a sophisticated Asset Monetization framework. By the 2025-26 fiscal cycle, Haryana will integrate several national and international models to bridge its revenue deficit and fund capital outlay.

Asset Monetisation can be undertaken through a range of instruments/ tools. This section summarizes some of the few models, which have been utilized and have proven to be effective in monetising brownfield assets. Monetisation models which are currently being explored/ availed may broadly be categorized into two approaches: (i) Direct Contractual Approach and (ii) Structured Financing models.¹⁰

'Direct Contractual' Approach	Structured financing models
Concession/ contract between a public entity and identified private sector developer(s)/ investor(s)	Structured instruments for long-term fund generation via capital markets or through a pool of investors

The above classification has been adopted in this Guidebook solely to outline the broad principles underlying different monetisation models and structures. It is intended to serve as an indicative framework for conceptual understanding and should not be

interpreted as a formal or prescriptive categorisation of asset monetisation approaches.

In practical implementation, the choice of monetisation model depends on multiple factors, including the asset profile, strategic objectives of

monetisation, risk allocation preferences, and the expectations of sponsors and investors. Accordingly, the most suitable structure may fall within one of the identified categories,

represent a hybrid model combining features of both, or even take the form of an alternative structure tailored to specific transaction requirements

Table 6 Indicative features of Direct Contractual mode¹⁰

Transaction	Asset OR rights over such asset-Transferred to a single or a consortium of 3 developers and / or investors, by way of defined contractual frameworks
Consideration	Upfront and/or periodic payments
Target Investor Class	Generally, infrastructure developers, strategic investors with direct involvement / oversight in operations
Selection modes	Through a competitive bidding process and as per prescribed guidelines of Government
Contractual aspects	Key performance indicators and clearly defined performance regime with commensurate incentive or penalty mechanisms, suitable exit provisions, termination and force majeure provisions
Prevalent Structures	PPP concessions

Table 7 Indicative features of Structured Financing Instruments¹⁰

Transactions	Partnership interest in the asset OR rights over such assets, granted to a pool of investors (under a capital market based instrument or otherwise)
Consideration	Generally Upfront
Target Investor Class	Institutional investors such as sovereign wealth funds, global/domestic insurance funds, pension funds Retail investors
Selection Modes	Public listing or private placement or other such mechanisms
Prevalent Structures	Infrastructure Investment Trust (InvIT), Real Estate Investment Trust (REIT), Asset - back securitisation (ABS)

Direct Contractual Models – Brownfield PPP Concessions

Historically, brownfield engagement with the private sector has primarily taken the form of management contracts, wherein the public authority retains overall responsibility for service delivery while delegating day-to-day operations and maintenance (O&M) to a private operator. These contractual arrangements are typically short- to medium-term in nature—generally spanning 3 to 5 years—and involve the private entity managing either a specific component or the entirety of an asset, facility, or service.

In contrast, brownfield Public-Private Partnership (PPP) models adopt a more comprehensive approach by engaging a private sector partner for end-to-end responsibilities, including operation, maintenance, service delivery to users, and, where required, asset augmentation or performance enhancement. Such models are designed to optimise efficiency, improve service quality, and unlock greater value from existing infrastructure assets owned by public sector entities, line ministries, or statutory authorities. Various structured PPP models can be deployed for monetising these mature infrastructure assets, depending on sectoral characteristics and risk-sharing arrangements.¹⁰

Brownfield Public Private Partnership Concessions		
Model	Operate Maintain Transfer (OMT)	Operate Maintain Develop (OMD)
Adopted as	Toll Operate Transfer (TOT) in Roads	Operation Management Development Agreement (OMDA) in Airports

Figure 4 Brownfield PPP Models

Operate-Maintain-Transfer Concession

The core principle of this model is to engage private sector partners to undertake the operation and maintenance (O&M) of infrastructure projects that have already been constructed by the government or public asset owner. Since the asset is operational and capable of immediate revenue collection, with established demand or traffic streams, the project typically carries lower construction and demand risk. This stability reduces commercial uncertainty and makes the asset more attractive to investors.¹⁰

From a bidder's perspective, the existence of predictable revenue streams allows future cash flows to be assessed with reasonable certainty. This, in turn, enables the asset owner to monetise the project through an upfront payment, periodic premium, or revenue-

sharing arrangement. The model generates assured cash inflows for the government while simultaneously relieving it of ongoing O&M responsibilities and associated financial commitments. As a result, public entities gain fiscal and operational bandwidth to focus on developing greenfield infrastructure projects and enhancing overall efficiency in service delivery.

In India, the Operate-Maintain-Transfer (OMT) model has gained significant traction in the road sector. OMT contracts combine toll collection rights with O&M responsibilities, allowing private operators to manage and maintain operational highways.¹¹ Between 2009–10 and 2014–15, the National Highways Authority of India (NHAI) awarded approximately 2,400 km of National Highways under the OMT framework, demonstrating the scalability and effectiveness of this brownfield monetisation approach.

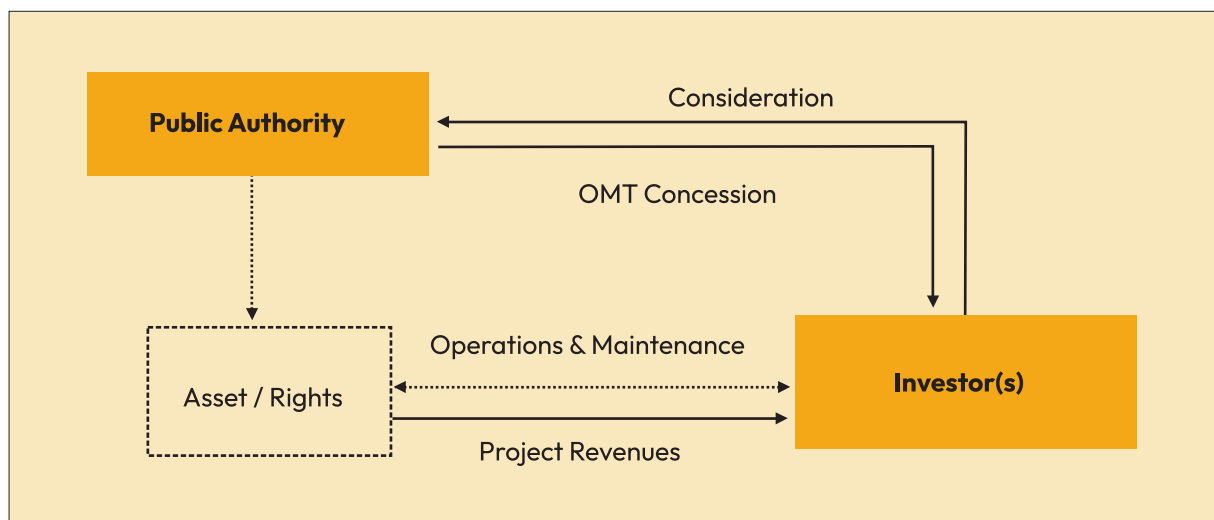


Figure 5 OMT Broad Structure⁹

Table 8 Key Terms of an OMT Concession

Key Requirement	Operational asset, preferably with one complete cycle/ year of operations
Potential Projects	Projects newly constructed and commissioned by the public asset owner through its own funds (EPC etc.) OR Project originally tendered out through PPP modes and for which have concession period is complete or termination has occurred
Primary Obligations	Operations and Maintenance of assets Provide service to users against a pre -determined/ regulated or market-based fee
Concession Period	10 years or more, however, depending on the asset category. 5nger concession periods with pre-defined terms of augmentation preferable
Consideration	Upfront or Annual Premium (Fixed OR in form of revenue share) variation of model where an upfront value is bid and paid by Concessionaire is TOT
Investor Class	Strategic investors or Infrastructure developer with direct involvement / oversight in operations
Selection	Through competitive bidding process and as per prescribed guidelines of Government
Other Terms	Standard terms as in case of PPP Projects

Toll Operate Transfer

Toll Operate Transfer (TOT) is an evolved variant of the Operate-Maintain-Transfer (OMT) model, widely adopted in the road sector for asset monetisation. Under the TOT framework, private investors are granted the right to operate and maintain operational toll road assets for a specified concession period in exchange for paying an upfront lump-sum premium to the authority. Unlike traditional OMT contracts, where

consideration may be structured as periodic payments or revenue share, the TOT model enables the government to realise substantial immediate capital receipts.¹⁰

The TOT model has emerged as one of the most successful monetisation instruments in India's road sector, implemented by both central and state authorities. In 2016, the Ministry of Road Transport and Highways (MoRTH) introduced the TOT concession framework to facilitate the monetisation of operational highway assets held by

the National Highways Authority of India (NHAI), targeting long-term institutional

investors and unlocking value from established toll-generating corridors.

Toll Operate Transfer (TOT) Model



Ensures efficient management of public funded and operational national highway projects through **structured contractual partnerships with defined KPIs and O&M standards**



Provides **upfront proceeds for ploughing back into greenfield national highway development**

The Toll Operate Transfer (TOT) model essentially involves the securitisation of future toll receivables through the collection of an upfront concession fee from the selected bidder, determined via a transparent and competitive bidding process. Under this structure, operational National Highways—typically developed under the Engineering, Procurement and Construction (EPC) model—are leased out to private investors in return for a lump-sum upfront payment to the authority.

The successful bidder is granted the right to collect toll revenues and assume responsibility for the operation and maintenance of the highway over a long-term concession period, generally ranging from 15 to 30 years. To preserve commercial viability and investor returns, the concession framework provides for periodic toll rate escalations linked to inflation indices, ensuring revenue stability over the life of the agreement.

Operate-Maintain-Develop Concession

Under the Operate, Maintain and Develop (OMD) structure, an operational asset that requires capacity expansion or performance enhancement is transferred to a private partner for augmentation as well as long-term operation and maintenance during the concession period. A key feature of this model is that service delivery generally continues uninterrupted, with augmentation works undertaken while the asset remains functional.¹¹

The private sector mobilises financing based on the strength of the existing operational asset and may supplement it with project finance and equity contributions to fund the required upgrades. In return, the concessionaire pays the authority either an upfront fee or periodic consideration in the form of a premium and/or revenue share. The investor recovers its investment and earns returns through revenues generated from the upgraded and more efficiently managed asset over the concession term.

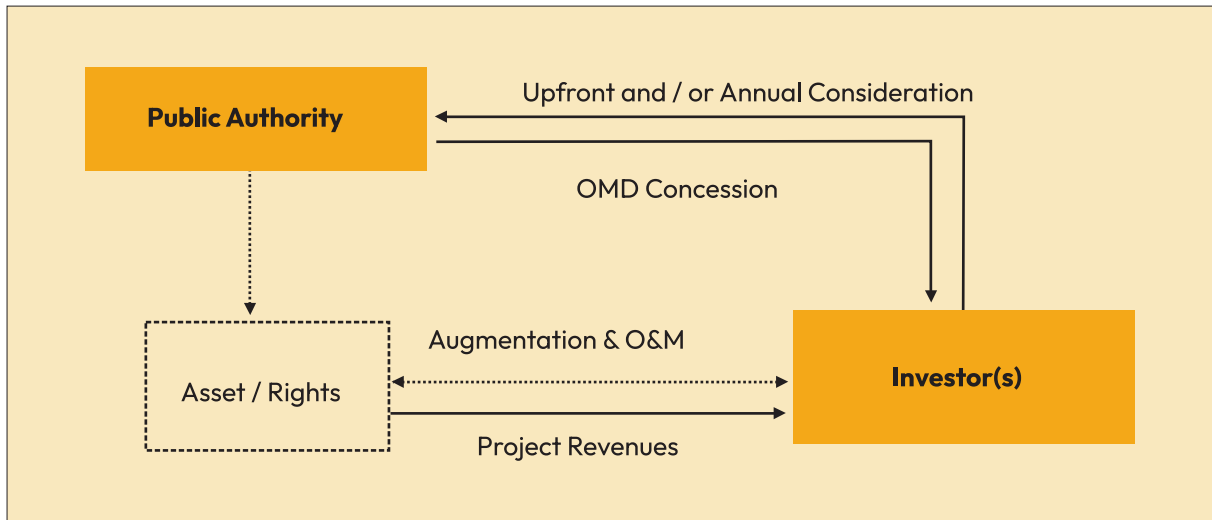


Figure 6 Operate-Maintain-Develop Structure¹⁰

Key Requirement	Operational asset which is due for augmentation
Potential Projects	Projects constructed and completed by public asset owner through their own funds OR Project originally tendered out through PPP modes and for which concession period is complete
Primary Obligations	Augmentation along with ongoing and future Operations and Maintenance of assets Provide service to users against a pre-determined/ regulated or market-based fee
Concession Period	25 years or more, however, depending on the asset category.
Consideration	Annual Premium (Fixed or in form of revenue share) and/ OR Upfront Premium? ³
Investor Class	Strategic investors with direct or active involvement in operations
Selection	Through a competitive bidding process and as per prescribed guidelines of Government
Other Terms	Standard terms as in case of PPP Projects

Table 9 Key Terms of an OMD Concession¹⁰

A closely related structure is the Rehabilitate-Operate-Maintain-Transfer (ROMT) model, which applies to existing assets that require substantial rehabilitation or upgradation before

full-scale operations and revenue collection can recommence. Under this framework, the private partner undertakes the necessary rehabilitation works at the outset and subsequently

assumes responsibility for operation and maintenance over the concession period. The overall concession terms are generally comparable to those under the OMD model, with appropriate structuring to account for and net off the rehabilitation costs in the consideration payable to the authority.

A defining characteristic of asset monetisation lies in the nature of the underlying asset. If the asset is already revenue-generating and possesses the potential for improved utilisation—thereby enabling higher revenue accruals or reducing the need for government grants or budgetary support—it can be appropriately classified under asset monetisation. The core objective is to unlock enhanced value from operational public assets while optimising fiscal outcomes for the authority.

Long Term Lease

A lease arrangement involves the transfer of the right to use an asset from the lessor to the lessee for an agreed period in exchange for a fixed payment or a series of payments. While long-term lease models share similarities with brownfield PPP structures, they differ primarily in the nature of the asset being leased and the manner in which it is utilised by the private party.¹⁰

Long-term lease models are particularly relevant in sectors such as telecommunications, where a private operator already holds the requisite

service licence. In such cases, underutilised or surplus infrastructure assets of a public sector entity may be leased to the private operator, enabling service delivery under the operator's own licence framework. Similarly, lease structures may be adopted where infrastructure assets—such as mines—are permitted for captive use by private sector entities.

These models are also useful for achieving asset-light balance sheets or facilitating innovative financing strategies for public sector organisations. In such arrangements, the infrastructure asset or operational rights are transferred to a private entity for a predetermined period in exchange for upfront or periodic consideration. The public authority may, in certain cases, continue to utilise the asset for public service delivery by making periodic payments to the lessee. Typically, long-term leases are structured with fixed upfront payments or fixed periodic payments, often incorporating annual escalation clauses.

Long-term lease models are also widely applied to urban land-based assets such as hospitality properties, bus terminals, and commercial real estate. In some instances, lease structures may be combined with other PPP formats such as the

Rehabilitate–Operate–Maintain–Transfer (ROMT) model to create hybrid solutions tailored to the specific asset profile and transaction objectives.

Scenarios	A. Assets of public entity leased out for providing service under its own license Right/ License to provide an infrastructure service already available with a private party B. Leasing of assets for Captive Use C. Leasing for achieving asset light balance sheets
Lease Period	10 years or more, however, depending on the asset category.
Consideration	Fixed upfront consideration OR Annual payments with escalation
Investor Class	Existing Licensees (Scenario A); Captive Users (Scenario B) Financial investors (Scenario C)
Potential Sectors	Power, Telecom, Pipeline, Ports, Mining etc.

Table 10 Key Features of Lease⁹

In such arrangements, the concession or lease period is typically extended to accommodate the scale of private investment involved. Where the private sector is required to undertake additional capital expenditure such as upgrades, modernisation, or capacity expansion a longer contract tenure helps ensure commercial viability and adequate return on investment.

The transfer of the asset under a lease agreement may be structured either with defined restrictions on its function or permitted usage, or with greater operational flexibility, depending on policy objectives and sectoral regulations. The specific terms are tailored to balance public interest

considerations with investor requirements and transaction feasibility.¹⁰

Leasing transactions offer distinct benefits for both public and private sector entities. For the public sector, they provide immediate financial returns from underutilized or idle assets, while eliminating the responsibility for ongoing maintenance. For the private sector, such arrangements ensure access to fully operational assets without bearing construction risks, enabling faster deployment of services.

Infrastructure Investment Trust

An Infrastructure Investment Trust (InvIT) is an innovative, trust-based financial instrument that allows investors to participate in infrastructure financing through a stable and liquid vehicle. InvITs provide an opportunity to invest in infrastructure assets that generate predictable cash flows and dividends.

Introduced in India in 2014, InvITs enable infrastructure asset owners to raise funds from a diverse set of investors by offering periodic payouts from the cash flows generated by their assets. Under an InvIT structure, asset owners transfer multiple revenue-generating asset SPVs either through a holding company or directly to a trust, which then issues units to investors to mobilize capital.

The funds raised upfront are typically used by developers to create new greenfield projects or to repay existing debt. This repayment frees up capital with lenders, enabling further investment in new infrastructure projects. In return for their investment, unit holders receive a proportionate share of the Net Distributable Cash Flows (NDCF) similar to dividend payouts on a regular basis.

Unit holders can also benefit from improved yields through portfolio expansion, by adding additional revenue-generating projects to the InvIT. The figure below illustrates the structure of a typical InvIT transaction and the flow of funds across different agencies.

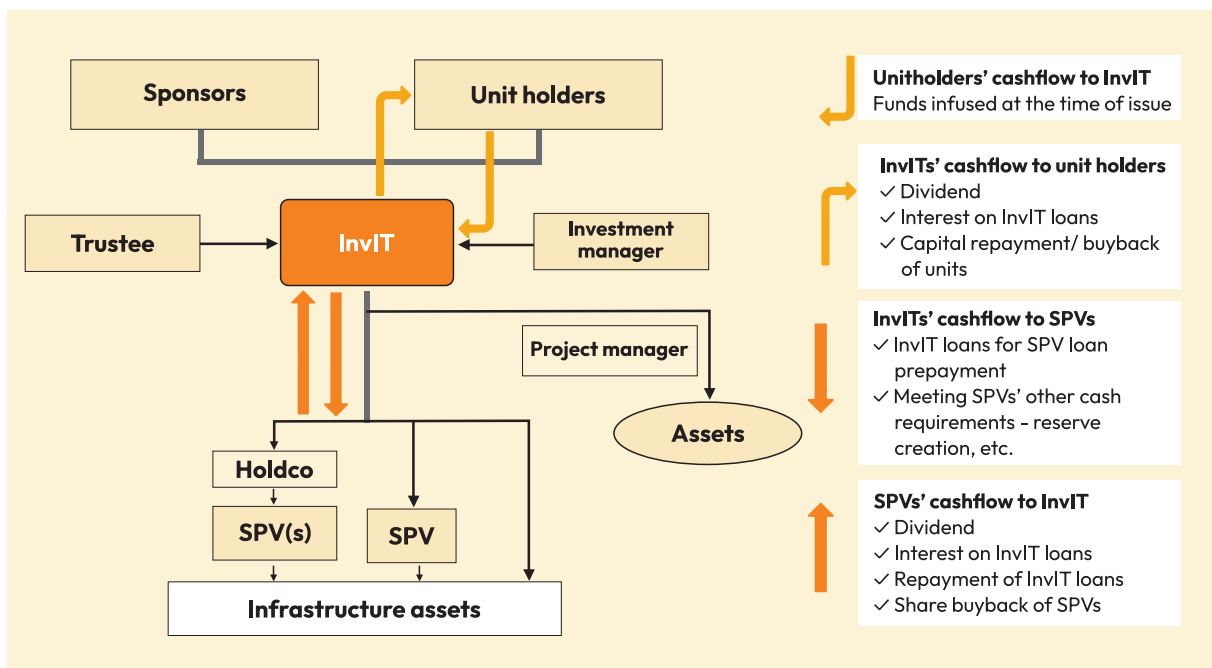


Figure 7 InvIT Transaction Structure

Key Stakeholders

Under an InvIT structure, the public asset owner ('Sponsor') creates an independent trust and transfers ownership or rights of the public assets to it. The investors ('Unit Holders') then become the beneficiaries of the trust.

The key stakeholders in an InvIT include:

- **Sponsor:** The sponsor is the public asset owner responsible for setting up the InvIT to monetize its assets. In the case of PPP projects, the sponsor may be the infrastructure developer or an SPV holding the concession agreement.
- **Trustee:** The trustee holds the InvIT assets in trust for the benefit of the unit holders and ensures compliance with applicable regulations.
- **Unit Holders:** These are the investors

who subscribe to the InvIT units and are the ultimate beneficiaries of the assets.

- **Investment Manager:** The investment manager makes strategic investment decisions on behalf of the unit holders, including acquisition of new assets, sale of existing assets, and managing leverage.
- **Project Manager:** The project manager provides operational expertise, ensuring the infrastructure assets are managed efficiently and in the interest of the unit holders.

Additional stakeholders involved in the InvIT registration and issuance process include valuers, auditors, merchant bankers, banks, registrars and transfer agents, credit rating agencies, and depository participants.¹⁰

Key Requirement	- Operational Infrastructure assets, with at least one year of operations Key for Public InvIT - Eligible sub-sectors as per Harmonised Master list of infrastructure subsectors of MoF
Types of InvIT	Public Open for participation by all kinds of investors including retail; and Types of InvIT Private Restricted for participation by Qualified Institutional Buyers and bodies corporate
Minimum value	Assets under InvIT: Rs. 500 crores (Initial offer size: At least Rs 250 crore)
Consideration	Upfront Consideration against subscription of InvIT units
Investor Class	Financial investors looking for stable yields; sovereign wealth funds and global pension funds, insurance funds, retail investors etc.
Investor Payment	Not less than 90% of the net distributable cash flows of the InvIT Payment distributed to unit holders

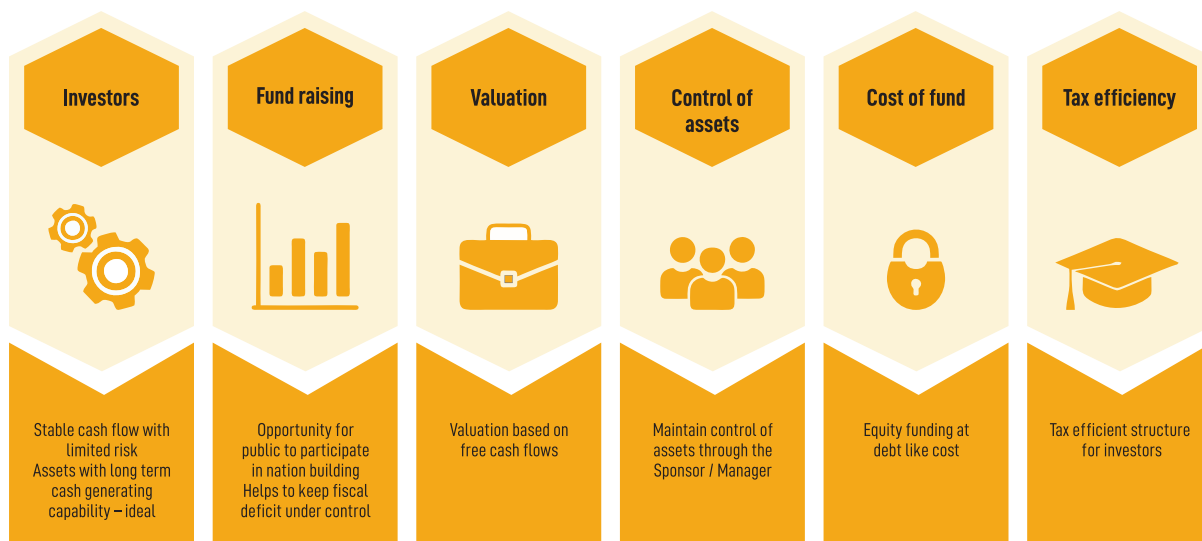


Figure 8 Key Benefits of InvIT

InvIT Process

InvITs are set up as trusts under the Indian Trusts Act, 1882 and are regulated by the SEBI (Infrastructure Investment

Trusts) Regulations, 2014. The key steps involved in a typical InvIT transaction are illustrated in the figure Figure 1 below¹⁰

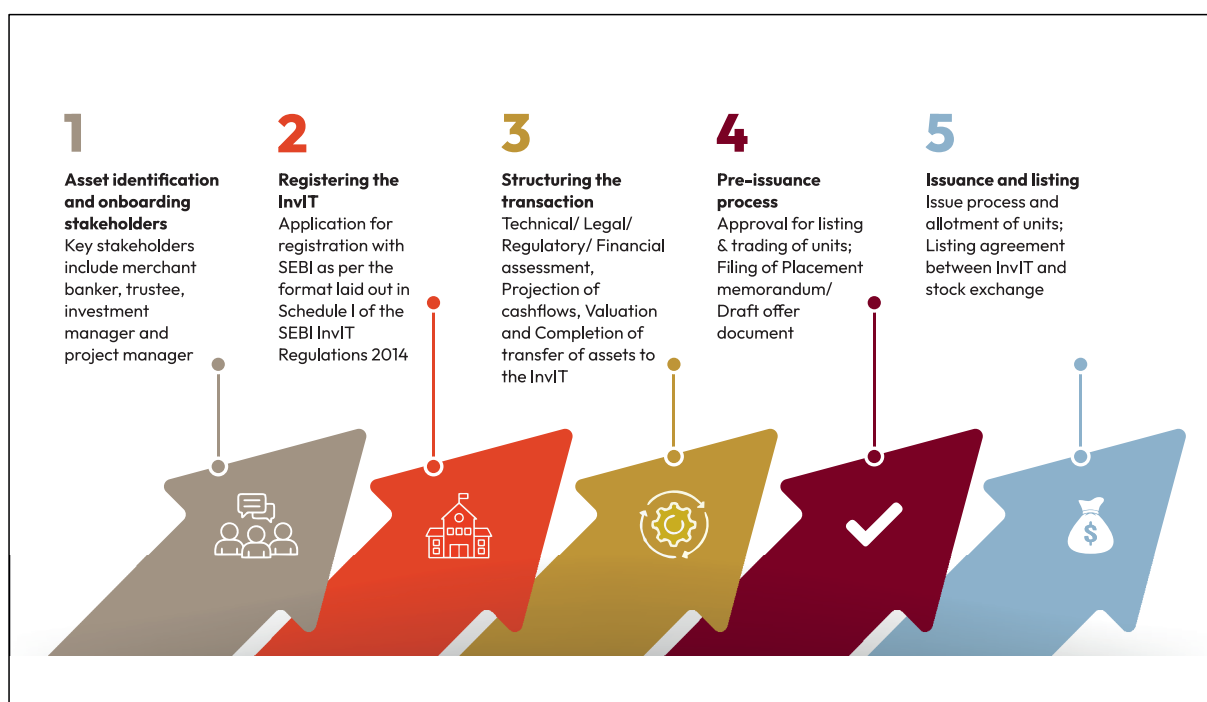


Figure 9 InvIT transaction - Illustrative steps

Real Estate Investment Trust

Real estate assets are inherently capital-intensive, requiring substantial upfront investment from developers. While traditional land- and building-based debt products exist, they often do not provide effective risk-sharing or cost-efficient financing. Real Estate Investment Trusts (REITs) offer an alternative and are structurally similar to InvITs, though unlike InvITs—which are unique to India—REITs have been implemented globally, originating in the United States in the 1960s. The primary objective of a REIT is to broaden funding options for developers and provide access to diversified sources of capital. Under this structure, only real estate

projects are eligible, and regulations require that at least 51% of the consolidated revenues of the REIT, its holding company, and associated SPVs must come from rental, leasing, or letting of real estate assets or other income incidental to such leasing. Exceptions are allowed for hotels, hospitals, and convention centres forming part of composite projects, as well as for common infrastructure in composite projects, industrial parks, and SEZs.

The structure of a typical REIT transaction and the fund flow across agencies is represented in the Figure 10 below—

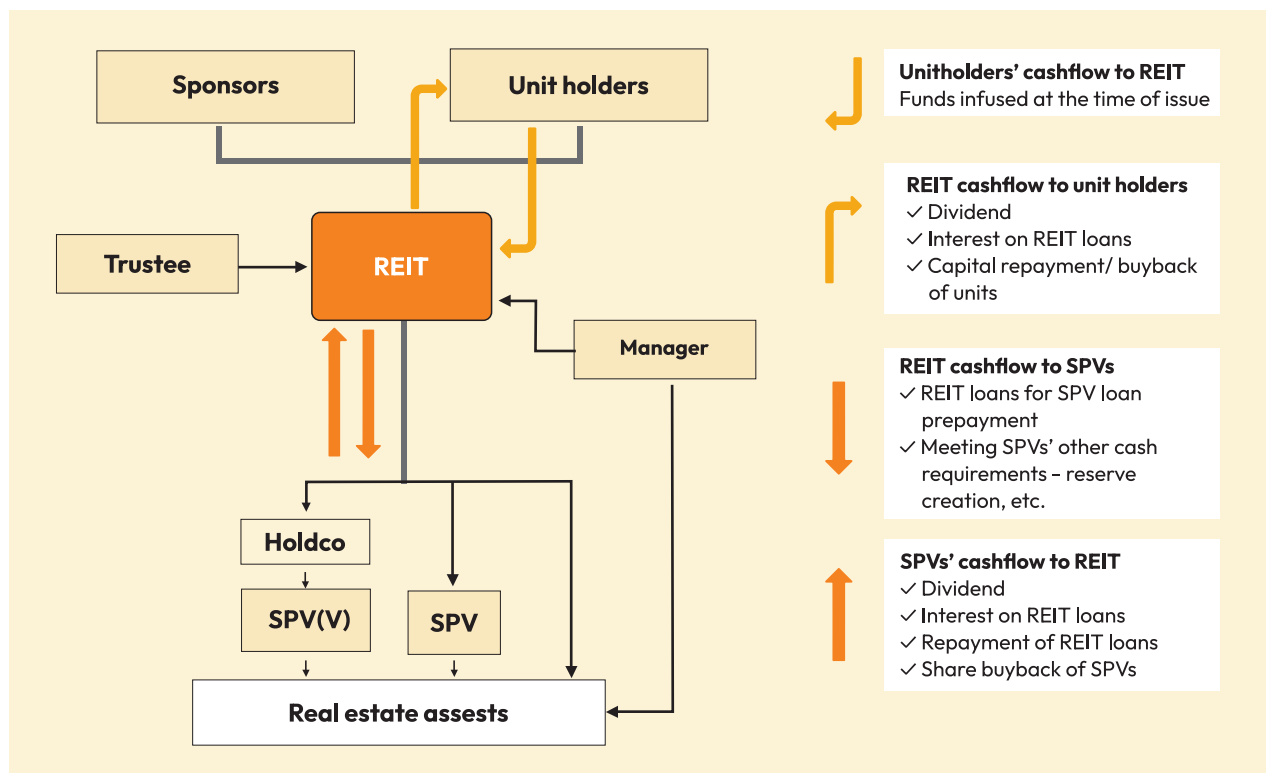


Figure 10 REIT transaction - Illustrative structure

¹⁴ Real estate" or "property" means land and any permanently attached improvements to it, whether leasehold or freehold and includes buildings, sheds, garages, fences, fittings, fixtures, warehouses, car parks, etc. and any other assets incidental to the ownership of real estate but does not include mortgage.

Real Estate (Regulation and Development) Act has brought in sizeable level of accountability and transparency in the segment. In this context, REIT structure has been able to provide an effective and robust

corporate governance framework with clearly delineated roles and responsibilities for key stakeholders such as sponsor, investment manager, etc. and the transparency on the revenue/ rent collections.

Key Requirement	- Revenues arise from rental, leasing and letting real estate assets or Key Requirement any other income incidental to the leasing of such assets - Mandatory Listing
Types of InvIT	Public (Open for participation by all kinds of investors including retail)
Consideration	Upfront Consideration against subscription of REIT units
Investor Class	Financial investors looking for stable yields; sovereign wealth funds and global pension funds, insurance funds, retail investors etc.
Investor Payment	Not less than 90% of the net distributable cash flows of the REIT distributed to unit holders
Potential Assets	- Railway warehouses/ god sheds - Multifunctional complexes - City-side development for Airports - Commercial development on Municipal land - Commercial development along the toll road stretches - Railway stations, commercial development etc.

Table 11 Key Requirements/terms of an REIT10

Public sector entities in India hold a significant inventory of underutilized land assets, often located in high-value real estate zones, which may include freehold or partially developed parcels. The REIT platform offers an effective mechanism to unlock value from these assets through commercial

development. By transferring revenue-generating real estate assets to the trust, public asset owners can raise capital upfront, while investors benefit from the net distributable cash flows generated by these assets.

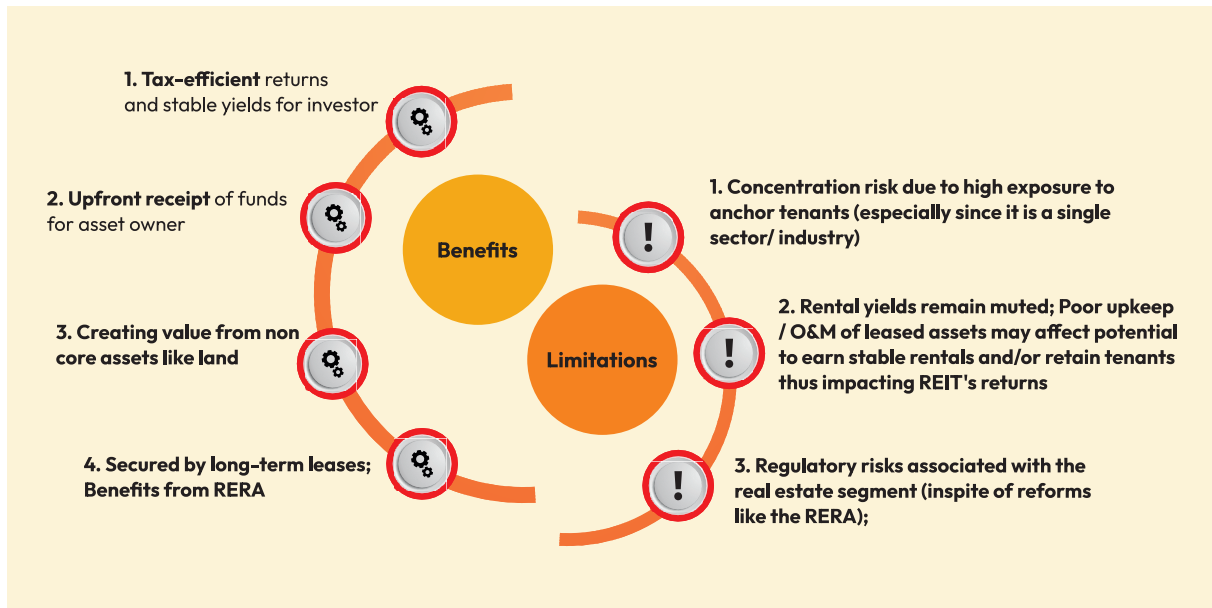


Figure 11 Benefits and limitations of Infrastructure Investment Trust

Factors Determining Choice of Model

The key decision-making criteria for monetizing public assets focus on maximizing value while balancing control and investor considerations. These include:¹⁰

- **Extent of funds raised:** Potential for significant upfront receipts for the public sector agency.
- **Tax efficiency and liquidity:** Ensuring favorable tax treatment and ease of trading for investors.
- **Target investor class:** Identifying the appropriate set of investors for the asset.
- **Operational control:** Level of control retained by the public sector agency over the asset.
- **Valuation potential:** Maximizing the value realization from the asset.

In practice, capital market instruments often provide better value realization for public assets, while PPP concessions may be more suitable in sectors where the private sector can bring operational efficiencies and deliver defined services to users under a structured framework.

Case Studies & Best Practices

National Monetisation Pipeline (India)

The National Monetisation Pipeline (NMP), spearheaded by NITI Aayog, serves as India's strategic roadmap for unlocking the inherent value of mature public infrastructure through a specialized "Asset Recycling" framework. By leasing out revenue-generating "brownfield" assets such as national highways, power transmission lines, and freight terminals—to private operators for a fixed tenure, the government generates significant non-tax revenue to fund the ₹111 lakh crore National Infrastructure Pipeline (NIP) without relinquishing sovereign ownership. The framework focuses primarily on five core sectors, including Roads, Railways, and Power, utilizing sophisticated financing mechanisms like Infrastructure Investment Trusts (InvITs) and the Toll-Operate-Transfer (TOT) model to attract long-term global and institutional capital.¹⁵

The framework for monetisation of core asset monetisation has three key imperatives.

- Monetization of 'Rights' not 'Ownership', Assets handed back to

the government at the end of transaction life.

- Brownfield de-risked assets, stable revenue streams.
- Structured partnerships under defined contractual frameworks with strict KPIs & performance standards

This approach emphasizes the selection of de-risked, brownfield assets with a stable revenue generation profile, with the overall transaction structured around revenue rights. The primary ownership of the assets remains with the government, while the framework ensures that the assets are handed back to the public authority at the end of the transaction's tenure.

Initiated following the Union Budget 2021-22, the National Monetisation Pipeline (NMP) was developed by NITI Aayog in collaboration with infrastructure ministries to unlock approximately ₹6 lakh crore from core assets of Central Ministries and Public Sector Enterprises (PSEs) over a four-year period. The program has demonstrated significant momentum, with the first two fiscal years achieving roughly ₹2.30 lakh crore against a ₹2.5 lakh crore target. In the benchmark fiscal year of 2023-24, the pipeline reached its highest annual target of ₹1.8 lakh crore, realizing approximately ₹1.56 lakh crore—a performance representing

¹⁵ National Infrastructure Pipeline, Ministry of Finance, GoI vol-1
[https://www.pppinindia.gov.in/report/Report-of-the%20Task-Force-National-Infrastructure-Pipeline-\(NIP\)-%20volume-i_1684908067.pdf](https://www.pppinindia.gov.in/report/Report-of-the%20Task-Force-National-Infrastructure-Pipeline-(NIP)-%20volume-i_1684908067.pdf)

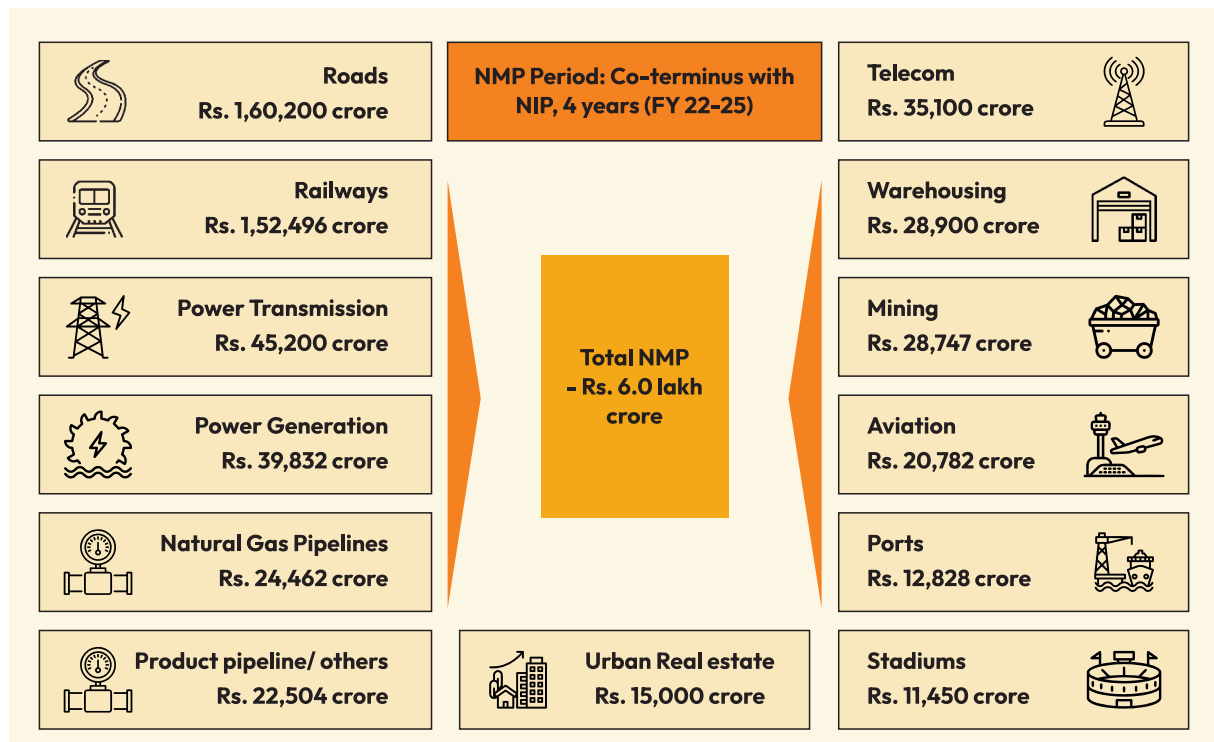


Figure 12 Sector wise monetization pipeline over FY 2022-25 (Rs. Crore) (NITI Aayog)¹⁵

a remarkable 159% growth compared to the inaugural year's achievement.¹⁵

This success was largely driven by the Ministry of Coal and the Ministry of Road Transport and Highways, which emerged as the top achievers in 2023-24 with a combined total of ₹97,000 crore. Specifically, the Ministry of Coal led with ₹56,794 crore, followed by Road Transport with ₹40,314 crore, while other sectors such as Power (₹14,690 crore), Petroleum and Natural Gas (₹9,587 crore), and Shipping (₹7,627 crore) all surpassed the 70% fulfilment threshold for their respective targets. To further streamline investor participation

and accelerate the process for 2024-25, the NHAI has already published an indicative list of 33 assets for monetization and shared its underlying macro-economic assumptions for calculating Initial Estimated Concession Values (IECV). Beyond fiscal gains, these efforts particularly within the coal sector—are fundamentally bolstering national energy security by facilitating private investment, increasing domestic production, and ensuring a steady fuel supply to thermal power plants.¹⁶

¹⁵ Press Information Bureau (PIB) release, 19 June 2024
<https://www.pib.gov.in/PressReleaseSelfFramePage.aspx?PRID=2026675®=3&lang=2>

Roles and responsibilities of the decision making and other bodies

Under the institutional and governance framework, the following roles and responsibilities are assigned to decision making and other bodies 9-

Table 12 Institutional bodies with their responsibilities

Name of Body/ Institution	Description	Roles and Responsibilities
Cabinet Committee on Economic Affairs (CCEA)	Committee headed by the Prime Minister of India	Approve any subsequent changes to the institutional framework approved by the Cabinet.
NITI Aayog	The apex public policy think tank of the Government of India	NITI Aayog serves as the apex public policy think tank of the Government of India, and the nodal agency tasked with catalyzing economic development and fostering cooperative federalism through the involvement of State Governments of India in the economic policymaking process using a bottom-up approach. ➤ NITI Aayog recommends the selection of CPSEs, the assets and the model of monetization in consultation with CGAM
Alternative Mechanism (AM)	Group constituted under Asset Monetization Program	The AM takes the primary role of approving the proposals, models, assets, and processes for monetization: ➤ To approve the proposals for the selection of assets and CPSEs as recommended by IMG and CGAM. ➤ To set a threshold based on value of asset which would determine the assets that would be monetized under the program. ➤ To approve model for monetization, model contract documents, transaction documents for inviting bids and contracts. ➤ • To approve detailed monetization process on the recommendation of IMG/ CGAM.
Core Group of Secretaries on Asset Monetization (CGAM)	Group constituted under Asset Monetization Program	The CGAM takes the primary role of recommending the proposals, models, assets, and processes for monetization: ➤ To recommend to CCEA the changes to institutional and governance framework. ➤ To recommend to AM the proposals related to selection of assets. ➤ To recommend to AM a threshold based on value of asset which would determine the assets that would be monetized under the program.

Name of Body/ Institution	Description	Roles and Responsibilities
		➤ To recommend to AM to lay down the detailed process for monetization. ➤ To supervise periodically and to monitor the Asset Monetization Program at least twice a year. ➤ To consider changes in transaction processes, if any.
Inter-ministerial Group (IMG)	Group constituted under Asset Monetization Program	The IMG also takes the primary role of recommending the proposals, models, assets, and processes for monetization; while some roles are same as CGAM, a few additional responsibilities include: ➤ To consider interpretation and deviation in the transaction process. ➤ Recommend to CGAM to lay down the detailed process for asset monetization. ➤ Selection of intermediaries and partnerships, with institutions such as multi-lateral agencies or other expert independent bodies. ➤ To recommend Alternative Mechanism, an appropriate model to be used for the selected asset. The IMG would be advised about the appropriate model for the transaction by the technical consultants at DIPAM, proposals of the Administrative Ministry/CPSE, and recommendation of NITI Aayog.
DIPAM	The Department of Investment and Public Asset Management (DIPAM)	The DIPAM is the Secretariat for Alternative Mechanism, CGAM, IMG and Oversight Committee and provides secretarial support including preparation of agenda notes, minutes, notices, etc. ➤ To coordinate and put up to CGAM the monitoring formats for supervision and monitoring of the Asset Monetization Program. ➤ Appoint intermediaries associated with Asset Monetization Program based on the recommendations of IMG. ➤ To develop an E-bidding platform. ➤ To function as a part of the Consultative Group. ➤ To interact with potential investors, potential bidders and other stakeholders including the State Government. ➤ To lay down the detailed transaction process for consideration of IMG/CGAM/AM.

State-Level Case studies

Case Study-TOT Model Bundle 1

The first TOT (Toll-Operate-Transfer) model was launched in 2018, covering nine highway stretches totaling 682 km across Andhra Pradesh and Gujarat, providing geographic diversification. Six of these stretches in Andhra Pradesh formed part of NH-5 of the Golden Quadrilateral, connecting Kolkata and Chennai, and benefited from strong

traffic potential due to nearby ports, industrial clusters, and consumption centres. The TOT-1 toll roads recorded a higher share of commercial traffic at 85%, compared to the national average of 75%. The winning bid of Rs 9,682 crore significantly exceeded NHAI's Initial Estimated Concession Value (IECV) of Rs 6,258 crore. The proceeds from monetization were deployed by NHAI to fund new road projects under the Bharatmala program, thereby diversifying its conventional sources of funding.¹⁰

Issue Size	Investors	Total revenue and revenue growth
IECV: Rs. 6,258 crore (Winning Bid: 1.5 times reserve price)	Macquarie Infrastructure and Real Assets	Aggregate toll revenue: Rs. 664 crore (FY 19) against Rs. 513 crore (FY 18)- showing a growth of ~29%

Key takeaways

- **Diversified asset mix and quality:** High-quality Road assets across Andhra Pradesh and Gujarat with stable traffic potential attracted strong investor interest.
- **Strategic location and traffic growth:** The projects' location, overall influence area, and projected traffic growth contributed to a winning bid nearly 1.5 times the reserve price.
- **Long concession and transparency:** A 30-year concession period and availability of historical traffic data provided clarity and confidence for investors.
- **Thorough project preparation:** Extensive due diligence, including drone surveys and network assessments, along with regulatory enhancements, strengthened investor appetite for the TOT transaction.

Case Study - OMDA In Airport Sector

- The development of airports in India through the PPP model began in 2006 with the Airports Authority of India (AAI) managing projects at Delhi and Mumbai. These contracts were structured as Operation, Management, and Development Agreements (OMDAs), which facilitated the creation of world-class airport infrastructure.¹⁰

For instance, the concession for Delhi International Airport combined airport augmentation and O&M with a revenue-sharing bid parameter. To enhance commercial viability, city-side real estate was included in the project. The 30-year concession (renewable after 30 years) ensured asset transfer back to AAI at the end of the period. The project, completed at a total cost of Rs 12,500 crore, enabled significant augmentation and long-term airport operations without additional expenditure for AAI.

In 2019, AAI undertook the development

of six brownfield airports Ahmedabad, Jaipur, Lucknow, Guwahati, Thiruvananthapuram, and Mangalore under the PPP model. The concessionaires were responsible for phased capacity expansion, ongoing and future O&M, and development of city-side infrastructure including hotels, restaurants, and retail facilities. These airports were awarded under a 50-year concession, with no extension provision, after which assets are handed back to AAI. The structure also included State Support Agreements with respective state governments to facilitate encroachment removal, security, utility clearances, and property protection.

The bid parameter for these projects was the per-passenger fee, with concessionaires required to pay a monthly fee based on domestic and international passenger throughput. The bidding process attracted participation from various funds and strategic investors, ultimately generating approximately Rs 900 crore upfront for AAI without any expenditure or capacity commitment over the next 50 years.

Assets	Bid Response	AAI Consideration
Ahemdabad, Lucknow, Jaipur, Guwati, Mangaluru	32 bids for 6 Airports	Rs. 900 crore as upfront consideration (Indicative Residual Asset Base) Average per passenger fee of Rs. 150 for each airport

Case Study – Indigrid Invit

IndiGrid InvIT was established in October 2016 by Sterlite Power Grid Ventures Ltd (SPGVL) to monetize two transmission assets: Bhopal Dhule Transmission Company Limited (BDTCL) and Jabalpur Transmission Company Limited (JTCL). Both assets are backed

by long-term contracts, feature low operational risks, and generate stable cash flows. IndiGrid successfully raised approximately Rs. 1,012 crore from 19 anchor investors, which not only enhanced retail investor participation in the InvIT but also helped maintain stable pricing levels.¹⁰

Issue size and assets	AUM and Assets (as of Q3 FY 21)	Sponsor (s)	Key unit holders
Rs 2,250 crore and 2 transmission assets	Rs 15,000 crore and 12 transmission assets	Sterlite power (initial sponsor), KKR (new Sopsner)	23% KKR 20% GIC 12% other FIIs 18% Retail 8% insurance cos

Key takeaways

- **Diversified Portfolio:** The Trust holds 12 inter-state transmission assets across 15 states and 1 Union Territory, operating under an availability-based payment mechanism with PGCIL as a credible counterparty.
- **High Asset Reliability:** The assets have maintained an average availability of over 99.5% from COD until December 31, 2020.
- **Portfolio Expansion:** Starting with 2 assets and an AUM of ~Rs. 3,700 crore in 2017, the InvIT now holds 15 assets with an aggregate AUM of ~Rs. 15,000 crore as of Q3 2021.

- **Governance and Value Growth:** Active involvement of KKR as co-sponsor in governance, management, and investment decisions has been critical in increasing investor interest, liquidity, and overall value appreciation.

Case Study – Mindspace Reit

Mindspace Business Parks REIT was established on 18 November 2019 as a Real Estate Investment Trust (REIT) platform, holding 10 commercial real estate assets through eight Special Purpose Vehicles (SPVs). The REIT's portfolio is a diversified Grade-A office portfolio across four major Indian office markets: Mumbai (41%), Hyderabad

(39%), Pune (17%), and Chennai (3%).

As of 31 March 2020, the portfolio had a total leasable area of 29.5 million square feet (msf), making it one of the largest Grade-A office portfolios in India. This comprised 23.0 msf of completed assets, 2.8 msf under construction, and 3.6 msf earmarked for future development, reflecting a balanced mix of operational, under-construction, and future growth assets.¹⁰

Key Takeaways

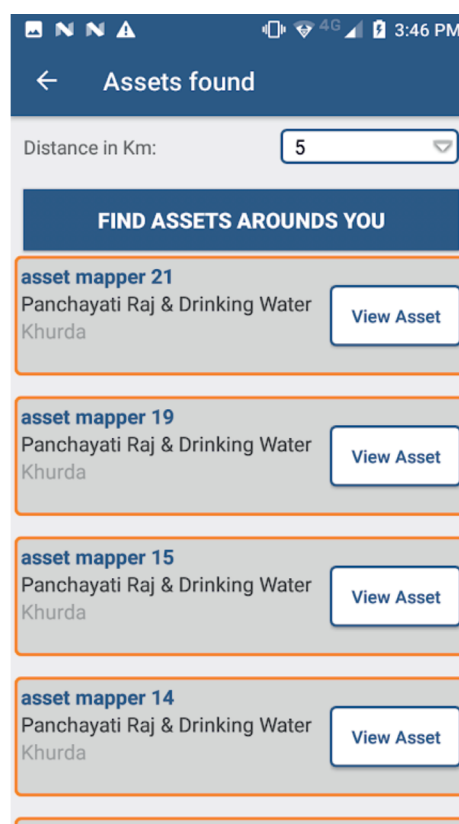
- **Strong Counterparty Profile:** The tenant base primarily comprises multinational corporations across diverse sectors, supporting higher rental realizations and reducing cash flow volatility. The portfolio achieved an average rental of approximately ₹60 per sq. ft. per month, reflecting stable income potential.
- **Comprehensive Counterparty Risk Assessment:** Assets selected for the REIT were backed by a rigorous
- evaluation of tenant creditworthiness, sectoral exposure, lease tenure stability, and revenue concentration risks, along with appropriate mitigation measures to protect investor interests.
- **Role of Anchor and Strategic Investors:** Securing reputable anchor and strategic investors during the public issue enhanced market credibility, supported price discovery, and strengthened overall investor confidence in the REIT.
- **Experienced Asset Sponsorship and Management:** The involvement of a seasoned real estate sponsor, Blackstone Group, with proven expertise in managing large commercial portfolios, attracted institutional investors, including pension and insurance funds, thereby ensuring long-term capital stability.

Issue size and assets	AUM and Assets (as of Q3 FY 21)	Sponsor (s)	Key unit holders
Rs 2,250 crore and 2 transmission assets	Rs 15,000 crore and 12 transmission assets	Sterlite power (initial sponser), KKR (new Sopsner)	23% KKR 20% GIC 12% other FIIs 18% Retail 8% insurance cos

Odisha Public Asset Management System

(Geo-ICT Web-Portal for Management of Public Assets of Odisha)

The Odisha Public Asset Management System (OPAMS) was conceptualized following high-level deliberations at Lok Seva Bhavan on 22 November 2019, where a roadmap for a unified state asset database was approved, emphasizing the need for a centralized and scalable asset repository.¹⁷



Technical Framework and Integration

ORSAC is leveraging advanced geospatial technologies to transition from static records to a dynamic, analytics-driven portal. Key technical components include:¹⁸

- **Geospatial Integration:** Linking departmental asset data with Odisha Spatial Data Infrastructure (OSDI) and the Odisha 4K-GEO platform.
- **High-Resolution Mapping:** Utilization of 1:4000 Cadastral Scale validated GIS data layers to ensure surgical precision in asset boundary

¹⁷ Odisha Public Asset Management System, Department of Finance
<https://opams.in/>

identification.

- **Data Analytics:** Providing departments with predictive and descriptive analytics-based services to monitor asset health and life cycles.

To ensure cross-departmental utility and cost-efficiency, ORSAC has developed OPAMS under a Software as a Service (SaaS) model. This approach provides several strategic advantages:

- **Unified Infrastructure:** A centralized IT and analytics software backbone that serves multiple state departments simultaneously.
- **Scalability:** Streamlined processes for the regular updating and maintenance of the state's public asset data repository.
- **Accessibility:** Improved IT infrastructure allows for seamless data sharing and inter-departmental transparency.

OPAMS as a Service to Government

- **Standardized Access:** Implementing a “Geo-Asset Centre as a Service” highlights the importance of providing departments with structured and consistent mechanisms to access Web-GIS

portals and mobile applications for search, analysis, and scenario-based decision-making.¹⁹

- **Seamless Data Integration:** A centralized data warehouse with OLAP capabilities and open API integration ensures efficient cross-departmental data access and sharing, which is critical for coordinated planning and policy-making.
- **Unified Repository Approach:** Consolidating data from multiple departments and agencies under a single service gateway demonstrates the value of integrated geo-asset management for better visualization and application of data.
- **Comprehensive Data Cataloguing:** Maintaining detailed spatial and non-spatial datasets supports data-driven decision-making, emphasizing that effective cataloguing and easy retrieval of datasets enhance operational efficiency and strategic planning.¹⁸

¹⁸ OPAMS, Geo-ICT Web-Portal for Management of Public Assets of Odisha <https://opams.in/static/media/Odisha-Public-Asset-Management-System.17c8b282.pdf>

¹⁹ OPAMS – GASAB Guideline Geo-ICT Web-Portal for Management of Public Assets of Odisha <https://opams.in/static/media/OPAMS-GASAB-Guideline.a7e875b1.pdf>

Project Components

- Structured storage,
- Multi-source data integration,
- Web and Mobile enabling of data,
- Mobile App for data capturing and Viewing
- Data analytics,
- Query module creation,
- Dashboard based information visualization & Citizen Services
- Net based dissemination and
- On-demand decision support provisions

Odisha 4k GEO IT infrastructure used in the project

Fixed Assets

Definition of Fixed Asset:

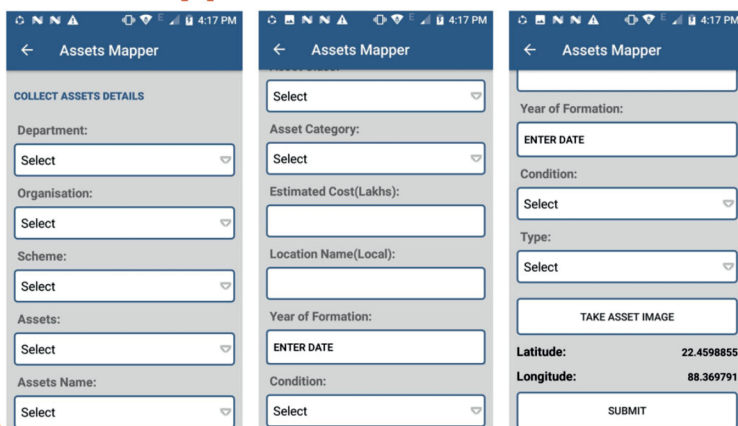
Fixed Asset is an asset held for use in the production or supply of goods or services for rental to others, or for administrative purposes and is expected to be used for more than 12 months. (GASAB guidance note on Accounting for Fixed Assets- 5.1.6)

Availability of information on:-

Capital Expenditure under Primary Units of Appropriation (PUA)
the fixed assets that have been acquired or inherited over the years in standardized disclosures.

Odisha Public Asset Management System

Data Capturing Asset Mobile App



The screenshots show the 'Assets Mapper' app interface. The first screen shows 'COLLECT ASSETS DETAILS' with fields for Department, Organisation, Scheme, Assets, and Assets Name, each with a 'Select' dropdown. The second screen shows 'Asset Information' with fields for Asset Category, Estimated Cost(Lakhs), Location Name(Local), Year of Formation, Condition, and a 'Select' dropdown. The third screen shows 'Asset Location/Status' with fields for Year of Formation, Condition, Type, and a 'Select' dropdown, along with a 'TAKE ASSET IMAGE' button and coordinates (Latitude: 22.4598855, Longitude: 88.369791) and a 'SUBMIT' button.

As Per OPAMS - GASAB Guideline, Fixed Asset is an asset held for use in the production or supply of goods or services for rental to others, or for administrative purposes and is expected

to be used for more than 12 months. (GASAB guidance note on accounting for fixed Assets-5.1.6).

Madhya Pradesh Assets Management System

The Public Asset Management (PAM) portal is managed by the Madhya Pradesh Public Assets Management Department and has been developed by the CoE (Centre for Excellence), Madhya Pradesh Agency for Promotion of Information Technology under the Department of Science & Technology. It has been established as a dedicated web-based platform to facilitate the submission and processing of asset monetization proposals from government departments and agencies. All departments are required to upload comprehensive details of disposable, redevelopable, or monetizable properties, including GIS coordinates and current utilization status. The portal functions as a centralized system for the systematic identification, assessment, and evaluation of public assets with potential for monetization through redevelopment, rationalization, or strategic disposal.²⁰

1. Problem Statement

The Government of Madhya Pradesh faced significant challenges in managing

unutilized and underutilized public assets
Key issues included²¹

- Absence of a comprehensive and updated database of government assets, limiting identification of surplus or underutilized properties.
- Inadequate information on available government land, resulting in delays in project implementation.
- Encroachment of vacant government land parcels, often leading to protracted litigation.
- Lack of a structured policy framework for monetization and management of surplus assets.
- Challenges in reserve price fixation, with potential future scrutiny of decision-making processes.
- Administrative difficulty for departments in identifying, documenting, and consolidating title-related records across the state, given that asset management was not a core priority.
- Large numbers of assets under liquidation due to absence of an effective disposal mechanism.

2. Institutional Solutions Envisaged

- To address these systemic gaps, the Government of Madhya Pradesh

²⁰ Public Assets Management Department, Government of Madhya Pradesh <https://pam.mp.gov.in/>

²¹ Department of Economic Affairs, Ministry of Finance, Government of India
<https://www.pppinindia.gov.in/bestpractices/best-practice-detail/public-assets-management>

implemented the following reforms:²²

- Establishment of a dedicated Public Assets Management Department (PAM) on 26 September 2020.
- Incorporation of a Special Purpose Vehicle (SPV), Madhya Pradesh State Assets Management Company Limited, on 16 February 2022 to provide professional asset management expertise.
- Constitution of an Apex Committee chaired by the Chief Secretary to select assets for monetization/management, determine reserve prices, and recommend highest bidders.
- Development of web-based portals for uploading and managing asset data.
- Utilization of the State's e-tendering platform for transparent disposal through a "Tender-cum-e-Auction" mechanism.
- Creation of a State Assets Register through a GIS-based platform

integrating location, survey details, and asset imagery into a unified database.

3. Rationale for Solution Design

The reform model was structured on the following principles:

- Creation of a specialized department to institutionalize asset management across districts and departments.
- Formation of a professionally managed company to handle technical, financial, and legal aspects of asset monetization.
- Establishment of an Apex Committee to ensure oversight, transparency, and strategic decision-making.
- Deployment of a web-based repository for centralized asset listing and transparent tendering.
- Development of a GIS-enabled State Assets Register as a single source of truth for all government assets.

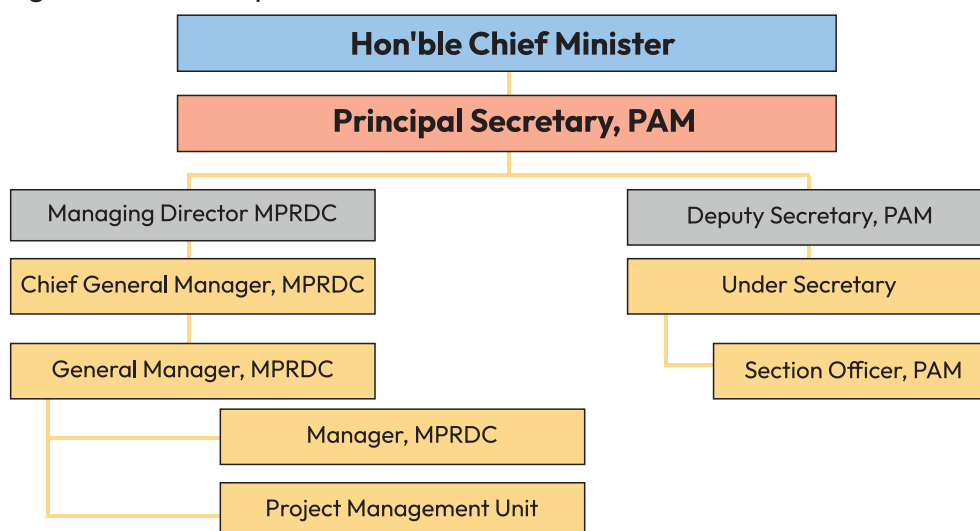


Figure 13 Departmental Structure of Madhya Pradesh Public Assets Management Department²⁰

Objectives

This Portal has the following objectives given below-²⁰

- Formulate and issue policy guidelines and directives to promote the rational use of public assets and ensure compliance across departments.
- Establish and maintain a comprehensive State Asset Register leveraging IT and GIS technologies.
- Undertake asset rationalization to ensure optimal utilization through structured inter-departmental consultation and coordination.
- Facilitate disinvestment and strategic restructuring of State Public Sector Undertakings (PSUs).
- Enhance state revenue through systematic monetization of underutilized and surplus assets.
- Provide advisory and technical support to departments in structuring and implementing PPP projects.
- Build in-house institutional capacity to identify, design, evaluate, and execute asset monetization initiatives.

Key Learnings

These are the major learnings from recent activities given below-

- Structuring land parcels in appropriate sizes aligned with market demand and bidders' paying capacity.
- Facilitating land use change approvals by the Government to enhance asset readiness.
- Ensuring provision of access infrastructure and relocation of public utilities within the asset boundary.
- Making assets encumbrance- and encroachment-free to enable faster transaction closure.
- Undertaking clear on-ground demarcation of asset boundaries by the Government.
- Ensuring timely and responsive handling of investor queries to build confidence and expedite the process.

²² Public Asset Management, Government of Madhya Pradesh.

https://pam.mp.gov.in/uploads/files/v17%20-%20CS%20Conference%2030_11_2022%20updated%20on%208Dec2022%201845%20Comments%20from%20CS%20Go7P.pdf

International Case Studies

Case Study - Port of Melbourne, Australia

The Port of Melbourne is strategically located across 510 hectares to the west and southwest of Melbourne's CBD, spanning both banks of the Yarra River from Bolte Bridge to the river mouth. The port handles approximately one-third of Australia's container trade and contributes an estimated AUD 7.5 billion annually to the national economy.¹⁰

During 2018–19, the port handled around 3 million twenty-foot equivalent units (TEUs), equivalent to approximately 75 million revenue tonnes. As per the 2050 Port Development Strategy released in 2019, container trade volumes are projected to grow at an average annual rate of 3.5%, increasing from 3 million TEUs in 2019 to approximately 8.9 million TEUs by 2050.

Originally operated as a Victorian Government entity, the port was monetised in 2016 under the Asset Recycling Initiative through a 50-year lease awarded by the Victorian Government to a private consortium comprising the Future Fund, QIC, OMERS, and Global Infrastructure Partners (GIP) for approximately AUD 9.7 billion. A central objective of the lease structure was to maintain and

enhance the port's competitiveness and operational efficiency, given its critical role in Australia's import and export supply chains.

The Port of Melbourne follows a landlord model, wherein the port authority retains responsibility for asset maintenance, assessment, and repairs, while cargo handling and maritime services are delivered by third-party operators. These include stevedores, pilotage, towage, mooring, shipping, and ancillary logistics service providers.

To align with projected growth and improve supply chain efficiency, the port has invested in on-port rail infrastructure to reduce dependence on road freight. Additionally, it has undertaken structured community engagement initiatives and comprehensive environmental compliance measures to safeguard and enhance the surrounding land and marine ecosystems.¹⁰

Key Takeaways

- **Stable Regulatory Framework:**
Trade-based tariff revisions are governed by a transparent and predictable regulatory regime, overseen by an independent external authority, ensuring pricing certainty for both the port operator and users.
- **Revenue Visibility through Long-Term Leases:**
A significant portion of revenue (approximately one-third) is secured

through long-term lease agreements, providing stable and relatively unregulated cash flows.

➤ **Structured Escalation Mechanism:**

Most lease agreements incorporate predefined escalation clauses, typically linked to the higher of CPI + 1.5% or 4%, thereby safeguarding revenue growth against inflationary pressures.

➤ **Balanced Risk Allocation:**

The combination of regulated tariff income and contracted lease revenue enhances financial stability and improves investor confidence in long-term asset performance.

➤ **Complementary Public Investment:**

Continued state investment in supporting transport infrastructure, particularly rail connectivity, strengthens the port's logistics integration, operational efficiency, and long-term competitiveness.

Case study on Concession Agreement (Asset Recycling), Philippines

Ninoy Aquino International Airport (NAIA), located approximately 8 kilometres south of Manila, serves as the primary international gateway to the Philippines. The airport comprises four passenger terminals with a designed handling capacity of 32–35 million passengers per annum. However, in 2023, NAIA handled approximately 45 million passengers—operating 30–40% above its intended capacity—resulting in congestion, long queues, and operational inefficiencies.⁵

To address these constraints, the Government initiated an asset recycling programme with dual objectives: monetizing the airport's future revenue potential and significantly enhancing passenger experience and operational efficiency. The scope of the transaction covers the airport's full asset base, including runways, all four passenger terminals, commercial assets, utility systems, airside facilities, and surface and inter-terminal access infrastructure.

Key performance targets under the initiative include:

- Increasing passenger capacity from 35 million to 62 million passengers per year; and
- Enhancing air traffic movements from 42 to 48 movements per hour.

This transaction represents the first public-private partnership (PPP) contract awarded under the Philippines' new PPP Code, which came into effect in December 2023, marking a significant milestone in the country's infrastructure reform framework.

Investor class

The NAIA concession attracted strong interest from leading conglomerates and strategic infrastructure investors in the Philippines, with three consortiums qualifying for the final bidding stage: the Manila International Airport Consortium (MIAC), the GMR Airports Consortium, and the SMC SAP & Company Consortium. Each consortium represented a combination of global infrastructure players and major Philippine business groups with extensive experience in airport development, operations, and large-scale infrastructure investment. MIAC was led by Global Infrastructure Partners and supported by prominent Philippine conglomerates including Filinvest Development Corporation, Aboitiz InfraCapital, Alliance Global Group, Ayala Corporation, JG Summit Infrastructure Holdings Corporation,

and Asia's Emerging Dragon Corporation. The GMR Airports Consortium was headed by GMR Airports International B.V., in partnership with House of Investments, Inc. and Cavitex Holdings Inc.²³

The SMC SAP & Company Consortium was led by San Miguel Holdings Corporation and supported by RMM Asian Logistics Inc., RLW Aviation Development Inc., and Incheon International Airport Corporation of South Korea. This consortium emerged as the highest bidder, offering 82.16% of future revenues to the Government, significantly higher than the 33.30% proposed by the GMR Consortium and 25.91% offered by MIAC, thereby securing the concession.

²³ Republic of Philippines Public Private Partnership of Philippines
https://ppp.gov.ph/press_releases/smc-sap-company-consortium-signs-naia-ppp-concession-agreement-first-ppp-contract-to-be-awarded-since-effectivity-of-ppp-code/

What should Haryana do?

Asset recycling is a cornerstone of Haryana's long-term strategy to generate the capital necessary for fuelling future infrastructure development and achieving the \$1 Trillion GSDP goal. Given that traditional fiscal sources and borrowing capacities are constrained by high committed expenditures, the shift toward innovative, non-debt funding is a paramount necessity. Asset monetization effectively bridges the gap between private investors—who seek stable, long-term revenue-generating assets and the State's requirement for large-scale "greenfield" infrastructure. By building partnerships in a transparent, cohesive environment supported by robust institutional policy and IT enablement, Haryana can create a self-sustaining cycle of "Creation through Monetization."

To transform this vision into a reality for the State of Haryana, the following strategic recommendations and implementation pathways are proposed:

➤ **Institutional Governance:**

Establishing an Empowered Entity Haryana should institutionalize (to be discussed with key departments) the monetization process by empowering a central body such as the Core Group of Secretaries on Asset Monetization (CGAM) and the Inter-

Ministerial Group (IMG). This structure, supported by the Finance Department Haryana, breaks departmental silos and ensures that asset recycling is treated as a state-level priority. This empowered entity is vital for making centralized, swift decisions that align with the Viksit Haryana @2047 vision, rather than viewing assets through isolated departmental lenses.⁹

➤ **Specialized Expertise and Pipeline Creation:**

The state should maintain a dedicated team of technical and financial experts to exclusively advise the government. This team will be responsible for identifying high-potential sectors—such as Power (HVPNL), Warehousing (HSWC), Roadways (HSRDC) to create a rolling ~5 to 10-year State Monetization Pipeline. This ensures a steady flow of "investor-ready" projects that can attract global institutional capital.⁹

➤ **IT-Enabled Transparency:**

The 'HariNidhi' Portal A fundamental pillar of this initiative is the 'HariNidhi' Haryana State Asset Management Portal. This GIS-enabled platform, integrated with State's Assets, brings all state assets onto a single digital interface. It provides "surgical precision" in identifying under-utilized or inefficient assets, making them visible to decision-makers and investors alike. By mapping existing

infrastructure against future developmental needs, Haryana can build a transparent, data-driven pipeline that significantly reduces information asymmetry and boosts investor confidence.

➤ **Strategic Collaboration with NITI**

Aayog To align with the National Monetisation Pipeline (NMP), Haryana should leverage the exclusive support wings of NITI Aayog. Organizing high-level workshops between senior state bureaucrats and NITI Aayog officials will help in benchmarking Haryana's framework against global best practices and unveiling the enormous possibilities across sectors like urban development, sports infrastructure, and renewable energy.

➤ **A Progressive Policy Framework**

The adoption of a formal Asset Monetization Framework for Haryana serves as a signal of political and administrative intent. A progressive policy document provides the legal and procedural "assurance" required by private investors to commit long-term capital. It standardizes contract models (TOT, InvITs, REITs) and ensures that the proceeds of monetization are strictly reinvested into new infrastructure, thereby creating a "virtuous cycle" of growth.

Asset monetization is the need of the hour for Haryana to ensure its growth story remains inclusive and fiscally resilient. By transitioning from an "owner-operator" to a "facilitator-partner" role, the State invites private sector participation not just as contractors, but as long-term stakeholders in Haryana's development. This extraction of value from existing assets ensures that the state can build the high-tech, sustainable infrastructure of the future without placing an additional tax burden on its citizens.

Annexures

Odisha Public Asset Management System

Objectives of OPAMS/ State Geo-Asset infrastructure

- The State Geo-Asset Portal will function as a unified, single-window gateway providing geospatially validated data of all public assets in the State, in accordance with Finance Department guidelines. It is envisioned to establish a modern information ecosystem that promotes good governance, optimal resource allocation, planned development, and citizen empowerment. The portal will offer an integrated and continuously updated view of asset information from all state departments through intuitive data visualisation tools, GIS-based asset mapping, mobile applications, and decision-support dashboards.¹⁸
- The platform will serve as a centralized Web-GIS system for all state departments, enabling access to geospatial asset data, mobile-based data collection tools, real-time information search, visualization of implemented decisions, and scenario-based planning. The system will operate on a robust, server-based infrastructure supported by standardized web services.
- User-friendly, domain-specific mobile applications will be developed for departmental officials and field teams to facilitate seamless data acquisition and updates. Additionally, executive dashboards will enable integrated real-time or near real-time monitoring of assets and departmental initiatives.
- The portal will support efficient storage, retrieval, and dissemination of asset data as a Decision Support System (DSS), following standardized and interoperable mechanisms aligned with the Open Government Data (OGD) framework.
- A common protocol will be established for periodic updating, integration, and automated sharing of geo-referenced data across departments to ensure consistency, reliability, and interoperability.
- The system will enable comprehensive utilization of departmental data, including standardized geospatial datasets, to strengthen planning, implementation, and monitoring of developmental programs and schemes. Access will be secure, with trusted data-sharing mechanisms in place.
- The departmental asset web portal will be accessible to stakeholders through the internet, in compliance with applicable policies, acts, and rules of the State and Government of

India, thereby enhancing transparency and citizen engagement

- The platform will ensure the timely availability of reliable and validated asset information to support effective development planning, scheme implementation, regulatory enforcement, and responsive governance.

Technology concepts of OPAMS

The OPAMS Geo-Asset Centre has been established as a secure, open-source-based platform to host and manage departmental application data, required open-source software, and one-time invested hardware infrastructure. The Centre is designed to provide a secure and scalable environment that enables departments to access permissible data and web services in a customised format, ensuring timely analysis, efficient decision support, and responsive governance.¹⁹

The proposed service delivery mechanism of the Odisha Geo-Asset Centre is as follows:

- **Departmental Data Submission:** Nodal Officers from each department or agency will submit details regarding data types, categories, and classifications to ORSAC.

- **Data Requirement Assessment:** ORSAC will prepare a comprehensive inventory of data requirements and identify appropriate methods for data acquisition, including procurement, mobile application-based data collection, crowdsourcing, or other relevant mechanisms.

- **Portal Requirement Analysis:** A detailed requirement study will be conducted in consultation with departmental decision-makers to define functional specifications, data architecture, and user needs.

- **System Development:** Data processing, integration, modelling, visualization, and development of web portals, mobile applications, and executive dashboards will be undertaken at the ORSAC Development Server using open-source technologies.

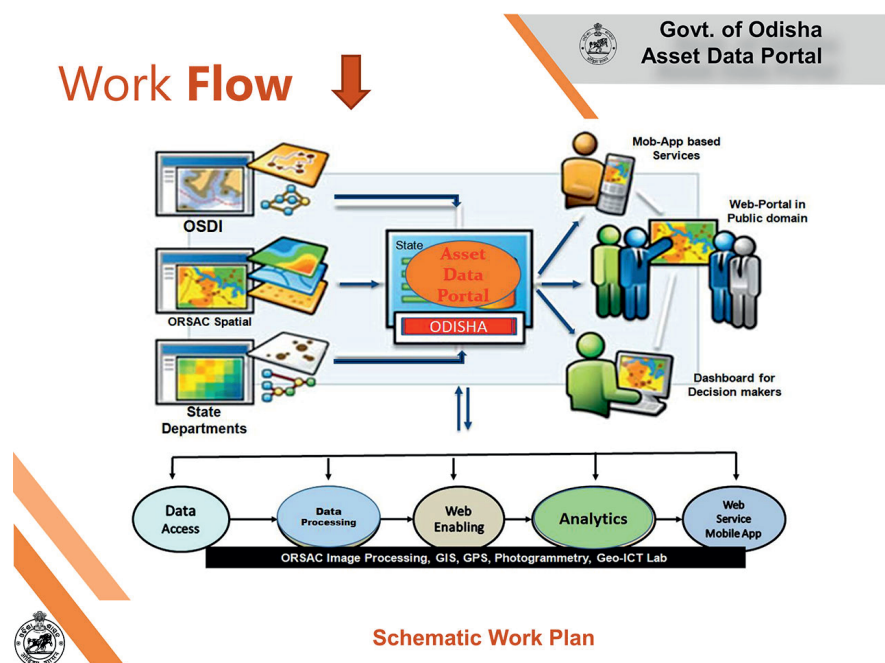
- **Deployment & Integration:** The developed solutions will be hosted and integrated with the respective departmental websites to ensure seamless accessibility.

- **User Access & Interoperability Framework:** The platform will provide a secure framework enabling authorised users to discover, access, analyse, create, and share data across platforms. It will support cross-platform compatibility and device-independent, web-responsive maps and applications that can be

accessed anytime, anywhere, from any device.

The Geo-Asset Centre will operate on a hybrid and hyper-converged infrastructure (HCI) architecture designed to ensure high availability, scalability, performance efficiency, and data security. The infrastructure will comprise 5–6 high-performance servers, a Storage Area Network (SAN), dedicated network connectivity from multiple ISPs, and cloud integration to enable redundancy and disaster recovery. The computing environment will follow a cluster-based architecture integrating GIS, database, and web servers, with on-demand virtual machine capability to ensure flexible resource allocation. Real-time backups and mirror imaging of systems will be maintained to guarantee 24×7 access to application web portals and web content, even in the event of system failures or disasters.

The platform will offer API-enabled services, Web-GIS portals, mobile GIS applications, and interactive dashboards for data visualization, search, retrieval, and download through a user-friendly interface. The Geo-Asset Centre will act as a centralized repository integrating diverse asset-related datasets from departments via structured data service mechanisms. Customized modules will be hosted on secure servers within a clustered open-source GIS environment. The system will manage spatial and non-spatial data—including satellite imagery, cadastral and thematic maps, survey data, and departmental MIS datasets while adhering to standardized metadata, defined data formats, and secure access protocols to ensure interoperability, data integrity, and effective decision support.



Madhya Pradesh Assets Management System

Implementation Framework²⁰

Asset Identification & Upload

- District/Division-level committees identify assets suitable for monetization.
- Nodal officers upload asset details on the PAM portal, including location, area, land use, and supporting documentation.
- PAM Department conducts feasibility examination and shortlisting.
- The Apex Committee approves asset selection and fixes reserve prices.

Pre-Monetization Preparation

- Land use change applications are submitted to the Directorate of Town and Country Planning with defined timelines under Standard Operating Procedures (SOPs).
- Infrastructure readiness is ensured through boundary wall construction, internal roads, and approach connectivity.
- Large land parcels are subdivided into market-aligned sizes to match

local bidder capacity.

Disposal Mechanism

Assets are disposed through the State's e-tender portal using a Tender-cum-e-Auction model:²²

- Two-cover bid system: Technical Bid (Cover-1) and Financial Bid (Cover-2).
- E-auction initiated at a predefined reserve price with incremental bidding.
- Final selection based on the highest price discovered either through financial bids or auction.
- Apex Committee recommends the highest bidder to the Cabinet for approval.

Post-Approval Process

- Issuance of Letter of Intent (LOI).
- Payment structure:
 - 25% within 30 days of LOI
 - Additional 25% within 30 days of Letter of Award (LOA)
- Remaining 50% within 60 days of LOA
- Execution of sale deed upon receipt of 100% payment.

Key Implementation Challenges

- Outdated land records and expired leases.
- Discovery of encumbrances during

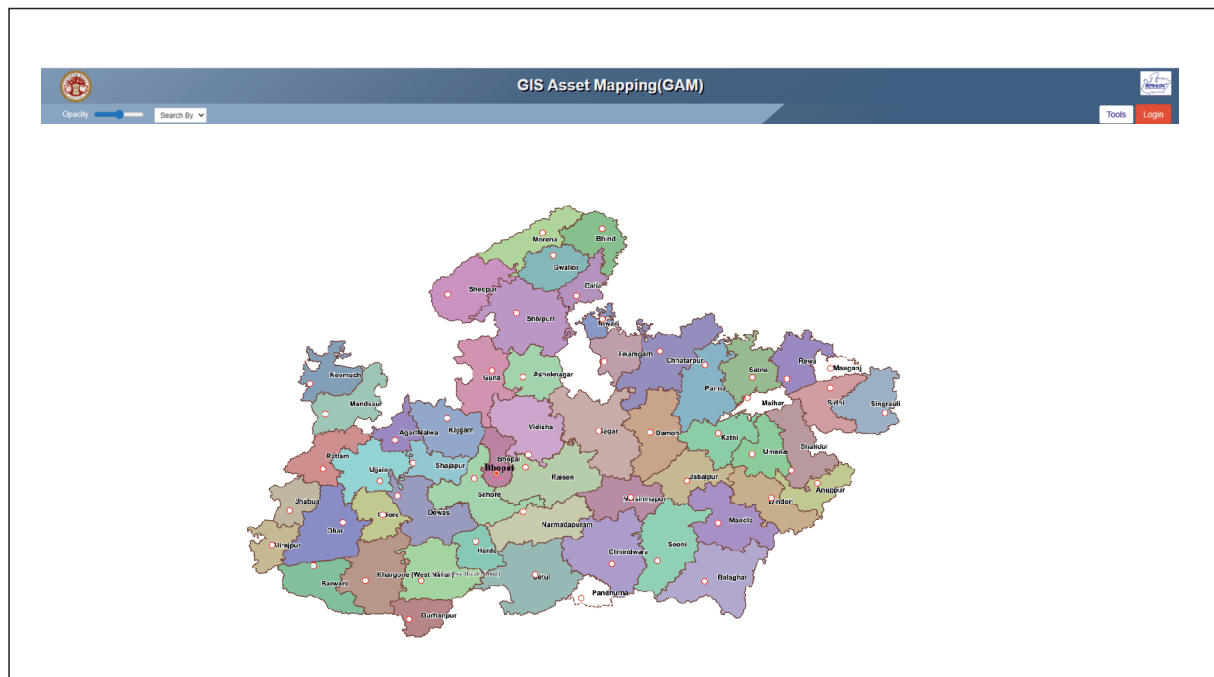
tender processes.

- Delays in land use change approvals.
- Site-level constraints such as tree removal, utility shifting, and discrepancies in actual land availability.
- Settlement of pending dues in assets under liquidation.
- Payment delays and defaults by bidders, particularly property intermediaries seeking investment partnerships.

Resolution Measures

- Transfer of ownership of leased land in favour of the State Government to strengthen legal standing.
- Engagement of senior advocates for expedited litigation resolution.
- Departmental facilitation of land use approvals and inter-departmental coordination.
- Proactive encroachment removal and on-site demarcation.
- Assistance in securing necessary NOCs and site clearances.
- Prompt grievance redressal and bidder support.
- Joint site visits with bidders and field officials to resolve operational issues efficiently

User interface-²²



Summary of National Monetization Pipeline (NMP 2.0)

The following section presents an indicative overview of the methodology adopted for estimating monetisation values under the major modes of asset monetisation identified in NMP 2.0. The estimates have been developed based

on standardized financial and valuation approaches; however, it is important to note that these projections are indicative in nature and may vary at the time of actual transaction structuring, bidding, and execution.⁸

Table 13 Illustrative summary of estimation methodology used for key monetisation modes⁸

Monetisation mode	Indicative list of Sectors leveraging this mode	Revenue share/proceeds		Private sector's capital investment in PPP projects	
		Type of monetisation proceed	Estimation method	Type of monetisation proceed	Estimation method
InvIT	Highways	Funds raised by National Highways Infra Trusts	Market approach	-----	-----
TOT	Highways	Upfront fee	Market approach	-----	-----
PPP User Pays models (e.g. DBFOT, BOT (Toll))	Highways, Ports, Railways, Warehousing and storage, Tourism	Premium/ Revenue share of the Government	Market approach	Investment from the private entity in development of asset	Capex approach
OMDA/ other O&M based concessions	Aviation, Railways	Upfront fee, revenue share, concession fee	Market approach	Investment from the private entity in major maintenance/ redevelopment of asset	Capex approach
IPO/ FPO/ Private placement	Power, Petroleum and natural gas, Aviation,	Proceeds from the sale of equity	Market approach	-----	-----

Table 13 Illustrative summary of estimation methodology used for key monetisation modes⁸

Monetisation mode	Indicative list of Sectors leveraging this mode	Revenue share/proceeds		Private sector's capital investment in PPP projects	
		Type of monetisation proceed	Estimation method	Type of monetisation proceed	Estimation method
Securitisation	Power	Proceeds to the PSU from securitisation of cash flows	Enterprise value approach	----	----
Lease	Telecom, Petroleum and natural gas	Lease rental payment Revenue share /proceeds	Market approach	----	----
Monetisation mode	Indicative list of Sectors leveraging this mode	Estimation method	----	Estimation method	----
Land based development	Railways, Ports, Urban, Telecom	Market approach	----	Capex approach	----
Commercial auction	Mines, Coal	Market approach	----	Capex approach	----



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