Senior Leadership Program on Public-Private Partnerships (PPP)

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PPP Procurement Models

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PPP Procurement Models at a Glance

PPP procurement models define how private parties are engaged to finance, build, operate, and transfer public infrastructure. The right model depends on the government's fiscal capacity, willingness to transfer risk, desired term, and strategic control requirements.

← Less Private Risk / Shorter Duration — More Private Risk / Longer Duration →

O&M	BT	ROT	BTO	BOT	BOOT	BOLT	BOO	Annuity
Operations & Maintenance	Build & Transfer	Rehabilitate Operate Transfer	Build Transfer Operate	Build Operate Transfer	Build Own Op Transfer	Build Own Lease Transfer	Build Own Operate	Annuity Model
3–10y	**5–15y**	**10–20y**	**15–25y**	**20–30y**	**25–30y**	**20–30y**	**30y+**	**15–30y**

Choosing the Right Procurement Model

Four key dimensions drive the model selection decision.

Does government want to retain ownership?	✓ BT, BTO, ROT, O&M	✗ BOT, BOOT, BOO
Is there a strong commercial revenue stream?	✓ BOT, BOOT, Concession	✗ Annuity, BTO, O&M
Is the asset new-build or rehabilitation?	✓ BOT/BOOT (greenfield)	✗ ROT, O&M (existing)
Is transfer back to government required?	✓ BOT, BOOT, BT, BTO, ROT	✗ BOO (no transfer)

BOT

Build-Operate-Transfer

TERM

20–30 years

PAYMENT

User toll fees

RISK

High → Private

HOW IT WORKS

1. Private party finances, constructs, operates and maintains the facility over the concession term.
2. The private party recovers investment through user fees or availability payments during the term.
3. Ownership remains with the government; the facility transfers back at concession expiry.

VALUE FLOW

Finance	Build	Operate	Transfer
Private	Private	Private + tolls	Government

REAL-WORLD EXAMPLE

Delhi Gurgaon Expressway —Toll Road Concession

JPDS Construction financed and built the 28 km urban expressway under a BOT structure. JPDSC collects tolls from users to recover investment over the concession period, after which the road reverts to NHAI. This was first Urban expressway after Delhi Noida Direct Toll BOT PPP awarded first time on premium.

BOT

Build-Operate-Transfer

TERM

20–30 years

PAYMENT

User toll fees

RISK

High → Private

Public Private Partnership (PPP) on design, build, finance, operate and transfer (DBFOT) Model

1. MMLPs aim to develop large scale infrastructure project through Public Private Partnership (PPP) mode for which both the Central Government and State Government have come together and a Government SPV formed amongst NHLML, RVNL, Chennai Port Authority & TNIDC.
2. In this model land is provided by Government or Government SPV and the technology, infrastructure design, and operations are managed by private developers.
3. The private entity is responsible for building and managing the logistics hub (warehouses, railway siding, customs, cargo handling) before transferring it after the end of concession period.

REAL-WORLD EXAMPLE

Multi Modal Logistics Park (MMLP) Chennai (2022)

It is a major 184-acre infrastructure project, situated 52 km from Chennai Port, 80 km from Ennore Port, and 87 km from Kattupalli Port, ensuring strong connectivity to manufacturing clusters. Direct access to the Chennai Peripheral Ring Road and a dedicated 10-km rail line from Kadambattur.

It offers integrated rail-road-sea access to improve logistics efficiency, reduce costs, and handle 7.17 million tonnes of cargo.

The MMLP Includes warehouses, cold storage, cargo terminals, truck terminals, and customs facilities.

BOOT

Build-Own-Operate-Transfer

TERM

25–30 years

PAYMENT

User fees / guests

RISK

High → Private

HOW IT WORKS

1. Private party finances, constructs, and owns the facility for the full concession period.
2. Unlike BOT, the private party holds title during operations — providing stronger collateral for project lenders.
3. Facility is transferred to the contracting authority on expiry of the agreed term.

VALUE FLOW

Finance	Build	Own + Operate	Transfer
Private	Private	Private (title)	Government

REAL-WORLD EXAMPLE

Tourism Beach Resort Development

A BOOT structure is well-suited for a luxury eco-lodge or marina resort on coastal public land: the developer finances, owns, and operates the resort for 25 years (charging guests directly), then hands the asset back to Government. Ownership during the term gives lenders security over the asset, improving bankability.

BOOT

Build-Own-Operate-Transfer

TERM

25–30 years

PAYMENT

User fees / guests

RISK

High → Private

HOW IT WORKS

Tirupur Water Supply and Sanitation Project

It was developed to address severe water scarcity issues and to provide treated and reliable supply of water to the industrial sector (dyeing units) and domestic users in Tirupur, reducing the reliance on depleting groundwater and improving environmental conditions.

A Special Purpose Vehicle (SPV) was formed i.e. New Tirupur Area Development Corporation Limited (NTADCL) was set up as public limited company, with equity holders consisting of Government of Tamil Nadu, TACID (Tamil Nadu Corporation for Industrial Infrastructure Development), Tirupur Exporters Association (TEA) & Infrastructure Leasing & Financial Services (IL&FS). This was the first public-private partnership in the water sector and has been operational since August 2005.

It is responsible for the offtake, treatment and transmission of water, distribution of water to industries and the municipality for domestic consumption, and treatment of the collected sewage, and maintenance of the sewage treatment plants. The project primarily seeks to address the water needs of the industrial area in Tirupur, with bulk of the water being supplied to the industry.

BTO

Build-Transfer-Operate

TERM

15–25 years

PAYMENT

Water tariffs

RISK

Medium → Shared

HOW IT WORKS

1. Private party constructs on a turn-key basis and immediately transfers title to the government on completion.
2. After transfer, the government grants the private party an operating concession to run the facility and collect user fees.
3. Used where government policy requires immediate state ownership but private operation is preferred.

VALUE FLOW

Finance & Build	Transfer	Operate	Revenue
Private	Government	Private (concession)	User fees

REAL-WORLD EXAMPLE

Water Treatment Plant

A private developer constructs a modern water treatment plant and transfers it to the County Water Service Provider on commissioning. The developer then operates it under a 20-year concession, collecting tariffs. Government retains asset ownership while benefiting from private operational efficiency.

BT

Build-Transfer

TERM

5–15 years

PAYMENT

Government schedule

RISK

Low → Private (construction)

HOW IT WORKS

1. Private party finances and constructs the facility at its own cost and risk.
2. On completion, title is transferred to the contracting authority, which reimburses total project investment on an agreed schedule.
3. Government operates the facility directly — used for strategic or security-sensitive infrastructure.

VALUE FLOW

Finance & Build	Transfer	Reimburse	Operate
Private	Government on completion	Government pays schedule	Government

REAL-WORLD EXAMPLE

National Security Infrastructure — Defence Barracks

Security-sensitive facilities such as military barracks, border control posts, or intelligence centres that cannot be privately operated are suitable for BT: private developer builds to specification and transfers immediately. Government reimburses the developer over 10–15 years from the national budget.

BOO

Build-Own-Operate

TERM

30 years+

PAYMENT

Power purchase fees

RISK

Full → Private

HOW IT WORKS

1. Private party finances, constructs, owns and operates the facility indefinitely — no transfer obligation.
2. Government retains the right to terminate obligations after a specified period, but ownership stays private.
3. Suited to commercially viable projects where government wants no long-term asset responsibility.

VALUE FLOW

Finance	Build	Own Forever	Operate
Private	Private	Private (no transfer)	Private

REAL-WORLD EXAMPLE

Independent Power Producer — Geothermal Energy Plant

Private IPP builds and owns a geothermal power plant under a Power Purchase Agreement with Authority. The plant remains permanently private — Authority simply buys the electricity output. No transfer is contemplated. BOO is the dominant structure in Sub-Saharan African energy PPPs.

BOLT

Build-Own-Lease-Transfer

TERM

20–30 years

PAYMENT

Government lease

RISK

Medium → Private

HOW IT WORKS

1. Private party finances, constructs, owns and operates the facility for the concession period.
2. The private party leases the facility to the contracting authority — which pays periodic lease rentals.
3. Lease payments cover investment recovery, operating costs, and a reasonable rate of return.
4. On expiry, the facility transfers to the contracting authority.

VALUE FLOW

Finance & Build	Own & Operate	Lease to Gov	Transfer
Private	Private	Rental payments	Government

REAL-WORLD EXAMPLE

Government Office Complex

A real-estate developer finances and builds a 20-storey government office building. Ministries lease it from the developer for 25 years (replacing expensive ad-hoc rentals), after which the government owns the building outright. BOLT replaces government construction debt with a predictable annual lease obligation.

Annuity

Annuity Model

TERM

15–25 years

PAYMENT

Fixed govt annuity

RISK

Low → Government

HOW IT WORKS

1. Private party funds the full upfront construction cost and all annual maintenance expenditure.
2. The contracting authority pays a fixed annual 'annuity' to the private party over the concession term — regardless of traffic or usage volumes.
3. The tender is awarded to the bidder quoting the lowest annuity, ensuring cost competition.
4. No demand risk to the private party — ideal where tolling is politically sensitive or volumes are uncertain.

VALUE FLOW

Finance & Build	Operate & Maintain	Annuity Payment	Transfer
Private	Private	Government (fixed)	Government

REAL-WORLD EXAMPLE

Road Upgrade

An annuity model is ideal for upgrading low-traffic rural roads where toll collection is not viable. The government pays a fixed annual amount to the private party for construction and 20-year maintenance. India's NHAI has used annuity for thousands of km of national highways

Hybrid Annuity

Hybrid Annuity Model

TERM

15–25 years

PAYMENT

Fixed govt annuity

RISK

Low → Government

HOW IT WORKS

1. Private party funds the part construction cost and all annual maintenance expenditure.
2. The contracting authority pays a part construction during construction normally 40% and pays 60 % of Capital cost fixed annual 'annuity' to the private party over the concession term — regardless of traffic or usage volumes.
3. The tender is awarded to the bidder quoting the lowest annuity, ensuring cost competition.
4. No demand risk to the private party — ideal where tolling is politically sensitive or volumes are uncertain.

VALUE FLOW

Finance & Build	Operate & Maintain	Annuity Payment	Transfer
Private Part	Private	Government (fixed)	Government

REAL-WORLD EXAMPLE

Road/STP under Namami Gange

An Hybrid annuity model is ideal for upgrading low-traffic rural roads where toll collection is not viable. The government pays a fixed annual amount to the private party for construction and 15-year maintenance. India's NHAI has used Hybrid annuity for thousands of km of national highways

HAM

Hybrid Annuity Model

TERM

15–25 years

PAYMENT

Fixed govt annuity

RISK

Low → Government

Hybrid Annuity Model (HAM)

1. The development of ropeways in India is taking place under the Public Private Partnership (PPP) model for better connectivity and convenience along with the promotion of various opportunities for tourism and livelihood. It will also be developed as an efficient mass transit mobility solution in India's congested roads and is expected to operate as cable taxis as an alternative to costlier and less green urban road transportation choices.
2. The Varanasi Ropeway Project is the first Urban Transport project undertaken by Government of India under HAM.
3. In order to make the sector attractive, the Government participation was at 60% and Developer at 40%.

REAL-WORLD EXAMPLE

For easing traffic as well as boosting tourism to the city of Ghats. The World's Third Urban Ropeway Project is a collaboration of National Highway Logistic Management Ltd. (NHLML) and Vishwa Samudra in collaboration with the Swiss-based firm Bartholet, for bringing faith and technology together by concretizing the vision of billions of Indians.

The Varanasi Ropeway project comprises of five station buildings and twenty-nine towers.

The ropeway is planned to transport 3000 passengers per hour in each direction. A total of 153 Gondolas (Cabins) with a capacity of 10 people will be deployed at a height of about 50 meters.

R/UOT

Rehabilitate/Upgrade -Operate-Transfer

TERM

15–25 years

PAYMENT

User / port fees/UDF

RISK

Medium → Shared

HOW IT WORKS

1. An existing — often dilapidated — infrastructure facility is handed to the private party for rehabilitation.
2. The private party refurbishes, then operates and maintains for the concession period, collecting user fees.
3. At concession expiry, the asset is returned to the contracting authority in agreed condition.

VALUE FLOW

Hand Over	Rehabilitate/Upgrade	Operate	Transfer
Existing asset	Private investment	Private + user fees	Government

REAL-WORLD EXAMPLE

Port Container Terminal Rehabilitation/Hospital/Airports

Ports Authority hands over an ageing container berth to a private terminal operator. The operator invests in dredging, cranes, and paving — then operates the terminal and collects port handling fees for 20 years before transfer back to Authority. ROT is widely used in airports, and water utilities.

O&M

Operations & Maintenance

TERM

3–10 years

PAYMENT

Mgmt fee + KPIs

RISK

Low → Government

HOW IT WORKS

1. Government retains ownership. An existing facility is handed to a private operator to run and maintain.
2. Government continues to provide the capital asset — private expertise drives operational efficiency.
3. Most common model for municipal services: water, solid waste, road maintenance, parking, recreation.
4. Performance penalties and bonuses are built into the contract to incentivise service quality.

VALUE FLOW

Asset Owned	Operate & Maintain	Performance	Oversight
Government	Private contractor	KPI-linked payment	Government monitors

REAL-WORLD EXAMPLE

Water & Sewerage Company — Operational Management

Water Authority can engage a specialist private operator under an O&M contract to run its treatment plants and distribution network. The operator is paid a management fee plus performance bonuses linked to non-revenue water reduction and service uptime targets — while asset ownership stays with the company.

O&M

Operations & Maintenance

TERM

3–10 years

PAYMENT

Mgmt fee + KPIs

RISK

Low → Government

REAL WORLD EXAMPLES

Operation & Maintenance (O&M) contracts are primarily short-term, item-rate, or performance-based contracts, often lasting one year, designed to maintain highway quality through routine maintenance and incident management after construction.

They focus on maintaining, managing, and upgrading national highways through models like Operations & Maintenance Contracts (OMT). These projects involve preventive maintenance, toll collection, and safety improvements, with recent initiatives focusing on technology-driven monitoring and smart road features. They ensure that concessionaires repair defects and adhere to safety standards.

There are specific contracts for tolling and maintenance, often awarded for existing highway sections.

NHAI awarded several major O&M contracts for toll plazas in June 2022 across multiple states, including Haryana (PIU Hisar), Assam (PIU Guwahati), Odisha (PIU Balasore), and Punjab (PIU Jalandhar).

Comparative Matrix — At a Glance

Model	Finance	Build	Ownership	Operate	Transfer	Revenue	Typical Term
BOT	Private	Private	Govt	Private	Yes	User fees	20–30y
BOOT	Private	Private	Private	Private	Yes	User fees	25–30y
BTO	Private	Private	Govt	Private	Yes	User fees	15–25y
BT	Private	Private	Govt	Govt	Yes	Govt sched	5–15y
BOO	Private	Private	Private	Private	No	User fees	30y+
BOLT	Private	Private	Private	Private	Yes	Govt lease	20–30y
Annuity	Private	Private	Govt	Private	Yes	Govt annuity	15–25y
ROT	Private	Private	Govt	Private	Yes	User fees	15–25y
O&M	Govt	N/A	Govt	Private	N/A	Mgmt fee	3–10y

Which Model for Which Sector?

Transport (Highways/Bridges)

BOT, BOOT, Annuity, BTO

Strong user-fee potential; large capex; long asset life

e.g. Nairobi Expressway (BOT), Rural roads (Annuity)

Energy (Power Generation)

BOO, BOT, BOOT

Long-term Power Purchase Agreements provide revenue certainty

e.g. KenGen Geothermal IPP (BOO), Solar plants (BOT)

Water & Sanitation

O&M, BTO, ROT, BOT

State retains ownership; private expertise improves efficiency

e.g. County water plants (O&M), New dams (BTO)

Tourism & Hospitality

BOOT, BOO, BOLT

Developer needs ownership security for financing; commercial upside

e.g. Beach resorts (BOOT), Wildlife lodges (BOO), Conference facilities (BOLT)

Healthcare & Education

BOLT, Annuity, BTO

Government pays availability fee; no user-fee revenue model

e.g. Hospital PPPs (BOLT), Schools (Annuity)

ICT & Digital Infra

BOO, BOT, O&M

Rapid technology change favours private ownership; user revenues viable

e.g. Fibre networks (BOO), Data centres (BOT)

Common Pitfalls & Auditor Red Flags

⚑ Model Misselection

Using a BOO model for a politically sensitive asset (e.g. water utility) where public ownership is constitutionally required. The AG should verify model appropriateness at feasibility stage.

⚑ Risk Not Transferred in Practice

Contract says private party bears demand risk (BOT), but government has provided a minimum revenue guarantee — making it an annuity in disguise. Auditors must look beyond labels.

⚑ Tenure Exceeds 30-Year Cap

Some contracts embed 'extension clauses' that effectively exceed Cap. 430's 30-year limit. The AG should verify the full economic term including all extension options.

⚑ Annuity Understated in Budget

Annuity obligations are often not captured in medium-term expenditure frameworks. Treasury and the AG must confirm all future payment streams are disclosed as contingent liabilities.

⚑ Renegotiation Converts Model

A BOT that loses toll revenue may be renegotiated into an annuity, transferring demand risk back to government. Any variation must be approved.

⚑ O&M Contract Without KPIs

O&M contracts without performance-based payment mechanisms provide no incentive for private operators to deliver. Auditors should check for enforceable KPIs and penalty clauses.

Case Study — Choosing a Model: Coastal Tourism Resort

Kenya Tourism Board (KTB) wants to develop an eco-resort on 50 acres of public beach land in Kilifi. The facility will have 120 rooms, a marina, and conference centre. Government has no capital budget but wishes to retain the land and derive revenue. Which PPP model fits?

BOOT ✓ RECOMMENDED

✓ **Advantages:**

Developer owns the resort for 25 years — provides strong collateral for project finance lenders. KTB receives ground rent + revenue share. Full transfer at year 25.

✗ **Limitations:**

Government has no control over asset during term. Requires robust concession agreement to enforce brand standards and environmental obligations.

BOT

✓ **Advantages:**

KTB owns asset throughout. Private operator pays user fees to recover investment. Clear transfer at concession end.

✗ **Limitations:**

Government ownership during operations may deter some lenders. Developer has less collateral security, potentially raising financing cost.

BOO

✓ **Advantages:**

Maximum private control — developer may operate indefinitely. Best for maximising private investment.

✗ **Limitations:**

Government never regains the asset. Difficult to justify retaining perpetual private rights to public coastal land.

O&M

✓ **Advantages:**

Government retains full ownership and control. Simple management contract.

✗ **Limitations:**

Government must fund construction itself — no private financing. Not viable given zero capital budget.

Examples – BOT: Multi Modal Logistics Parks

SPV Structure

RVNL | State Govt. | NHLML

PPP

DBFOT model

Private Party(s) (Consortium) as Concessionaire

Indian Railways (IR):

- **IR** to provide **dedicated** rail siding line to the MMLP, to improve rail connectivity
- Railway connectivity to be provided within 4 years of Appointed Date

State Govt. to provide land for development of MMLP at proposed location

- **90% of land** to be provided by **Appointed Date**

MoRTH:

- Act as **appraisal / nodal agency** and provide **external trunk infrastructure** & **procure** relevant **approvals**
- **Road connectivity and utilities** to be provided within **18 months of Appointed Date**

Concessionaire:

- **Design, construct, finance, operate and maintain** the project for 45 years concession period
- **Revenue Share** (as a % of Gross Revenue) on XNPV basis discounted on the Appointed Date to SPV **post moratorium period**

Examples – Hybrid Annuity: Ropeways

State-level Partnership (comprising of Central Govt. + State Govt.) being formed for implementation of Ropeway project under Annuity mode

सत्यमेव जयते
MoRTH
Ministry of Road Transport and Highways

Centre – State Partnership

+

Karnataka One state. Many worlds. Department of Tourism

सत्यमेव जयते
गुजरात सरकार
Government of Gujarat

उत्तराखण्ड राज्य

State Govt. / UT

PPP

Ropeway developer

MoRTH:

- Act as **appraisal / nodal** agency; **execute project**
- **Procure** statutory **clearances** related to **Center**
- **Capex investment, Payment of Annuity, and O&M**
- **Collect all revenues**

State Government:

- **Provide land** for development of Stations, Towers, and facilities
- **Procure** all **statutory clearances** related to **State**
- **Provide Aerial Right of Use**

Ropeway Developer:

- **Design, construction and O&M** of the project
- Undertake **commercial development** & advertising

Examples – O&M: Wayside Amenities

Bidding Parameter

Quoted Annual Lease Rental

Duration of Lease

30 Years
Unconstructed Site

15 Years
Constructed Site

- **O&M period -** 30 years.
- **Mandatory Facilities:** Food Court; Kiosks; Restaurants; Convenience Store/Shops; Toilet / Washroom Facility; Baby Feeding/Care Room; Drinking Water; Parking (4W & Bus) & EV Charging Station; Children's Play area; Village Haat /MSME Craft Shop; Fuel Station; Medical Facility/ Pharmacy; ATM facility; Trucker Amenities etc.

Roles & Responsibilities

Authority

- Access permission for land parcels
- Provision of land for development of WSA
- Approval on construction and development plan shared by private party for unconstructed brownfield sites
- Monitor development and operations of WSA

Private Party

- Funds for establishment of WSA
- Design, construction and development of WSA including Operations & Maintenance
- Obtaining clearance and approval from concerned Authority for operationalization
- Maintain and operate WSA as per industry standard

Examples – O&M: Wayside Amenities: Mandatory & Optional Facilities

Car Passenger Amenity

- **Food Court, Kiosks, Restaurants**
- **Convenience Store/Shops**
- **Toilet / Washroom Facility,**
- **Baby Feeding/Care Room**
- **Drinking Water**
- **Parking (4W & Bus) & EV Charging Station**
- **Children's Play area**
- **Village Haat** /MSME Craft Shop
- **Fuel Station**
- **Medical Facility/ Pharmacy, ATM facility**
- Emergency Room/ Care Center
- Car Mechanic/ Car Wash
- Motel/Convention Centre

Trucker's Amenity

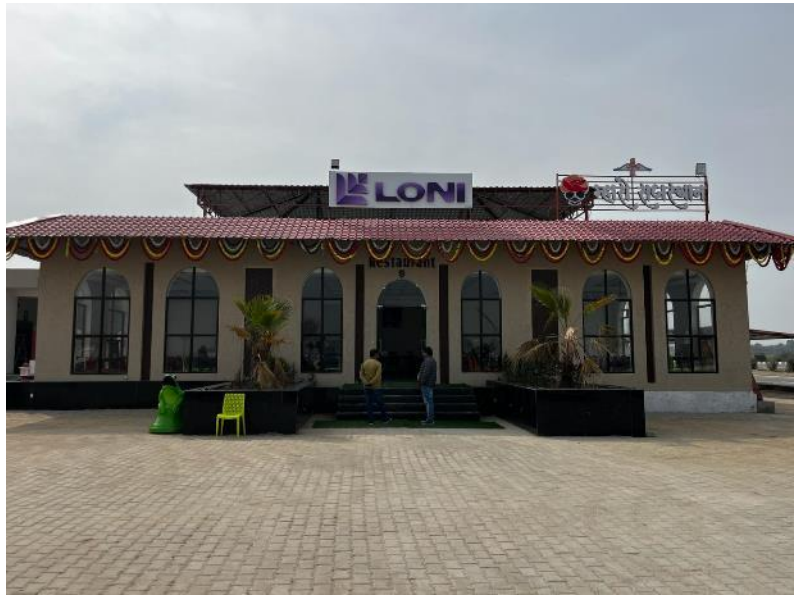
- **Dhabas for Truckers**
- **Convenience Store/Shops**
- **Toilet / Washroom Facility**
- **Drinking Water**
- **Truck Parking**
- **Village Haat**
- **Fuel Station**
- **Medical Facility/ Pharmacy, ATM facility**
- Dormitory for Drivers*
- Car Mechanic/ Car Wash
- Self Laundry & Cooking facility for Truckers*
- Vehicle Repair Shop

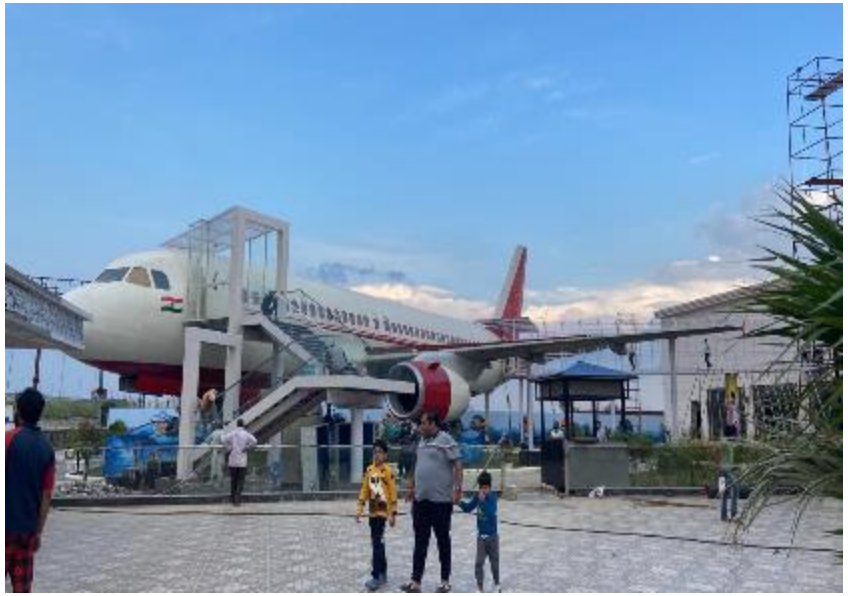
Site Development

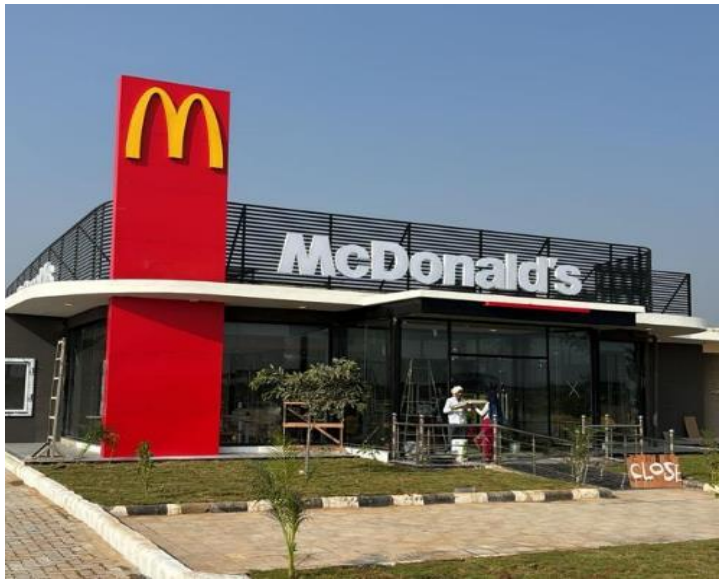
- **Landscaping**
- **Open Gym & Open rest area with benches and tables**
- **High Mast Lightings**
- **Entry / Exit markings**
- **Road markings**
- **Signage's (Emergency & Advertisement)**
- **24X7 Security / Camera's**

Mandatory Facilities
Optional Facilities

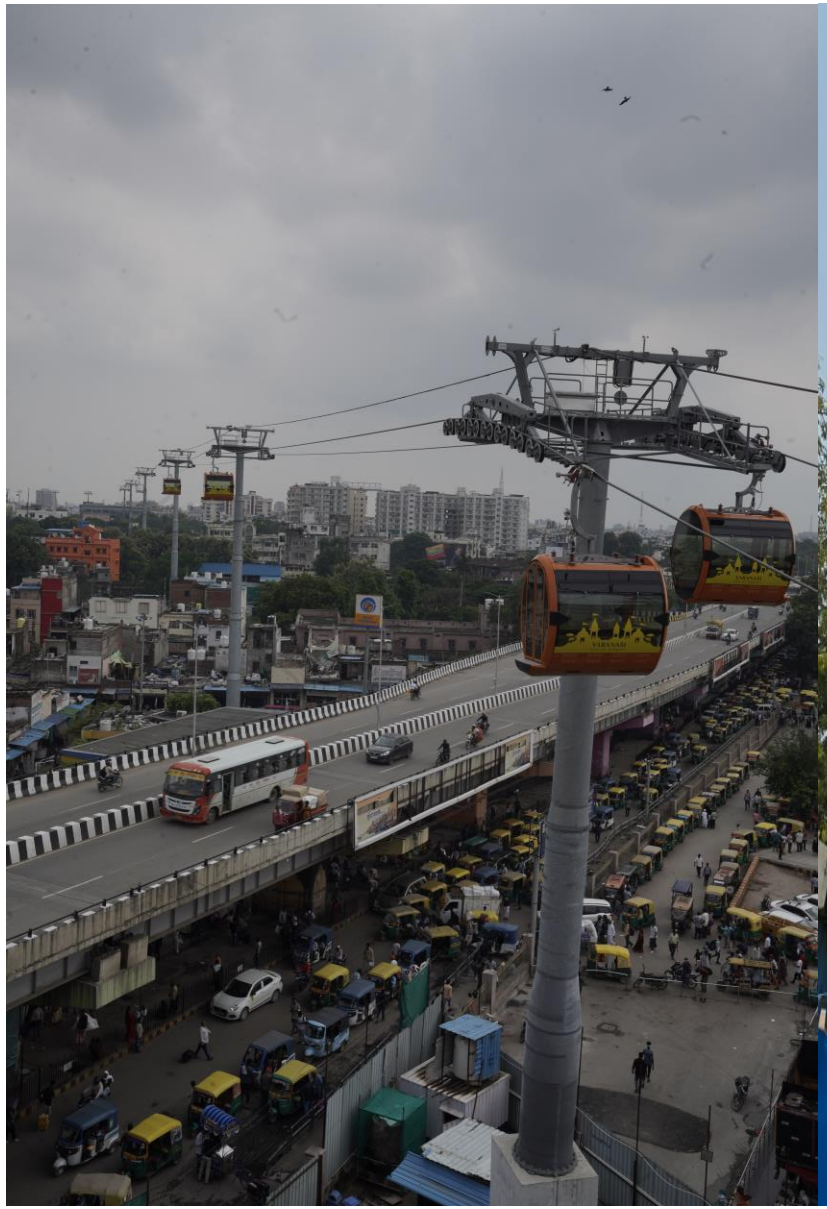
Restaurant Facilities Operationalized across Wayside Amenities

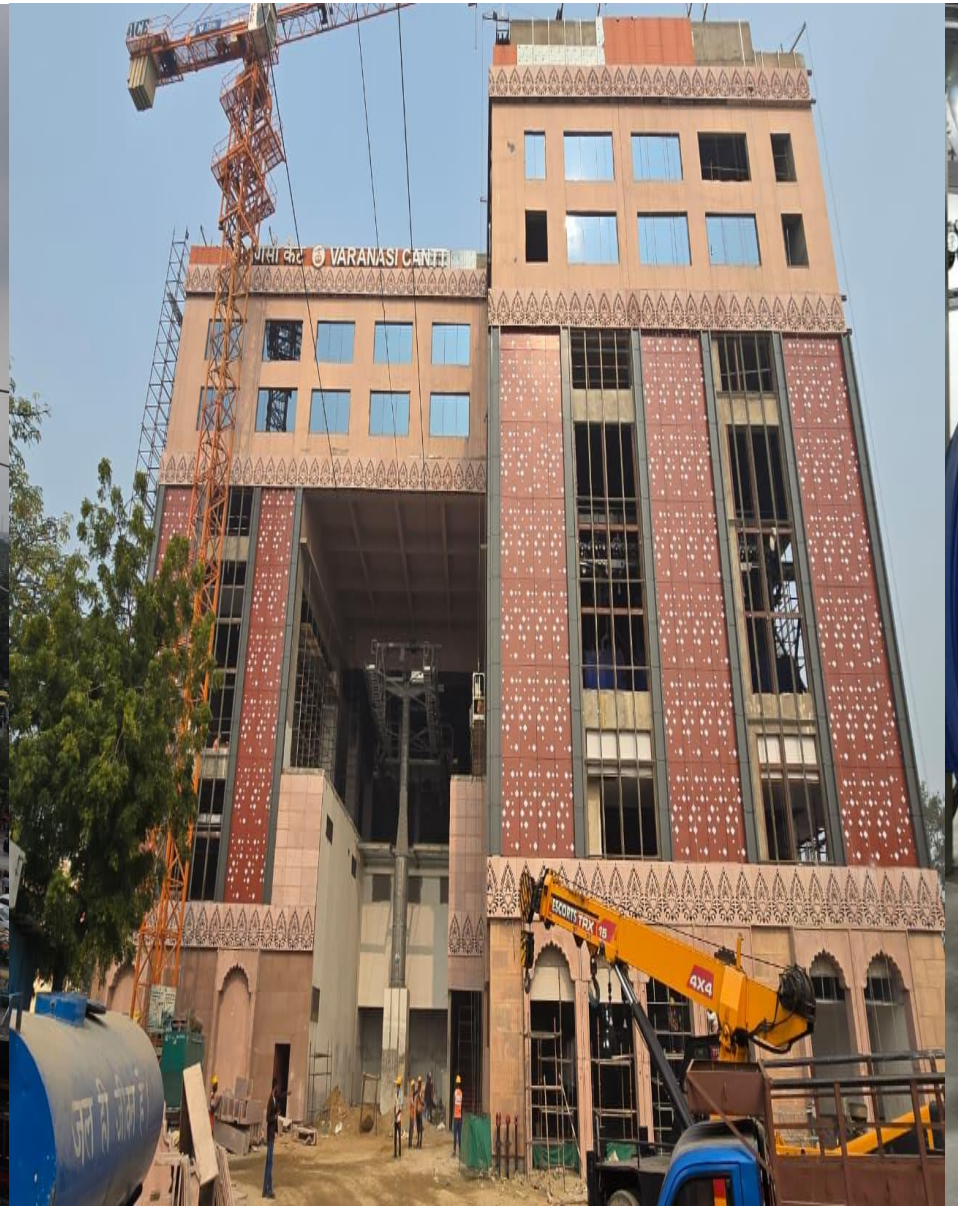


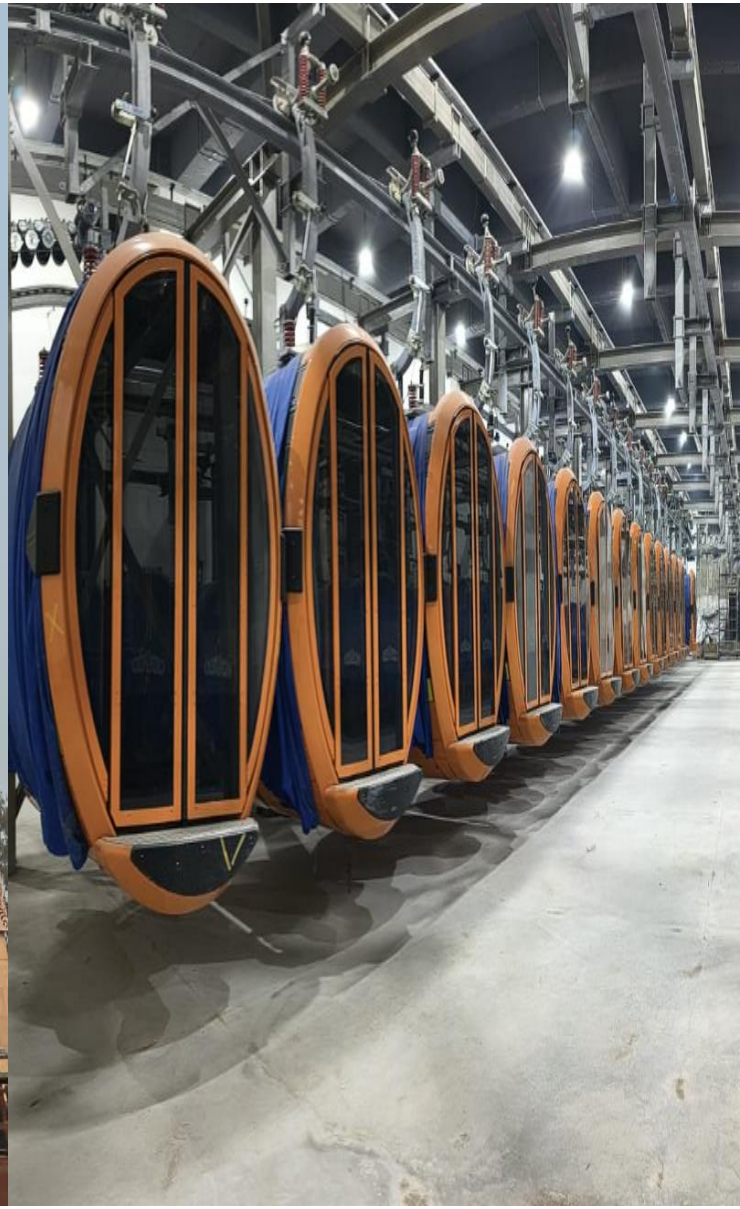




Hybrid Annuity Model – Varanasi Ropeway







Discussion

Questions and Deliberations