NFSSM ALLIANCE

WASH INSTITUTE

स्वच्छ भारत
एक कदम स्वच्छता की ओर

Ministry of Housing and Urban Affairs
Government of India

TOILETS 2.0

Models for Community and Public Toilets in India


स्वच्छ भारत मिशन
सामुदायिक शौचालय
स्वच्छ चुनार
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Contributing Organizations

The National Faecal Sludge and Septage Management Alliance (NFSSM Alliance) is a coalition of 35+ premier organisations of repute who have come together to advance sanitation and related water goals (SDG 6.2) in India. The NFSSM Alliance assists national and state governments in advancing SBM 2.0 and AMRUT 2.0 to address City-wide Inclusive Sanitation (CWIS) outcomes. This collaborative platform brings together practical experience and multidisciplinary expertise in the fields of inclusive sanitation with focus on municipal capacity building and reforms, technology innovations, worker safety and well-being, behaviour-change communication, ICT tools for monitoring, and policy development through documenting good practices and promoting replication efforts. The NFSSM Alliance works in 14+ states in different capacities to drive innovation in sanitation planning, infrastructure and services to ensure safe and inclusive sanitation outcomes for all.

WASH Institute (Water, Sanitation and Hygiene Institute) is a registered non-profit organization established in Kodaikanal, Tamil Nadu, India, in the year 2008, providing technical, training, research and development services to a wide range of stakeholders - Governments, Industry, DFIs, philanthropic organizations, and other NGOs. WASH Institute is dedicated to providing practical solutions to a wide range of water, sanitation, hygiene and environmental issues. WASH Institute operates from 16 locations across nine states and one Union Territory in India. The organization supports the Ministry of Housing and Urban Affairs (MoHUA) and the Ministry of Jal Shakti in implementing India's flagship water and sanitation missions. WASH Institute has a multi-disciplinary team of over 140 employees with expertise in engineering, urban planning, policy and business models, capacity building, and behaviour change communication.

Dasra is a leading strategic philanthropy foundation, whose focus is on creating large-scale social change in India. Dasra drives collaborative action and powerful partnerships for impact. They work together with other funders, nonprofits and the government to share learnings and create joint solutions that work. They facilitate collaborations between funders, non-profits, corporations and the government. They also handhold NGOs to achieve scale and sustainability, and work with other philanthropists to help understand problems towards solutions. As Secretariat of the NFSSM Alliance, Dasra anchors engagements of the Alliance towards its programmatic outcomes, in convergence with national priorities on inclusive sanitation.


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SYMBOL OF CLEANLINESS
SULABH TOILET COMPLEX
TOILETS,BATHS,URINALS & CLOAK ROOM
FINANCED BY
DEPARTMENT OF TOURISM
GOVT-OF GOA.
SULABH INTERNATIONAL SOCIAL SERVICE ORGANISATION
GOA BRANCH
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Message

SECRETARY
Ministry of Housing and Urban Affairs

In the last few years, India has moved a long way in ensuring improved sanitation systems, as part of the Government of India's flagship scheme Swachh Bharat Mission. Our cities, streets, and neighbourhoods have become visibly cleaner, and finding a functioning public or community toilet every few kilometers has now become a common sight.

While having achieved the outcomes of ODF and ODF+ for all towns and cities, we must continue to ensure that community and public toilet services remain sustainable, clean, and always functional for the communities. This objective demands that we look for innovations in the form of technology, design, operating model, and ways of involving communities towards ensuring access to quality sanitation services at each toilet facility.

We launched the vision of a reimagined Toilets 2.0 on the occasion of World Toilet Day 2022. We envisioned accessible and inclusive toilets catering to the needs of all, especially the most marginalized and ones with special needs. It is commendable to see that Indian cities have already taken strides toward realizing the vision of Toilets 2.0 using ingenious solutions. One year on, for World Toilet Day 2023, I am happy to note that the ministry, with the support of our partners, is publishing a set of case studies. This compilation describes exemplars that we hope will inspire more cities, as well as other sector actors, and private entities, to adopt these innovations and build on the momentum offered by Swachh Bharat Mission 2.0.


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ELECTRIC DRY CLEANERS
DRY WASH
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IRON

Message

JOINT SECRETARY
Ministry of Housing and Urban Affairs

Since the launch of Swachh Bharat Mission (SBM), India has witnessed a significant change in the urban sanitation scenario – there has been a marked positive change in attitudes and mindsets of citizens towards 'swachhata'. In fact, Swachh Bharat Mission has emerged as the largest behavioural change programme in the world.

The second phase of SBM has an ambitious agenda of extending sanitation infrastructure and services to all towns across the country. Public and Community Toilets are an important component of SBM and provide a critical sanitation service to our citizens. Functional community and public toilets are vital to achieve the ultimate goal of ODF++ and Water+ cities. 'Toilets 2.0', put forward under SBM, provides a vision for reimagined public and community toilets.

Toilets 2.0 envisions access to clean and well-maintained toilets for all. That means toilet infrastructure with the right features that ensure ease of use for women, children, the elderly, the disabled and other marginalized groups. It also means aesthetic designs that citizens use responsibly out of civic pride, sustained cleanliness within the toilet and responsible management of toilet waste. Technology enabled toilets provide a way to improve the quality of user experience and reduce costs. Partnerships with local businesses, community groups, and other stakeholders is key to achieving the vision of Toilets 2.0.

This compendium titled "Toilets 2.0: Public and Community Toilets across India" aims to showcase case studies capturing the different ideas discussed above. It documents various innovative models of public and community toilets that should provide a ready reference to urban local bodies, community based organizations, and other non governmental allies, for sustainable scaling. As we continue to work towards the vision of 'Toilets 2.0', it is hoped that through the collective efforts of governments, civil society, and NGOs, we can accelerate the implementation of inclusive and equitable toilets for all.

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Toilets 2.0 – A vision for Community and Public Toilets in India

India has made great strides in providing toilets to its citizens in the past few years with the result that the country has become Open Defecation Free (ODF). This means that households have access to a toilet whether individual or shared. Individual household toilets remain the primary form of toilet access and should be prioritized. However, shared toilets are necessary, and play an important role in achieving public health and environmental outcomes. Shared toilets come in different forms – Community Toilets shared among households with a well-defined set of users, and Public Toilets catering to 'floating populations' that use the social, commercial, or leisure spaces in a city. The Swachh Bharat Mission Urban in phase 2 will bring much needed focus to Community and Public Toilets in India.

Several basic questions immediately present themselves in the context of shared toilets. How do we know if a town or city has adequate number of shared toilets? Where should these toilets ideally be located? How do we ensure that shared toilets are in fact accessible to all that need them, including the most vulnerable – disabled, elderly, pregnant, women, trans-people, and children? How do we ensure that shared toilets remain clean and useable at all times? Many towns and cities have addressed these questions successfully and have shown the way for us to emulate. This document presents a collection of case studies that showcases good models from across the country.

It is however important to recognize that shared toilets must fulfil other roles as well. Public toilet structures, as essential elements of urban infrastructure, have to reflect the cultural and aesthetic sense of the locality or city. Tourism – both domestic and international – plays an important role in our economy. Public conveniences should be an integral part of tourism planning. What role should design, and architecture play in the making of a public toilet? Beyond immediate economic concerns, a building that evokes pride in the community will have a greater chance of being used respectfully and maintained well. Between the basic functions of providing sanitation services and contributing to the aesthetics of an urban scape, shared toilets play different roles with multiple design challenges that require a focused and holistic approach.

'Toilets 2.0' envisions addressing all the dimensions of shared toilets to make them universally and inclusively accessible in a sustained manner. Three key principles should guide the provision of shared toilets to ensure they are - (i) Accessible to all, (ii) Always clean and operational, (iii) Managing toilet wastes responsibly. These principles are self-evident and require no justification. For shared toilets to adhere to these basic principles requires a complex set of interdependent actions. The broad themes under which these actions may be grouped are listed below.

1. **Access to All** sections of population,
    a. Especially including vulnerable sections - disabled, elderly, pregnant, women, transgender, and children
    b. Access to toilets for itinerant populations such as construction workers, and frontline service providers such as sanitation workers
    c. Access to toilets at large gatherings of people such as public festivals, Kumbh Mela
2. **Sustainable Models for Operation and Maintenance** of community and public toilets to ensure continued operations and provide a dignified place of work with reliable livelihoods
3. **Technology Enabled Toilets** that reduce operational costs and provide clean toilets at all times. The use of technology is also expected to enable treatment of toilet wastes and promotes reuse of treated water where feasible.
4. **People's Toilets** – toilets designed to overcome aversion to public conveniences among citizens, especially among women, and evoke civic pride leading to a sense of ownership
5. **Partnerships for Toilets** – corporates and local businesses partnering with local governments to provide communities with access to toilets in a sustainable manner

Several case studies are presented under each theme to highlight the various dimensions under that theme. For example, under 'Sustainable Models for Operations and Maintenance (O&M)', different "owner-operator" models have been described to showcase a diverse set of solutions. The theme also demonstrates various revenue streams for cost recovery in shared toilets – from largely user fee dependent models to zerouser fee models with revenues generated by co-located retail operations, to municipalities bearing cost of operations.

The core challenge of providing sanitation services is ultimately that of getting citizens to care enough. Strong community engagement can solve several issues facing shared toilets and is the single most important factor contributing to successful operations. The 'People's toilet' theme requires greater study and contributions from urban planners, designers, and architects.

Toilet buildings and the infrastructure within have to be designed to specifications that ensure a certain quality of user experience. Basic specifications ensuring ergonomic comfort, unhindered user movement, and amenities (handwashing, etc.) should be adhered to for all toilets. In addition, design elements such as space configuration, lighting, ventilation, amenities, and use of appropriate materials for the interiors ensure psychological acceptance of the space by users and go a long way in overcoming any hesitation citizens, especially women, have in accessing public toilets. The architectural design of the building plays a key role in citizens feeling comfortable in using public toilets. And finally, there is a great need to recognize public toilets as a necessary part of town planning and earmark space for these at the zoning stage itself. Public representatives and city officials should insist on good designs that blend in with or add to the urban scape of a locality or city contribute to making the place more aesthetic.

The successful adoption of these themes requires a cross-section of stakeholders from local governments, communities, local businesses, citizens, the private sector including architects and designers, corporates, and NGOs to work in cohesion. This can be seen in the case studies, in many of which multiple stakeholders have come together to implement locally appropriate solutions. It is therefore paramount to continue and further encourage the "jan andolan" or citizen participation aspects of SBM. Many towns and cities have started adopting 'City Sanitation Task Forces' at sub-ward, ward, and town levels towards this end. NGOs, CBOs, civic and business leaders, educational institutions, and religious institutions must all be brought into participatory dialogue on what our shared toilets mean for a town/city and how we build, operate, and manage them.

It is evident that multiple approaches are available under a theme, each with different degrees of success in providing a sustainable solution. Addressing the several challenges facing shared toilets requires a coherent, thoughtful, and broad-based effort. Toilets 2.0 adds a new sense of purpose to the efforts achieved under SBM and builds on our progress so far to provide universal and inclusive sanitation for all.


शौचालय
WASH ROOM

01

ACCESS TO TOILETS

OVERVIEW: ACCESS TO TOILETS

Universal inclusive access as an ideal requires a redoubling of efforts to identify groups that are unable to use existing toilets or do not have access to toilets. Public and community toilets should be accessible to every person irrespective of gender, age, abilities (especially mobility and cognitive), or any other social, cultural, or physical aspects. The priority should be to provide Individual Household Toilets, failing which community toilets may be provided. The Toilets 2.0 vision envisages facilities that are accessible to and usable by all in a comfortable, safe, and efficient manner ensuring privacy and dignity. Public and community toilets should be designed for inclusivity.

Under this theme, a set of successful public and community toilet case studies are presented demonstrating inclusivity and accessibility to women, transgender, differently abled, and senior citizen, and child friendly. The cases describe specific design features and services that are provided in these public and community toilets that make these facilities inclusive and accessible to all.

Sunidhi public toilets in Dindigul/Madurai, Tamil Nadu and SHE toilets in Warangal, Telangana are designed exclusively for women with safety and privacy features, a woman caretaker, and provide sanitary pad dispenser and an incinerator for disposing used sanitary pad. These cases demonstrate that the cost of providing exclusive toilets for women is not very high. While the additional hardware for sanitary pads costs about ₹25,000, what makes these toilets useable is the design. The additional costs of providing a separate toilet block exclusively for women are negligible compared to a combined toilet block for men and women.

The idea of a separate toilet for women can potentially improve the planning and design process by focusing the planners' attention on the real needs of women in the locality.

Gramalaya a NGO in Tamil Nadu (case not included) has helped build child friendly community toilets with design features in toilets that make it easier for children to use them comfortably. These toilets have smaller size toilet pans/seats that are easier for children to use. Typically, almost all public and community toilets provide separate section for men and women. There is no such provision for the transgender community.

Any public and community toilets should mandatorily have features that are disabled and elderly friendly. Rarely have we come across a public and community toilets that have all the required design features to make them disable and elderly friendly. A short note on key design features to be included in our public and community toilet is described. The **case of Nellore city in Andhra Pradesh** describes the experience of retrofitting traditional toilets with disabled friendly features. Their experience shows that for retrofitting one male and one female toilet unit into a disabled friendly toilet cubicle cost on average ₹2.2 lakhs including the cost of ramps.

A second dimension under access to toilets relates to workers in vulnerable conditions and itinerant groups. While resident and floating populations have largely been catered to, there are certain groups that suffer from lack of access to toilets. Based on the profession, access to toilet has been a critical requirement. Two such professions that need special attention

are construction workers and sanitation workers. In the **case of construction workers,** the majority tend to live at the construction facility in temporary dwellings and lack access to toilets. 3S SARA PLAST Pvt. Ltd., a private agency in Pune is providing construction sites with temporary toilets at a cost of about ₹200 to ₹240 per worker per month. The service provided by SARA PLAST Pvt. Ltd. extends to ensuring cleanliness and usability of the toilets. While the large construction projects have adopted portable toilets, it is the informal and small construction sites which require a nudge towards providing safe sanitation facilities to their workers.

The situation is similar for sanitation workers such as road sweepers, door-to-door solid waste collection workers, desludging operators, and drainage and sewer cleaning workers. Their profession is such that they require amenities for cleaning themselves to ensure safety and hygiene for not just themselves but also for the people they serve. **Leh city, Ladakh,** has implemented **community toilets specifically for sanitation workers.** These early pilot projects have many learnings for towns and cities to adopt, the biggest among which is that sanitation workers also deserve good sanitation facilities.

An analysis of the cases presented under this theme (and other themes) brings out useful insights for planners and practitioners as described below.

There is a need to **define a comprehensive specification for inclusivity features** that should be made available across the varied groups of age, gender, and disabilities. Most community and public toilets have adopted only a limited set of features that define access. A universal definition for inclusivity features is a critical necessity for our toilets to bridge the gap towards 'toilets for all'. Such a definition should cater to toilets of different sizes and footfalls, and distinguish mandatory features (e.g., ramps and disabled friendly cubicles) from optional features dictated by the local context.

A key consideration in infrastructure planning is the capital costs incurred towards provisioning improved features of accessibility. The cases in this theme show that costs vary widely with construction material/method used. Conventionally built toilets (brick and mortar) cost about ₹2 lakhs per seat for SHE toilets, whereas the pre-cast Sunidhi toilets cost ₹75,000 per seat, and the prefabricated HDPE toilet seat from SARA PLAST Pvt. Ltd. costs ₹30,000. These toilets vary in the features they have provided as well as their sizes, thus making comparisons difficult. It is however evident that defining specifications with **cost estimations for all inclusivity features expected in toilets** will be of great help to planners.

Universal access to toilets and i**nclusion should extend** beyond age, gender, and disability, **to users 'ability to pay'.** Many towns and cities are acknowledging this aspect of inclusion by providing no cost or free access to community and public toilets. The general norm seems to be to set the cost at around ₹5 per use. However, when unmanned coin deposit panels are used, the fees deposited vary from ₹1 to ₹5, showing a variability in 'willingness' or 'ability' to pay. It is a challenge to fix an equitable user fee for a public toilet. Our journey towards inclusion begins from the willingness to find answers to such questions.

1.1 CASE STUDY

‘SHE’ TOILETS

LOCATION

Warangal, Telangana

VALUE PROPOSITION

A public toilet exclusively for women ensuring ease of access, privacy, and safety to improve gender inclusive sanitation

FOOTFALL

100-250 users per toilet

FINANCING MECHANISM

Capital Expenditure: ₹8,00,000
Operational Expenditure: ₹2,500 per seat, i.e. ₹10,000 per toilet per month
Financing Entity: The first toilet was constructed through CSR support. Three more were constructed with viability gap funding and land from Greater Warangal Municipal Corporation (GWMC) under PPP contract to Safai Karamchari related private entities.

KEY PARTNER

Implementation Partner: Greater Warangal Municipal Corporation (GWMC)
Technical Partner: Administrative Staff College of India (ASCI)

Warangal city, at the forefront of sanitation

The city of Warangal in Telangana has undergone a remarkable transformation on the sanitation front. Not only has it achieved increased access to toilets, but also developed effective containment practices and timely and safe transport and treatment of toilet waste. It has done this through government engagement, using on-ground data, involving the private sector and using innovative technologies and processes, keeping its citizens at the forefront. The city has implemented several initiatives to achieve comprehensive sanitation improvements in mission mode.

How did this happen?

The Greater Warangal Municipal Corporation (GWMC) had built over 45 public toilets with well-defined service level standards and modest user charges for cost recovery across the city to improve sanitation arrangements. However, the number of women using these public toilets was low.

An in-depth study was carried out by the Administrative Staff College of India (ASCI), covering women from different income and social backgrounds, age groups, and educational level to understand the patterns and determinants of usage of public toilets (PTs) by women. The key findings from the study are indicated below:

1. Almost all women (99.5%) said they had a public toilet close to their house, but few chose to use them. “If 600 men were using a public toilet, only ten women did,” said Professor Chary, ASCI.

2. Some of the reasons provided by the respondents for not using public toilets were lack of safety, lack of cleanliness, poor facilities and privacy, inappropriate location, presence of too many men near the toilet, and the presence of a male caretaker.

3. The survey also found that there was a clear demand for exclusive toilets for women with women caretakers.

4. Availability of clean and well-maintained toilets with running water supply, facilities for hand washing with soap and water, availability of sanitary pads and facilities for their disposal were some of the key needs identified by the women.

Based on these findings, the Technical Support Unit (ASCI) of the GWMC focused on interventions to improve access to toilets in households, public/commercial spaces, and institutions.

Interventions planned/undertaken

ASCI provided technical support in designing and facilitating stakeholder engagement and capacity building. ASCI also conducted a gender audit of the existing public toilets to bring out the gaps/ barriers and the same were addressed during the construction of SHE toilets.

The first toilet was built by a private telecom cellular tower company as part of their CSR initiative. The O&M cost of the toilet is also borne by the same company. GWMC then replicated the toilet model by providing land and extending viability gap funding to construct three toilets to private entities. The private entity constructs the SHE toilet (as part of a larger program of constructing public toilets) per GWMC's specifications. These private entities then operate the toilets per service levels defined in the contract.

Toilet Features

Construction of toilets

The toilets use conventional materials like brick, cement, steel, and prefabricated fiber cement sheets. It takes approximately two months to install one unit. These are two-seater toilets but can be scaled up to accommodate four or more. The space required for a two-seater toilet is approximately 19'2" X 9'4", with a daily water consumption of around 500 litres. Wastewater from the toilet is disposed of in a septic tank, and the outlet is connected to a drain.

Women friendly design

The SHE-toilet is a specialised public convenience facility designed exclusively for women, which includes napkin dispensers and incinerators. User-friendly features are prioritised, such as a secure and aesthetically pleasing entrance. Privacy and safety are enhanced through front partitions that divide spaces, while additional security measures, such as CCTV cameras, are installed. A woman caretaker is stationed at the entrance, and customer feedback machines are available at all units. Safety features include a comprehensive fire fighting system compliant with CPWD and NBC norms and safety grills and doors to prevent vandalism.

Costs incurred and operation and maintenance of the toilets

Four SHE toilets have been constructed in the city of Warangal. The cost of construction of one unit is approximately ₹8,00,000 and its operation and maintenance cost is about ₹2,500 per toilet seat per month. There is no user fee for SHE toilets constructed by a telecom tower company under their CSR initiative.

Private entities constructing SHE Toilets in PPP mode are provided with a VGF of ₹1 lakh by GWMC where required. The GWMC is paying ₹2,500 per toilet seat per month for maintenance, with varying amounts averaging between ₹10,000 to ₹12,000, depending on the number of seats. The private entity also charges a user fee of ₹10 per use. The caretaker is paid a monthly salary of ₹6,000. One caretaker is stationed at each toilet and one cleaning person is responsible for all four toilets.

Wastewater management is achieved through septic tanks, which undergo regular desludging every six months by licensed desludging vehicles, and the municipality bears the cost. Water supply is provided through borewells, with each toilet having an overhead tank to ensure a constant water supply. Maintenance supplies are covered within the allocated O&M budget. Monitoring is facilitated by the Municipal Administration Department, Government of Telangana, through the Pattana Pragathi Toilet Monitoring System (PPTMS), an online app for reviewing toilet performance.

GWMC sanitary inspectors conduct bi-weekly inspections and upload data and pictures to the mobile app, which is subsequently reviewed by state officials every week. Structural improvements or modifications have been made based on gender audit findings, including incorporating features like feeding centers, sanitary pad vending machines, incinerators, mirrors, hooks, and platforms for placing bags. GWMC owns the land, and electricity and water bills are the responsibility of the ULBs.

Location and special occasions influence footfall

On average, the footfall is between 100 – 250 users depending on the location, special occasions etc. Each SHE toilet unit has two to four toilet seats, and no separate urinals are provided in these toilets.

Replication and scaling up has already begun

Following this initiative undertaken by the city of Warangal, the Government of Telangana has announced that every town in Telangana should build SHE toilets to increase women's access and use of public toilet facilities. So far, more than 55 'SHE Toilets' have been constructed throughout the State, and a decision has been taken to build toilets for women in all police stations. A provision of ₹20 crore has been proposed in the Budget for the construction of SHE Toilets in police stations to address the challenges faced by women police officers, visitors, and women prisoners, apart from ₹10 crore proposed for the construction of SHE Toilets in universities keeping in view the hardships of women professors, staff, and students.

The SHE Toilets are located at accessible places with adequate privacy and safety measures undertaken. These include institutional areas (hospitals, colleges, sports complexes), marketplaces and public areas (burial grounds, parks etc.).

MOBILE SHE TOILETS

Filling the need in space constrained and time sensitive locations where space is limited and toilets are used only for a specific time during the day, it is sometimes not viable to build a public toilet. The mobile toilet enables municipalities to respond to demand dynamically by providing toilets temporarily where required. Typically, these toilets are built in buses which have reached the end of their road life by remodelling them into toilets for this purpose.

The Greater Hyderabad Municipal Corporation (GHMC) has introduced mobile toilets that offer free, easily accessible facilities to differently-abled and aged women. These mobile toilets are equipped with a 1000 liter water storage tank, can accommodate four people at a time, and are GPS-enabled and geo-tagged for monitoring from an integrated command and control centre, even including a infant feeding room. Mobile toilet decants waste in the FSTP. The cost of remodelling is about ₹10 lakhs, borne by the municipality, as are the O&M costs. Making sanitation facilities accessible and leaving no one behind has been a key focus area for the state of Telangana.

Ti Toilets, an initiative by 3S-SARA PLAST Pvt. Ltd., has deployed public toilets exclusively for women in Pune, with the support of the Pune Municipal Corporation and serves as another example of this kind of initiative.

There is an increasing push for the launch of mobile women's toilets to enable accessibility of toilets to women. The mobile toilets are deployed at crowded places, tourist spots, special events and other areas where conventional toilets cannot be constructed.

Credit: We are grateful to ASCI for having provided the information used in this case.

1.2 CASE STUDY

WOMEN-FRIENDLY ‘SUNIDHI’ TOILETS

LOCATION

13 Sunidhi toilets piloted in Dindigul & Madurai districts of Tamil Nadu

VALUE PROPOSITION

Easy to install and cost-efficient, pre-fabricated women-friendly toilet facility designed to cater to the needs of women

FOOTFALL

2,350 women visitors/passengers daily across locations

FINANCING MECHANISM

Capital Expenditure: ₹1.3 lakhs to ₹1.5 lakhs
Operational Expenditure: ₹3250 (approx.)
Financing Entity: Capital cost of the 13 toilets was borne by donor organizations - HCL Foundation, The Bill and Melinda Gates Foundation (BMGF). ₹1,00,000 was provided by the Madurai Municipal Corporation for 5 Sunidhi toilets. The Operations & Maintenance of the Sunidhi toilets is being takencare of by the Dindigul Corporation & Madurai Corporation.

KEY PARTNER

Implementation Partner: Water, Sanitation and Hygiene Institute (WASH Institute)
Supporting Partner: Madurai Corporation, Dindigul Corporation, HCL Foundation & BMGF

Poor access to sanitation facilities can be harmful for the health of women and girls

Women lack access to appropriate sanitation facilities despite the developmental strides the country has been making in recent years. There is a reluctance among women to use community/public toilets due to their poor cleanliness, or lack of water facilities. Due to this, women often have to go long distances or wait for long hours to relieve themselves. This is especially common for women when they are travelling over long distances, shopping in markets, waiting at bus stands or visiting melas etc.

Moreover, the already existing community and public toilets fail to address the specific needs of adolescent girls and women, especially during their menstrual cycle. Public & community toilets lack menstrual hygiene facilities across the country. The presence of sanitary pad vending and disposal machines in community toilets is a rare sight, leading to high discomfort and increasing vulnerability to infections. As a result of absence of facilities for proper disposal of sanitary napkins, they are disposed of in an unhygienic manner by either leaving them on floors, or flushing them, often leading to pipe blockages. The soiled napkins are collected by cleaners and disposed, further posing health risks to cleaners.

On an average, women need to change sanitary pads at least every four hours during their menstrual period. Hence, in all public places, they should be provided with toilets and access to sanitary pads along with safe disposal facilities. A women's toilet hence should be able to meet the above needs.

Sunidhi toilet: A model women's toilet

Recognizing the need to address the aforesaid challenges faced by women, WASH Institute has developed a model toilet facility, called 'Sunidhi Toilet', designed for women. The toilet facilities are connected to either a leach pit or underground drainage systems. What distinctly sets apart Sunidhi toilet from other toilets is that the design of the toilet was tailored by WASH Institute to meet the specific requirements of travelling women & girls. Moreover, this is a pre-fabricated toilet which takes on an average only 2 days to install and is a relatively cheaper option than a conventional public toilet.

Toilet Features

The primary material used in the construction of Sunidhi toilets is ferro-cement. The structural components of these modular facilities are prefabricated in a factory (4 weeks). This ensures ease of installation, typically taking around two days to set up on site.

These toilets are tailored to the requirements of adolescent girls and working women, emphasising gender and child-friendliness. Sunidhi toilets feature both Indian and western water closets, a sanitary napkin vending machine, an electronic incinerator, and a wash basin with a mirror.

No specific wastewater treatment facilities have been integrated with these toilets. The toilet can be connected to an onsite system such as septic tank or to underground drainage system. The wastewater generation from each Sunidhi toilet is estimated to be in the range of 750 to 1,000 liters per toilet per day.

Indian and western water closets

Sanitary napkin vending machine

Electronic incinerator

Wash basin with a mirror

Costs incurred and operation and maintenance of the toilets

The capital cost of a Sunidhi toilet is ₹1.5 lakhs for the 2-seater model with the single seat model marginally lower in cost. This cost includes ₹20,000 towards the vending machine and incinerator. Notably, no user fees are imposed by the Urban Local Bodies (ULBs) and the model operates on a free of charge basis.

Presently, the Operations & Maintenance (O&M) of the piloted Sunidhi toilets is being taken care of by the Dindigul Corporation and Madurai Corporation. The cleaning costs are shared over multiple toilets as the cleaners are allocated for cleaning multiple toilets in nearby areas by the ULBs. An estimated average monthly cost of approximately ₹3,250 is incurred by the ULBs for the operation and maintenance of each Sunidhi toilet.

These toilets have no permanent caretakers. The deployment of sanitation workers on the payroll of ULBs for regular cleaning is done on a rotational basis. Wastewater from the toilet is discharged into the underground municipal sewer network. Water supply is provided either through borewells or municipal water supplied by the ULBs, with a 1,000 liter water tank adjacent to the toilets. The frequency of tank refilling depends on the availability of submersible pumps, ranging from daily to every two days for 3-4 hours in areas with municipal water supply connections. The maintenance and repair of these facilities are the responsibility of the ULBs, with monitoring carried out by the city's 'animators' (community mobilizers) and engineering department through weekly visits. The respective ULBs also cover the minimal electricity costs incurred by the toilets, for two bulbs and a sanitary napkin incinerator and water bills for municipal water supply.

Women are using these toilets on a daily basis

There is a high floating population of women in the busy public places of Dindigul & Madurai where 13 women friendly Sunidhi toilets were installed. Around 2,350 women visitors/passengers use these toilet facilities on a daily basis.

Pilot units of Sunidhi toilets were installed in public places (such as bus stand, market, park etc.) in Dindigul and Madurai cities of Tamil Nadu. In Dindigul, a total of five Sunidhi toilets were constructed in the year 2018 at public places such as bus stands, parks, markets, and a government hospital. Five years on, all the Sunidhi toilets are operational with a daily usage of around 150-200 people per toilet facility.

The story in Madurai is also similar, four years from construction in 2019, all eight Sunidhi toilets located at public places such as corporation office campuses, high court campus, markets and bus stands, are operational. A daily usage of around 150-250 people per toilet facility is observed. A cumulative number of around 2,350 women visitors/passengers use these toilet facilities daily.

These facilities have provided comfort and convenience to thousands of women visitors, passengers and daily commuters passing through these areas. The WASH Institute obtained feedback from several users from these facilities, and they were appreciative of the women friendly facilities. They said that the facilities have provided them with a clean and women friendly option at busy public places, which are highly beneficial especially during their menstrual cycle. They were further of the opinion that it resulted in increased convenience, saved time, and that such facilities needed to be expanded throughout the country.

> The toilet is good. I will recommend it to my friends as well in the engineering college".

Kavipriya
A final year engineering student

> I use this toilet often, including my friends at the bus stand. It is nice and neat and hence useful to us".

Puramma
A vendor for bead chains at the Dindigul bus stand

> I am happy to use this facility. I also am aware of the machine and its usage. Good to have this facility here".

Lakshmi
A working woman

> Our main concept of working in Madurai is based on constructing and maintaining proper toilets for all. WASH institute helped us by constructing women friendly toilet (Sunidhi toilet) located inside the premises of Madurai Corporation. The space around Madurai Corporation & the adjacent garden is being utilised by various aspirants trying to get through public services examination, particularly a good number of girl students. The Sunidhi toilet has all the necessary facilities for women like napkin vending machine, napkin incinerators & wash basins. For the benefit of the girl students, Madurai Corporation is maintaining the Sunidhi toilet with regular water supply and cleaning. Thanks to the initiative by WASH Institute and its partners".

Jayalakshmi
Working as SBM Co-ordinator at Madurai Corporation

Challenges that were overcome

Some women from rural areas were unable to read the instructions to operate the sanitary napkin vending machine and incinerators. To overcome this challenge, pictorial representations of user instructions were displayed which helped them to easily understand & follow the usage instructions.

There have been no reported major issues apart from occasional operational challenges due to water supply scarcity.

The toilet has great potential for replication at scale

Sunidhi toilets can be easily replicated throughout all geographies of India, especially in urban areas. With proper training on the prefabricated components, local entrepreneurs can be involved in the production and installation of Sunidhi Toilets across the country. Even with a small profit margin added to the cost, the Sunidhi toilet costs less than conventional construction, which is estimated to cost ₹2 lakhs.

Sunidhi toilet, right from fabrication to installation has already been demonstrated and users have expressed their satisfaction and happiness after using the toilet. Local media channels have also highlighted the special features of Sunidhi toilet. This is a very simple and scalable model that caters to the needs of women. Wider dissemination of this model will help many towns and cities adopt Sunidhi toilets. Appropriate user fees can be charged based on the number of users to meet the maintenance cost.

Thus, the Sunidhi toilet, if scaled up throughout the country, can ensure access to safe and improved sanitation facilities for women and girls in transit or at public places and contribute towards promoting a gender inclusive society. Sunidhi toilet is a step towards achieving - SDG 3 'Good Health & well- being', SDG 5 'Gender Equality', SDG 6 'Clean Water & Sanitation' and SDG 10 'Reduced Inequalities' in India's quest towards achieving these goals by 2030.

Credit: We are grateful to WASH Institute for having provided the information used in this case.

1.3 CASE STUDY

OVERVIEW OF DISABILITY-FRIENDLY TOILET INFRASTRUCTURE IN INDIA

The 2011 national census in India reported a differently-abled population of 2.68 crore, comprising 2.21% of the total population. Despite legislative initiatives like the Persons with Disability Act (1995) and the Rights of Persons with Disabilities Act (2016), individuals with disabilities encounter challenges in accessing inclusive infrastructure, particularly in terms of sanitation facilities. These obstacles include limited mobility, infrastructure gaps like long distances and poor positioning of facilities, lack of representation in planning, and societal misconceptions hindering access. To address these issues, the Swachh Bharat Mission (Urban) has updated guidelines, emphasizing the incorporation of disabled-friendly toilets in urban local bodies (ULBs). These toilets feature essential elements such as smooth ramps, anti-skid flooring, accessible handles, wide entrances, and trained staff, aiming to ensure safety, access, and usability for persons with disabilities.

Several successful models across the country showcase the effective integration of disability-friendly toilet infrastructure. The Ministry of Social Justice & Empowerment reports accessibility initiatives in airports, railway stations, and government buildings nationwide, including disabled-friendly toilets. Notable examples in Tamil Nadu and Uttar Pradesh demonstrate the momentum towards incorporating such practices. As the nation reimagines sanitation models, these examples underscore the imperative to adopt disability-friendly practices nationwide, recognizing the urgency of providing inclusive infrastructure.

The Divyang Toilets: A showcase in Nellore for enhanced accessibility and user-friendly facilities

The Divyang Toilets in Nellore specifically demonstrate the potential standards and design specifications for people with physical disabilities. Emphasizing features like ramps, wide entrances, and adjustable support infrastructure, these toilets ensure easy access and usability. A set of specifications have been used for standardisation, which include, minimum sizes, mirror placement, and door configurations for optimal accessibility. Mandated by the Nadu-Nedu program in public and community toilets, steps have been taken to integrate disabled toilets in new constructions.

11 PTs were retrofitted as divyang toilets under this initiative in Nellore, one seat each for male and female. Total cost for 11 toilets was about ₹24 lakhs plus supervision and support charges to Sulabh of ₹7 lakhs. This initiative by Nellore municipal corporation underscores the commitment to inclusivity and accessible infrastructure for individuals with disabilities, promoting a more inclusive society.

Credit: We are grateful to ASCI for having provided the information used in this case.

1.4 CASE STUDY

WORK WITH DIGNITY: RESTING AND CLEANING-UP FACILITIES FOR SANITATION WORKERS

LOCATION

Leh, Ladakh

VALUE PROPOSITION

Improving access to sanitation facilities for sanitation workers with beneficial impact on their health

FOOTFALL

25-30 sanitation workers residing near the facility

FINANCING MECHANISM

Capital Expenditure: ~₹45,00,000
Operational Expenditure: ~₹5,000 (per month)
Financing Entity: Partnership between Leh Municipal Committee and BORDA - which provided the funding and technical expertise. The local municipality of Leh provided the land for the facility. O&M is undertaken by the Leh Municipality

KEY PARTNER

Implementation Partner: Municipal Committee - Leh, Department of Urban Local Bodies (DULB), Ladakh
Technical Partner: Bremen Overseas Research and Development Association (BORDA)

Poor, deprived and at risk: The sanitation workers of India

The nature of sanitation work such as waste collection and segregation, faecal sludge management, and sewer maintenance, exposes those involved in ground-level work in this sector to unhygienic conditions, putting them at risk of diseases and infections. However, despite these risks being common knowledge, workers are often unable to avail even basic sanitation facilities for themselves (mostly due to the lack of a fixed employer or place of work) and also at home (as most sanitation workers reside in informal settlements without proper access to clean water or toilets). The lack of sanitation facilities and dedicated storage areas for PPEs also increases the risk of them carrying diseases back home to their families.

In the city of Leh, this challenge was aggravated during the pandemic when sanitation workers were employed in hospitals, were responsible for picking garbage from COVID-19-positive households and were tasked with the disposal of bodies of COVID-19 victims. Hence, there was a need identified to improve the availability and access to dedicated sanitation facilities for these workers to minimise the risks faced by them.

Designing and implementing sanitation facilities for sanitation workers

Recognising this need to develop infrastructure for sanitation workers, BORDA (Bremen Overseas Research and Development Association) initiated collaboration with Ladakh Union Territory to develop integrated WASH facilities. BORDA supported Ladakh in conceptualising, designing, and implementing these facilities. This was undertaken on the lines of similar projects undertaken in the cities of Chintamani and Chikkaballapur in Karnataka. While these projects require funding and land to be provided by the ULBs, BORDA brings in their expertise in building and operationalising high-quality public infrastructure which is ultimately used by the sanitation workers, who are also responsible for its O&M. To improve the operations cost recovery, space is provided within the toilet premises to be leased for shops/café. The Leh facility was conceptualised in May 2020 with construction initiated by October 2020, and the project was commissioned by December 2020.

Toilet Features

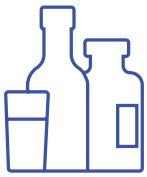
Beyond the basic utilities of clean and reliable toilets and bathing units, these structures transcend general public facilities as they include solar water heaters, changing rooms, individual lockers, and laundry rooms where workers can clean up before heading home. It also includes clean RO drinking water, first-aid, a pantry as well as a common recreational and dining area where the workers can eat or relax during non-working hours.

With the use of bright paints and artwork on the walls, the facilities have been deliberately designed as beautiful spaces which the workers can take pride in. Additional design considerations include air-lock entries present at the facility to avoid the heat loss from inside during the winter, thereby reducing electricity consumption. Further, the water pipes are insulated, and solar water heaters are provided to ensure that the facility has running water throughout the year. Most public facilities in Leh remain shut during winters due to frozen pipes. The facility has a separate entry way for men and women. This was given special attention as the facility provides bathing and changing spaces for the sanitation workers, which is beneficial especially after their work.

To ensure a sustainable stream of revenue for the regular maintenance of this facility, spaces for establishing commercial units were incorporated in its design, to help the workers run other businesses from the facility.

RO drinking water

First-aid



Pantry

Costs and Operation and Maintenance requirements

The capital cost for the PT was taken up by BORDA, with funding received from BMZ, totaling approximately 45 lakhs. However, as the shop/cafe space remains inactive, there is currently no revenue generation. The operation and maintenance (O&M) expenses, which amount to around ₹5,000 per month, are managed by the Urban Local Body (ULB). There are no labour costs involved, as the sanitation workers themselves maintain the facility. For the Leh facility, wastewater is collected through the sewage network without any current charges for the service. Other expenses include the supply of water through tankers by the municipality and cleaning supplies, which cost around ₹2,000 monthly. Additionally, there is a provision for structural improvements or modifications, with an allocation of approximately ₹20,000 for waterproofing the roof.

Use of the facility and impact

The facility is actively and exclusively used by a group of 25-30 sanitation workers who reside in close proximity. It features a comprehensive setup, including one urinal, three water closets, and three bathing areas for men, as well as three water closets and three bathing areas for women. With a total area of approximately 1000 square feet, the facility offers ample space for its users. Additionally, the facility is equipped with three washing machines for the convenience of the workers to wash their clothes. Furthermore, there is a common area within the facility dedicated to resting and recreation, ensuring that the sanitation workers have a comfortable and supportive environment to meet their daily needs.

The facility has been designed as a financially self-sustaining unit to be ultimately run by the sanitation workers. While the construction and initial operations cost were borne by BORDA, the facility has now been transferred to the sanitation workers, so that they are able to establish ownership and ensure the maintenance of the facility themselves. For instance, in Leh, the sanitation workers had a workers' committee consisting of eight representatives to whom the facility was handed over after consulting with the sanitation worker community and obtaining the requisite signatures of approval from them. Following this, one of the committee members is establishing a commercial unit (daily needs store) within the facility, the revenues from which will contribute towards the facility's maintenance. BORDA had also imparted the basic knowledge to the sanitation workers, required to run these units in the future.

The uniqueness of these facilities lies in that they are tailored to meet the contextual needs of the local sanitation workers instead of following a standard design template. This was demonstrated in the first sanitation facility constructed in Leh which was equipped to function even during the harshest of winters when the temperature is between -23°C and -8°C. The 1008 sq ft1 facility is currently used by 40-50 sanitation workers and their families daily. Users can wash their clothes and comfortably rest in a warm space that is located in close proximity to their place of dwelling.

Potential for replication at scale and learnings

The pilot facility at Leh served as a learning model for scaling up of this idea to other regions. It served as a proof of concept that allowed BORDA to pitch this model of development of sanitation facilities to other municipalities. The uptake of the pilot facilities has also been instrumental in overcoming funding hesitancies among the municipal officials. Given the ease of adoption of the designs and standards set by BORDA and the low technical and technological requirements for the same, states like Karnataka are taking the lead in scaling the project across their jurisdiction with BORDA providing the required implementation expertise.

The success of this in Karnataka could pave the way for similar adoption across other states in the country, with such facilities becoming the norm for the development of sanitation infrastructure. Institutionalising this project at the union or state level would aid with its large-scale deployment as adoption at the local level can be a long process.

Through this model, BORDA has stepped up to address a basic gap in the sanitation ecosystem - the lack of dignified sanitation facilities for the sanitation workers. Both the objective of this programme as well as the conceptual design of the facilities have been well thought out to ensure long-term sustainability of this intervention, making it an exemplary case study for ensuring safe and dignified working conditions for sanitation workers across the country.

The concepts designed by BORDA are a base structure which can be adapted to the needs of the particular community and region. Through the construction of the first site in Leh, various learnings are now being applied to other locations like Karnataka and Bangladesh as detailed below:

1. While government finance, where assured and continuously available, can be used to facilitate operation, **a revenue business model is essential for the long-term sustainability of the public sanitation facilities.** In Leh, the business model includes a retail unit (daily needs store) while in Karnataka they provide office related utilities (photocopier and stationery).

2. **Contextualisation is key for greater uptake of the facilities.** The design, usage pattern and location of the facility should be decided based on the community that they serve. The Leh facility has only 50% of its expected footfall of 100 workers per day. One of the reasons postulated is that though the location was chosen to ensure easy access for sanitation workers and their families, the facility was accessible for only a portion of the intended users as only a few workers stayed near the facility while others had to take a roundtrip of 5-10 kilometres to reach the facility and back home. In Karnataka, the facilities are planned in close to the offices where the sanitation workers report for their shifts even using creative solutions like converting vacant convention centres to ensure its proximity. The site saw a large uptake even before the construction was completed due to the availability of a clean dining space. Similarly, in Karnataka, the workers were asked about their preference for specific utilities. This was not done in Leh and has led to resources being underused.

3. **Appropriate government funding under various central and state schemes is required to meet the construction and maintenance costs of the facilities.** The initial centres were set up as pilots by BORDA to encourage future funding and uptake by other municipalities across the country and the larger South. In Karnataka,

the initial investment for construction is being provided by BORDA and the subsequent expenditures will be taken on by the State Government. In Nepal and Bangladesh, the government is ready to make the entire investment and BORDA will be providing the technical support. The ultimate ownership of these facilities is with the government and the sanitation workers' community.

4 **There is a need to sensitise government authorities on recognising that dignity and happiness are basic needs of sanitation workers.** These sanitation facilities are meant to be community spaces for sanitation workers where they can rest and are not to be seen simply as public toilets. Keeping this in mind, the spaces are designed to be bright and cheerful.

The governments of Karnataka and Bangladesh are also expanding on the building of such high quality integrated sanitation facilities for sanitation workers. This has had a ripple effect as six months after the construction began on the first facility in Karnataka, three ULBs in the Chikkaballapura district of Karnataka sanctioned funds for the construction of such facilities. The operational model varies across sites. This has allowed for the rapid implementation and expansion of the initiative.

The state-wide replication of this model is being discussed by the government with projects being proposed in more than ten other locations. These locations can also hope to see a renewed focus on the training for worker safety, improving access to other basic services including water supply in the sanitation worker settlements and other institutional facilities, while adding dignity to their work. A similar approach was taken in implementing the facility in Kargil.

The largest impact has been the noticeable importance being given to the wellbeing of sanitation workers through discussions on the matter at the local and state level. A similar project in Kirtipur, Nepal was also implemented in 2020 where a 1000 sq ft facility was built for around 40 sanitation workers.

Credit: We are grateful to Bremen Overseas Research and Development Association (BORDA) for having provided the information used in this case.

1.5 CASE STUDY

TOILET FACILITIES FOR CONSTRUCTION WORKERS

LOCATION

Mumbai, Pune, Delhi, Chennai, Bangalore, Hyderabad, and Ahmedabad

VALUE PROPOSITION

Portable and recyclable toilets for construction workers which can be installed anywhere, including locations which are difficult to reach or may not have water and drainage facilities

FOOTFALL

Approx. 25 construction workers per toilet; 10,000 toilets currently managed by SARA PLAST Pvt. Ltd. market-wide

FINANCING MECHANISM

Capital Expenditure: ~₹30,000 – ₹50,000 per toilet seat Monthly rental charge incurred by construction company: ₹5,000 – ₹6,000, includes O&M
Operational Expenditure: ~₹1.50 per person per use (effective cost incurred by construction company)
Financing Entity: The toilets are constructed through partners of SARA PLAST Pvt. Ltd, which then rents these units to construction companies.

KEY PARTNER

SARA PLAST Pvt. Ltd.

Construction workers face health risks due to lack of toilets

Construction workers face various health hazards due to the lack of toilet facilities at construction sites, leading to poor health, work hour losses, and a high cost of labour. Women construction workers specifically, suffer from various gynaecological issues due to the lack of access to toilets at construction sites, especially during menstruation. Not only are onsite toilets a basic facility that labourers should have access to, but the cost incurred by the construction company by not offering sanitation services, in the long run, outweighs the cost of providing them. Being mindful of these gaps, SARA PLAST Pvt. Ltd.'s portable toilets include basic facilities with proper standards to ensure a healthy and hygienic environment not only for the labourers but also for their families, who are often staying at labour camps at the construction site.

Sanitation solutions for labourers on construction sites was a new concept when SARA PLAST Pvt. Ltd. started its work. However, placing toilet units on construction sites has been found to be highly beneficial, improving the productivity of labourers, while keeping the site clean and hygienic.

The company did a study with the National Institute of Construction Management and Research a few years ago, which confirmed that portable toilets save money for construction companies. A cost calculation showed that 15% of the wages being paid to construction workers are spent going to the toilet. The average construction labourer frequents the toilet 3 times in an 8-hour shift. The labourer spends approximately 3-4 minutes in the restroom if it is on-site. However, if the lavatory facility is off-site, the average labourer spends 15-28 minutes travelling to the facility, and then 4-9 minutes using it. This adds up to 19-37 minutes per trip, or up to 1 ½ hours for 3 visits. If a labourer is paid ₹250 per day, they are getting up to ₹30-₹50 per 8-hour shift to use the restroom. If this amount is viewed in totality for all labourers in a company, the high cost to a construction company for not offering portable restrooms is made evident.

Providing portable toilets, at constructions sites

Usually, Indian squat-type portable toilets are provided for labourers working at construction sites. Through SARA PLAST Pvt. Ltd.'s model, a long-term rental contract is provided to the construction fraternity, and these toilets are mains free which means they need not be connected to a drainage line or septic tank. These toilets have in built tank of 200 litres which is evacuated once a day or at a predetermined frequency. The cleaning and evacuation are done by the suction vehicles owned by SARA PLAST Pvt. Ltd. The charges are between ₹5,000 – ₹6,000 per month. These charges include the rent of the toilet as well as cleaning services. For every 25 construction workers, one toilet is provided. In addition to provision of portable toilets, SARA PLAST Pvt. Ltd. provides cleaning services, maintenance, septic evacuation, and septic management, providing end-to-end solutions for every sanitation issue.

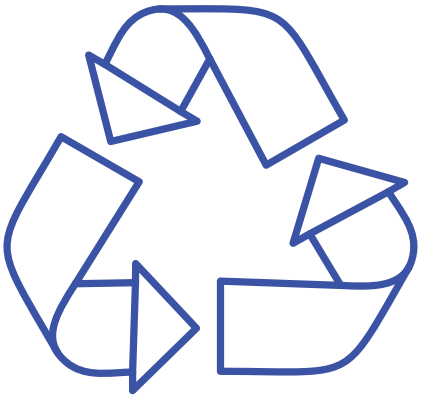
Toilet Features

SARA PLAST Pvt. Ltd. ensures that every toilet meets the international standard of 4 feet by 4 feet by 7 feet. The material being used to make portable toilets is crucial. In India, Fiber Re-enforced Plastic (FRP), or fiber glass, is generally used to make toilets. This material is not ideal because it is not recyclable, it is difficult to clean, and is known to be carcinogenic. As an alternative to this, SARA PLAST Pvt. Ltd. locally produces toilets made of HDPE which is 100% recyclable, easy to clean, and hygienic. This high-quality material results in better hygiene, prevents sickness, and reduces the levels of absenteeism. These toilets are constructed using 100% recyclable polyethylene (HDPE) material, significantly reducing the environmental impact and mitigating landfill waste. In the event of a damaged toilet, the HDPE material can be extruded and transformed into granules to produce new toilets.

Biochemical additives are incorporated into the toilet tank to facilitate partial degradation of waste and minimise unpleasant odours.

Responsible waste management is a priority, with waste collected from the tank being disposed of conscientiously, either into the sewage treatment plant of the municipal corporation or at a designated point allocated by the corporation. These toilets are compact in size, measuring 4' x 4' x 7.5' and weighing 80 kg. Rigorous and regular audits are conducted at construction sites to ensure strict adherence to standard procedures during the cleaning and evacuation processes, maintaining a high level of hygiene and efficiency. The company provides septic tanks at construction sites where there is no facility for drainage and septic evacuation for regular maintenance.

SARA PLAST Pvt. Ltd. manufactures, designs, and services all its products in-house, making its products and services cost-efficient. All members of staff are trained to dissemble, assemble, cater to wear and tear, and repair all the portable toilets, which gives them a competitive edge.



Toilets made with 100% Recyclable polyethylene (HDPE) material

Costs and Operation and Maintenance of the toilets

Construction of portable toilets typically costs between ₹30,000 – ₹50,000. A basic Indian squat toilet would be around ₹35,000 – ₹40,000, while a top-of-the-line western toilet with freshwater flushing and hand wash facilities would be between ₹50,000 – ₹60,000. SARA PLAST Pvt. Ltd. charges the construction company between ₹5,000 – ₹6,000 per month per toilet, for which they provide the unit, along with a cleaning service 3 times a week. Each toilet has a tank under the seat, which is evacuated 3 or 5 times a week, depending on the frequency and number of users.

Through this model, the cost to the construction company is around ₹1.50 per person per use, which is as cheap as a public toilet, but the portable toilets are privately owned and cleaned.

The effort has greatly helped in provision of adequate sanitation facilities for women

Sara Plast Pvt. Ltd. has made a considerable impact over the last 20 years. Their biggest impact has been providing adequate sanitation facilities for women labour on site. On a construction site in Pune, women used to get up at 4 am and go to the designated area for defecation, because after 6 am the men would use the area. The women, and young and adolescent girls had to time their body clocks in this way, after which they would sleep again, and then wake up at 8 am for school. This was extremely inconvenient, but also difficult for women during menstruation. The provision of portable toilets has eased this process for women. Safety has also improved, with a reduction in molestation, UTIs, and stings and bites. For men, the improvement in the health and hygiene situation has led to a reduction in absenteeism on sites.

The company works across seven locations – Mumbai, Pune, Delhi, Chennai, Bangalore, Hyderabad and Ahmedabad, and is planning to open 13 more branch offices. The company not only caters to construction workers but also provided portable toilets for events which require 1,000 to 1,500 toilet units and services. Its services for portable solutions have benefitted more than 1 million users per year. The highest percentage of users are either labourers at construction sites or common people attending various cultural and religious events like the Kumbh Mela and Pandharpur Waari.

Potential for replication at scale is high

SARA PLAST Pvt. Ltd. has been in existence for the last two decades and has been providing portable toilet services to construction firms and to event management agencies. The rental and servicing model negates the need for construction firms to create infrastructure for toilets and its maintenance. SARA PLAST Pvt. Ltd. handles the entire process, from provision of the toilet to maintenance, cleaning, and evacuation.

The Building and other Construction Workers Act (BOCW) 1996 states that in every place where building or other construction work is carried on, the employer shall provide sufficient latrine and urinal accommodation and they shall be conveniently situated so that they are accessible to the construction workers at all times. This regulation plays a vital role in replicating this model as all construction firms need to comply with these legal requirements.

This model is highly replicable and scalable in all metro towns and Tier 1 cities across India where we are observing a boom in construction of large apartments and gated colonies. Similarly, large events and gatherings are another such place where this model can be easily deployed.

Credit: We are grateful to SARA PLAST Pvt. Ltd. for having provided the information used in this case.

02

MODELS FOR SUSTAINABLE OPERATIONS & MAINTENANCE


Book now your vacation
with safety
Online check in and check out
Use mask indoor and outdoor
Use hydroalcoholic gel
Rooms desinfected daily
Cafe by the Loo
MENU
Clean
Restrooms,
Free!
OPEN
6AM to 9PM

OVERVIEW: MODELS FOR SUSTAINABLE OPERATIONS & MAINTENANCE

A key component of the vision for Toilets 2.0 are sustainable operations for community and public toilets. Meeting the costs of operations and maintenance (O&M) is the biggest challenge in sustaining the toilets. An allied challenge is the quality of O&M services, which has a direct bearing on users' perception of and willingness to use the facilities. Therefore, meeting the costs of O&M is critical to a sustainable toilet.

The simplest model for meeting O&M costs is for the local government to fund these costs. Typically, local governments are short of funds and support a part of the costs with the remaining funds coming from user payments. User payments – modest amounts ranging from ₹1-₹5 – are the most common source of revenues for a public toilet. Community toilets see more stable subscription models where users contribute ₹10-₹30 or more per month and thus meet the costs.

To augment these revenues both community and public toilets have started providing more services. Suvidha Complex provides toilets, bathing, and laundry facilities among other services to the local community in return for a subscription model charging fees to each family. Public toilets on the other hand have seen Café's being integrated (see cases Lootel and Loo Café) to provide conveniences to the users and generate additional revenue for the toilet. The Café is expected to generate excess revenue that is in turn used to meet the costs of keeping the toilets clean. These models – called the 'bundled services models' – rely on sufficient footfall to the toilet for the models to sustain. Bundled services models are now able to support implementation of public toilets in 'Public Private Partnership' mode with significant investment from the private sector. However, a key criterion for private agencies to invest would be the number of users, i.e., footfalls expected. With higher footfalls, advertising revenues also open up potentially recovering a small part of the cost. It is upto the local governments to ensure that high footfall areas are not cherry picked by private agencies.

Another dimension to sustainable O&M models is the owner-operator relationship. While governments have hitherto owned all community and public toilets, private ownership of public toilets in PPP mode is increasing, as discussed above. Operators however range from one person managing a public toilet for their livelihood to self-help groups operating multiple public toilets. With PPP operators under 'Build-Own-Operate' contracts also joining, there is a growing trend of outsourcing of O&M of public toilets. Outsourced O&M creates the need for generating a surplus to meet the income requirements of the operators.

A successful model incorporates appropriate owner-operator contracts with the right revenue models. Community toilets can be sustained only when the community takes complete ownership and creates suitable mechanisms for O&M. These may be informal arrangements or as shown in cases under this theme, formal groups

(SHGs) from the community. Public toilets have greater revenue stability and hence attract private entrepreneurs. In such cases SHGs must be evaluated and held to the same standards as a private agency.

A final dimension of the discussion on O&M models is the specification of quality of service. SBM 2.0 under the ODF+ protocols have defined the standards expected from a well-functioning public toilet. These indicators are a combination of infrastructure and services but can be used as a basis for generating service level indicators for O&M of public toilets. With properly defined service quality expectations comes standard processes and objective evaluation of performance. Good performance can start the virtuous circle of satisfied users and increased revenues leading to meeting costs and hence a sustainably operating public toilet.

An analysis of the cases presented in this document brings to fore the following key insights:

The major sources of revenue for a public or community toilet are (i) User fee, typically upto ₹10 per use, (ii) Advertising revenues, which vary widely based on location and footfall, (iii) Revenue from a café or other retail shop within the toilet, which varies by nature of shop. (iv) Typically, the ULB funds any shortfall in revenue to meet O&M costs and hence is another source of revenue for the toilet. Revenue sources (i) to (iii) are **highly dependent on socio-economic background of the user base and footfall at the toilet.**

Several cases have demonstrated the ability to meet O&M costs through a combination of the above revenue streams (i) to (iii). Cases such as Loo Café operate in PPP mode and aim to recover capital investment as well. Whereas Sulabh Shauchalaya is an example of using capital grants for infrastructure and revenues for O&M cost recovery. In either approach the operators prefer working with **multiple toilets to achieve a certain scale and improve viability** (e.g., Dhenkanal, Odisha SHG operator case).

Managing several **toilets in a cluster allows for reduction of operations costs.** For example, Altersoft, Loo Café, and others deploy **one team to serve multiple toilet locations** thus distributing personnel and equipment costs. In many instances this has led to avoiding a dedicated caretaker in toilets. All the tech-enabled toilets (Eram, Altersoft IP toilet) deploy shared resources to reduce cost of operations. The technology enables them to maintain cleanliness. Even without the technology, toilets with low or time-sensitive footfall can have shared caretakers.

Given the above it is imperative for thoughtful planning of operations models for public and community toilets.

2.1 CASE STUDY

A SMART TOILET BUNDLED WITH A CAFÉ – LOOTEL

LOCATION

Indore, Madhya Pradesh

VALUE PROPOSITION

Providing premium public toilets at affordable prices by cross-subsidising the costs from the earnings of a profit making café

FOOTFALL

This infrastructure can serve 200-300 (500 sq ft block) to 500-1000 (1000 sq ft block) people.

FINANCING MECHANISM

Capital Expenditure: The capital costs are around ₹15-₹16 lakhs for 500 sq ft block and ₹23-₹25 lakhs for 1000 sq ft block
Operational Expenditure: The operational costs vary between ₹85,000 to ₹110,000 per month.
Financing Entity: The toilet is financed through its revenue generation model linked to purchases made at the café. The user fee per toilet usage is ₹10. The revenue is earned through toilet use and café accounting for 30% and 70% respectively. Advertisements are another potential source of revenue.

KEY PARTNER

Founders: The Lootel smart restroom café is founded by Yashwant Suthar, an Industrial Designer (IIT Delhi) with 7.5 years of OEM Exp. Neelam Singh is the Operation and Quality Expert with 7-years of experience.
Key Partner: Indore Municipal Corporation

Smart Toilet-cum-Café from Indore

Public toilets in India are often in a dilapidated condition due to lack of adequate resources to meet the O&M costs. This leads to sub-optimal utilisation of the public toilets and puts a strain on resources due to inadequate user fee collection. Lack of well-maintained and hygienic public toilets pose a problem to a wide range of stakeholders such as commuters, small-shopkeepers and sales personnel, gig workers, daily wage labourers, street hawkers etc. This is especially true for women, for whom, lack of public toilets limits mobility, opportunities, and the amount of time they can work. Recognising the opportunity to make a difference, Lootel, an Indore-based start-up, partnered with Indore Municipal Corporation to create a model Smart Toilet-cum-Café block in Indore.

The toilet includes an Internet of Things (IOT) based restroom that provides premium quality clean and hygienic restroom services. Tied with it is the Lootel Smart Toilet Café that offers food and beverages with free smart toilet coupons. Lootel Café provides enhanced user experience through tech-enabled premium-quality clean and hygienic restroom services and café, while recovering costs efficiently. This "Take a Break" concept of combining food break and loo-break together provides users the choice to either:

1. Pay for their restroom use and get a discount at Lootel Café
2. Purchase food or beverage at Lootel Café and get free toilet coupons

Toilet Features

Compactness

Lootel Cafe can be set up in any public place with high footfall. It has a compact size varying 500 to 1000 sq ft. At least 50% of the area is dedicated to the toilet block. This infrastructure can serve from 200-300 to 500-1000 people depending on the size. Typically, in the layout, the cafe also acts as the front for the toilet. Coupons for the toilet and the payment for the restroom is made at the café itself.

Disability and gender Friendliness

Lootel Café includes accessibility features for people with disabilities such as ramps and handrails, and facilities like diaper-changing rooms.

Potential for technology integration

This entails sensors for counting footfall, as well as a range of features such as entry access system, user feedback system, user redeeming system, washroom odour detection, washroom uv/ozonisation cleaning system, occupancy sensor, a water level detector, a smoke detector and emergency buttons.

Costs incurred and Operation and Maintenance

Lootel Café works in public-private partnership mode by investing capital and operational costs with the government providing land for free or at a long-term lease. The government also has the responsibility for ensuring that the private party gets all the necessary permissions from different departments such as revenue, water utility and electricity board smoothly. In the current model of operations, the user fee is ₹10 per use but then it is paid back to the customer as a discount coupon of ₹10, redeemable at the café. The menu at the café starts at a mere ₹20 and with discount it lowers further at ₹10, becoming an affordable deal to a large section of society. If purchasing at the cafe directly, then toilet coupons are free.

- Manpower Deployment - Lootel Café requires a minimum of 5 people. Of that, 2 are needed exclusively for toilet cleaning and maintenance, and the rest are mainly involved in the café and overall management of the facility. Due to presence of the café, qualified people can be hired and trained to take up managerial roles for the facility.
- Lootel has a user feedback mechanism as a core part of its system enabling it to monitor the performance of the unit. It monitors data collected from the sensors mentioned under the 'internet of things', CC TV and mystery audits. Besides Lootel, the local governments can have performance based MoUs to monitor the functioning of the toilet units.

Lootel, an attractive model for public toilets

Since its inception in 2017, Lootel Cafes have served 10 lakh consumers and at least 44% of the users are women. It has demonstrated that clean, equipped, and well-maintained toilets can be made affordable by cross-subsidising it with a profit-making service. The venture can be profitable if around 40% customers purchase items at the cafe which are charged more than the restroom coupon prices. This makes Lootel an attractive model to adopt for a public toilet. Today it has 4 operational units – 2 in Indore, 1 in Bilaspur and 1 in Rameshwaram, with 3 upcoming units in Bilaspur.

Lootel Cafe provides an example of how seemingly different services can be bundled together to ensure efficient cost recovery. For users, the combination of the toilet and cafe use makes it highly attractive. For the private party, it combines a low revenue, but high demand service of a toilet block with high revenue medium demand service of the cafe, thereby turning it profitable. For the government, it ensures implementation of public amenities without any investments, apart from providing land. If the land is leased out, the government can earn revenue on the same.

Lootel Café is an asset intensive model. Efforts are also being made to promoting franchise model for scaling up. As a part of this, entrepreneurs are supported with technology and digital marketing, in exchange for a franchise fee. Alternatively, local entrepreneurs can be trained to come up with their own services that can be bundled with toilets.

Lootel Café provides a critical public amenity. Therefore, it needs government support through provision of land for free or at minimal lease amount and facilitating permissions smoothly.

Credit: We are grateful to Lootel for having provided the information used in this case.

2.2 CASE STUDY

A PUBLIC TOILET BUNDLED WITH A CAFÉ – THE LOO CAFÉ

LOCATION Hyderabad

VALUE PROPOSITION LooCafé offers clean toilets for free, maintained by earnings from retail/food space operated by small entrepreneurs.

FOOTFALL 200 to 1,500 people

FINANCING MECHANISM

Capital Expenditure:
- For an average 20' by 8' unit: ₹12 lakhs to ₹15 lakhs
- For an average 8' by 8' unit: ₹2.5 to ₹3 lakhs

Operational Expenditure: ₹20,000 to ₹25,000 per month
Financing Entity: The Loo Café works in PPP mode with 100% capital investment in large cities and a 50-50 CAPEX split with the ULB in small ULBs.

KEY PARTNER

Founders: Ixora Group owns patent and trademark for LooCafe.
Key Partners: Municipal Corporations, Utility Departments, Strategic Partnerships with Food and Retail Entrepreneurs.
Partnerships and engagements: The LooCafe team coordinates amongst the different government departments (e.g. land, water, electricity) and has a dedicated O&M team for service.

The Loo Café: An innovative luxury toilet in the middle of the city

Sustainability of public toilets continues to remain a key issue. The average life cycle of a public toilet unit is estimated to be anywhere between 1-1.5 years and such 'street furniture' suffers regular wear and tear, break-ins and vandalism, which poses a heavy financial and maintenance risk. There is an aversion among the urban population, especially women and children with regards to the usage of public toilets and there is a pressing need to have more up scaled and safer versions of these units to improve user perceptions. The day-to-day maintenance of these units is also a heavy burden on local municipalities as there needs to be coordination between multiple utility departments for the land, electricity, water and sewerage services. The Loo Café, founded by Abhishek Nath in 2018, aims to change the perception of the Indian public toilet by improving its brand via the construction of 'classier', high-end models delivering exceptional customer service.

The Loo Café was conceptualised keeping the growing sanitation and hygiene issues in the public domain. It works with the core intention of providing comfortable, elite, and unique toilets which are safe and hygienic to use. The motto behind The Loo Café is to provide luxury washrooms at every 1 km radius to ordinary people. The first "The Loo Café" was installed in Hyderabad, Telangana, on an area of 160 sq ft with smart facility. Apart from providing a host of facilities, these luxury washrooms are designed to cater to the requirements of the physically challenged, women, and commuters.

Toilet Features

Originally made out of shipping containers (the enterprise now also dabbles in prefabricated units), Loo Cafés vary in size ranging from 40 by 8 feet to 20 by 8 feet to the new 8 by 8 feet model in response to the space constraints experienced. A typical 20 by 8 Loo Café structure contains 3 toilet seats and 3 urinals with retail space, and a Loo Café Mini has 2 WCs (1 male and 1 female) with a small shop in the front.

For setting up the structure, a scouting team from the organisation first surveys potential areas for elements such as footfall rate, prospective surrounding construction, growth, water levels, dust levels, community usage behaviors, etc. The enterprise then goes through the standard tendering process with the local authorities where it submits its tenders for land and designs for 'Smart Toilets', and if they win the tender, construction is undertaken.

The Loo Café enterprise is at its core, focused on ensuring clean and safe toilets and has 35+ copyrights on washroom sizes and architectures. The model is constantly undergoing innovation to ensure greater accessibility and comfort of use. For example, the enterprise undertook an analysis that revealed that temperatures in India vary between 45 to 46 degrees in the summer and approximately 12 degrees in winter. The footfall in summer for public toilets are drastically reduced as the heat causes toilets to smell. To combat the same, the enterprise has revised its space matrix to increase the height of its units and is experimenting with construction material to ensure improved air circulation and odour reduction. The enterprise has also used its learnings from the pandemic to innovate on self-disinfecting infrastructure. All units are compliant with the enterprise's vision of gender and disabled-friendly toilets with ramp access, disability-access WCs, and spacious units for women.

Construction costs incurred and Operations and Maintenance

The building of Loo Café units regardless of size requires a heavy capital investment. For an average 20 by 8 unit, the capital expenditure cost can vary between ₹12 to ₹15 lakhs depending on the location features and footfall with running costs per month around ₹60,000 covering facets such as utilities, cleaning materials, corrosion and breakage costs.

For an average 8 by 8 unit, the capital cost runs approximately between ₹2.5 to ₹3 lakhs with a monthly running cost of approximately ₹20,000 to ₹25,000, which can be reduced depending on the location.

It is worth noting that the operation cost recovery is not calculated per unit, but is recovered from multiple units leveraging scale to ensure stability over a period. The enterprise estimates that a unit, irrespective of its size has to be operating for 7 years to become economically viable. The enterprise aims to recover its capital investment through revenues earned from the 'Café' and a management fee it charges for providing

incubation support to entrepreneurs. The toilets are never charged and are free to use.

Maintaining clean and sustainable toilets is the key to ensuring the success of this initiative. The enterprise has a dedicated team for quality assurance of its toilets focusing on both monitoring and day-to-day operations. The enterprise has innovated a cost-saving strategy for O&M, based on a 'beat' - a small team (e.g., 2 to 3 units per kilometer) servicing multiple Loo Cafes in a particular stretch. The beat team undertakes O&M and refill water tank.

Take the team at Hyderabad, for instance. The O&M team consists of 90+ members out of which:

- There is a 10-person back-end control and command center, which helps monitor and coordinate operations on-ground
- An 80-member team split location-wise (by beats) who go from unit to unit to maintain the day-to-day cleanliness of the toilets
- A 7 to 10 member maintenance team of plumbers, welders, etc. who respond to any support required on breakage, wear and tear of units

The enterprise is also piloting the implementation of IoT (Internet of Things) to link back to its command center to track smell, water levels, and cleanliness status to ensure better quality control.

The Loo Café: An innovative luxury toilet in the middle of the city

The Loo Café in Hyderabad, Telangana, offers a dual-functional approach, providing free and accessible toilet facilities alongside a retail/food space, complemented by up-skilling and business management support for entrepreneurs. With an investment of approximately ₹15 - ₹18 lakhs per café, the model aims to address sustainability and user aversion issues in public toilets, contributing to improved public hygiene and economic empowerment. The initiative's impact relies on maintaining clean and safe facilities, with a potential for replication and scale, although continuous adaptation is emphasised to meet localised needs.

Thus, while serving as an inspirational model for public toilets, the enterprise cautions that its model does not represent a solved problem that can be scaled and replicated as is, but there is much work to be done in terms of continuously improving the design and adapting it to local needs.

Some of the key learnings for building an ecosystem for replication and scale of this model are:

- Scale is important – A single unit in a city cannot solve a problem, nor is it going to be financially viable. At least 25-30 units in high footfall areas are required to recover costs through economy of scale and ensure proper access and usage.
- Customisation of infrastructure – It is important that customers feel comfortable using the facilities to ensure repeated usage and therefore an understanding of local customs and traditions are important for the design. For example, none of the Loo Cafés in Kashmir face the West in compliance with local traditions. Similarly, accommodations for the disabled, elderly, women, and children are vital.

Credit: We are grateful to Ixora Group for having provided the information used in this case.

2.3 CASE STUDY

USER-FEE BASED PUBLIC TOILET MODEL

LOCATION

Delhi

VALUE PROPOSITION

Privately operated model for offering neatly maintained sanitation complexes in high footfall areas

FOOTFALL

The daily footfall numbers vary across the 4 sample Sulabh locations as follows:

- Hazrat Nizamuddin: 450-500
- Nehru Place: 300-320
- Kakardooma: 90-100
- Rohini 18/19: 70-80
- Samaypur Badli: 90-100

FINANCING MECHANISM

Capital Expenditure: ₹23,00,000 (for a toilet complex with 4 urinals with 1 western and 1 eastern toilet for men; 1 western and 1 eastern toilet for women.
Operational Expenditure: ₹15,500 to ₹38,000 per month depending on the footfall
Financing Entity: Tripartite model, wherein a private CSR or company entity is the first party as its funding partner, followed by a government counterpart (in this case DMRC1) as second party and Sulabh International being the third party

KEY PARTNER

Sulabh International

Sulabh Shouchalaya for hygienic and affordable sanitation

The Sulabh 'Shauchalaya' was first introduced in the early 1970s as a simple and cost effective toilet system designed to provide hygienic and affordable sanitation as an amenity in public spaces. In the initial stages, a conventional sewer system was not feasible and toilet complexes were connected to biogas digestors and twin pits and these were further upscaled into core urban areas where the toilets were connected to the citywide sewerage systems. Due to the quality of maintenance offered irrespective of its location, Sulabh toilets showcase a working example of an operating model that has a long-term viability for high-footfall areas.

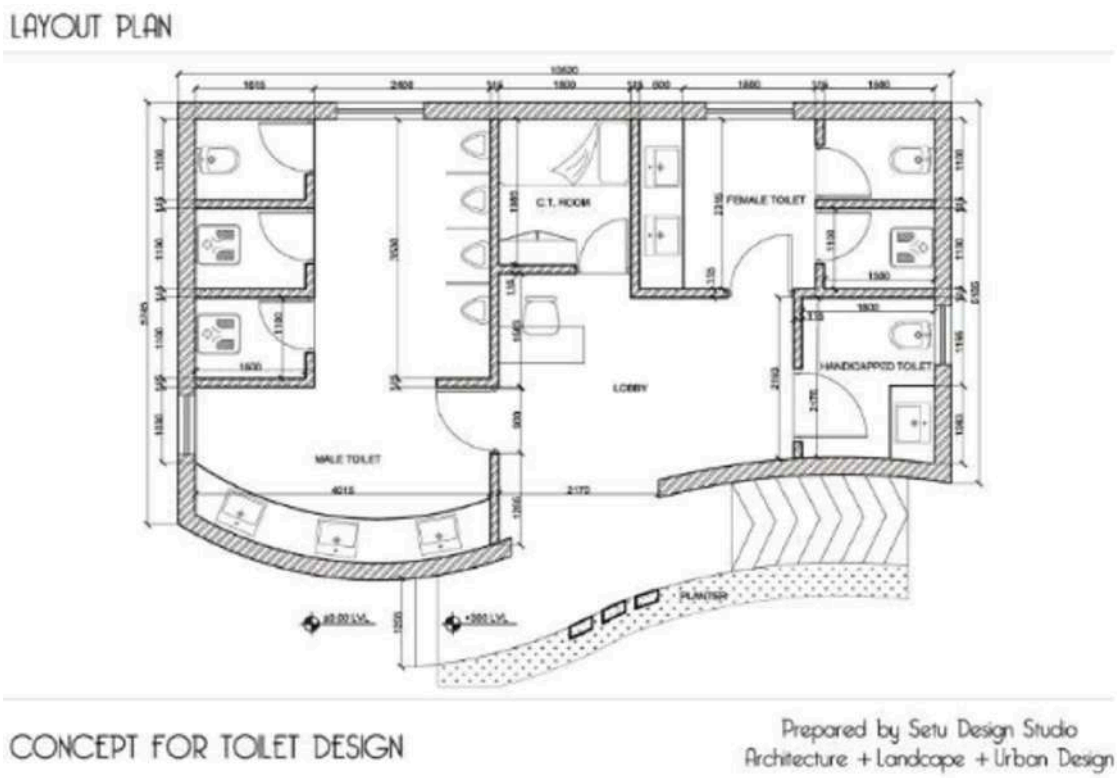
Sulabh's public toilet models developed as a market response to facilitate a privately operated solution for public sanitation in urban areas having a high footfall. This was in response to the poor capacities demonstrated within urban local bodies to facilitate asset creation and provide round-the-clock operation and maintenance for sanitation services in public areas. Thus, a sustainable operating model which did not require government monitoring of O&M standards was facilitated, and Sulabh offered a private model for public sanitation by virtue of which features like water saving, odour control and safe sanitation became an imperative for cost recovery

Sulabh toilet complexes strive to provide a well rounded experience to users

Sulabh's toilet complexes often adhere to a standard design archetype, as observed in case studies from various locations, including Delhi. This approach aims to streamline the approval process of layouts by government authorities, expediting implementation. The typical prototype of a standard Sulabh toilet complex includes facilities for men such as four urinals, 2 Indian style commode toilets, one western style toilet commode, and three wash basins. For women, there are one western style and one Indian style commodes, along with one wash basin.

Moreover, provisions for the physically challenged encompass one western style commode with support handrails and one wash basin. Newer complexes have incorporated amenities like ramps and grab bars to enhance accessibility for physically challenged users. In a move towards gender inclusion, some of these complexes, such as the one documented at Hazrat Nizamuddin, offer access to transgender as well. These facilities not only benefit from regular urban local government services, such as electricity, water supply, and wastewater discharge, provided by entities like the Delhi Metro Rail Corporation (DMRC), but also offer on-site amenities such as handwashing basins, soap and soap dispensers, air fresheners, clean mirrors, and sanitary pad disposal bins, ensuring a well-rounded and convenient experience for users.

Layout plan and concept for floor plan of a Sulabh Toilet Complex



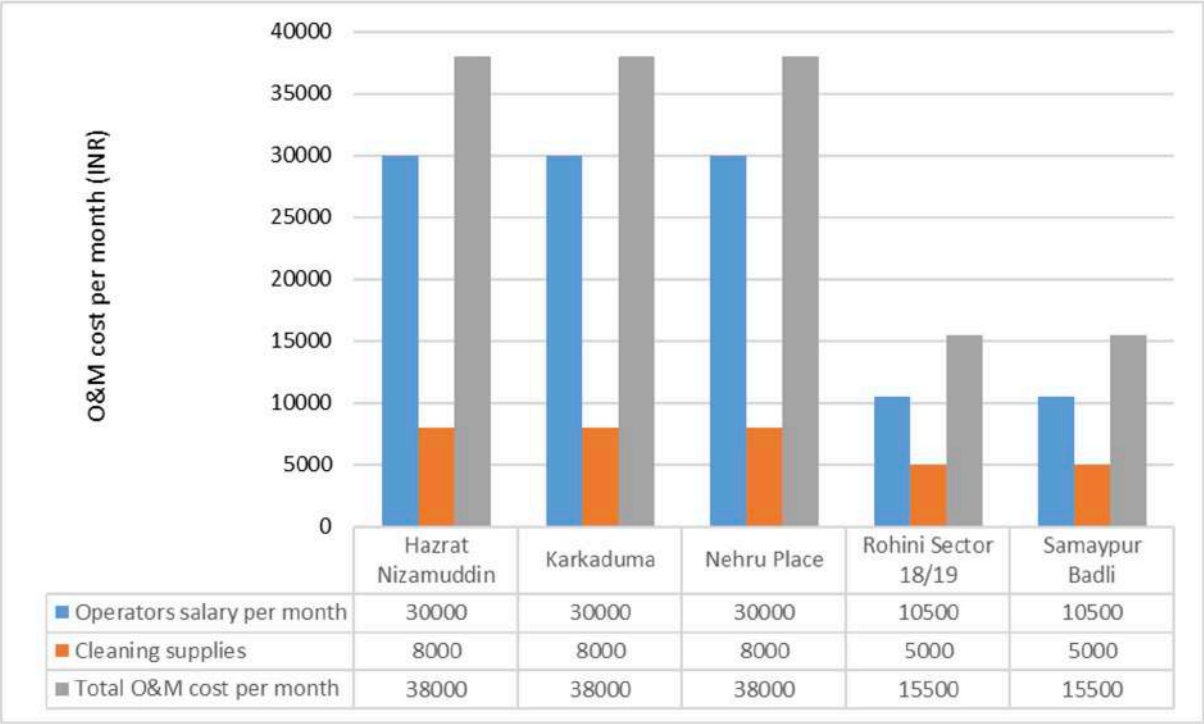
Construction costs and Operation and Maintenance

The construction costs of the Sulabh public toilet are met through capital investment that is funded by local government agencies or private CSR grants. The operations and maintenance costs are met through an agreement between Sulabh and the government agency (generally an arm of local government such as DMRC or DDA that owns the land) concerned with the jurisdiction, for up to twenty years, during which time Sulabh operates the asset on a 'pay and use' basis. The O&M is financed by the user charges paid by visiting users, which in turn serves the maintenance costs through their pay and use model (₹2-₹5 per use). The monthly O&M cost incurred ranges from ₹15,500 at Rohini Sector 18/19 and Samaypur Badli to ₹38,000 at Hazrat Nizamuddin, Karkaduma and Nehru Place in Delhi.

Wastewater management primarily relies on citywide underground drainage systems, although Sulabh has demonstrated examples of discharging wastewater into treatment or on-site modules like biogas digesters and twin pit systems. Water supply is sourced from the city government, with each toilet complex, as exemplified in the case studies, equipped with two 1000-litre storage tanks. The documented water demand varies, ranging from 3000 to 4000 litres per day at toilets like Nehru Place and Hazrat Nizamuddin. Cleaning supplies are provided by Sulabh to operators for maintaining the toilets, with documented costs ranging from ₹5000 to ₹8000 per month. Operators follow a regular cleaning schedule, mopping the facilities once every 3-4 hours. Cleaning supplies are distributed by designated coordinators responsible for supplying equipment and products like mops, brooms, disinfectants, hand wash, and air fresheners for maintenance activities. Monitoring cleanliness and user fee collections is the responsibility of Sulabh coordinators, who coordinate supplies and maintain a user feedback log-book at each toilet complex to document user feedback and ensure efficient O&M practices.

The allocation of user charges for the operation and maintenance (O&M) of Sulabh's public toilets is illustrated through the following graph:

O&M expenses per month



Operational data details for 5 Sulabh Complexes in Delhi

Name of Toilet	Hazrat Nizammuddin	Nehru Place	Kakardooma	Rohini 18/19	Samaypur Badli
Hours of operation	5 AM to 11 PM	5 AM to 11 PM	5 AM to 11 PM	5 AM to 9:30 PM	5 AM to 9:30 PM
Charges for urinal usage	₹2	₹2	₹2	₹2	₹2
Charges for toilet/WC usage	₹5	₹5	₹5	₹5	₹5
No. of people using toilet daily	450-500	300-320	90-100	70-80	90-100
Source of Water	DMRC	DMRC	DMRC	DMRC	DMRC
No. of operators	2	2	2	1	1
Salary of operator (₹/Month)	₹15,000	₹15,000	₹15,000	₹10,500	₹10,500

It has proved to be a scalable, replicable and cost effective toilet model

Sulabh's user-fee based public toilet model in Delhi, with a daily footfall of approximately 1027, showcases a privately operated and sustainable solution for high footfall urban areas. Financed through a tri-partite model, it involves CSR or private company, government counterparts like DMRC, and Sulabh International. This model, initiated in the early 1970s, offers a cost-effective and hygienic public toilet system, evolving into a long-term viable solution for diverse locations. With standardised designs, inclusive features, and a pay-and-use approach, Sulabh's impact extends to over 8000 public toilets nationwide, demonstrating scalability and replicability.

The pay and use model of Sulabh has been scaled across the country. The toilets are maintained by Sulabh, who has a fleet of personnel such as operators, supervisors and management team. Sulabh maintains many toilets in a city and there are supervisors who look after each zone and having more toilets under their O&M enables them to share the resources and reduce the O&M costs to breakeven their expenses. This model has been scaled due to the first mover advantage and no competition when they started the construction of toilets.

Credit: We are grateful to Sulabh International for having provided the information used in this case.

2.4 CASE STUDY

SHG MANAGED COMMUNITY & PUBLIC TOILETS

LOCATION

Perungudi, Chennai

VALUE PROPOSITION

Sustained O&M of Community & Public Toilets (CT/PTs) demonstrated through ownership undertaken by self-help groups (SHGs) from the local community

FOOTFALL

~500 users daily, around 100+ HH and homeless are dependent on the CT

FINANCING MECHANISM

Capital Expenditure: ₹3,00,000 – ₹4,00,000 (refurbishment cost)
Operational Expenditure: ~₹1,08,200
Financing Entity: The CT is currently managed through a grant from the Bill & Melinda Gates Foundation and is to be financed by the ULB after April 2024. The toilets are free to use, hence no user charges are levied.

KEY PARTNER

Supervising Partner: Tamil Nadu Urban Sanitation Support Programme (TNUSSP) at the Indian Institute for Human Settlements (IIHS)
SHG: Tiruvalluvar Nagar Area Level Federation (Women's SHG)- Anna Nedunchalai, Perungudi CT

Community toilets, crucial for meeting the sanitation needs of urban poor

Community toilets (CTs) play an important role in the provision of safe sanitation services. The users dependent on CTs comprise communities – especially urban poor communities, occasional users, and users in transit. A city like Chennai has 800+ public convenience facilities, directly or indirectly managed by the Urban Local Body (ULB). With the increase in the demand for improved service provision, ULBs face two key challenges in managing CTs – increasing service coverage while at the same time improving services and sustenance of operations, including financing operations.

There are nine CT/PTs in the area, of which currently six are managed by private enterprises and three by SHG/CBOs. SHG/CBOs are supported by partner NGOs for capacity building. This case presents learnings from the ongoing project in Chennai covering O&M of the Perungudi Community Toilet under the Tamil Nadu Urban Sanitation Support Programme (TNUSSP).

Interventions undertaken at the Perungudi community toilet

This toilet complex was earlier a public toilet (PT) and is more than 20 years old. It was refurbished by June 2022 before handing over to the SHG. The refurbishment was done by Greater Chennai Corporation (GCC) - toilet seats and doors were changed, roofing for the open space was provided, motor pumps, and overhead tanks were installed, and plumbing repairs were completed.

The IIHS-TNUSSP team reached out to NULM and through them, had discussions with 50+ SHGs. After a series of discussions, a few SHGs came forward to take up the enterprise. There was reluctance and hesitation among the members initially, even among the ones who came to take up the enterprise as they were unsure of how the people in the community would perceive them. However, many are now proud of their achievements. TNUSSP collaborated with NGOs and experts who have worked with community managed toilets in cities like Mumbai to build the capacities of the SHGs/ALF.

Currently, the wastewater flows into leach pits which have to desludged frequently as percolation rates are low and the pits fill up quickly. As part of technology and treatment processes, the installation of Community Reinvented Toilet technology developed by the Bill and Melinda Gates Foundation is being planned to treat the used water. The treated water is proposed to be used for the nearby garden, for cleaning the toilets, and for flushing toilets if feasible. Flow meters have been installed to monitor water consumption.

Many families live in rented houses in the area where more than 5 families share a single toilet. There are more than 100 such families in the neighbourhood and several homeless people who live in temporary shelters and depend on this toilet complex. Therefore, the nature of the toilet usage is now more of a mixture of public and community toilet.

Toilet Features

The Community Toilet is managed by the Tiruvalluvar Nagar Area Level Federation (Women's SHG), located at Anna Nedunchalai, Perungudi.

The demonstration CT in Perungudi is operational since July 2022. The staffing at the toilet undertaken by different service providers supported by IIHS-TNUSSP is as per the guidelines of the CPHEEO. TNUSSP team carries out the overall supervision. Common reporting formats have been developed for monitoring user count, inventory, expenses, repair and maintenance, de-sludging, and grievance resolution. Service providers adhere to the service level agreements (SLAs) measured through a list of indicators using KOBO Collect App. SLAs are designed based on:

1. Operational hours and presence of staff

4. Water, lighting, and consumables

2. Accessibility, safety, and outer premises

5. Infrastructure and maintenance

3. Toilet usage, cleanliness, and hygiene

6. Grievance redressal and documentation

The SLAs will be linked to penalty and incentive structure. The SLAs are displayed in local language at the toilet facility for users to understand the kind of services to expect. Regular site visits and fortnightly meetings of the project team and service providers are undertaken.

The SHG/ALF-managed toilets have demonstrated standardisation in O&M. TNUSSP has also engaged in capacity building of service providers for better O&M services and user education campaigns by the service providers.

Features of the SHG managed community toilets

The CT offers a comprehensive range of amenities, including 10 Indian closets, 6 urinals, and 2 wash basins for males, along with 8 Indian closets, 3 baths, and 2 wash basins for females. Additionally, the facility is equipped with provisions for physically challenged individuals, offering 1 Indian closet for both males and females, ensuring accessibility and convenience for all users, irrespective of their physical abilities. This setup reflects a well-thought-out design, accommodating the specific needs of different user groups, and promoting inclusivity and equitable access to sanitation services.

These toilets were refurbished for lighting, ventilation, accessibility for senior citizens and differently abled citizens, installation of sanitary napkin vending machines, feedback instruments, CCTV cameras, mirrors, soap trays, and towel rods in all toilet complexes. The refurbishment is key for improved service provision. Child-friendly toilet seating which can be fixed on a western closet is available and provided on request.

Costs and Operation and Maintenance of the toilets

The toilets, which have been in operation for over 20 years, underwent a significant refurbishment in May and June 2022 before being handed over to the SHGs for O&M. This refurbishment, carried out by Greater Chennai Corporation (GCC), involved various upgrades, and cost ₹3 to ₹4 lakhs.

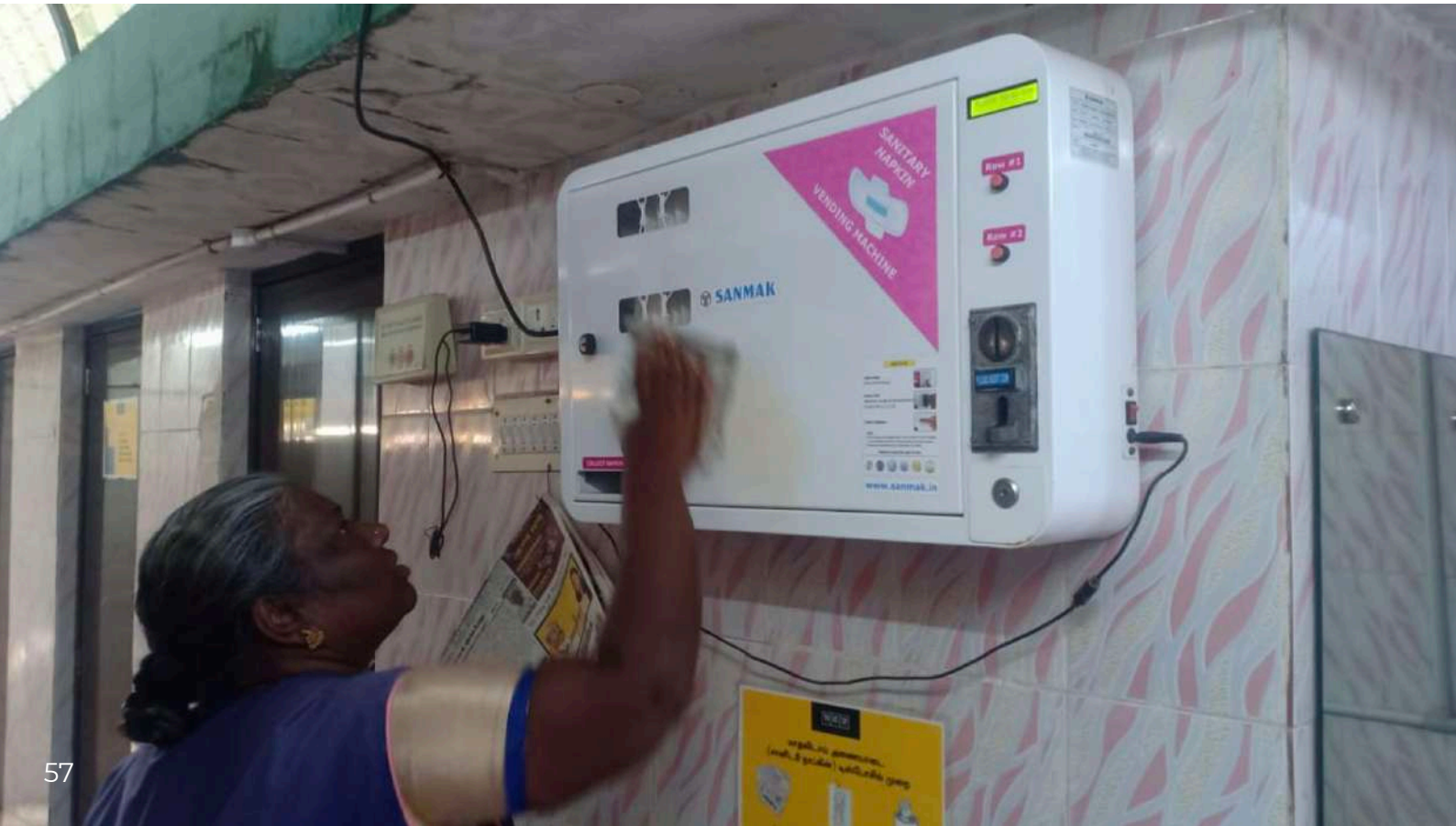
The toilets operate around the clock, with a dedicated SHG staff of 4 cleaners and 1 caretaker, incurring a monthly cost of ₹83,000. Consumables amount to ₹19,000, while repair and maintenance costs are approximately ₹2,500. The financing for the staff and maintenance supplies are currently taken care of by the Indian Institute for Human Settlements (IIHS), and this financing responsibility will be transferred to GCC in 2024. Water supply is sourced from a borewell, and the associated electricity cost, around ₹3,000 per month is covered by GCC. Additionally, desludging costs, currently at ₹700 per trip, are borne by GCC.

Diverse user base highlights the good quality of services provided

Before the SHG took over, this community toilet was functioning and operated directly with the Greater Chennai Corporation (GCC). However, there were issues of vandalism, lack of flowing water, cleanliness was average and the facility was not open after 7 pm. Now, with the efforts of the SHG, the CT is open 24 hours, is clean and always has water available. In 15 months, there is a drastic decline in vandalism due to user education and awareness campaigns organised by the Area Level Federation (ALF).

The Perungudi CT currently attracts a daily footfall from various categories, with an average of 305 male visitors, 240 female visitors, 22 physically challenged individuals, and 9 transgender persons. A user record is maintained at the CT, with bifurcation of male, female, transgender and physically challenged. This is marked daily, and records are always available at the toilets. This diverse user base underscores the facility's inclusive nature, catering to the sanitation needs of different segments of the population and contributing to its importance as a public amenity.

The CT is located in an interior road where a number of urban poor reside. Most houses here have household toilets, but one toilet seat has to be shared between four to five families and the need for community toilets in the area still continues to persist. Besides, there are several homeless people and migrants who reside in temporary shelters and have no access to toilets who are in dire need of toilets. . The solid waste management workers too now use the facility to bathe as well as relieve themselves as they are clean and usable.



hours, the rest are open for 16 hours. The inception period witnessed frequent issues related to repair and maintenance, de-sludging, and minor vandalism incidents, the resolution of which has now been streamlined.

It is important to note that there is often a perception that SHGs only undertake management of Community Toilets, however the TNHB Velacherry Area Level Federation has demonstrated successful operations and management of the Maruthpandi Salai PT in Chennai under TNUSSP.

Going forward, a scalable monitoring system will be developed, and community engagement will be improved. In addition to this, revenue generation options to offset the O&M cost will be explored. The two-year demonstration will assess the feasibility and financial viability of each of the service model for different types of CT/PTs.

Assessment of the service model for replication at scale is in process

CT/PTs were selected based on the location of toilets (main road, inner roads, within a community), types of users, footfall pattern and arrangements for waste disposal.

As of September 2023, the selected service providers have delivered free, hygienic, safe, and accessible sanitation services to its users in nine toilet facilities. 5 out of 9 toilets function for 24

Credit: We are grateful to Indian Institute for Human Settlements (IIHS) for having provided the information used in this case.

2.5 CASE STUDY

MALE SANITATION WORKER SHGs OPERATING COMMUNITY AND PUBLIC TOILETS

LOCATION

Dhenkanal, Odisha

VALUE PROPOSITION

Engagement of male sanitation worker SHG to operate clusters of Community & Public Toilets in Dhenkanal municipality

FOOTFALL

~1,500 users per day across 6 community toilets;
Approx. 35 male and 25 female users per seat per day

FINANCING MECHANISM

Capital Expenditure: ₹19,50,000
Operational Expenditure: ₹22,000 per month
Remuneration by municipality: ₹70,000 per month
Financing Entity: SHGs bear the expense for the operation and maintenance of Community & Public toilets. Dhenkanal Municipality provides a fixed monthly fee of ₹1,000 per seat to SHG for operating the facilities. The agreement allows revenue sharing from the advertisement on walls of the community toilets.

KEY PARTNER

Monitoring & Engagement: Dhenkanal Municipality
O&M: Omm Sai SHG Technical, Financial and Capacity **Building Support:** Urban Management Centre (UMC)

Context: SBM and DAY-NULM Convergence in Odisha

In 2016, DAY-NULM issued an advisory to states to form self-help groups (SHGs) of people involved in vulnerable occupations, such as sanitation workers, waste pickers, and transgenders. Activity-based SHGs of male members was also encouraged as part of this advisory. In 2018, the Ministry of Housing and Urban Affairs (MoHUA) issued the convergence guidelines, which focused on involving sanitation workers in sanitation service delivery. The guidelines advised states to allocate a minimum of 10% of their annual SHG formation target to such groups in 2019. This target allocation was intended to achieve 100% coverage of informal sanitation workers.

In line with the convergence guidelines, the state of Odisha issued an advisory to include marginalized and vulnerable groups as service providers in its urban local bodies (ULBs). In Dhenkanal municipality, Urban Management Centre (UMC) provided support to the ULB in formation of SHGs of marginalized male sanitation workers, including informal waste pickers, sanitation workers, transgenders, and persons with disabilities.

Interventions to engage SHG in managing community toilets

The convergence process in Dhenkanal included three significant components: a) the formation of SHGs, b) capacity building and skilling of workers, and c) engaging SHGs in sanitation-based livelihoods. Dhenkanal Municipality with the support of UMC engaged the local SHGs that were formed under the DAY-NULM, to carry out the upkeep of community toilets.

Dhenkanal municipality selected eligible and interested SHGs for outsourcing operations of community toilet. As per the state advisory, Dhenkanal municipality prioritized supporting SHGs from vulnerable communities for engaging in sanitation work. Omm Sai SHG, comprising of members who are municipal sanitation workers, expressed their interest in operating and maintaining community toilets in the municipality.

Members of Omm Sai SHG underwent training and skilling for three months (following panchasutra, the 5 cardinal principles of SHGs) before the ULB agreed to handover operations of community toilets to them. In addition to training on community toilet operations, SHG was also mobilised and trained to work as a group, conduct regular meetings and undertake group savings activity. Dhenkanal Municipality was one of the first pilot cities to implement sanitation activities as per MOHUA convergence guidelines and in the formation of sanitation worker SHG.

Earnings for SHG and responsibilities of SHG and ULB

The capital cost of the community toilets in Dhenkanal is ₹65,000/seat inclusive of all accessories. To ensure a sustainable operating model for SHGs and for Dhenkanal Municipality, an analysis of total seats available in the ULB in community toilets and its allocation to SHG was undertaken. Based on this analysis, an incentive amount of ₹1,000 per seat was decided as remuneration to the SHG for managing the community toilets. Each community toilet comprises of 5 seats and the net amount would not be enough to incentivize any SHG to manage one community toilet. An analysis was undertaken to cluster a few community and public toilets to arrive at a remuneration amount that would be financially attractive and viable.

Omm Sai SHG was awarded the O&M contract of 6 community and 9 public toilets hence ensuring an income ₹70,000 per month. The SHG bears a monthly expense of ₹300-₹350 per seat for cleaning the toilets. SHG members have mutually allocated different community and public toilets including shifts for management and maintenance of facilities. The SHG is responsible to keep the toilets clean and usable, paying for consumables such as cleaning supplies and soap and minor repairs such as replacing bulbs, latches and taps. The total monthly expense incurred by the SHG is about ₹22,000. ULB is responsible for paying utility bills, desludging of containment system and undertake any major structural repairs. Managing these toilets provides an additional income to the members of Omm Sai SHG who also undertake their regular activity of being municipal sanitation worker.

Toilet Features

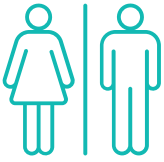
The community toilets are typically 5-seater toilets. Clear signages are provided on all toilets with separate entrances for men and women. In the women's section, the toilets have sanitary napkin incinerator. All toilets have a ramp for access for disabled persons and railing for the elderly. Newer toilets are equipped with rainwater harvesting systems and feature wall paintings. These toilets have a QR code system to obtain user feedback and suggestions.

Sanitary napkin incinerator

Rainwater harvesting

Ramp for access for disabled persons

QR Code system



Separate entrance for Men & Women

Railing for elderly

Impact

The community toilets constructed in Dhenkanal cater majorly to populations from slums. Each of the community toilets has a footfall of 200-250 persons per day and public toilets cater to 40-50 persons per day, however this number increases during festive seasons up to 100-150 persons per day. A key lesson from Omm Sai SHG management is that the involvement of community members rather than private contractors creates better accountability within the community. And this model also shows informal sanitation workers who are part of urban poor can be formally engaged in sanitation livelihoods.

Potential for replication of the SBM DAY-NULM convergence approach

To strengthen the monitoring system, standard bookkeeping formats were introduced, and the care takers of the community and public toilets were trained to fill them. It helped in streamlining the reporting and payment mechanisms. This model created a sense of ownership within the community and increased the accountability of the cleaners and caretakers.

These initiatives confirm that community-led sanitation service delivery can benefit cities and the engaged SHGs. Owing to the success of this model, it was replicated across Dhenkanal and Warangal, Telangana. In Dhenkanal, operations and maintenance of all community and public toilets were given to SHGs and similarly in Warangal, 62 SHGs were engaged for the O&M of public toilets across the city.

Similar approaches of SHGs managing community toilets under DAY-NULM can ensure convergence and potential cost recovery for ULB towards payment for O&M of community toilets. Majority of small towns in India can potentially take up such approach used by Dhenkanal municipality to engage SHGs to manage clusters of Community and Public toilets.

Credit: We are grateful to Urban Management Centre (UMC) for having provided the information used in this case.

03

TECHNOLOGY ENABLED TOILETS

OVERVIEW: TECHNOLOGY ENABLED TOILETS

Public toilets are seeing an infusion of technologies that are giving this most basic of infrastructure a very futuristic feel. From toilets that can sense bad odours to self-cleaning toilets, automation has caught the imagination of a new wave of entrepreneurs. These toilets show us the benefits of technology so much so that the entrepreneurs deploying them believe they have the answer to several challenges.

Operating and maintaining toilets has always been a challenge – both from a service quality and cost perspective. Technology addresses both these concerns by minimizing human intervention required in operating and maintaining toilets. Coin operated, or otherwise automated entry toilets eliminate the need for a permanent caretaker. A host of sensors that help flag when a toilet is smelling (and requires cleaning) to when the water tank is running low, allow for a shared maintenance crew to service multiple toilets, thus reducing overall operation costs. Automation ensures that cleaning and disinfection remain consistently good quality.

Technology enabled toilets are typically made of aluminum and steel to enable sturdy construction, quick replication, and easy cleaning. The designs look modern, in keeping with the technology theme. As a result, such toilets bring their own aesthetic to a public toilet. In providing solutions to several challenges facing traditional toilets, technology enabled toilets truly present a viable alternative. The success of Eram Scientific is testimony to this emerging trend of technology enabled toilets. Other entrepreneurs are now emerging as well, as seen in the Altersoft story. Altersoft, Loo Café, Lootel are all looking to integrate technology to varying degrees into their toilet installations. This means that soon we may see technology being integrated into existing toilets.

There is a premium to be paid for the capital cost of technology enabled toilets when compared to traditional toilets. While a traditional toilet costs about ₹1.5 lakh/seat, a fully automated, self-cleaning, and remotely monitored toilet with sensors can cost more than ₹3 lakhs/seat. However, this additional cost brings a host of features and automation that traditional toilets lack and hence the costs are not truly comparable.

Tech-enabled public toilets showcase a range of technologies that can improve functionality

of public toilets from the perspective of usage, hygiene, and sustainability. Eram Scientific's eToilets, for instance, utilize automatic cleaning, coin-operated entry, and efficient water usage, with remote monitoring through a dedicated mobile app. Altersoft's Intelligent Public Toilets leverage IoT and AI for minimal human intervention, featuring prefabricated stainless-steel units with various configurations, providing portability and customization.

The ELEFO Biotech NEWgen Community Reinvented Toilet (CRT) (case not presented) in Kichripur, Delhi, emphasizes resource recovery, employing a compact, modular design for waste elimination and water recycling. Woloo (see case under Partnerships theme) uses technology to monitor and audit the functioning and cleanliness of toilets in businesses. They certify toilets and connect users to toilets, in the process bringing new customers to businesses perhaps. This is an innovative use of technology for increasing access to toilets.

Despite the impressive progress and undeniable potential, challenges still exist in deploying technology enabled toilets. While IoT technologies can provide real time feedback, local governments do not have the staff to monitor and respond in time to address issues. Outsourcing this function is also an option but the additional costs should be borne by the local government.

Recovering operating costs remains a challenge – with user generated collections and advertising fees being the two modes of revenues available. It is estimated that tech enabled toilets incur O&M costs of about ₹5500/unit/month, whereas traditional toilet costs vary widely from as low as ₹1000-₹7600/unit/month. It is difficult to compare these costs since the quality of service varies significantly between a tech enabled toilet and a traditional toilet. Technology enabled toilets do reduce O&M costs when compared with traditional models. This improves the chances that these toilets will sustain in places with good footfall which ensures good collections as well as increases advertising potential. It can be argued that technology is in fact a way to achieve sustainable O&M. It is safe to say that technology enabled toilets will play an important role in achieving the Toilets 2.0 vision.

3.1 CASE STUDY

AUTOMATED LOW-MAINTENANCE eTOILETS

LOCATION

Trivandrum, Kerala and across India

VALUE PROPOSITION

A scalable , automated, and low-maintenance toilet that provides consistently clean, high quality user experience.

FOOTFALL

An approximate footfall of 50 people per toilet seat

FINANCING MECHANISM

Capital Expenditure: Capital cost of a toilet ranges between ₹2 lakhs to ₹7 lakhs per unit)
Operational Expenditure: Monthly maintenance cost of around ₹ 5500 per toilet seat
Financing Entity: Typically, Eram builds and operates the eToilet for a fixed period. Eram recovers its costs through user charges, coin collection, and advertising revenue in that period.

KEY PARTNER

The partners are generally government institutions like urban local bodies while Eram Scientific supports with the implementation of the eToilet.

Providing sanitation facilities in space constrained urban areas presents challenges

The provision of cost-effective and hygienic public toilets in space-constrained urban areas is a big challenge. In such places, there is a reluctance to take up caretaker and cleaning responsibilities among people. Cost recovery is an ongoing challenge which is compounded due to vandalism and frequent repairs required in high footfall areas.

To address this challenge, Thiruvananthapuram-based Eram Scientific Solutions (ESS) designed an eToilet in 2010. It is a compact, modular, pre-fabricated stainless steel structure designed for minimum human involvement in day-to-day operations.

Cost effective, hygienic eToilets for high footfall areas

The eToilets are fully automated public toilets with notable features such as self-cleaning by automatic flushing and floor washing, coin operated entry-door, remote monitoring, and toilet locator by mobile app. It combines electrical, mechanical, web and mobile technologies, thereby, earning the name eToilet. These toilets have been installed at more than 4000 locations in India and other countries at public places, institutional buildings like schools and offices, and among low-income communities.

Types of Models: There are different models that cater to various user segments, such as, schools, housing areas, public streets, urinals, women, children, people with disabilities, etc.

eToilets are available in 3 variants:

1. Apart from various locations in India, Eram eToilets have been implemented internationally in Kuwait, Qatar, Haiti, Nepal
2. 4000+ units have been implemented in India and other countries

The Stainless Steel and Mild Steel models can be customised exclusively for women users with sanitary napkin vending machines and napkin incinerators integrated. Civic models are a scaled-down version of the public model without some functions such as GPRS connectivity, coin validator. e-Lite14 is the new model launched exclusively for schools with child friendly features.

Toilet Features

eToilets typically require 25 to 35 sqm of space. The toilet superstructure is built from aluminium and steel alloys used to increase strength and durability of the units and provide better finish to the structures. Some key features of the eToilets are:

Automatic cleaning

The toilet gets flushed automatically before and after every use and the floor is automatically washed after every 10 usages.

Easy user access

Brightly lighted toilet units and a dedicated mobile phone app to aid users to find the nearest e-Toilet location.

Coin operated entry door

Programmed to accept ₹1/₹2/₹5 coins as decided by local government or toilet operator, ensuring efficient user fee collection.

Remote monitoring

Remote monitoring of each block using internet and a GPRS (2G) network

Efficient water usage

Toilets flush 1.5 litres of water after three minutes of usage and 4.5 litres of water for more than three minutes of usage.

Used water management

Currently as per local site conditions, e.g., sewerage network where available. Automation of onsite sewage treatment and water recycling capabilities is being actively developed.

Costs involved and Operation and Maintenance

- **Capital Cost:** The cost of eToilet infrastructure with installation and commissioning ranges from ₹2 lakhs to ₹7 lakhs per unit depending upon the model and requirements.
- **Revenue from Users:** User charge will vary from place to place as per the preference of client/government. In some places, governments provide free service to the public, while in others, a user fee between ₹1 to ₹5 per usage is charged.
- **Revenues from Advertising:** The interior and exterior walls of eToilets can also be used to generate advertising revenue. Advertising agencies specifically install eToilets to gain from the revenue from the advertisements. In a high footfall area, advertisements potentially help to recover the capital costs in about 5 years.
- **O&M Expenses:** Eram provides comprehensive 'Annual Maintenance Contracts' of approximately ₹5500 per toilet seat per month, which are used towards the cost of:
    - Daily visit by a cleaner who maintains the surroundings of the toilet and empties the dustbin
    - Replenishment of consumables as needed
    - Weekly visit by technical personnel to carry out preventive maintenance activities and repairs and replacements as and when needed – this cost reduces with higher number of eToilets installed, and is challenging when very few eToilets are there in an area.
    - Electricity bills and internet bills
- **Recovery of O&M cost:** The operation costs are easily recoverable through the coins collected as a result of user footfall through the coin validator.
    - At 100 people average daily footfall per toilet seat providing on average ₹2 per use, ₹5500 can be collected in a month to recover cost of operations completely. This is challenging in low footfall areas.
    - The coins are either collected by Eram or by the institutions paying for the operations of the eToilets, depending on the arrangement, and is adjusted against the maintenance contract of Eram. In case of the civic model, the toilet operator collects.
    - The operational expenses, when compared to conventional toilets, are significantly lower due to automatic cleaning and on-ground support by cleaning personnel. The costs vary based on the type of maintenance service the client seeks.
- **Client Warranty:** Eram provides warranty for all installed eToilets. However, a comprehensive annual maintenance contract (AMC) package facilitates the warranty.

Popularity of eToilets is high

The popularity of eToilets can be attributed to its durability, compact size, self-cleaning mechanism, minimal labour requirement and efficient cost recovery. It has been replicated in over 4000 locations across India and abroad (Kuwait, Qatar, Haiti, Nepal). In India, eToilets are operational in more than 20 Smart Cities across 24 states. The oldest of these toilets have been in operation since 2010. Eram claims the life cycle of these toilets can run for around 15-20 years.

Challenges faced and mitigation measures undertaken

- This type of toilet requires continuous electricity supply and internet connectivity. In such cases, off-grid solutions such as solar panel are used, and the internet connectivity requirement is at the minimum of 2G spectrum.
- Coins getting stuck has been reported as a common glitch in such toilets.

eToilets are most sought after for quick set up solutions in public areas

Amongst various types of public toilet models available, eToilets pioneered the automation model. These models allow for rapid deployment due to ease of installation, compact design, low maintenance costs. Smart features like automatic unmanned cleaning, very little human intervention, and ease of monitoring significantly ease the O&M burden. This is the key value proposition of eToilets and explains their popularity.

Credit: We are grateful to Eram Scientific for having provided the information used in this case.

3.2 CASE STUDY

INTELLIGENT PUBLIC TOILETS

LOCATION

Kochi, Kerala

VALUE PROPOSITION

Utilizing technology to ensure clean toilets and 'minimize human intervention' for monitoring service quality of 'minimum/no user contact' toilets

FOOTFALL

50 per site on average across all installations

FINANCING MECHANISM

Capital Expenditure: ₹3–₹4 lakhs for a single seater and ₹6–₹8 lakhs for a double seater
Operational Expenditure: Around ₹3000 per month per unit, including salary for one caretaker per 30 IP toilets.
Financing Entity: : Altersoft or a private distribution partner works in PPP mode sharing investments with ULB.

KEY PARTNER

ULBs provide land, private partners provide O&M services and advertising revenues, and Altersoft monitors service quality online.

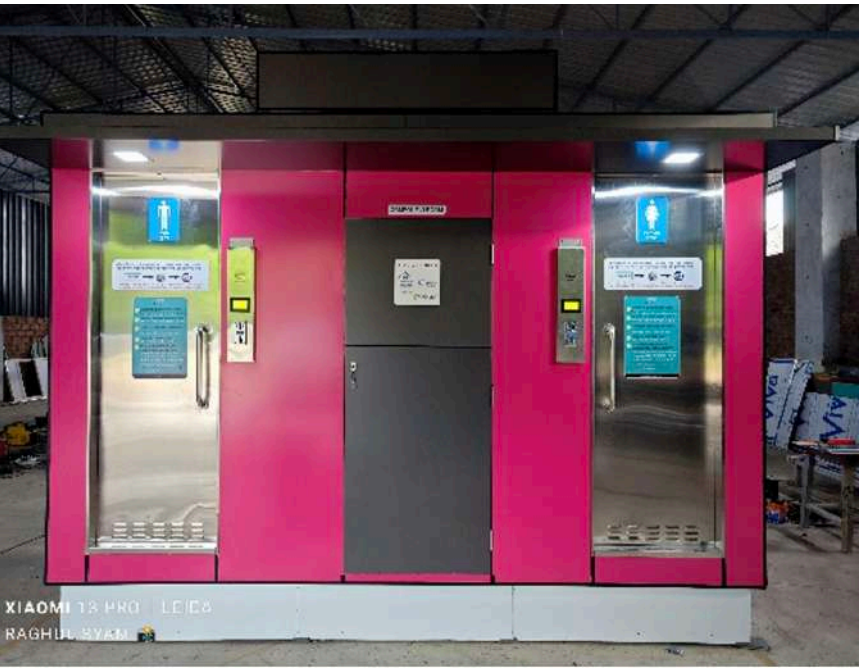
Context

Hygiene in Public Toilets determines user experience, further impacting the functional status of the toilet. Despite the availability of public toilets, citizens tend to urinate or defecate in the open largely because of lack of hygiene and cleanliness in the toilets. This is witnessed especially in high footfall areas like market places, bus stands and railway stations in urban areas. Considering the quantum of public toilets to be constructed and maintained, huge investments are required to meet demand. Real time monitoring of hygiene and cleanliness aspects is a challenge since the importance of public hygiene is not ingrained in operators. Though caretaker is deployed for each public toilet, they are not trained appropriately and hence are ineffective. Overall, public toilets become the easy target for vandalism and property damage.

Intervention

Towards this purpose, Altersoft Innovations India Pvt. Ltd., with 'Intelligent Public (IP) Toilet' aims to address the operational issues by using Internet of Things (IoT) and Artificial Intelligence (AI) to simplify and streamline maintenance with cost-effective and energy-efficient solutions.

The IP toilets developed by Altersoft are prefabricated stainless steel units with sensors that are fully connected to Internet of Things (IoT), thus requiring minimum human intervention. All the IP toilets are prefabricated stainless steel structures, customised to the needs of the ULB. Altersoft has developed multiple variants like Single Unit, Double Unit, Unit for Divyang, Basic and Basic Plus. The unit is portable as a whole or packed to install at site. The key features of IP toilet are:



Elegant yet minimalist design

Intelligence

Minimum/no user contact

Vandal proof design

Smart performance

Access to all

Investments & Operations

Altersoft services its distributors through tender participation channels. As part of its initial technical feasibility support, the company develops site plans, builds consent details, undertakes site works, lays foundation, installs the unit, connects with public services like underground sewer lines and also does the necessary paving and landscaping around the toilet to match with surroundings.

- **Land ownership:** Land is owned by local bodies (corporation/municipality/panchayat) or NHAI and Railways/ ports, etc
- **O&M Partner:** The local support partners are trained by Altersoft to provide support and maintenance. Online training and support are also offered to clients or their authorized representatives (A login ID and password is provided to access data of operating toilets). Data can be accessed for any operating issues, people turnout count, water usage statistics, water leakage issues, electricity or power usage, service person attendance, etc
- **Water Supply:** State water Utility, i.e. Kerala Water Authority
- **Monitoring & Evaluation:** IP toilet gives online monitoring information of water usage, cleaning, operations, leaks, fused bulbs, etc.
- **Advertising Partner:** Both the capital cost and operational costs for the facility can be covered by incorporating advertisement panels facing road visibility, contingent on the advertisement's value and a minimum size of 400 sq. ft. along major roads. Various options exist in certain cities:
    - Advertising Model
    - Public toilets within a shop
    - Public toilets with a pay-per-use model with various government schemes
- **Other ancillary services (if any):** IP toilet is an IoT-based toilet that is designed with a vandal-proof way to prevent public vandalism in unmanned public facilities. This will generate data for analysis, monitoring, and management of facilities to help policy decisions and city planning. This can further extend to greywater monitoring and WASH-related public health.

The following section reflects upon the details of financing the IP toilet infrastructure:

- **Capital Cost Heads** (Most IP toilets are 50% installed with own funds financed by urban local bodies or through local contractors. About 100 toilets operating at Ahmadabad are installed by a local private agency (an advertisement hoarding company) that have signed up for a 15-year maintenance service contract along with advertising rights (on the 20X20 ft toilet walls).
    - Using the smart toilet, which facilitates monitoring of operations, water consumption can be reduced by 50% compared to conventional toilets thereby ensuring maximum uptime cleaning and hygiene. The government has to authorize the health department of all operators (local bodies) for online monitoring of these facilities and keep provisions for AMC, internet, power as well as water charges.

- **Earnings from Operations, including User Fees:** The user fees are collected from toilets using a pay-per-use 'coin mechanism', but are not sufficient to cover operational cost. The balance of these operating costs is paid by:
  - urban local bodies either directly or
  - through some facility contractors or
  - through a 5-year O&M contract along with toilet installation
- The type of models propagated by Altersoft are as follows:
  - Economy Model - 800 x 1200 SS cubicle - Single Unit ₹3,73,000
  - Premium Model - 1200 x 1200 SS cubicle – Single Unit ₹5,11,000
  - Premium Model -1200 x 1200 SS cubicle-Double Unit ₹9,71,000
  - Disabled Unit 2100 x 1200 SS cubicle and EWC- PH Unit Single ₹7,61,750
  - Smart Gents Urinal 800 x 1200 SS cubicle and pot- Single Cubicle ₹2,88,650
  - Triple unit with Ladies, Gents, and disabled one- Triple units ₹11,55,000
  - Retrofitting existing toilets to 'smart toilets' - Single unit ₹1,45,000

Particulars	IPtoilet 1010 Double	IPtoilet 1020 Double	IPtoilet 1030 Single Disabled	IPtoilet Basic Single	IPtoilet Basic Plus Single
Size	1200 mm Length x 1200 mm Width x 2300 mm Height	2400 mm Length x 2400 mm Width x 2300 mm Height	2100 mm Length x 1200 mm Width x 2300 mm Height	1200 mm Length x 1000 mm Width x 2100 mm Height	1200 mm Length x 900 mm Width x 2100 mm Height
Floor	Perforated SS floor double layer	Perforated SS floor double layer	Perforated SS floor double layer	SS floor	SS floor
Classification	Ladies or unisex	Ladies and Gents	Ladies or unisex	Ladies or unisex	Ladies or unisex
Outer Height	2700 mm	2700 mm	2700 mm	2700 mm	2700 mm
Automated sliding Door	No	No	No	No	No
Door Size	700 mm x 1800 mm	700 mm x 1800 mm	900 mm x 1800 mm	600 mm x 1700 mm	600 mm x 1700 mm

O&M expenses/requirements

The broad outlay of break-up of O&M expenses for an IP toilet facility is as follows:

- Manpower Deployment: approx. ₹20,000 per 30-40 toilets
- Water Supply & Usage: ₹400 per month
- Supplies for Maintenance: ₹200 per month
- Monitoring Mechanism: ₹800 per month (which includes ₹150 for internet)
- Land lease: Free of cost from ULB
- Electricity Bills: ₹350 per month
- Water Bills: ₹500 per month

Toilet Features

Tech. Enablement

This entails sensors for counting footfall (IP toilets can be integrated with third party software for further enhancement of real time data monitoring, e.g., for automated treatment systems). The IP Toilets provide voice instructions in local language starting from the user entry; Further to that, toilet consoles are equipped with WC/Wash/Access control which can be calibrated with mobile phones for reduced water consumption/checking air-quality within/water leakage/fused bulbs. The door access control of the toilet is further integrated with digital UPI payments.

Robust materials

IP toilets have double layer of fabrication wherein the inside area is made of stainless steel and components are fixed behind this stainless-steel cladding.

Sustainability Interventions

IP toilets uses pressurised water with sensors to reduce water consumption including automatic closing of taps.

Area coverage

A single unit of the IP toilet needs 30 sq ft and a double unit structure requires 60 sq ft. All the IP toilets are prefabricated stainless steel structures. These toilets are made with materials that are particularly resistant to vandalism and graffiti ensuring that the units remain in good condition over the long term.

Touch-free operations

The AI based intelligence embedded in IP toilet keeps it clean, in spite of careless usage. IP toilet offers touch-free operations. The toilets are designed such that they self-cleanse all the surfaces whenever required.

- The timed pressure-sprayers, perforated floors, auto-flush and the stainless-steel body helps in self-cleaning of IP toilets with minimum/no human intervention.

Patented floor cleansing mechanism

IP toilet is equipped with patented wall and floor cleaning mechanism. The floor cleaning mechanism ensures that all the grime from footwears does not remain on the floor surface and thus periodical water jet cleaning of walls and floors are more effective. The cleaning technique is patented and is more effective than competing technologies used in public toilets.

Technology & Treatment processes

Generally, within the IP toilet model implementation, Altersoft suggests the implementation of bio-membrane tanks or readymade sewage tanks when the toilet cannot be directly connected to an underground sewer line. These bio-membrane tanks (or mini-STPs) usually take up 30 sq ft.

Impact

Altersoft's Intelligent Public Toilets (IP Toilets), utilizing IoT and AI that aim at minimizing human intervention offer a scalable solution for real-time monitoring of multiple toilet complexes, alongside their footfall count, and hygiene data. The toilet also facilitates operational additions such as touch-free experience, through features like automated cleaning and payment systems. Adding to these smart interventions, these toilet units provide a robust (made with prefabricated stainless-steel) and vandal-proof solution for urban local bodies to meet the public sanitation needs in urban areas.

Challenges Faced & Mitigation Measures Taken

- User fee collection is typically low, which is be mitigated by high footfalls and advertisement revenues.
- The toilet may need customization in areas such as access system (digital/coin/free may need to be considered).
    - The major challenge within IP toilets is in its 'coin collection mechanism'. The issue is that the various available denominations for coins in India (i.e., the one-, two- or five-rupee coins) will need to be programmed into the pay-per-use coin deposit machine of the toilet, with an appropriate access control to the toilets in order to prevent misuse.
- This apart, the needs and preference of the disabled users and gender sensitive needs will also need to be evaluated across implemented case studies.
- The usage of IoT and AI in toilet operations, though having initially triggered interest, has met with lack of enthusiasm lately. In a few cases, authorities are not willing to monitor toilet operations due to inadequate IT related capacities. As a result, issues such as dysfunctional automatic doors, disconnected power and water supply, refill of sanitary napkins are not addressed in a timely manner. Certain cities such as Ahmedabad and Solapur have incorporated modalities like generating a timely monitoring report for evaluating impact of working operations.

Potential for Replication & Scale

This toilet has provided a demonstrated case for affordably smartening public toilets in India at a cost of ₹3-₹8 lakhs. Challenges remain for scalability such as resistance to technology adoption as well as the low user fees collected (which is especially intensified by the limited coin deposit mechanism at each toilet). Despite these hurdles, if this model can be supported with evaluated interventions to improve it, the IP Toilet model demonstrates potential for replication in addressing hygiene issues and impacting public well-being positively.

Credit: We are grateful to Altersoft for having provided the information used in this case.

04

PEOPLE'S TOILETS


TOILET

OVERVIEW: PEOPLE'S TOILETS

Many people, especially women, shy away from using public toilets in India. The perception that public toilets lack cleanliness, are not hygienic, and are unsafe persists despite the best efforts of many local governments to address these issues. It can be argued that gender specific toilets (SHE toilets), and specific features such as separate entrances for women are all aimed at addressing the well-founded insecurities of women in using public toilets. Even technology enabled toilets are developed with the promise of consistently high-quality cleanliness and hygiene. Despite these interventions citizens do not use public toilets. The question of how to win the trust of citizens for public conveniences built for them is a complex one.

A small niche of practitioners is approaching the problem from a different perspective. Their response to this problem is to see public toilets as an architectural element in the larger cityscape and bring an aesthetic quality to public toilets. They endeavour to situate the public toilet building as a welcoming space in the public consciousness. The **case of 'Lightbox' in Thane** shows how a public toilet can be designed to be a space where people can congregate for cultural events. Another approach – that adopted by Urbanloo in Hyderabad (case not presented) - is that of providing "airport toilet" quality interiors in public toilets with exteriors designed to be welcoming. These practitioners argue that public toilets should be creatively designed buildings, properly integrating into a streetscape, to be seen as more than a utilitarian space, as a space that embodies India's growth story.

Another facet to these arguments is the integration of public toilet buildings into the cultural aesthetic of a place, especially in places of religious and heritage significance. The **case of the public toilet in Leh, Ladakh** is one such example.

In both the cases presented the capital cost of the toilet is significantly higher (about ₹3 lakhs/unit for Lightbox; ₹2.9 lakhs/unit Leh, Ladakh) than the norm of ₹1.5 lakh/unit for a traditional public or community toilet. This is because these toilets strive to create designed spaces with many elements that are lacking in traditional toilets, and hence the costs are not truly comparable. For example, the toilets in Leh integrate a café and art exhibit space which is not seen in a traditional toilet. For such designed toilet structures to be the norm, ULBs have to invest in architectural and planning expertise at project inception.

It is important to note that these toilet buildings are not merely good-looking spaces. The aesthetic design is a way to package all the necessary aspects discussed under the theme "access to toilets". For such designs to succeed the basic elements such as well-lit and ventilated toilets with running water, privacy enabling doors with working latches etc., have to necessarily be implemented properly. The cases documented combine all the features of an inclusive toilet design considering access for persons with disabilities and gender sensitive designs along with environment friendly features. While including all these features may qualify the toilet to be called 'aspirational', only a designed toilet structure that evokes pride and a sense of responsible ownership can be called truly 'aspirational'.

Sanitation has long suffered from the apathy of its biggest beneficiaries, the citizens themselves. Any initiative that can break through the indifference of our citizens, engage them, and delight them should be encouraged and explored further. Public toilets are meant to make our cities more livable, making them beautiful can only add to that.

4.1 CASE STUDY

THE LIGHTBOX PUBLIC TOILETS

LOCATION

Thane, Maharashtra

VALUE PROPOSITION

Aesthetically designed public toilet aiming to change the perception of toilets to be safe, restorative, public spaces evoking civic pride and responsible use.

FOOTFALL

An approximate footfall of 50 people per toilet seat

FINANCING MECHANISM

Capital Expenditure: ₹12 Lakhs
Operational Expenditure: ₹30,000 per month approximately
Financing Entity: Thane Municipal Corporation
₹5 user fees charged

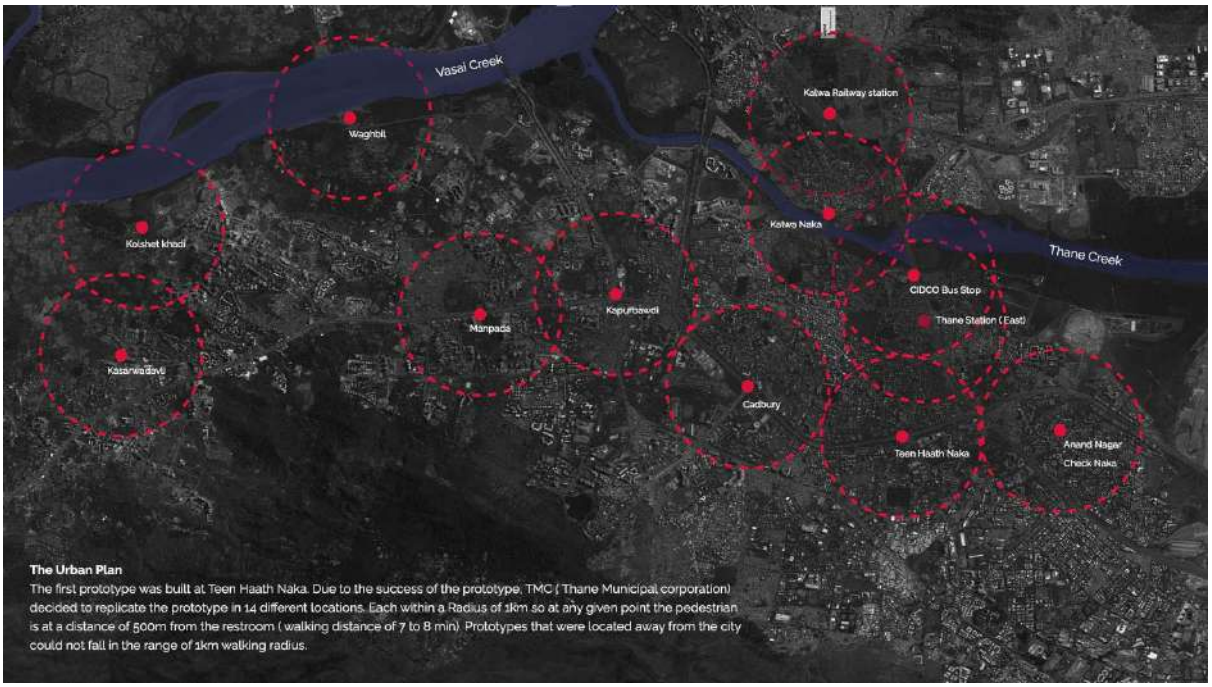
KEY PARTNER

Implementing Agency: Rohan Chavan, RC Architects
Financing Agency: Thane Municipal Corporation
For M&E and O&M: Thane Municipal Corporation; a third-party agency model is being considered

Public Toilets in Thane were uninviting, especially for women

Many Public Toilets of India have turned out to be dark, dingy, unsafe and at times even inaccessible and repulsive places. Among many shortcomings of the public toilets in Thane, one of the key complaints was that they were not women friendly, thus deterring women users from even considering using the existing toilets.

The aim of the Lightbox restrooms was to provide exclusive restrooms for women that are accessible to users within every 500 meters/walking distance of 7-8 minutes. These restrooms were envisioned to be safe, sanitary, well-lit, and spacious enough to be inviting for women. Existing local public toilets and potential user surveys provided the basic guiding principles for the concept design of the Lightboxes. Thane Municipal Corporation engaged RC Architects to formulate a design that fit the footpath width and addresses the issues identified. Starting with a prototype, that proved to be successful, 14 more Lightboxes were implemented at locations throughout Thane, as indicated in the following map:



The Urban Plan
The first prototype was built at Teen Haath Naka. Due to the success of the prototype, TMC (Thane Municipal corporation) decided to replicate the prototype in 14 different locations. Each within a Radius of 1km so at any given point the pedestrian is at a distance of 500m from the restroom (walking distance of 7 to 8 min). Prototypes that were located away from the city could not fall in the range of 1km walking radius.

Solution – The Lightbox, a unique design for women exclusive PT

The lightbox toilet prototype was developed by RC Architects with a resolve to evaluate what elements contribute to insanitary conditions for public toilets that satisfy TMC guidelines. Overall, the design of the restroom prioritizes functionality, mitigates vandalism, eases maintenance, and enhances the restroom's aesthetic and functional appeal. The key design principles adopted by lightbox may be summarized as follows:

- Ease of Operations and Maintenance
- Clear lighting and visibility during day and night hours
- Should serve as a restful place for users
- Integration with existing infrastructure and natural elements

One defining aesthetic and functional design feature of this model is the use of skylights instead of windows (evoking a lightbox; hence the name), thereby minimizing nuisance and operations required to clean them. Additionally, there is space and facilities for resting, laundry, grooming (saloon).

The design is conceptualized so as to adaptably utilize locally available material and tailor the same to the local behaviour patterns of toilet users. The total time taken to implement it is 2 months, out of which 1 month was taken up by the Biodigester treatment system and additional 3-4 weeks for the superstructure. There were issues of theft of materials during construction, which led to regular locking of unused materials as well as informed the design to embed covered utilities to prevent theft once the Lightboxes are in use.

Investments & Operations

- The capital cost for building a lightbox toilet is ₹12 lakhs, 60% of which entails the cost for its Biodigester treatment module and 40% is the cost of its superstructure. With different scales and contexts, the cost could be further optimized to fit different budgets of implementation, operations and maintenance.
- Operations take into account requirements for a total of 4 staff members and 1 supervisor for the upkeep of the restrooms, with the costs adding up to ₹30,000.
- The User Fees which began with ₹2 has been increased to ₹5, in order to meet the upkeep expenses for the facility.
- In case of the Lightboxes, 1 operator is generally required for upkeep and monitoring.
- The toilet is serviced by bio-digester utilizes 500 litres of bacteria; which needs to be recharged only after 5 years, if used at the rate of 250 users/day.

Toilet Features

The lightbox restroom features eco-friendly elements like a micro-STP for water conservation and it reduces reliance on fresh water, recycling for gardening and flush tanks. The women's restroom, integrates a central garden around a tree for diverse activities. Divided into four blocks, it includes a water closet, a nursing room, and facilities for the handicapped, in addition to a seating area. It provides ancillary amenities such as a sanitary pad vending machine and an incinerator.

The toilet floor is designed to be seamless, making it easier to clean. Since the windows generally attract a lot of solid waste, spitting etc., the Lightboxes replace them with perforated walls and skylights that provide the required lighting and ventilation.

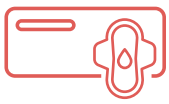
The restroom features a polycarbonate roof for natural light, polyurethane flooring for seamless cleaning, and walls of durable aluminium composite or stainless steel, suitable for public toilets. Easily replaceable single panels maintain cost-effective maintenance. Perforated walls promote cross ventilation and sunlight. Security measures include CCTV cameras and concealed plumbing and electrical systems (mobile charging points) for safety (such as a panic alarm system).

Nursing room

Facilities for handicapped

CCTV Cameras

Water conservation



Sanitary napkin vending machine

Mobile charging points

Impact

The Lightbox concept uses a very flexible model and can be adapted to any scale/ number of seats, space, etc. As conveyed by the designer, a good buffer space and accessibility can make these structures more welcoming and thus serve their users better.

After the success of the first prototype of lightbox model at Teen Haath Naka, the Thane Municipal Corporation scaled the model to a total number of 14 Lightboxes, with the idea that each of the Lightbox being around 1 km from each other so the pedestrian in the area always has access to a clean public toilet well within 500m (walking distance of 7-8 mins).

Challenges Faced & Mitigation Measures Taken

There are issues with realizing the potential of the Lightbox model. For instance, of the five restrooms currently being monitored by Thane Municipal Corporation, only 2 out of the 5 operational lightbox toilets perform up to the mark. These toilets have the potential to be revived through an appropriately devised revenue model that is responsibly monitored by a third-party agency that is contracted and empanelled by the TMC.

Potential for Replication & Scale

The Lightbox concept uses a very flexible model and can be adapted to any scale or number of seats as well as in terms of spatial scale. As conveyed by its designer, a good buffer space can make this facility more accessible and thereby serve their users better. Based on some of the other similar projects, it has been observed that the upkeep of this restroom is easy to monitor and visibly better if given to a third party, with due monitoring and inspections.

PAUSE RESTROOM

The Pause Restroom variant of the Lightbox Model along the Bombay Goa Highway

Pause Restroom on the Bombay Goa Highway is yet another good example of mindful public restroom design. It focuses on serving the needs of the common people and the truck drivers to refuel, eat, unwind and relax during their journeys, with an aim to care for the existing community and encourage others to join in. Taking cues from other public utilities, including London's famous telephone booths, post boxes, and buses, all coloured in red, 'Pause' is painted in the same colour to allow passers-by to quickly identify its public facilities in the urban landscape.

Credit: We are grateful to Rohan Chavan, Light Box for having provided the information used in this case.

4.2 CASE STUDY

ALL WEATHER, ECO-FRIENDLY PUBLIC TOILETS OF LADAKH

LOCATION

Leh, Ladakh

VALUE PROPOSITION

All weather and eco-friendly toilets that evoke a sense of pride and responsible use among users

FOOTFALL

~200 people

FINANCING MECHANISM

Capital Expenditure: ₹55,00,000 (19 toilets)
Operational Expenditure: ₹9000 per month
Financing Entity:
BORDA & Govt. funding. O&M undertaken by PAGIR NGO (selected through tendering process by Leh Municipality)

KEY PARTNER

Leh Municipal Committee
Technical Partners: Bremen Overseas Research and Development Association, Ladakh Ecological and Environmental Group (LEDeG)

Boosting access and use of public toilets in Ladakh

Leh town, situated 3,500 metres above mean sea level, is one of the top tourist destinations in India attracting around 3 lakh tourists a year. The town struggled to provide public toilet facilities to tourists in high-footfall areas. People refrained from using the existing toilets because of poor maintenance. Misconceptions about tasks such as cleaning and maintaining of toilets as 'impure' prevailed. Extreme cold conditions often led to frequent freezing of water in the water pipes rendering them useless. People believed that toilets were not worth using in winter as freezing weather conditions led to constant failure of infrastructure.

To boost access and usage of toilets, it was necessary to set up facilities that were conducive to both locals as well as tourists. It was also important to ensure that these toilets were weatherproof to function during the winter months. This led to the implementation of two key interventions:

1. The re-popularisation of eco-friendly dry toilets which the average Ladhaki was familiar with, and which worked well in winter.
2. The introduction of efficient all-weather wet toilets with flush for incoming tourists with a special technology that would prevent the water from freezing in winter.

Dry toilets, best suited for extreme weather conditions in Ladakh

The traditional Ladakhi dry-compost toilet, called dechod, is an age-old, hygienic, and eco-friendly method wherein human excreta is composted and used for agriculture. This traditional method eliminates the need for water in the cold and arid desert of Ladakh in the long winter months when water sources freeze. Dry-compost toilets also eliminate the need for wastewater treatment plants, elaborate sewage networks, and the expenses that accompany the maintenance of these systems.

The basic structure of the traditional dry toilet includes a small, two-storey mud-brick structure. A flight of stairs leads to the top room which has a rectangular hole, a stock of soil, and a small shovel to cover the faecal matter with soil, post defecation. The lower level of the toilet is where the composting takes place. The contents are emptied once a year or once in two years (depending on usage) and left for a few months for further decomposition before it is mixed with livestock manure and applied to farm land.

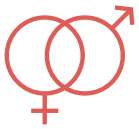
Toilet Features

Sustainable construction through use of local materials and technology

The all-weather public toilet at Zangsti and the new Bus Stand has been built in an eco-friendly way using local techniques and knowledge of architecture with insulated walls plastered with mud. The public toilets remain functional throughout the year, as they are constructed using passive solar techniques such as direct gain technology – direct gain is the heat from the sun being collected and contained in a space/surface, which is the simplest and most cost-effective way of passively heating a structure.

The direct gain technology is leveraged to warm the running water in pipes and prevent them from freezing in winter. A toughened double-layer glass with aluminium spacers has been used for glazing the water pipes. PPR – Polypropylene pipes act as insulators and are double-layered with nitrile foam to further prevent heat from escaping. A pressure pump is used to maintain water pressure in each tap. There is also an overhead-insulated water tank, kept in a glass chamber to retain heat and improve thermal conductivity.

The outside 'shell' of the toilet infrastructure is insulated using Polyurethane Foam (PUF) and Expandable Polystyrene Foam (EPF) that have been sandwiched between the double wall to block the heat from escaping. An 18 mm plywood, a thin layer of tar felt, an EP Foam, straw and soil mix have been used in the roof. A corrugated tin sheet has also been incorporated on the roof as a waterproofing agent.



Gender and disabled friendly features given importance

There are separate male and female toilets and one common toilet for physically disabled along with ramps for access. The facility also has menstrual pads vending machine.

Weather/Climate friendly technology and treatment processes ensure smooth functioning

A scientific septic tank has been constructed to take care of the toilet used water. There is also an insulated overhead tank kept in a glass chamber to prevent the water from freezing in extreme cold in winters.

Costs and Operation and Maintenance

The capital expenditure to set up the units was obtained through a combination of funder support through BORDA and the local government's own funds. The cost of construction of a traditional single pit dry toilet is around ₹2-3 lakhs, while the construction of the traditional twin pit is around ₹4-5 lakhs. More elaborate and modern mechanised designs may cost more than ₹10 lakhs.

Post construction, the Zangsti toilet has been tendered out for operations. The O&M is carried out by an NGO, PAGIR (selected through the tendering process by the municipality). The toilet facility has a common area with a small kitchen, which is now utilised to run a café and art expo/shop by the NGO. The NGO collects ₹10 per person as a user charge for the toilet, which is utilised for regular operation and maintenance.

The responsibility for running of the Bus stand toilets was given to local entrepreneurs who were chosen through a tender process. The operator, for an annual license fee, can use the commercial space if the toilets were kept clean and well-maintained. A committee consisting of the Ladakh Ecological and Environmental Group (LEDeG), Urban Local Body (ULB), and other local resident members monitors the toilet operations.

The facility is constructed on government land, and no rent or lease is collected. The water supply and wastewater costs are also taken care of by the municipality. Other expenses include labour deployment of one person and maintenance supplies. Repair of taps and installation of sensors were carried out post construction (nearly ₹10,000 provided by BORDA through BMZ funding).

The table below provides the details of the capital expenditure, operating costs, and daily revenue from the two public toilet units, one installed at Zangsti and the other at the bus stand in Ladakh.

Features	Unit 1 (Zangsti)	Unit 2 (Bus Stand)
Facilities	11 toilets (7 men, 4 women), 4 urinals	8 toilets (4 men & 4 women), 4 urinals
Capital Expenditure	₹35,00,000	₹20,00,000
Additional facilities	All weather functional, café, art gallery, outside dining, and hand wash station with a focus on disability access run by a local NGO	Small café run by a local entrepreneur
Operating costs	₹15,000 (toilet) + ₹30,000 (café) = ₹45,000 Monthly	₹12,000 (toilet) + ₹20,000 (café) = ₹32,000 Monthly
Average daily revenue	₹2000 (toilet) + ₹3000 (café) ₹1,50,000 Monthly	₹2000 (toilet) + ₹1000 (café) ₹90,000 Monthly

The number of people using the toilets is growing

The average footfall is upto 200 people, and the total area of the facility is 1130 sq ft. Dry toilets are present across almost every town in Leh, and almost all local houses used to access them in winter. However, the numbers are now reducing since there has been a shift amongst both locals and tourists toward all-weather winter water-supplied toilets. There has now been an increase in active usage of the toilet units that have been set up. The Zangsti unit sees an average footfall of up to 200 users a day (user numbers vary from up to 500 during the tourist season to 100 during winter) while the bus stand toilet sees an average usage of 150 users per day.

In order to ensure the safe disposal of waste and modernise dry toilets, BORDA and LEDeG have also worked on providing the appropriate protective equipment to sanitation workers for maintaining these units as well as an adequate number of wheelbarrows to transfer waste. They are also working with the local government to find an alternative to this by exploring mechanised solutions for waste transfer.

The introduction of café and restaurant spaces run by entrepreneurs has also helped dispel misconceptions amongst the local population of viewing the maintenance of toilets as an 'impure profession'. The revenue generated from these commercial spaces is also helping to run the toilets.

Incorporating the technical elements into the public toilet setup has helped create a sense of familiarity among local citizens to use the facilities. To further ensure uptake and usage, the toilets are also constructed with the use of local materials such as stones, wood, etc. to bring down the costs and add local flavour.

The toilet is already being scaled up across the Union Territory of Ladakh

The toilet is located at a prime and easily accessible location for tourists. The combination of an art/craft shop and café along with the public toilet, has improved the people's perception and expectation from the facility, which has also been met due to proper O&M at the new facility. The café+toilet model has made it a safe and clean space for tourists and local users alike.

The success of the units indicates that local elements can be integrated with modern technology to provide sustainable infrastructure.

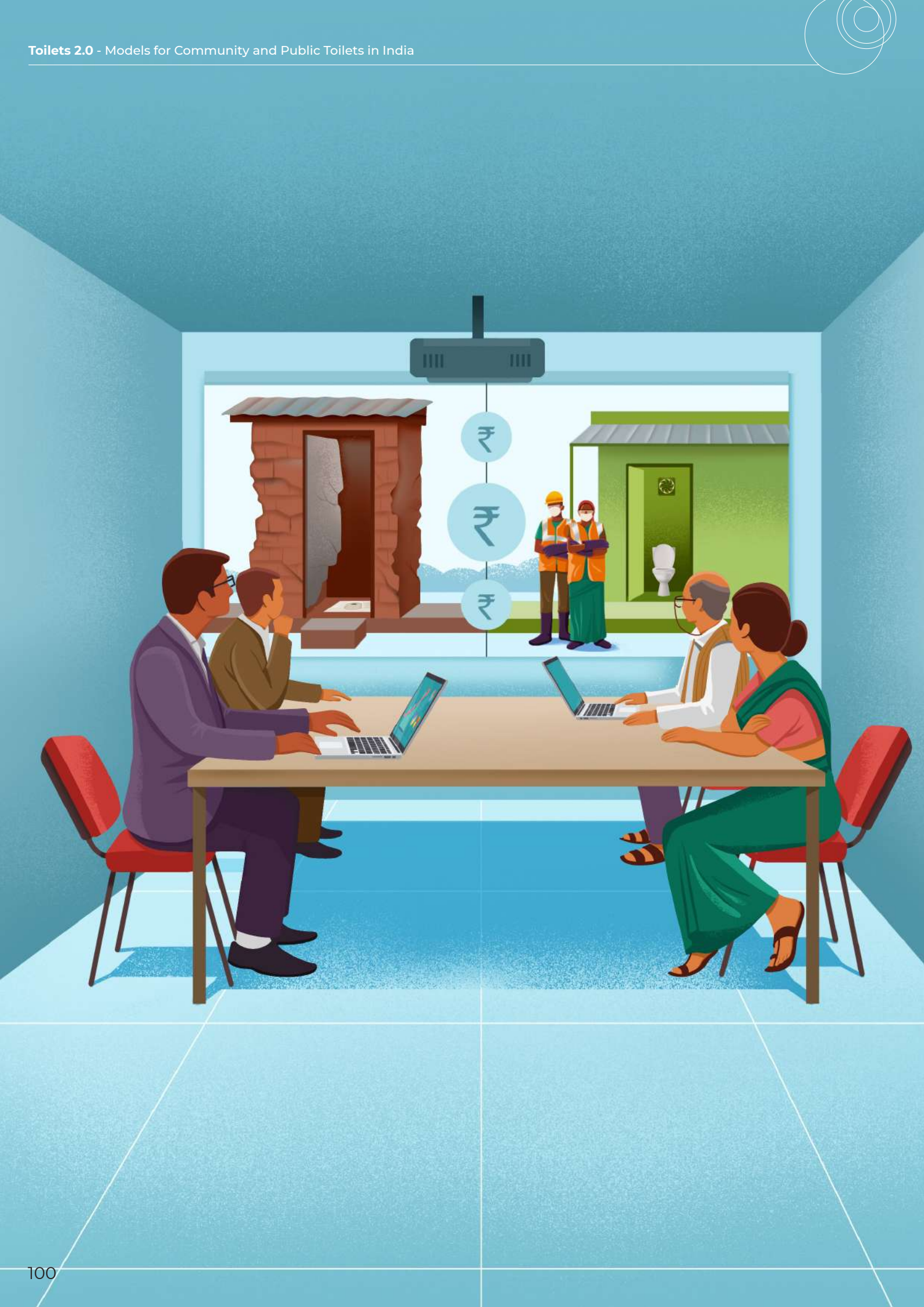
The use of local elements such as dry toilets as well as native materials and architectural techniques seen in the eco-friendly toilet at Zangsti help add a cultural flavour as well as drive down capital costs. These toilet-cum-commercial units took two to three years to construct but are now being scaled across the Union Territory of Ladakh with a focus on potential heavy usage areas such as highways, with the aim of making the facilities suitable for women as well as for people with special needs.

To replicate the success of these units, there is a need to support ULBs in identifying proper sources of finance to construct such facilities such as tourist cess, SBM 2.0 funds, CSR joint initiatives, or other taxes that can be leveraged, as well as the need to identify auxiliary services that can be offered such as a café or a gift shop that can help with revenue generation.

Credit: We are grateful to Bremen Overseas Research and Development Association (BORDA) for having provided the information used in this case.

05

PARTNERSHIPS FOR TOILETS



OVERVIEW: PARTNERSHIPS FOR TOILETS

Providing safe and hygienic sanitation is inherently the responsibility of the government. Public and community toilets are one of the key interventions to ensure access to sanitation facilities for the residents of a town. The investment required for planning, implementation and operations of public and community toilets is provided by the ULBs. Given the significant investments required for all aspects of sanitation including public and community toilets, the funds available with the ULBs are insufficient. Further, due to limited skilled human resources in the ULBs, they are unable to judiciously plan for public and community toilets in a holistic manner.

To achieve the goals of Toilet 2.0, ULBs need support for additional funds and human resources to assist them in implementing safe, clean and hygienic public and community toilets. Under this theme, the cases showcased demonstrate the innovative partnership arrangement between the local governments and the business corporates in planning, implementation, and operations of public toilets.

The **case of Nirmala Saulabhya, in Mysore** demonstrates a partnership between the district administration and the corporate sector in establishing a trust for construction and operation of public toilet in the Chamundi Hills – a well-known tourist destination. The partnership also engages urban designer to design the public toilet to ensure access to all gender, children and differently abled people while ensuring the facility is a showcase for water conservation, reuse, and self-sufficiency in energy requirements.

Another case is of **Suvidha complex,** where local government, corporates, and NGOs have come together to provide end to end sanitation facilities for low-income communities in Mumbai. The partnership is unique where government has provided land, corporate has provided funding and the NGOs operate the facility as per the required service level. A similar situation existed in D'Souza Gardens, Bengaluru, where the Wipro Foundation funded the renovation of a community toilet, and the municipal corporation is undertaking O&M. The renovation was done with input from the residents to meet their needs – a true partnership.

An analysis of the cases presented under this theme and inputs from practitioners provides the following insights:

For good outcomes, **multiple partners each working to their strengths is highly desirable.** The ULB is expected to provide land, secure, and monitor the infrastructure, while funding is provided by the CSR/philanthropy partner, with CBOs/NGOs/experts providing technical support, planning input, and community engagement.

Local governments and communities should **proactively identify opportunities for corporate and philanthropic support.** Successful partnerships often emerge when Public Toilet (PT) projects strategically align with corporate interests, positively impacting brand image and reputation. Eco-sensitive and tourism friendly locations provide easy opportunities for such collaborations. A key area that has not been explored sufficiently is to mobilize local businesses, especially for O&M funds leading to better amenities for their customers which helps their businesses. Philanthropic funds are more amenable when the potential impacts of a project are tangible. ULBs should state and commit to a vision for their town/city, and to global values such as the SDG targets to then mobilize communities. NGOs, and funders.

In hill stations and core areas of many cities where space is a constraint, encouraging **local businesses to open their toilets for all.** A good example of such an arrangement is of the Oil Marketing Companies mandating dealers of petrol station to provide clean and usable public toilets. Businesses, by providing access to toilets from the street directly (where possible), will obviate the need for creating new public toilet infrastructure. In return the city can provide incentives in the form of free garbage pickup, or a modest rebate on property taxes. In tourist areas the city can promote such businesses through its information centers. Such innovative partnerships are the need of the hour.

The **Woloo** case describes a technology-based approach to the problem described above. Woloo aims to build trust among users by certifying the toilets of businesses and listing them on their App. In return, the businesses get exposure to a very local user base potentially bringing them customers. This is a unique approach to partnership building and more such innovation is to be encouraged!

5.1 CASE STUDY

AN ECO-FRIENDLY PUBLIC TOILET FACILITY - NIRMALA SAULABHYA

LOCATION

Mysuru, Karnataka

VALUE PROPOSITION

Eco-friendly public toilet complex built with CSR funds to serve the need of the pilgrims visiting the Chamundeshwari Temple

FOOTFALL

Approximately 55 lakh pilgrims visit the temple every year and peak daily footfall goes up to 2 lakhs. The minimum footfall required for the toilet complex to be cost-effective is 2000 per day.

FINANCING MECHANISM

Capital Expenditure: Approximately ₹1.25 crore.
Operational Expenditure: The minimum footfall required for the toilet complex to be cost-effective is 2000 per day, which amounts to ₹4000 to ₹8000 per day.
Financing Entity: The corporates funding the project formed a trust that operates the toilet on Build Own Operate and Transfer (BOOT) basis for five years.

KEY PARTNER

Implementation Agency: Confederation of Indian Industries

A state-of-the-art green public convenience facility atop the Mysuru hills

An eco-friendly public toilet complex near Sri Chamundeshwari Temple atop the hills in Mysuru, Karnataka, has been developed by the Confederation of Indian Industries (CII), to provide support towards the Swachha Bharat Mission. This green public convenience facility is called 'Nirmala Saulabhya'. The toilet was designed by the Urban Designer Mr. G. K. Sudheendra, and its first prototype was demonstrated on 1st October 2016.

The Nirmala Saulabhya caters to pilgrims visiting Chamundeshwari temple and includes innovative services incorporated into it such as rainwater harvesting, sewage treatment (followed by recycling), and a rooftop solar power system. Apart from this, the facility also has a separate toilet facility for differently abled people with wheelchair access. The complex also has a childcare facility.

Toilet Features

The facility has been constructed using mud bricks, concrete, and construction steel. The interiors of the toilet extensively use sanitary fittings, baggage platforms, and childcare units made up of stainless steel, urinal partitions made up of glass and ceramic wash basins, floor tiles and WC. The doors of the toilet cabins are made of Polyvinyl chloride (PVC). The urinal flush and wash basin fixtures are automated with motion sensors. The average installation time for one toilet complex is approximately one year. The design has been developed in such a way that it can be improvised on or altered as per requirement.

The Nirmala Saulabhya toilets have been constructed with a sensor-based hand-washing system with narrow outlets to prevent wastage of water. A rooftop solar power system produces 5KW of electricity that is double the requirement of the toilet complex and is connected to a grid making it a net-zero energy building. The waste that is generated is converted to manure with the help of a solid waste management plant.

The facility also has a separate toilet facility for differently abled people that can be easily accessed using wheelchairs. The complex also has a childcare facility.

The total water requirement of the complex is approximately 8,000 litres per day. 70% of the complex's water requirement is met by recycled water that is used for maintaining the garden and flushing the toilets. The facility has been fixed with a drinking water kiosk with a Reverse Osmosis (RO) plant that can supply 200 litres per hour of water. A sewage treatment plant has also been set up.

The complex has been constructed in such a way that it does not require artificial lighting during the daytime. The LED lighting and the solar power system in the complex helps conserve energy. The toilet complex can be located by using GPS.

Sanitary fittings

Solar power system

Childcare units

Solid waste management plant

Costs and Operation and Maintenance of the toilets

The capital cost of construction of the entire toilet complex is approximately ₹1.25 crore. Pilgrims visiting Chamundeshwari Temple and other tourists are charged a nominal fee of ₹2 (for urinals) to ₹4 (for female users) per user. High capital costs have been hindrances at the inception of this model.

The restroom functions according to the guidelines of a Trust structured on a Build Own Operate and Transfer (BOOT) framework. This Trust is accountable for the upkeep and management of the toilet complex for a duration of five years. The corporate entities involved in the construction of the complex are members of this Trust.

The minimum footfall required for the toilet complex to be cost-effective is 2000 per day. Currently, seven people manage the complex, working in two shifts, which creates a fixed cost burden requiring a minimum user fee and hence a minimum footfall.

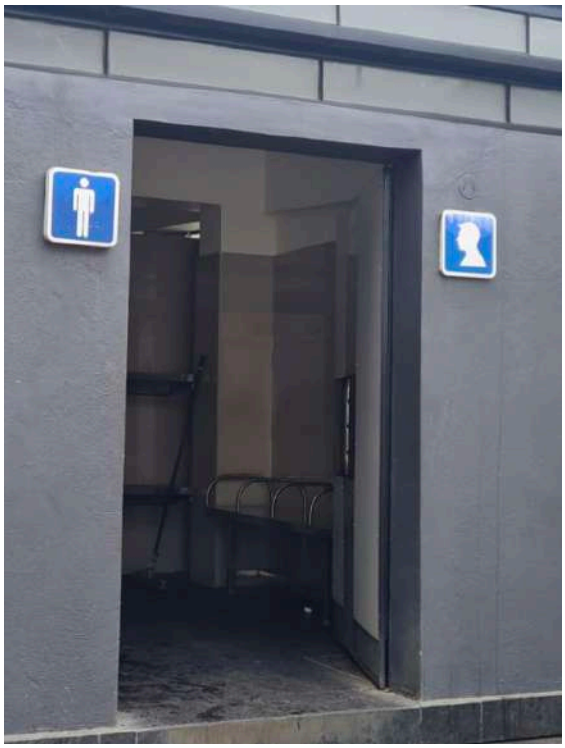
Sustainability features add value to the toilet design

The Nirmala Saulabhya is a one-of-a-kind carbon positive and water positive toilet infrastructure, which boasts of a rainwater harvesting facility, sewage treatment plant and a rooftop solar power system. This public toilet intervention's key value proposition is its sustainability features that reduce wasteful resource allocation and maximise reuse and recovery. The Indian Green Building Council has declared the complex as the country's first 'Green Public Convenience' facility.

Land acquisition, high capital costs and water shortages present challenges

One key hindrance faced in the installation of toilets was with regard to disputes associated with acquiring and allocating land towards the construction of this facility. Apart from this, high capital costs were hindrances at the inception level, which eventually benefited from user fees and donations.

Additionally, the area faces a shortage of water, as a result of which around 6000 litres of water is bought from tankers every week, to operate and maintain the complex. The complex demands a large water requirement of 8,000 litres per day, 70% of which is recycled water that is used for maintaining the garden and flushing the toilets. The facility also has a drinking water kiosk with a Reverse Osmosis (RO) plant that can supply 200 litres per hour of water.



The potential for replication and scale lies in the unique sustainability features of the toilets

A similar facility has been constructed in Amba Vilas Palace (Mysuru Palace) and construction of more of such facilities is proposed in major tourist destinations in and around Mysuru. The 'Nirmala Saulabhya,' serves as a unique and sustainable eco-friendly model which can accommodate services for approximately 55 lakh pilgrims annually visiting the Chamundi Hills. Despite initial challenges related to high capital costs and water scarcity, the facility showcases an innovative design with mud bricks, concrete, and sustainable materials.

The facility is a good example for a public-private partnership model (BOOT in this case) and can be replicated in other tourist places having high footfall, through corporate social responsibility funding from the private sector. Moreover, it also demonstrates an innovative integration of features focused around closing the loop of nutrients, energy and water like rainwater harvesting, sewage treatment, and a rooftop solar power system. The facility stands as a replicable example of a carbon-positive and water-positive public toilet.

While the amenity has faced challenges including water shortage, innovative measures like recycled water usage have been adopted to address these issues. Apart from this, a drinking water kiosk with an RO plant has been installed within the vicinity, and the facility is connected to the grid as a net-zero energy building. The potential for replication and scale lies particularly in these sustainability features of this toilet, offering a blueprint for future eco-friendly public toilet initiatives.

Source: Innovative Toilet Concepts for Urban India, National Institute of Urban Affairs (IHUWASH Project), 2018, pages 38-39; Photo Credit: WASH Institute

5.2 CASE STUDY

SUVIDHA, A COMMUNITY SANITARY COMPLEX

LOCATION

7 Suvidha centres across Mumbai, Maharashtra.

VALUE PROPOSITION

An innovative public-private partnership model that facilitates and provisions high quality amenities to significantly improve access to sanitation for low-income settlements, while also addressing access to economic opportunities.

FOOTFALL

Suvidha Centres cater to 200,000 users per year

FINANCING MECHANISM

Capital Expenditure: ₹4 lakhs per seat;
Operational Expenditure: ₹3,000 per seat (60-70% on salaries of human resources engaged)
Financing Entity: Hindustan Unilever Limited (CSR based funding)

KEY PARTNER

Implementing Organisation: Hindustan Unilever Limited, Municipal Corporation of Greater Mumbai and HSBC India
Support Partners (Operations): United Way, Mumbai; Pratha Samajik Sanstha

Urban informal settlements continue to be deprived of adequate WASH facilities

Despite remarkable progress made through various sanitation initiatives, the challenges experienced by communities living in urban informal settlements in India continue to persist. Contextual and multifaceted solutions like well-designed Sanitary Complexes have gained traction, especially when a large population needs to be facilitated with WASH - clean drinking water and improved sanitation and hygiene facilities. Limited space and lack of ownership rights to construct toilets pushes the dependency of communities further on to public toilet facilities. However, the quality of public toilets in India continues to be poor. Considering the complexity of issues that extend beyond just the infrastructure, effective partnerships become a key factor to formulating a solution that holds up and adapts to these challenges.

Seven Suvidha centres now launched in Mumbai

In 2016, the first Suvidha (i.e., 'convenience') centre was launched in Mumbai. A total of 7 Suvidha centres now exist that aim to serve as a sustainable community centre which addresses the sanitation, hygiene, drinking water and laundry needs of low-income urban households. The centre claims to save about 4 million litres of water annually using a close looped approach to reusing water from the handwashing and laundry facilities.

The target audience includes people from lower-income urban households that tend to rely on local public and/or community toilets for access to sanitation facilities, and Suvidha centre thus aims at making the facilities safe, secure, and affordable.

Hindustan Unilever Pvt Ltd shares a common concern with Municipal Corporation of Greater Mumbai, regarding the poor hygiene and sanitation situation in low-income households and communities residing in congested urban informal settlements. This has further boosted the demand for a well designed community sanitary complex to cater to the needs of the population residing in such low income settings.

Toilet Features

Operations and maintenance and its high costs have been identified by the Suvidha complex team to be a bigger challenge than the Capital expenses and implementation. The facility provides key water-based amenities like toilets, laundromat, showers, and purified drinking water at an affordable price.

- There are family passes available for daily usage of toilets costing about ₹150/month, while a per use charge costs about ₹3.
- The user charge for the laundromat is priced at ₹55 per load, and the same for showers is set at ₹10, while purified drinking water is charged at ₹1/litre.

Clean Toilets

Showers

Laundromat

Purified drinking water

Costs involved and Operation and Maintenance

Investments for Suvidha Complexes have been done around 7 Suvidha centres across Mumbai, i.e.:

Dharavi

Malad

Andheri

Kurla

Two in Ghatkopar

Govandi

The Suvidha Complex model ensures paid employment opportunities to community members, providing about 122,000 person days annually (ensuring paid employment opportunities to run, clean and manage the centres), demonstrating an effective public-private partnership model for replicable and scalable community sanitary complexes. The implementing agency (Hindustan Unilever Pvt Ltd; HUL in short) still participates and guides the operations, to ensure that the intended purpose of the infrastructure and its business model is intact. While HUL is the main implementing CSR partner, the model allows other NGOs and civil society organisations to make contributions to support specific parts of operations within the model. For instance, while the concern took shape of an initiative, and after the success of the first pilot funded by HUL Pvt Ltd., HSBC India joined for funding in the next 6 Suvidha toilet complexes. United Way Mumbai in collaboration with Partha Samajik Sanstha were engaged for overall operations and awareness and behaviour change programmes with a shared motivation to set up a good example of community sanitation.

The Suvidha toilet complexes adopt a model in which the infrastructure is owned by the respective municipality, while being operated by NGOs (United Way Mumbai and Pratha Samajik Sanstha) under the guidance of HUL Pvt Ltd. The financial commitment involved a capital expenditure of ₹4 lakh per seat (which includes provisions for disabled, children and women), along with other amenities and provisions such as laundry, water ATMs, shower facilities, handwashing stations and toilets.

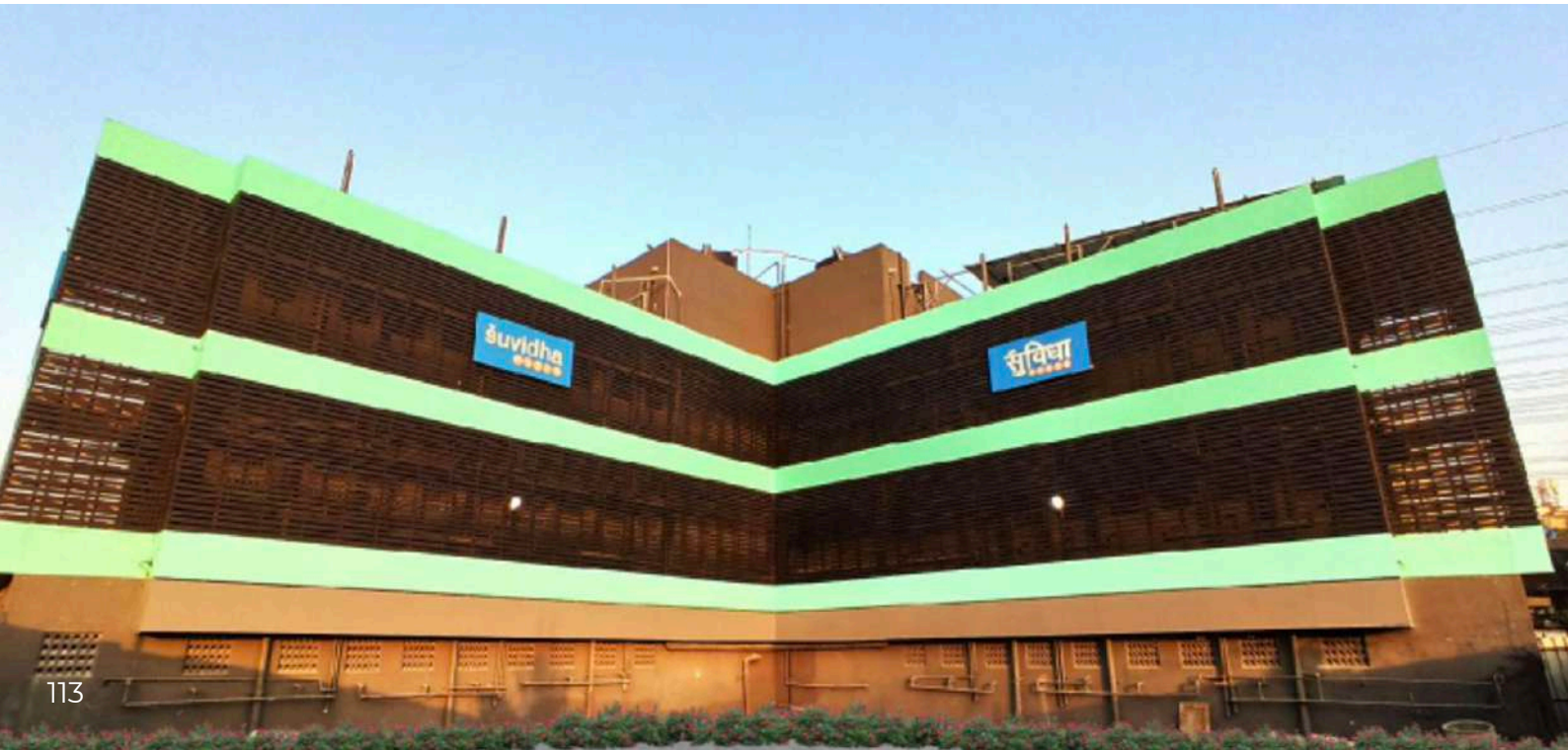
Toilet use has led to improved health outcomes among users

Suvidha Centres cater to 200,000 users per year, while also ensuring paid employment opportunities to run, clean, and manage the centres for around 122,000 person days, annually. High quality facilities further improve the health benefits of their users, and it was found that there was a 1.4 times reduction in diarrhoea cases among Suvidha users. Behaviour change programmes continue to be prioritised with focus on community awareness on WASH & Nutrition.

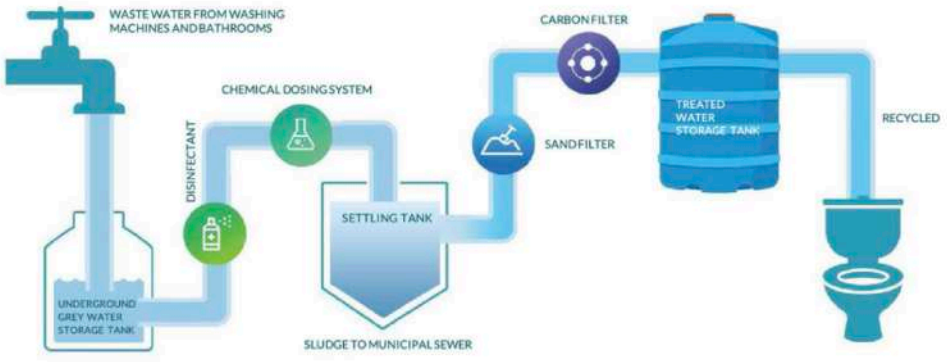
Four thousand community members have been part of a 3-month intensive programme conducted as part of the Suvidha complex programme. In addition to the listed positive impacts, Suvidha complexes have set an example of effective public and private partnership in terms of implementation and operations for others to follow.

High operational costs pose a challenge to sustainability of toilets

The Suvidha Toilet Model faces challenges primarily related to high operational costs, surpassing capital expenses. Key challenges include operational sustainability and maintenance costs, which are catered through various measures.



Water saving at the heart of the centre



- Water from handwashing and washing machines is treated and reused in the toilets
- All centres collectively save 35 million litres of water every year

Effective partnerships, community engagement and adaptive capacities enhance replicability

The complex's impact is evident in its 200,000 users annually, reduced diarrhoea cases and community engagement. Design wise too, Suvidha complexes are replicable and scalable and one of the important distinguishing features of the toilets is the effective Public Private Partnership model. Through the 7 Suvidha centres, the design has been improved to 'Suvidha 2.0' with due learnings from the initial setups. The Suvidha Complex focuses on the following objectives for its appropriate implementation:

- **The Right Partnership:** This necessitates a non-linear approach, and a partnership between municipal administration/local bodies, NGOs/SHGs and technical experts.
- **Community engagement:** Utilising an inclusive process, Suvidha Complexes were able to get a buy-in from local stakeholders and develop a sense of ownership through a consultative process, ultimately integrating insights from a wide range of stakeholders like end-users, regulators, agencies with varying relevant expertise, thus bringing in the factor of resilience to the model.
- **Adaptive capacities and preparedness:** One can only plan so much and expect everything to go accordingly. Regardless of ample planning, staying prepared for uncertainties is the key to sustaining operations. Factors like weather, festivals, unforeseen delays, and events can slow the process down, sometimes even to a standstill. Effective risk management and alternative measures turn out to be mostly adaptive strategies. Being flexible and ready to adapt to unpredictable environment proves to be essential.

5.3 CASE STUDY

PARTNERING WITH BUSINESSES FOR IMPROVED ACCESS TO TOILETS

LOCATION

Pan India - 104 cities

VALUE PROPOSITION

Providing a shared service model of certified, quality-assured toilets with a focus on access for women.

FOOTFALL

The woloo app has 4000 active users

FINANCING MECHANISM

- Revenue from subscription on App Monthly: 99, Annually 365
- Revenue from WAH star rating toilets for listing on App (₹25000 for 4-star, ₹50,000 for 5-star)

KEY PARTNER

The Woloo app partners with A-grade restaurant affiliates through a subscription-based aggregator model (till date the platform has connected with 1200 restaurants in Mumbai) to certify and locate toilets. This is done through the installation of IoT based sensors and motion sensing toilet seats across the affiliate clients (for 4 and 5-star affiliates).

The hardware of the platform ecosystem entails:

1. When a host is onboarded, a motion sensing toilet seat is provided to the affiliate partner.
2. Within that same toilet seat, there is an IoT sensor that detects stink levels for every hour.
3. If the stink crosses a set threshold (which has been set within the sensor) three times, then that facility gets de-listed from the platform.

Context

While the Swachh Bharat Mission has brought about great impetus to recognizing the need for access to toilets and their usage, a lot of work has to be done in enhancing the 'user experience' of such toilets, especially in public and commercial spaces. At the core of this is the issue of sustainability, while there has been an uptick in the construction and placement of toilet units, there is difficulty in leveraging processes and technology to ensure that they are maintained as per the requisite standards.

Woloo presents itself as an innovative solution to this problem. It has effectively developed standards, methodology, and auditing processes (through a digital platform) for monitoring the facility usage and hygiene standards of toilets that hold owners of facilities or maintenance contractors accountable for quality assurance. These efforts are additionally supported through the enterprise's app, which allows customers to discover, use and provide community feedback on audited toilets to provide a holistic review of facilities.

Intervention

Woloo uses the Woloo Assurance of Hygiene (WAH) standards to audit washroom facilities for upgradation and certification. The enterprise has a back-end war room, which helps identify and build partnerships with commercial organizations such as shops, cafes, petrol pumps, etc. to audit their facilities. The Woloo application also allows such commercial organizations to volunteer to become 'Woloo Host'; where they sign up to be audited and then their facilities are displayed for public use on the application.

Investments & Operations

The Woloo model entails an auditing process (through a digital platform) for monitoring the facility usage and hygiene standards of toilets that hold owners of facilities or maintenance contractors accountable for quality assurance. The auditing services are offered in two ways:

- The first is a one-time service, known as a 3-star audit (₹999 per unit), which is an analogous, one-time physical audit conducted by Woloo to ensure that the facility is compliant with WAH standards. Post this, compliant toilets and washrooms are uploaded on the Woloo application where they are reviewed by users and have to retain a 4 out of 5-star quality rating or they are delisted.
- The second, recurring services include the 4-star audit, (₹25,000 per unit one-time payment with lifetime service) involves the installation of a single IoT device, mystery audits, and access to reward features on the Woloo application.
    - The 5-star audit, (₹50,000 per unit one-time payment with lifetime service) offers the installation of multiple IoT devices, the installation of motion sensor infrastructure, and regular facility management services such as deep cleaning, etc.
    - In the 4 or 5-star audit, where IoT devices are installed, real-time updates on facility conditions are relayed both to the Woloo backroom and to the owners in terms of either monitoring screens or reports so that accountability is ensured for facility maintenance.
- The enterprise aims to create a 'shared' ecosystem for toilets where commercial enterprises open their toilet units to the general public. Toilets that are compliant with the above-mentioned 'WAH' are geotagged and on-boarded to the Woloo app so that anyone using the application can access and use the apps. Customers use and review the toilets on the application which benefits other users to identify high-quality toilets. Customers, especially women, are incentivized to review facilities on the application by being rewarded cashback points for the discounted purchase of hygiene and MHM products. Toilets who have used the recurring audit facility also enjoy cashback for discounted cleaning products when reviewed well, which helps reduce the cost of O&M. It costs a user ₹99 a month or an annual subscription fee of ₹365 to use the application.

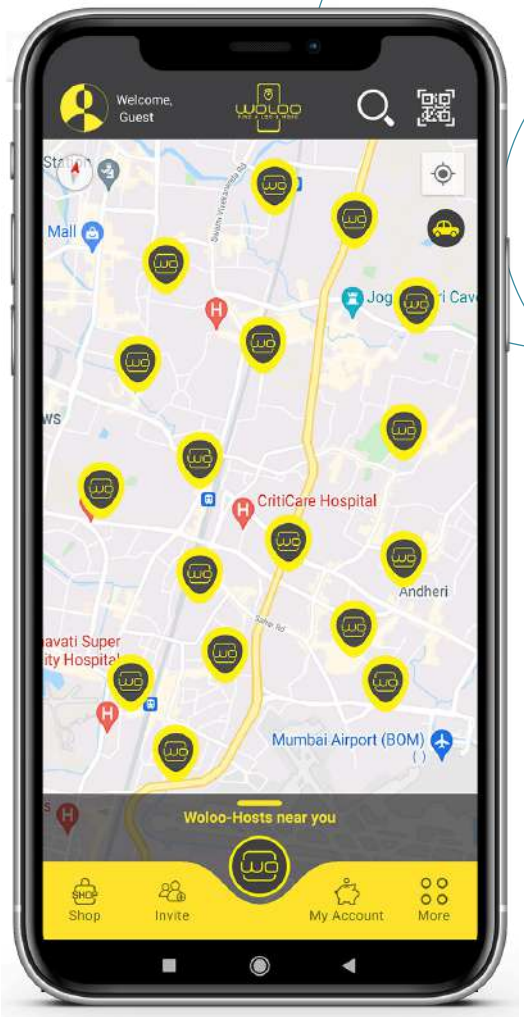
Toilet Features

The Woloo platform aims to create a shared ecosystem for public toilets, fostering community-driven quality assurance and improved user experiences. This is facilitated by:

- Developing standards through auditing and certification
- Citizen feedback mechanisms through the Woloo application

Impact

The Woloo application currently has 25,000+ toilets listed and certified across 104 cities of India. The WAH audit protocols have also made significant progress with Woloo being an audit partner for large brands such as Indian Oil gas stations, BPCL, and Adani airports.



TOILETS
25,000+

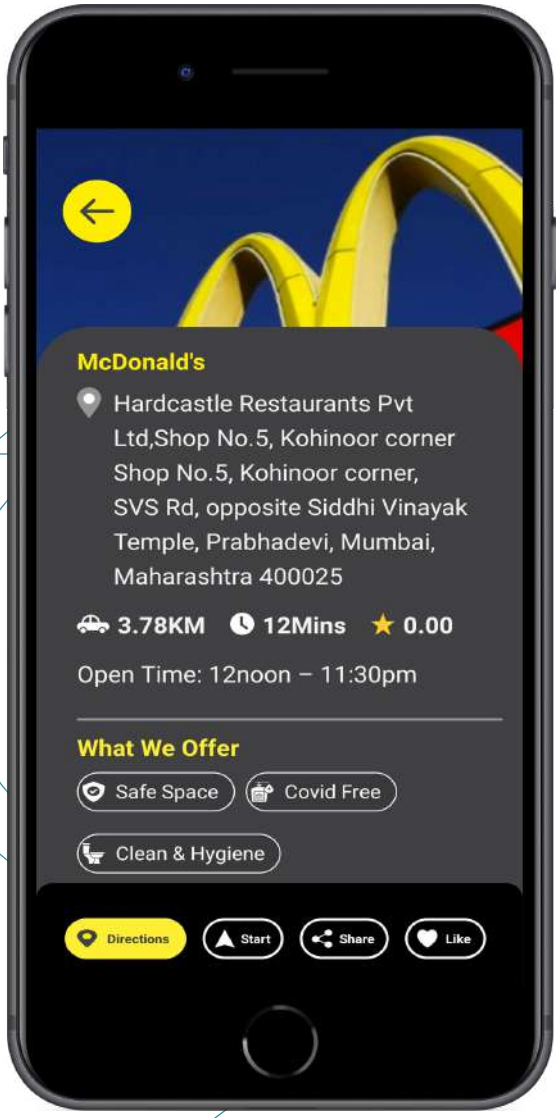
104 CITIES

Challenges Faced & Mitigation Measures Taken

The enterprise has set a challenging target of 1 lakh certified toilets by the end of this year and 5 lakh toilets over the next three years.

Woloo currently delists toilets that do not meet its WAH standards. The challenge is to instead help such toilets meet the standards.

The greatest challenge for Woloo is to scale up as a consumer App with paid subscriptions for a service that few people appreciate.



Potential for Replication & Scale

Woloo has unlocked the potential of leveraging existing toilets inside businesses as publicly accessible toilets. To do so they have built an IT platform which helps locate such toilets. The IT platform also helps built trust in the cleanliness and usability of such toilets by integrating sensors and by auditing toilets to the WAH standards.

This IT platform thus provides the businesses exposure to subscribers of the Woloo app potentially driving customers to the business. This potential will increase exponentially with increasing subscriber base of the Woloo app. The payoff for the businesses and their incentive to list their toilets (and their business) with Woloo should be studied in greater detail.

There is no doubt however that idea of Woloo is refreshingly original and potentially empowering for ULBs that are constrained for space to build sufficient number of public toilets. Several hill cities with large tourist footfalls need such solutions. Woloo aims to achieve 1 lakh certified toilets by the end of this year and 5 lakh toilets over the next three years.

In addition, Woloo's model of using a combination of IoT-based real-time data and community feedback for the maintenance of toilets shows potential in the field of O&M for public toilets. It can be deployed by ULBs to ensure contractor and third-party bodies are held accountable for the quality and safety of PTs.

5
LAKH TOILETS
Over the next three years

Credit: We are grateful to Woloo for having provided the information used in this case.

5.4 CASE STUDY

RENOVATING COMMUNITY TOILETS THROUGH PHILANTHROPY

LOCATION

Bangalore, Karnataka

VALUE PROPOSITION

Access to safe and clean community toilets for a low-income settlement (LIS) in core city area of a metro city

FOOTFALL

~200 users per day

FINANCING MECHANISM

Capital Expenditure: ₹13,00,000
Operational Expenditure: ₹1,15,000 per annum
Revenues from user fee: Monthly fee of ₹100 per HH
Financing Entity: CDD in partnership with Bangalore city administration and funding from Wipro Foundation renovated a community toilet within a slum settlement. The community toilet is operated and maintained by the Mahanagara Palike (BBMP).

KEY PARTNER

Implementing Organisation: Bruhat Bengaluru Mahanagara Palike (BBMP)
Technical Partner: Consortium for DEWATS Dissemination Society (CDD India)
Supporting Stakeholders: Wipro Foundation

Unhygienic community toilets limited access of D'Souza Garden residents to safe sanitation

D'Souza Garden is a low-income settlement of approximately 200 households (HHs) in the core city area of Bangalore. The households are closely spaced, often sharing a common wall. The narrow lane running through the settlement is only wide enough to admit one person at a time.

Given the level of space constraints, most households did not have individual toilets. They depended on a community toilet of the municipal body, which was in a dilapidated state with no water supply, seats in damaged condition, broken doors and windows, insufficient lighting, broken washbasins, leaking roof etc. All these factors were contributing to unhygienic and insanitary conditions in the settlement.

The renovation project, which began in December 2022, addressed all these issues, and the upgraded toilet has been functioning since March 2023.

The existing toilets were redesigned based on community inputs

The design for the renovated toilet was planned based on the needs assessed and expressed by the residents who depended on the toilets. This included adding extra toilet seats, improving water supply and providing better lighting facilities. This was to ensure that households in the settlement which lacked individual toilets had access to improved sanitation facilities.

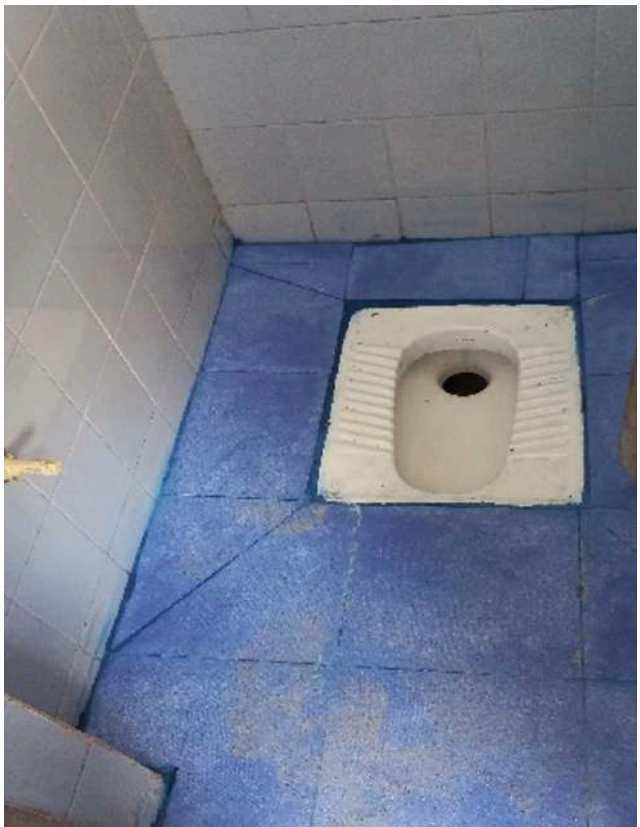
The public toilet was designed to accommodate 200 users per day and currently serves 150 HHs in the settlement. In total, 10 toilet seats were refurbished or built anew with one dedicated facility created for elderly or persons with disability. Post project completion, it was handed over to residents and the operator for O&M was selected from the community.

Toilet Features

The renovated community toilets in the low-income settlement include dedicated toilets for elderly/physically challenged, with facilities for improved menstrual hygiene waste management. The facility also includes improved water supply and water saving push taps to prevent wastage of water. The overall design of the community toilet facilitates natural lighting and improved ventilation.

Costs and Operation and Maintenance of the toilets

Wipro Foundation provided CDD India the funding to set up the improved community toilet in D'Souza Garden slum. Through these funds, the existing community toilet was renovated, adding extra toilet seats, re-plastering and waterproofing of walls and roof, improvements in plumbing through laying of sewer pipes, provision of adequate lighting and better ventilation, and improvement in water supply. Additionally, a toilet on the lower floor was dedicated for elderly people and persons with disability. The project was completed with a construction cost of ₹13 lakhs - amounting to a capital expenditure of around ₹6,500 per beneficiary.

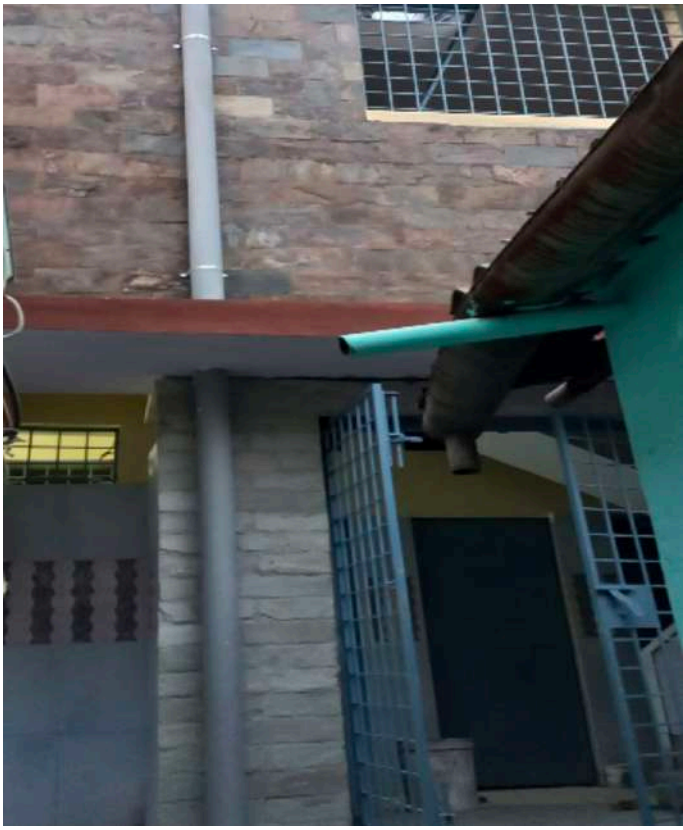


The annual operating expenditure for the renovated toilet amounts to around ₹1.15 lakhs per annum, including operator salary and consumables for toilet cleaning while electricity and water are supplied free. This is supported by the collection of a user fee of ₹100 per month per household.

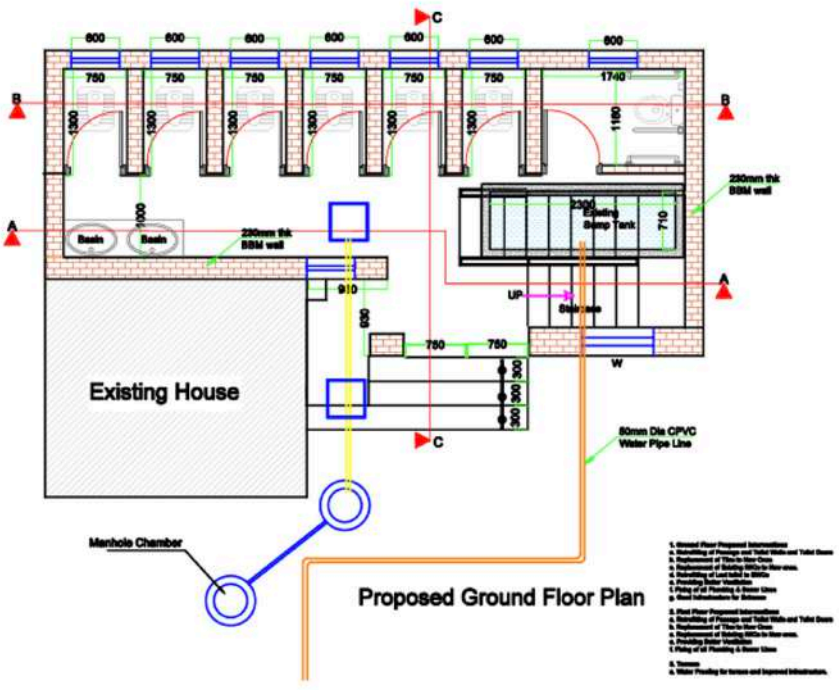
Wipro Foundation provides a gap funding of ₹6000 per month for the first year of operations. As the footfalls are expected to increase over the course of the first year, more families are expected to contribute towards the O&M expenses thereby avoiding dependence on external funding. One of the residents staying near the toilet, has come forward to maintain the toilets.

Better WASH facilities have improved sanitation practices of the community

One hundred and fifty HHs are dependent on the CT and a significant improvement has been observed in the sanitation and hygiene practices among residents in this low-income settlement because of access to better WASH facilities. Management by the community themselves is ensuring regular maintenance and sustainability of the facility.



The design has a great potential for replication as it is based on real needs



The design of the D'Souza Garden CT is based on the real needs of users. Its features such as natural lighting and ventilation, water saving plumbing fixtures can potentially lower operations and maintenance costs, and aid replication of similar models.

CSR support from Wipro and other corporates can take up such initiatives to identify low-income communities where IHHL is not feasible and undertake similar CSR funding program.

Credit: We are grateful to CDD India for having provided the information used in this case.


स्वच्छ शौचालय
म्हापसा
बालिका
swachh
BHARAT


NFSSM
ALLIANCE
WASH
INSTITUTE
स्वच्छ भारत
एक कदम स्वच्छता की ओर
सत्यमेव जयते
Ministry of Housing and Urban Affairs
Government of India