Public Sanitation Facilities in Tirupati

*Project Report: Vol. I**

*This report has been prepared by the Centre for Development Finance, IFMR, Chennai for the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) under its new programme on "Advisory support to the National Urban Sanitation Policy" of the Ministry of Urban Development (MoUD), GoI

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I. Introduction

Deutsche Gesellschaft für internationale Zusammenarbeit (GIZ) under its new programme on " Support to the National Urban Sanitation Policy (SNUSP)" supports the Ministry of Urban Development (MoUD), Government of India in the National Urban Sanitation Policy (NUSP) policy guidelines. As per the NUSP guidelines, all states are to develop State Sanitation Strategies, parallel to development of City Sanitation Plans (CSPs) for the urban areas. The ULBs have to implement 100% sanitation, as well as provide adequate financing mechanisms, tariff systems and shall consider Private Public Partnerships (PPP) for efficient implementation. Under its Advisory Services in Environmental Management (ASEM) program, GIZ had supported six cities in the preparation of CSPs, including the city of Tirupati.

The CSP of Tirupati, formulated in close collaboration with the Tirupati Municipal Corporation (TMC), has adopted an integrated perspective on inclusive sanitation, taking into account the varied linkages to environmental sanitation, including, access to toilets, water supply, waste-water management, storm water management and solid waste management. With this background, in December 2012, GIZ entered into an understanding with the Centre for Development Finance to execute a study to provide for sustained management of public sanitation facilities by Tirupati Municipal Corporation. The Centre for Development Finance (CDF) is a non-profit research centre at the Institute for Financial Management and Research (IFMR), Chennai.

Objective and Scope of Study

The project has four stated tasks and objectives as per the Terms of References given by GIZ to CDF, IFMR, as below:

- Review the various technical and management models for public sanitation facilities management currently used in India and in particular Andhra Pradesh and Tirupati city
- Assessment of status of Public sanitation facilities in Tirupati and development of options
- Develop model DPR framework in assist in the preparation of DPRs for 5 locations in Tirupati
- Capacity improvement for various stakeholders for sustained management of public sanitation facilities

In accordance with the Terms of Reference, the project will aim to carry out the above tasks to the extent of developing a DPR framework for the construction of public/community toilets, as appropriate, in 5 locations approved by the TMC, develop operational and maintenance guidelines and help strengthen the capacities of various stakeholders towards sustained management of public sanitation facilities. The approach and guidelines would augment measures already taken by the Government of Andhra Pradesh India and the TMC towards a more systematic and demand-based design and management of public sanitation facilities. While the DPR framework itself is being developed for the 5 locations in Tirupati, the key findings and guidelines will be transferable across other cities.

The Project Report has been written to fit within this brief and is organized under the following chapters:

I. Management Models in Public Sanitation
II. Technical Models and Design
III. Public Sanitation Scenario in Tirupati
    a. Supply-side analysis
    b. Demand-side analysis
    c. Gaps and Actions
IV. Policy and Institutional Frameworks
V. Financing Public Sanitation
VI. City-wide strategies and Action plan

II. Management Models in Public Sanitation

The project's development objective is to support the improvement of public sanitation facilities and their management in TMC, by carrying out detailed demand supply analysis in the city and also carrying out a review of best practices of public sanitation models in India for purposes of comparison. There are a number of challenges in the financing, operations and sustained management of public toilets. Most often, sanitation models fail in their operations and management after a couple of years, for varied reasons -

- poor design and infrastructure (unplanned or poorly planned spaces, clogged networks, insufficient water, electricity, lack of ventilation, etc.)
- selection of construction material
- poor maintenance
- absence of monitoring and enforcement mechanisms
- insufficient funds
- failure to incorporate user preferences (privacy, gender/disabled preferences, safety, etc.)
- supply shortage
- inaccessible toilets

Consequently, it was essential to not only carry out a situational analysis of public sanitation in TMC, but also to thoroughly review best practices in urban sanitation service delivery and public-private participation, in order to propose appropriate service delivery models for the city.

In India as in most parts of the world, pay-per-use public toilets are commonly seen in public locations, while community toilets which are subsidized cater to low income, high-density areas. In our review of public sanitation models, we found a number of variants in the management and operations of public and community toilets across India. Broadly, the management practices of these models can be categorized as below:

Private Managed Models

Private participation in public sanitation delivery typically involves design, funding, construction, operation and maintenance of toilet blocks by the private sector, usually on municipally land. User fees are charged. These usually are Build-Operate-Transfer (BOT) or Design-Build-Operate-Transfer (DBOT) contracts, and the private players get concessions from the government (land lease at a nominal price) to invest in building infrastructure. Under this model, while the private sector likely bears the upfront costs for construction, the cost is eventually borne by the end user through the user charges that is paid by them. Under BOT contracts, ownership and transfer contracts, ownership of the premises transfers to the municipality when the lease period expires, typically after 5-7 years. Concession and Lease contracts are other variants of private participation in public sanitation. Under these contracts, the public toilet constructed by the municipality with municipal funds, on municipal land is outsourced to private contractors for an agreed upon period for on-going maintenance. PPPs on a BOT basis appear to be the preferred mode of service delivery by the centre as well as the state of Andhra Pradesh, owing to funding and manpower constraints.

The sector is still perceived as unorganized, with very limited pan-India private players who offer standardized sanitation services, notable among them being Sulabh, Toilets and Toilets, GMR Suvidha. The barriers to entry for larger private entrants appear to be mainly in the form of service providers/O&M contractors who have a stronger local presence and hold cost advantages and are consequently able to win toilet construction/O&M contracts from municipalities easily.

Community Managed Sanitation Models

Typically, community toilets under this model are constructed and managed by NGOs under contract by the municipality, on municipal land, with close community involvement. Moderate per-household monthly fees are collected to pay for a caretaker-cum-cleaner and even these fees are waived in certain municipalities depending on political will. The centrepiece of successful community managed models in India and abroad involves instilling a community sense of ownership and hygiene associated with sanitation. For community managed models, Community Based Organizations play a critical role in the planning, execution and on-going management of the model. The typical steps involved in this approach include:

a. CBO identifies technology and design requirements based on a participatory, user-needs based review
b. CBO executes project with varied degrees of assistance from the state government/ULB and also leverages donor funding
c. CBO carries out on-going maintenance and leverages user fees for this purpose

Community managed models are particularly relevant for the context of Tirupati city, since a majority of the municipal toilet blocks or the Tirumala Tirupati Devasthanams (TTD) managed toilet blocks in the city were not constructed with an intent to serve slum inhabitants. Three public toilets blocks serve both as community toilets as well as public toilets. One toilet block opposite the city court, near Poolathota slum, one in Indira Nagar slum and one near Kumarathopu slum are catering to the slums in the vicinity. While household coverage of toilets is quite high even among slum localities in Tirupati, access to sanitation facilities falls below prescribed norms in certain slum pockets. Consequently, there is a high incidence of open defecation and urination around slum localities. In Andhra Pradesh, the ILCS scheme is being implemented since 1982-83 and Tirupati is one of the cities to receive assistance under this scheme. There are a few slum households who have utilized these funds to construct toilets outside their homes where vacant area is available. These are pour and flush type toilets connected to a septic tank. However, most of these toilets have fallen into disuse because the septic tank is never cleaned and overflows during the rainy season.

Innovations in Public Sanitation

Our review of public sanitation models under this segment involves models that feature technology and design innovations as an alternative to conventional delivery of sanitation systems. The innovations range from using solar panels for electricity and bore-wells to bio-digesters for waste processing, eco-sanitation solutions that involve recycling and reuse of waste water, user operated e-Toilets and mobile (portable) toilets that address temporary sanitation requirements. Typically, the management model for these innovative approaches is three pronged:

a. Technology and design innovation by the private sector/external entity
b. Execution with the assistance of the state government/ULB/donor agencies
c. On-going maintenance by the ULB/NGO/private sector

Key Learnings from various Public Sanitation Models

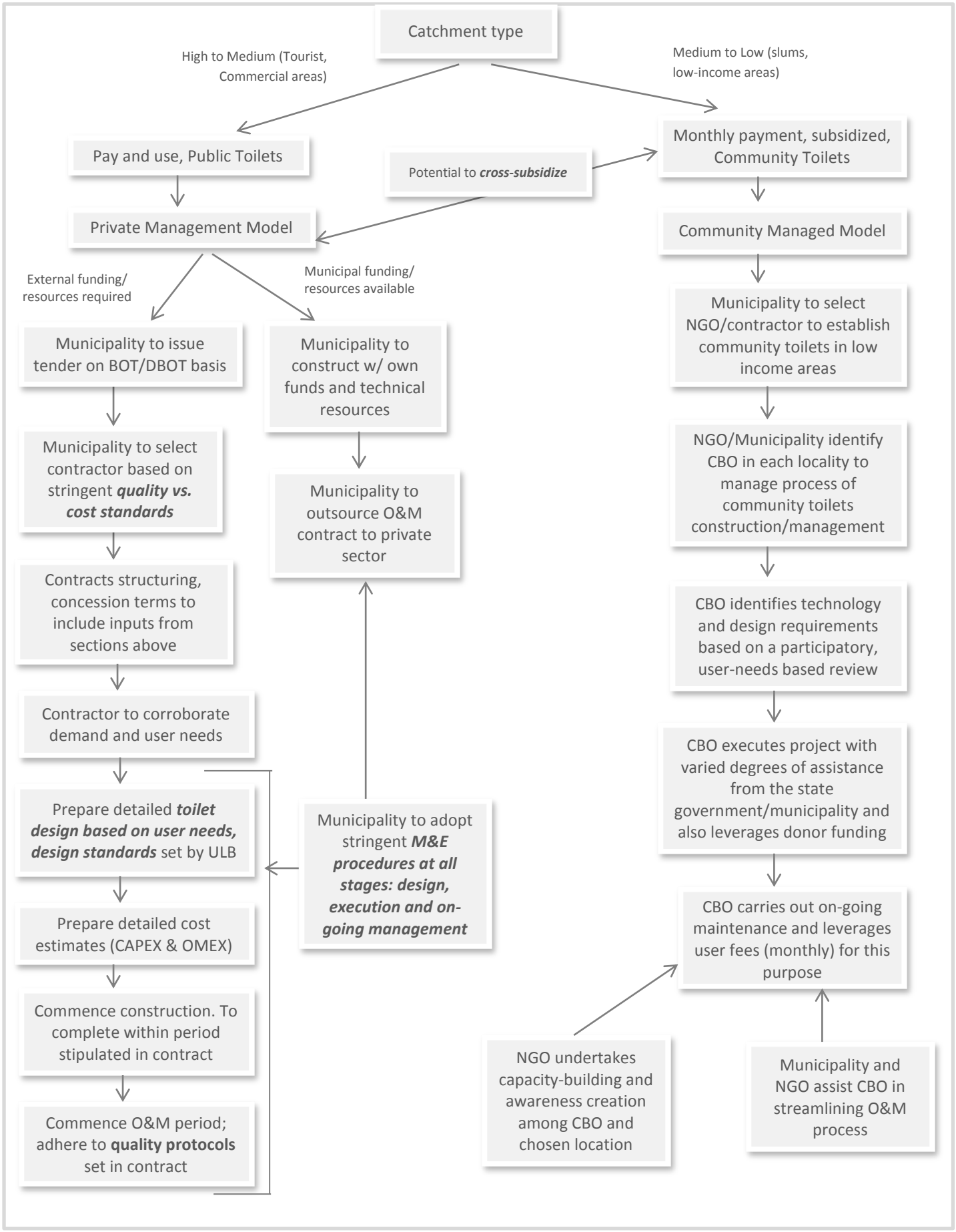
Private Management Models	Community Managed Models	Innovative Models
•Typically executed in areas with high footfall • Profit-driven management, hence success depends on understanding of footfall and sharing of risks at the time of project structuring •Expected rate of return by private sector under a BOT model or concessions//O&M contracts ~ 15-20% • Reasonable concession periods 5-10 years •Financial incentives to private sector (appropriately designed concession awards to mitigate risks) •Monitoring and Enforcement to be retained by ULB •Capital costs borne/shared by private and/or public sectors •Capital costs depend on location, design and usage levels •Design standards to be set by government, actual design to depend on land and location needs •Tariff/advertising fees for full cost recovery (including sewerage costs) •Categorization of user fees (eg. free for children, very poor users) •Stringent O&M protocols and monitoring and evalutation standards to be set by government to ensure quality and sustained use	•Typically in low-income areas where access to sanitation is poor •Demand driven, hence understanding user needs is key to success •Participatory planning and maintenance is essential •Specific consultation with women to meet needs of women and children •Toilet site to be close to area of demand, to include sustained water supply, waste management options, provide for safety and security, •Design standards to be set by government and to incorporate user preferences •Capital costs borne by donors, NGOs, ULB, central/state schemes •User-fee subsidies •Employment of caretaker based on need •Creation of community awareness of linkages between sanitation and hygiene •Stringent O&M protocols required to ensure sustained use •Committed source of funding to ensure quality and sustained use	•Applicability and relevance in dense urban context needs to be understood prior to planning, implementation and scale-up •Environmental considerations are strong •Existing sanitation systems need to be understood prior to shift •Catchment and user needs needs to be incorporated into toilet and waste management design •Capitals costs and O&M costs need to be clearly understood •If pay-per-use, tariff to allow for full cost recovery •In a community toilet context, funds to be committed to ensure cost recovery and sustained use •Specific O&M needs to be clearly understood and upheld

Successful management practices in Public and Community Toilets

	Institutional Arrangements	Financing Arrangements	O&M	Monitoring & Control
Public Toilets	• Private financing of public infrastructure - BOT contracts: facility is constructed, financed and operated by the contractor and ownership is transferred to Municipality after the concession period • Local body provides land and monitors functioning. • Concession period - varies from 5 - 10 years (Delhi), Tirupati (25 years) • Expenses on major and minor repairs typically borne by the concessionaire • Concessionaire to provide criteria adopted for deciding maintenance needs • To ensure efficiencies in sub-contracted O&M, stringent maintenance standards and monitoring protocols to be created • Advertisement Rights given to concessionaire; Ads displayed as per prescribed dimensions on outer walls • Concessionaire enters into a contract with public outdoor advertising agency that is charged to use the advertising space - business risk transferred Examples of best practices include – Sulabh in certain cities, GMR Suvidha in Hyderabad and Bangalore, Toilets and Toilets in Hyderabad, Goa, Fumes in Delhi, Portable models for public areas - E-Toilets (Kerala), Saraplast – Shramik (Pune)	• Capital costs from donor agencies- externally aided projects, Government schemes like JnNURM, state funds and general funds from ULB budgets, etc. PPP options with private/corporate sector, partnerships with NGO/TRUST/FOUNDATIONs, private sector and other sanitation sector participants • User charges for recovery of O&M costs worked out depending on costing of service and category of target users. Common user charges: Re 1 for urinal, Rs 2 for toilet, Rs 5 for bath • Scope for high revenue from Advertising, particularly in commercial areas of larger cities • Profits from PTs in heavy footfall areas generate enough revenue that can cover their construction costs in less than a year; Surplus used to cross-subsidize toilets in low footfall areas. • O&M costs include water, electricity charges, disinfectant chemical needs, labor costs	• Local Body provides water supply and electricity at a point closest to premises; Concessionaire responsible for laying of connection, payment of usage charges • Manpower requirement: 1 caretaker and 2 cleaners; A room provided for the caretaker; staff always in uniform. Continuous janitor services to maintain cleanliness • Concessionaire maintains cleanliness; cleaning divided into Spot cleaning (of specific areas that are soiled) and Thorough cleaning (of the entire restroom, usually once a day). Periodic cleaning to maintain surfaces, wares, fixtures and fittings done on a weekly, fortnightly or monthly basis during non- peak hours. • Timing and frequency of cleaning dependent on footfall/no. of users. Eg. PTs in commercial/ shopping areas could be cleaned 6-8 times a day (1 thorough cleaning; 5-7 spot cleaning) with frequency being higher during peak hours. • Installation of litterbins and disposal of the collected waste • Landscaping area around toilets • Timings: 24 hours in tourist areas, near bus stands , railway stations; 6 am to 11 pm in other areas-could be closed earlier in case of commercial areas if activities shut down before 11 pm	• A clear monitoring plan included in contract documentation; Local Body takes up monitoring- could appoint a Steering Group within Municipality to provide a single contact point for the concessionaire to solve issues & monitor the performance of the toilets. • Monitoring system like an Inspection Card with checklists to ensure facilities meet the necessary standards. • Monitoring of toilets using GPRS controls. Audio system installed in toilet units for users to communicate complaints. • A board displayed with contractor's name, phone numbers and rate-list ; users could call contractors directly in case of grievances • Maintenance agencies keep track of exhaustion of water tank or filling-up of septic tank through automatic SMS alerts

	Institutional Arrangements	Financing Arrangements	O&M	Monitoring & Control
Community Toilets	• Toilets managed by community instead of contractors. • Collaborative partnership among Municipality, NGOs, private enterprises and Community Based Organizations. • Municipality provides the capital investment to construct toilet blocks; Private construction companies carry out toilet construction, in partnership with NGOs. • NGOs assist in formation of CBOs which are mainstay institutions in planning, implementation and maintenance. ; Moue/ Operation - Maintenance Contract between CBO and Municipality • Municipality and NGO provide continued support to CBO until O&M is stabilized • Water and Electricity charges borne by CBOs while Municipality provides network connection service • CBO carries out and pays for minor while the Municipality attends to major repairs • Best practices include Gramalaya (Trichy), Mumbai SSP, SPARC (Pune), Slum Networking Project (Ahmedabad), Portable solutions for slums – E-Toilets, Saraplast - Shramik	• Funds for construction from donor agencies- externally aided projects, Government schemes like JnNURM, ILCS, RAY, etc., partnerships with NGO/TRUST/FOUNDATIONs, private sector and other sanitation sector participants. • User Charges: Monthly Pass system as well as pay per use followed. User fee structure: 50 paise/use; Rs 2 - Rs 3 for bathing and washing; Free for children, single women and elderly people; monthly pass system between Rs. 15 and 30 per family per month • Community financed O&M, including corpus (built at the planning stage, with upfront contribution or Rs.100/ adult from users). Amount deposited in a joint bank account (with CBO and municipality) to meet O&M expenses. • Waiving off of Electricity charges by Municipality for CTCs with less number of users and subsidizing charges for other CTCs requiring them to pay the domestic rates instead of commercial rates. • Profits from PTs in heavy footfall areas generate enough revenue that can cover their construction costs in less than a year; Surplus used to cross-subsidize toilets in low footfall areas	• Community managed and maintained. • Manpower requirement: A care taker is hired who lives in the upper most floor/premises of the toilet block with his family. He is responsible for its cleanliness; 2 cleaners hired. Some cases 2 caretakers hired to work on a shift basis. • Frequency of cleaning depends on no. of users. Mumbai SSP Toilets cleaned 4 times a day (7 a.m., 12.30 pm, 5.30 p.m. and 12 a.m.) • CBOs maintain membership registers, books of accounts, and minutes of meetings. • In areas where water provided by municipality is not enough to maintain toilets well, CBOs provide bore-well or other sources of supply • CTCs connected to sewer or septic tank; cleaning of septic tank at regular intervals by CBOs; Some CTCs follow Decentralized system of waste water management (DEWAT)- waste water recycled and used for cultivation • Free space above toilets to create non- profit businesses for the community like - subsidized gym, women's self-employment outfits, etc.	• Community-centered feedback method for monitoring - team of women from the community to assess conditions along parameters in the contract every 15 days, make surprise visits especially before peak hours and report findings to community and NGO ; quarterly meetings held with stakeholders to rectify defects • Another method could involve the Municipality designating an officer and a team especially for sanitation programs in slums to be regularly in touch with the CBOs; counsel, visit and take feedback and monitor.

Public Sanitation Models: Process of Selection, Execution and Management



Box 1: Basic facilities and design parameters to be incorporated into public toilet complexes include:

- *Provision for uninterrupted water supply*
- *Ample water storage facilities*
- *Appropriate toilet technologies (connections to sewer networks, septic tanks for waste water disposal)*
- *Accessibility, particularly for the disabled*
- *Privacy and security, particularly for women*
- *Separate toilet blocks for men and women*
- *Urinals for men*
- *Separate shower facilities for men and women*
- *Planned usage of space, with provision for caretaker seating, storage needs, basins for hand-wash/cleaning*
- *Adequate natural ventilation*
- *Adequate external signage to promote visibility and encourage usage*
- *Adequate internal signage to encourage users to keep facility clean*

Optional (based on locational need and land availability)

- *Seats for children*
- *Waiting areas*
- *Luggage storage room*
- *Rest room, living quarters for caretaker*
- *Space to wash clothes*
- *Store room for cleaning material*

III. Technical Models and Design

Most often, the sustainability of public sanitation facilities fails owing to poor planning and design choices. Effective public toilet design is critical to safe, accessibility and long-term usability of these toilets. Understanding and incorporating user needs into toilet design is paramount to the success of public toilets as are design choices and maintenance approaches that prolong the lifespan of these public assets.

While planning for new facilities, it is essential to strike a balance between local context, site conditions, user needs and demand within the aegis of planning norms such as CPHEEO and building byelaws and standards (eg. Bureau of Indian Standards). Box 1 outlines the basic facilities that must be offered within every public toilet complex in urban areas. In addition, it is necessary to use quality construction material that are suited for easy maintenance and adopt stringent management and maintenance standards to ensure quality and thereby, sustained use.

Opportunities to make public toilets more environmentally sustainable should also be actively pursued by state and local governments. From a costing perspective, choice of toilet technology and superstructure has maximum bearing on the overall capital costs of any toilet model.

Toilet technology

Sanitation technology can be classified as on-site and off-site technologies depending upon population densities and investment capacities. On-site systems store and/or treat excreta at the point of generation. In off-site systems (eg. sewerage) excreta is transported to another location for treatment, disposal or use. Some on-site systems, particularly in densely populated regions or with permanent structures, will have off-site treatment components as well.

In densely packed areas sewerage systems are frequently used to transport wastes off-site where they can be treated and disposed. Conventional centralized sewerage systems require an elaborate infrastructure and large amounts of water to carry the wastes away. This type of approach may work well in some circumstances but is impractical for many other locations. The cost of sewerage system (which can be as much as 70 times more expensive than on-site alternatives and its requirement of a piped water supply preclude its adoption in the many communities in less-industrialized countries that lack adequate sanitation. In specific circumstances, cost-effective alternatives to conventional sewerage systems have been developed including small diameter gravity sewers, vacuum and pressure sewers. Simplified sewer systems have been successfully used in Brazil, Ghana and other countries.

In areas with low population densities, it is common to store and treat wastes where they are produced on-site. There are a number of technical options for onsite waste management

which if designed, constructed, operated and maintained correctly will provide adequate service and health benefits when combined with good hygiene. Examples of some onsite storage options include single pit or vault latrine, double pit or vault, double leachpit, single leachpit and septic tanks with soakaway or drain field. All these options require transport of material to either the point of use or to septage/faecal sludge treatment facilities.

Toilet superstructure

Toilet super structures are mainly of two types in urban areas – 1) pre-fabricated structures or modular units which can be easily installed and, 2) reinforced cement concrete slabs for roof and brick masonry or pre-fabricated synthetic material for partition (similar to air ports). The cost of pre-fabricated structures varies significantly depending upon the material used for construction and the number of units being used. Such pre-fabricated units will not have provision to keep the overhead tanks on the top of the toilets. Most of the time separate overhead tanks are provided. The durability of the toilet depends on the material used for construction. As regards reinforced cement concrete slab option, for Indian closets and very rough use, brick partitions may be a better option than fragile synthetic material partition.

Design and related costs

Based on a detailed overview of various technical models in public sanitation, it was observed that the technical specifications and design approaches for each of these models are fairly unique. The variations between models originate from multiple aspects – material used for construction, treatment options, type of toilet seat adopted and provisions for power supply. The variations in technology and design justifiably influence the costs for construction and maintenance of these models, with costs ranging from Rs. 1,000 to Rs. 70,000. The table below captures the specific features of most of the prevalent technical models and their related costs. Knowledge of the options available in terms of technology and design and related costs is imperative to effective sanitation planning and selection of models that are best suited to local conditions.

Planning and Design norms for Public toilet construction

Table 1 Prescribed norms for toilet design

Norms	Sanitary Unit	For Male	For Female*	Area
CPHEEO	Water Closet	One per 100 persons up to 400 persons; for over 400 add at the rate of one per 250 persons or part thereof	Two for 10 persons up to 200 persons; over 200 add at the rate of one per 100 persons or part thereof	Sizing for toilet is constant - 1.2 x 1.5 m
	Urinals	One for 50 persons or part thereof	Nil	Opening of basin should be 450 mm, so size 0.65 x 0.95 m
	Shower	No specified norms	No specified norms	1.2 x 1.5 m
	Ablution Tap	One per water closet	One per water closet	-
BIS	Water Closet	Three per 1000 persons	Four per 1000 persons	1.2m x 1.5m
	Urinals	Four per 1000 persons	Nil	Opening of basin should be 450 mm, so size 0.65 x 0.95 m
	Shower	Two per 1000 persons	Two per 1000 persons	1.2 x 1.5 m
	Ablution Tap	One per water closet	One per water closet	-
	PH Toilet	One per toilet complex	One per toilet complex	1.5 m x 2.0 m

*In both cases, norms assume 2/3rds of the number are male and 1/3rd female

Source: Draft Manual for Sewerage and Sewage Treatment, 2012, CPHEEO, MoUD and National Building Code of India, Bureau of Indian Standards

Design approaches, Construction costs for various Technical Models of Public and Community Toilets in India

Toilet location	Power Supply	Ventilation	Treatment Options	Toilet base style	Dimension or Size	Material used for construction	Unit construction cost	Revenue earned after construction	Funding Agency
Namma Toilet - Tambaram	Solar Panels installed will supply power	Ventilation provided in superstructure on three sides for the entire length	Bio-Digester (Two numbers) with sump to process waste and release sewage into the existing network after processing it.	Improved ventilated pit latrine – 3 units (1 Men, 1 for Women and 1 for Physically challenged person).	1.2 m in width and 1.5 m in length and 0.9 m in height	Material used for construction fiber reinforced polymeric material.	**Rs.70,000 for entire construction** includes water supply, sump construction, solar panels installation and piping's and sewer connections	200 persons using per day and expected to increase 2000 per day within 3 years. – Right now it is free of cost (Planned to charge Rest. 1 for urinal and 3 for Toilet)	Funded by Tambaram municipal corporation and Maintained by IDBI Bank for 3 year contract
GRAMALAYA – Trichy (Kolakudipatti in Thottiam block, Tiruchi district)	The power provided from TNEB, Trichy power network	The ventilation provided above the door and has vent pipe in collection tank	Collected in sump and sent in nearby sewer network and treated in STP	Single pit pour flush toilet.	4 feet by 4 feet and height 5.5 feet	Brick masonry is used for construction of sub structure and super structure	**Unit construction cost Rs.6875** and Rs.150 – 15000 Varied readymade toilet models available.	Rs.1 for urinal and Rs 2 for toilets. Maintained by GRAMALYA and local farmers	Water aid and water org groups
DRDO Bio digester toilets – Arunachal Pradesh, Sikkim and J&K	No external power required, it is taken from the digester	Ventilation is at the top of toilet super structure	Bio digester technology- Two compartments - anaerobic microbial consortium and specially designed fermentation tank	Single pit toilet.	1.5 m x 1.2 m (BIS standard toilet design) and height 2.75 m	FRP material of volume 1 – 2 cu. m	**Rs.15000 unit construction cost**	Free of cost	FICCI , MoEF and DRDO
KARNIK toilets – 10 units in Karnataka district	Power supplied from the Karnataka state	Ventilation as per BIS dimension was provided at the side of masonry walls	Released into nearby sewer line and treated in STP	Community based – Double roof ventilated pit latrine	4 feet by 5 feet and height 9 feet	Brick masonry structure and RCC	**Rs.20000 to Rs.25000 for all accessories and other facilities**	Constructed in colleges and schools for girls students and its **free of cost**	NID, TRFI and Karnataka Nirmana Kendra

Toilet location	Power Supply	Ventilation	Treatment Options	Toilet base style	Dimension or Size	Material used for construction	Unit construction cost	Revenue earned after construction	Funding Agency
	electricity board								
Sulabh Toilet – Gandhi Maidan, Patna, Bihar	Power provided from state electricity board power networks	Ventilation as per BIS dimension was provided at the side of masonry walls	Released into nearby sewer line and treated in STP	Twin pit pour and flush toilet	1.2 m x 1.13 m and height 2..25 m	Brick masonry and RCC	**Unit cost of construction vary from Rs.875 to Rs.60500**	Free of cost for first 5 years and charges approximately Rs.1 for urinal and Rs.3 for Toilet	Sulabh International
ECOSAN – Thaneerpandal, Madurai	The power provided from TNEB, Trichy power network	Ventilation provided at the side of walls as per BIS standard dimension	Water and solids are separated and treated separately. Solids are composted and used as manure.	Compost type toilet, Brick masonry structure	1.22 m x 1.52 m (4 feet x 5 feet) and height 9 feet	Brick masonry or hollow block masonry structure.	**Unit cost of construction is Rs.14285**	Revenue earned per year Rs.1200	SCOPE International
SPA toilets	-	Ventilation provided in the doors of the toilet	-	Single pit latrine	1.0 m width x 1.0 m length. or 1.0 m Diameter circular toilets units were used	The composite membranes are used for construction like fiber plastic, glass fiber and FRP materials.	-	-	School of architecture and planning, New Delhi


Namma Toilet. Chennai


Gramalaya, Trichy

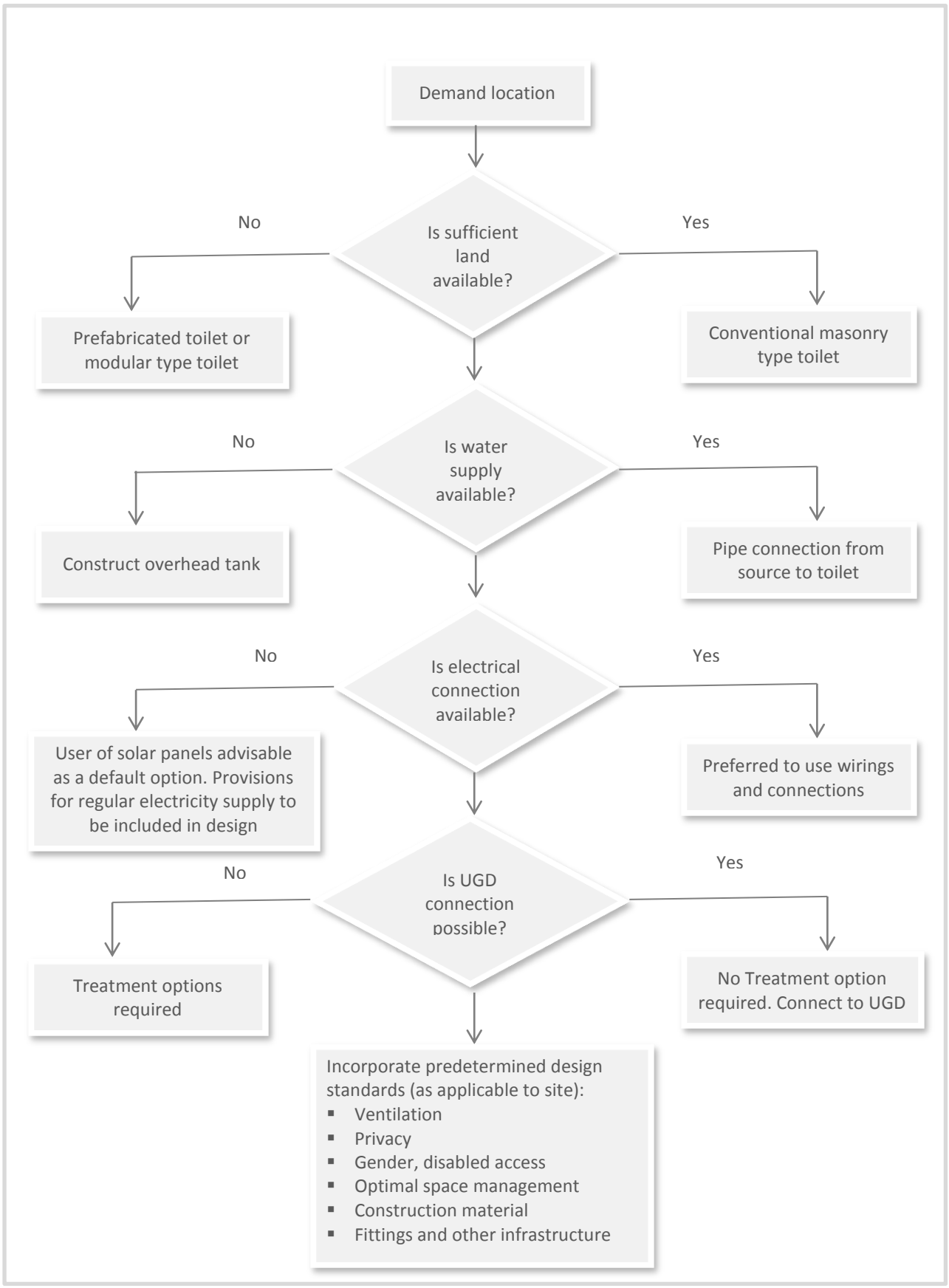

DRDO Bio-toilets


Sulabh Twin-pit Toilet


E-Toilets, Kerala


SPA Heritage Toilet, Delhi

Decision points in technical model selection



IV. Public Sanitation Scenario in Tirupati

Tirupati city, famous for its Lord Venkateshwara temple in the Tirumala hills, is located in Chittoor district in south-eastern Andhra Pradesh. Attracting thousands of devotees on a daily basis, the city is among the busiest pilgrim centres globally. Tirupati's economy is predominantly pilgrim and tourism based and related trade and commerce activities, with 96.5% of workforce engaged in the tertiary sector. More recently, the city's emergence as a regional centre for trade, higher end educational facilities has contributed to its economic growth. As the administrative headquarters of Tirupati Revenue Division, the town has a number of government offices, which adds to its floating population. Given its growing stature as an important urban hub in the region and its position as a renowned pilgrim centre, TMC was included for support under GoI's JNNURM program in 2009. The sanitation demands of such a rapidly growing urban hub are justifiably quite high, more so due to the unusually high levels of floating population in this city.

Mapping the access and quality of existing public sanitation facilities and understanding the nature of demand are imperative first steps to formulating strategies that will address gaps in service delivery. The city of Tirupati boasts of good coverage of toilets at the household level.[1] However, the inadequacy in coverage and lack of adequate public sanitation facilities is evident through high prevalence of open defecation and open urination, poor quality and maintenance of public sanitation facilities, weak safeguards for waste water management and absence of community toilets in low income areas. Review of user profile of existing public sanitation facilities in Tirupati city revealed four distinct user typologies:

- ***Tourist/Floating population*** - These users frequent public toilets in the pilgrim routes and transit hubs of the city. Transit hubs are primarily the RTC bus stand and Railway Station and floating population in the city access the sanitation facilities in these hubs
- ***Commercial population*** – Users from streets with more than 90% commercial establishments are termed commercial. Such locations, particularly with establishments such as shops and go-downs which do not house toilets within their premises, include; Beri Street, Prakasam Road, Tilak Road, Mosque Road, Gandhi Road, Karnala Street, KT Road, Devendra Theatre Road, Porla Street, Bandla Street, RTC Bus Stand area, AIR Bypass Road, Rayalcheru Road
- ***General Population*** - Persons who are not tourists, or working in an establishment in a commercial area or residing in a slum is deemed as a 'general' user
- ***Slum population*** – TMC has 42 slums with varying levels of access to sanitation at the household level. Residents of these slums who depend on public/community toilets for their daily use constitute this user type

Supply-side: Findings and Assessment

The city of Tirupati[2] has functional public and institutional toilets in 26 locations and 14 open urinal blocks, catering to floating/tourist, general, commercial and slum populations. Of these toilets, TTD has constructed 2 public toilets during 2012 – one of which is managed by Sulabh (inside Sridevi Complex) and the other (near Ramalayam) is managed by TTD itself. In 2013, TTD has constructed a toilet complex on Hare Krishna Road, near RUYA Hospital which is not yet open for public. There is 1 toilet block inside the Railway Reservation Counter, constructed by the Railway authorities and managed by private vendors which are primarily meant for users in this location. The 26 toilet locations also include 5 toilet complexes inside the city bus stand, which are owned by APSRTC and managed by private vendors.

It should be noted here that institutional toilets (toilets in schools / govt. institutions / hotels etc.) share some of the burden of increased public sanitation in the city. One of the key institutional providers of

[1] According to the CSP, the access to individual toilets is 93%

[2] For purposes of the study, Tirupati city would refer to the Municipal Corporation of Tirupati and the administrative boundaries of 16.07 sq. km comprising the TMC

sanitation facilities in the city is TTD. TTD owns the toilet complexes and Sulabh international operates under a maintenance contract which is located within the two pilgrim amenities complexes in the city (total of 15 toilets/142 seats within these two complexes). These toilets cater exclusively to pilgrim populations that use the TTD rest house facilities, and are not advertised as public toilets to prevent over-use.

Thus, the effective supply by the TMC is only 15 public toilet blocks against its total demand for public sanitation.

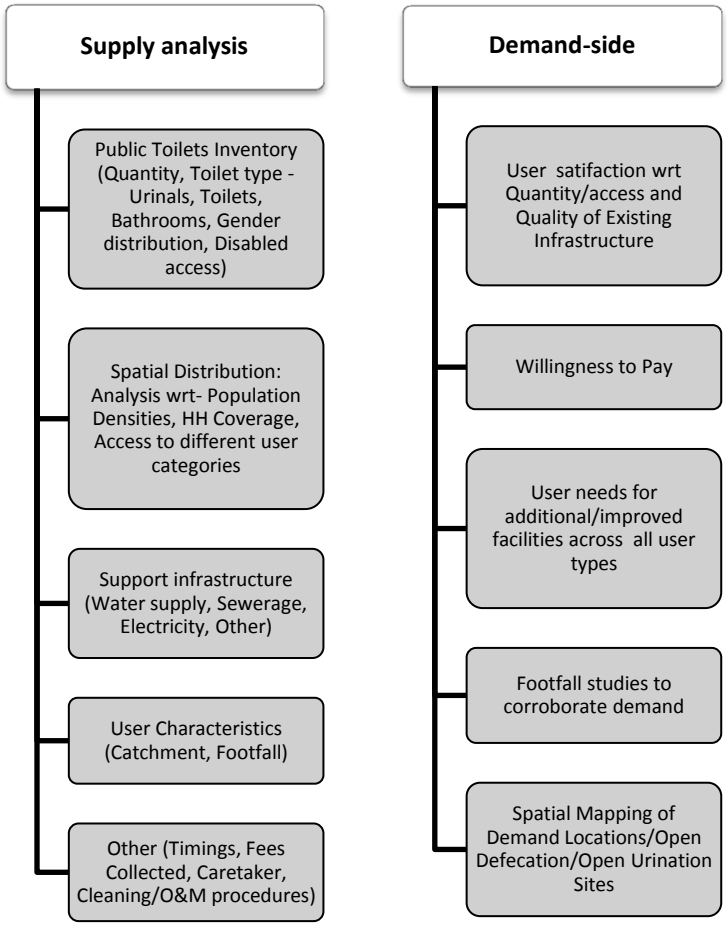


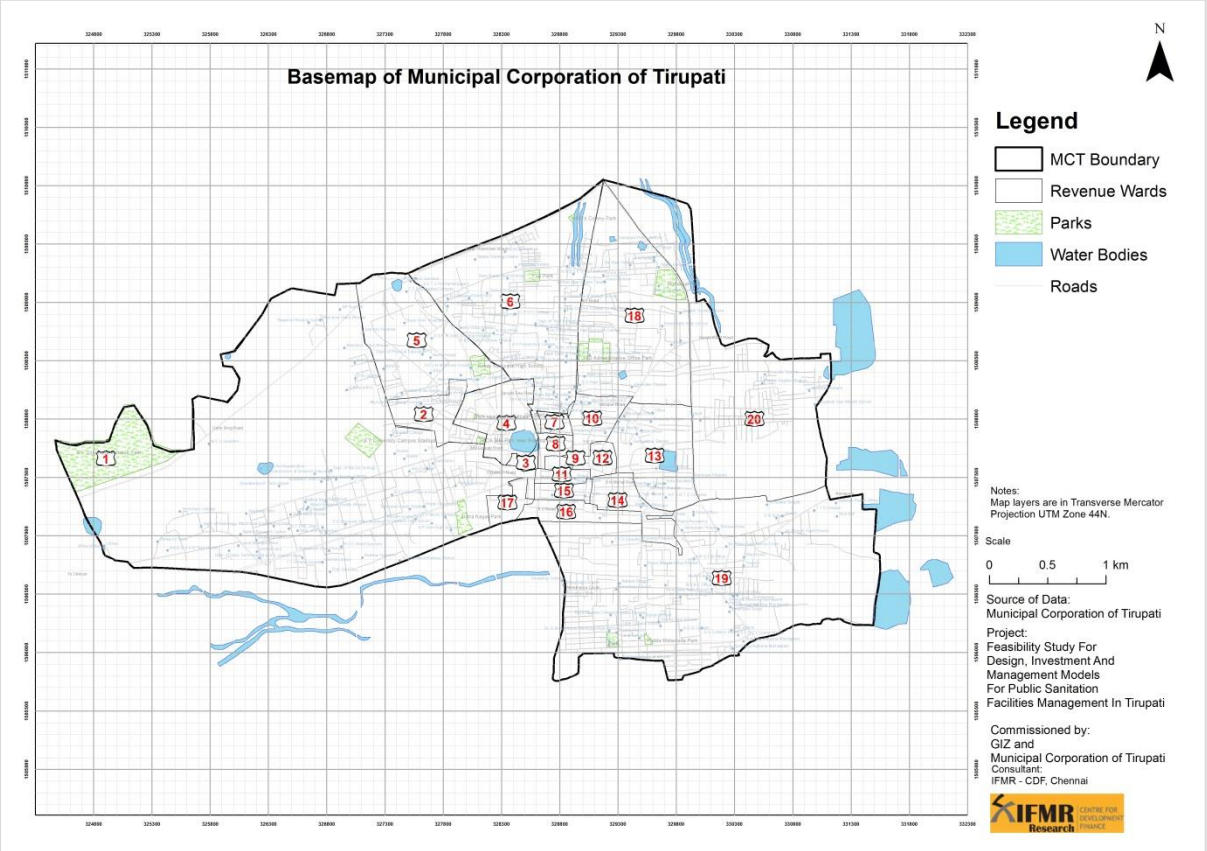
Table 2 Supply Gaps: Norms vs. Actual

Parameter	MoUD Norm	TMC Baseline
Access	Public toilet @ every 1km on roads and in open areas	Limited spatial dispersion of facilities
Gender	1:1 ratio (M/F)	Over 50% facilities owned by TMC have more seats for men (50 seats for men : 33 for women)
Disabled access	Full provision for disabled	No facility is disabled-friendly
Cleaning	Cleaning after every use (~40 secs)	Poor Maintenance (cleaning done 2-3 times a day at maximum)

General Infrastructure

All public toilets in the city are of the *pour and flush* variety. All toilets cater to both men and women - of the 307 toilet seats, 161 seats are for women and 146 seats for men. There are 127 shower facilities across the toilets owned by TMC and TTD, and none within the toilets managed by APSRTC and Railways.

Owner	Category	Toilet complexes	Seats	Seats (M)	Seats (F)	Urinal	Shower	Seats (Disabled)	Seats (Children)
TMC	Public, community	15	83	50	33	19	23	0	0
TTD	Public, institutional	5	153	60	93	76	104	0	0
APSRTC, Railways	Institutional	6	71	36	35	72	0	0	0
Tirupati City (total)	Public, Institutional, Community	**26**	**307**	**146**	**161**	**167**	**127**	**0**	**0**



All toilets have access to water, sourced through piped supply, bore-wells or water tankers. For those complexes dependent on bore water, when there is a water shortage, water tankers provide water which is stored in overhead tanks or tubs in/outside the complex. Caretakers in all toilets report seasonal variation in water supply and availability. During times of water scarcity, water for the toilets is reported to be collected manually at least 2-4 times a day from the nearest source. All TMC and TTD owned toilets have overhead tanks while APSRTC and Railways' toilets have sumps. TMC owned public toilet outside the city bus stand (opposite Hotel Kences) is not in use due to water supply issues.

Only one TMC-owned toilet – near Bommagunta (managed by Sulabh) is connected to septic tanks for waste disposal. The toilet in Balaji Colony Police Quarters (behind Kumarathopu slum) is a pit

latrine, and has only a hand bore for water supply without any water storage facilities. The remaining toilets are connected to the city's under-ground drainage system for waste treatment.

Electricity is available 24*7 in all toilets, with the exception of the toilet in Balaji Colony and the toilet in Indira Nagar slum. Electricity is primarily utilized for lighting, water sumps and cleaning.

There is no signage to assist in locating any of the public toilets in the city and signboards containing user fees are not displayed prominently in several toilets. There are no provisions for registering user complaints and their redressal. Even in the few toilets that display phone numbers for reporting complaints, the numbers are not functional.

User fees are not standardized across the city – toilets (Rs. 3/4/5), Shower (Rs. 6/7/10/15/20), Urinals (Free). However, no complex has records of usage and fees collected.

All public toilets in the city, except the toilet in Balaji Colony, have caretakers who are appointed by the service provider. Cleaning and daily maintenance are typically undertaken by cleaners, and only in their absence do caretakers take over.

There is no record of the public toilets year of construction, building and structural plans with the ULBs. During the surveys it was found that all public toilets, with the exception of two – near Jyothi Talkies (Bommagunta) and near Ramakrishna Deluxe (Bommagunta) – were constructed after year 2000. Six public toilets have been constructed since 2010 – Sulabh complex near RTC Bus Stand (Opp. Sreenivasam complex), Sulabh complex inside Indira Priyadarshini Market, Sulabh complex adjacent to Municipal Corporation of Tirupati Office, Sulabh complex opposite TUDA Office, Suvidha International near Sridevi Complex, and one toilet near Ramalayam (constructed by TTD). This indicates that the public toilet stock in the city is well below the estimated average life span of about 25 years for public toilets in general, suggesting a fairly satisfactory external structure that may not require immediate replacement. A structural audit may be required to assess the soundness of existing buildings and develop a retrofit plan of the toilet blocks to upgrade and modernize existing facilities.

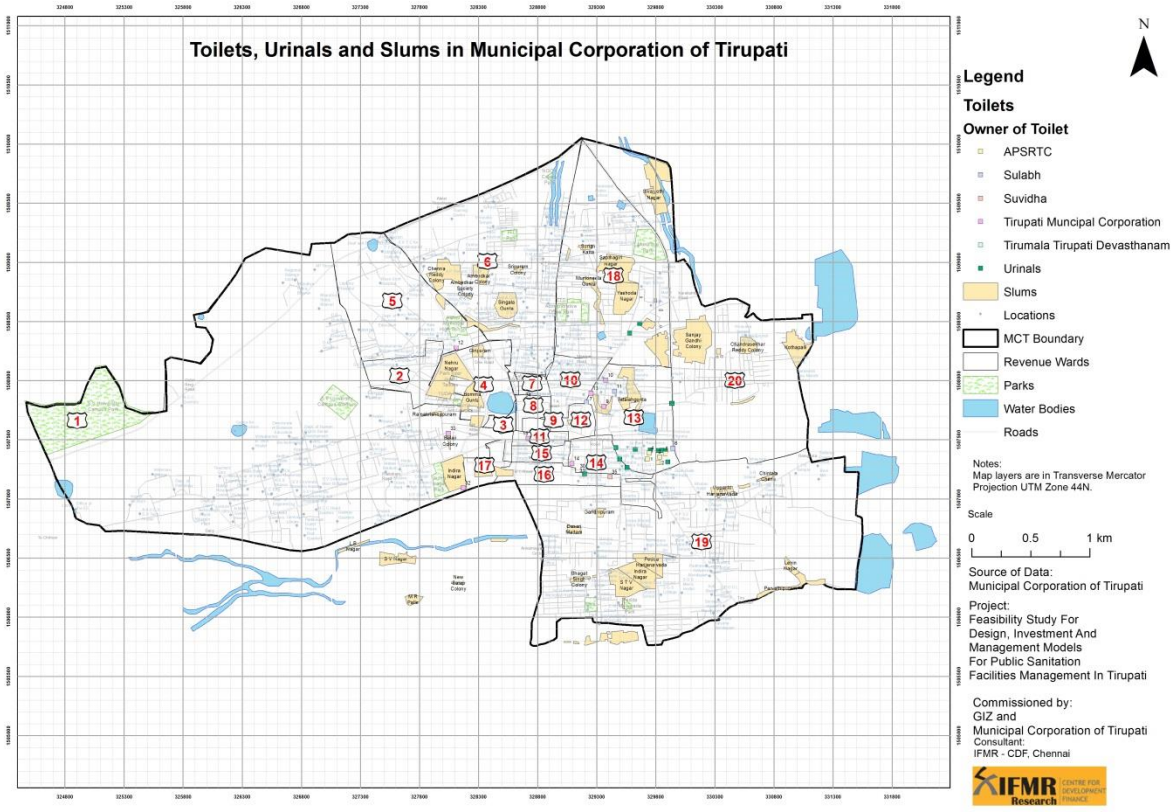
Location and Usage

Distribution of sanitation facilities is not consistent with population densities at the ward level. Prevalence of OD was particularly observed in wards 4, 6, and 20, in proximity to the slum neighbourhoods. There is limited spatial dispersion in the placement of public toilets, covering wards 1, 4, 9, 10, 13, 16 and 17. Clustering is observed, with 7 public toilets being located in ward 13, followed by ward 1 which has 4 facilities.

Commercial areas that correspond to the following wards: 2, 6, 10, 11, 15, 16, 18 and 19 have access to 1 or nil public toilets. This includes highly commercial areas of: Prakasam Road, Gandhi Road, Karnala Street, Tilak Road, Mosque Road, KT Road, Devendra Theatre Road, Porla Street, AIR Bypass Road and Rayalcheru Road. From a distance standpoint, the closest public toilet or urinal is at least 1km away from certain commercial areas such as KT Road, Prakasam Road, Rayalcheru Road and AIR Bypass Road, underscoring the need to improve services in these locations.

In the tourist corridor, which spans the transit hubs in the city including the Railway Station and RTC Bus Stand (wards 13 and 14), there appears to be adequate supply of public toilets. However, the quality and infrastructure of these toilets are quite poor with persistent water supply and clogging issues. Consequently, these areas are also the "sanitation hotspots" of the city, with a high prevalence of open urination. Further, the user catchment is particularly high in these locations since both the RTC Bus Stand and Railway Station serve as transit hubs and critical pilgrim entry points into the city. Owing to the high catchment, there are a number of small commercial establishments in the vicinity, compounding the demand for better public sanitation services along this corridor. TTD's pilgrim amenities complexes – Srinivasam and Vishnuvasam, located adjacent to the RTC Bus Stand and Railway Station, respectively – handle a bulk of the daily pilgrim catchment. However, given the

scale of pilgrim movement in these areas, there is a strong need to improve service delivery in this corridor.



According to the City Sanitation Plan of Tirupati, the average daily floating population is around 55,000 persons, and projected to grow to at least 67,000 by 2021 (according to the CDP). As the administrative headquarters of the Tirupati Revenue Division, the government offices in the city attract high floating populations as well. The sanitation demands of such high levels of floating populations have a strong bearing on the city sanitation planning process and necessitate improvement of public sanitation facilities along this corridor both in terms of quantity and quality.

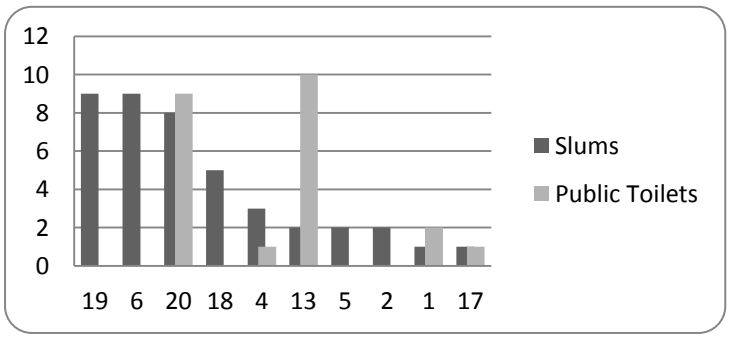


Figure 1 Public Toilet dispersion in wards with Slums in Tirupati

In terms of geographical spread, slums appear to be concentrated in specific wards and not evenly dispersed across the city, with high concentration in revenue wards 6 (8 slums), 19 (9 slums) and 20 (8 slums). However, there are no public toilets in wards 6 and 19. Ward 20 lies at the heart of the tourist corridor of the city and TTD is a key institutional provider of public sanitation in this ward. All 9 public toilets in the ward are managed by TTD (inside pilgrim amenities complex) and are not accessible to the general public or slum populations in the city. Apart from ward 13, the remaining wards which house the slums in the city have access to only 1 public toilet block (wards 1, 4, and 17) per ward or no access to public sanitation facilities at all (wards 6, 18, 19, and 20). Approximately 30% of slums (12 slums) have less than 50% coverage in terms of household level sanitation. This underscores the high demand for public/community sanitation facilities in these locations.

Daily user catchment in each complex is in the range of 200-1000 users. RTC Bus Stand and Sridevi Complex record the highest catchment, and record maximum daily collections. Peak usage is in the morning, and urinals and toilets receive maximum patronage in comparison to showers.

It should also be noted here that only 8 out of the 26 toilets in the city are built on patta land owned by TMC. 7 toilets are built on road margins and 2 over nalas due to land constraints within the city as well as precedence of land for purposes other than public sanitation. The remaining toilets are built on land owned by APSRTC, TTD and Railways departments.

Table 3 Land on which toilet structure is built

Inside Railways reservation counter	Inside RTC Bus stand	Nala	Amenities complex	Patta land	Road Margin	Scavenging lane	Total
1	5	2	2	8	7	1	26

Asset Management

Since demand for sanitation in the city is highest due to the pilgrim/floating populations, TTD is key stakeholder for sanitation service provision in the city. TTD owns two public toilets in the city, both of which are managed and maintained well. TTD owned toilet inside Sridevi complex is managed by Sulabh, which holds a good reputation as a sanitation service provider in this city. This complex receives a high footfall – 500 users/day and records daily collections of approximately Rs.1600. The caretaker of this toilet reportedly receives a salary of Rs. 4000 per month. The additional major O&M costs for this toilet would primarily include salary for 1 cleaner, electricity costs and cleaning supplies. However, given the footfall received by this complex, the potential income generated seems adequate to cover the O&M costs incurred on this toilet.

The toilet in Ramalayam, managed directly by TTD, also appears to be managed quite well. The complex records a much lower footfall – reportedly, 100 users per day. The caretaker of the complex doubles up as a cleaner and reported to being paid Rs.15, 000 per month. This toilet again is free of cost to users. As with Srinivasam and Vishnuvasam complexes, the O&M costs on this toilet is also managed entirely by TTD with the support of Sulabh International.

Table 4 Public Toilet Management Models in Tirupati

Constructed/O&M	# Toilets	% of Total
TTD/Sulabh	1	5%
APSRTC/Private	5	24%
TMC/Sulabh	6	29%
TMC/Private	6	29%
Sulabh/Sulabh*	2	10%
TTD/TTD	1	5%
TTD/TTD (Institutional)**	15	

* BOT basis, both toilets owned by TMC, constructed/managed by Sulabh; ** Toilets inside pilgrim complexes (Vishnuvasam and Srinivasam) managed by TTD (Institutional category)

One of the predominant management/service provider models in Tirupati is Sulabh. Sulabh manages 7 out of the 17 toilets owned by TMC. All toilets appear well-maintained. All toilets managed by Sulabh contain shower facilities. Each toilet receives a footfall in the range of 200-500 users/day. With the exception of toilets near Jothi Talkies and opposite Court complex, all other Sulabh toilets have caretakers and cleaners. Cleaning is handled 5-8 times a day. Caretakers are paid a monthly salary. Though connected to bore-wells, a majority of Sulabh's toilets appear to get their water supplied through water tankers. This is an additional O&M cost that the provider has to bear during times of water scarcity. In any case, review of the contracts with Sulabh indicates that contracts have been awarded by TMC for a 30-year period and with provisions to increase user fees by 20% annually. Sulabh is entitled to effect this annual increase based on just the contractual provisions. Additionally, Sulabh also stands a spatial advantage since all toilets that it manages are

located in medium-to-high footfall areas and consequently the revenues generated through user fees are considerable. Further, Sulabh is permitted to use the toilet walls for advertising purposes without any revenue sharing requirements with the Corporation.

Hence, Sulabh appears well-positioned to meet the O&M expenses incurred on these toilets through its user charges. Further, the long-term nature of the contract offers an adequate opportunity for the provider to recover any capital costs and generate ample surplus. It should be observed here that TTD has hired Sulabh as the primary O&M provider for sanitation services in Tirumala and TTD assets in Tirupati. Sulabh had approximately 2840 employees operating in Tirumala and Tirupati. However, TTD has recently initiated a drive to identify areas that receive lesser footfall and consequently lower levels of maintenance. TTD also intends a more rigorous monitoring of performance and demand, and seeks to strengthen its contract awards process through strong tendering mechanisms. There are lessons that can be incorporated while planning and management of facilities in Tirupati city.

Another management model in Tirupati is toilets constructed by TMC and management outsourced to private contractors as maintenance contracts. 6 toilets in the city follow this model. Except Suvidha Social Organization which appears to have a presence outside of Tirupati, it is unclear if any of the other private contractors operate outside the city. Contractual terms and conditions between the city and these providers are unclear. A majority of these toilets appear unclean and ill-maintained although it is reported that cleaners are appointed to clean the toilets 5-6 times daily.

The last management model is toilets constructed by APSRTC and O&M outsourced to private contractor. These toilets receive the maximum footfall in the city (approximately 1000 users/day). Each toilet appears to have 2 cleaners in addition to the caretaker and toilets are reported to be cleaned 5-10 times daily. Nevertheless, the toilets appear very poorly maintained, with issues including – lack of cleanliness and hygiene, bad odour, water clogging, inadequate water supply, etc. The contractual terms between APSRTC/TMC and the private contractor are unclear.

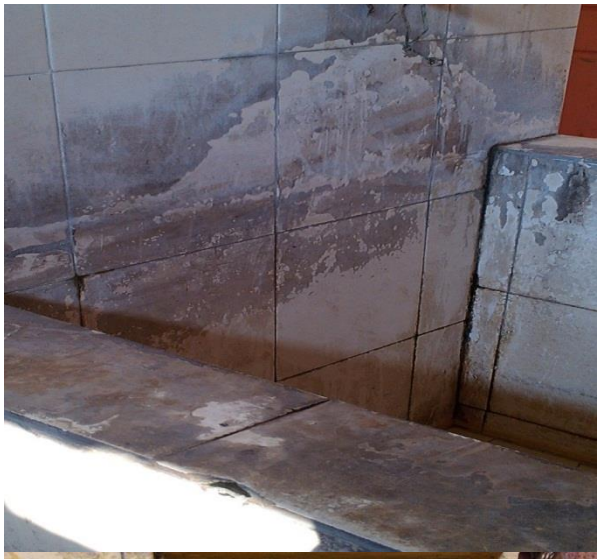
Over 47% of the gross total supply in the city is provided by TTD, through their pilgrim amenities complexes, Srinivasam and Vishnuvasam, and additional toilets in two other locations. Constructed in 2002, the Srinivasam complex is older than Vishnuvasam, which was constructed in 2010. Both complexes are well-maintained and are managed by supervisors appointed by TTD. The toilets do not have dedicated caretakers. Each complex has between 3-6 cleaners who are responsible for cleaning the entire complex, including the toilets. The toilets are cleaned 7-8 times every day. Water supply and electricity are available 24*7 and the complexes are open 24*7.The toilets are in good condition, clean, odour-free and do not have water clogging or any other issues. TTD appears to bear the entire O&M costs on these toilets since they are extended free of charge to pilgrims.

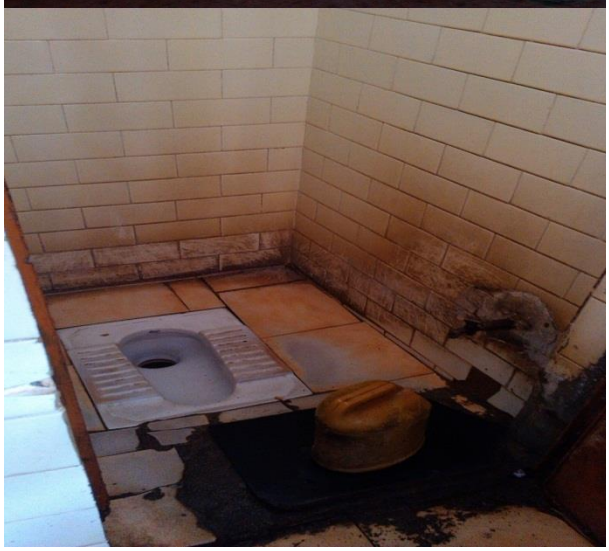
Two public toilets in the city – both opposite court complex, one near Visalammana Temple and another in Balaji Colony, double up as community toilets, serving the slums in the vicinity, Poola Thota and Kumarathopu, respectively. The toilet adjacent to Poola Thota is managed by Sulabh with 4 toilet seats (2 for men and 2 for women), with 1 shower stall. This facility has a caretaker and the user charges are nominal – Rs. 3 for defecation and Rs. 6 for use of shower and receives an average footfall of 200 users/day. The toilet appears clean and well-maintained. On the other hand, the toilet near Kumarathopu is maintained directly by TMC. It caters primarily to households in this slum.

However, the toilet does not have a caretaker, there is no water connectivity or electricity inside the toilet complex and no user charges are collected. Users draw water from a hand pump nearby and are required to bring water containers from their house for their use. Visits by our field team revealed that the complex is maintained very poorly with open defecation around the toilet complex.

In summary, the quality of supply appears to be better in the facilities managed by TTD and Sulabh. The reasons for this are varied. TTD aims to provide a satisfactory user experience for pilgrims and is guided by its philanthropic motive to provide well-maintained facilities for its patrons at no cost. Sulabh is an established sanitation service provider with a pan-India presence and reputation and plausibly brings its quality standards and experience into service provision in Tirupati. However, it

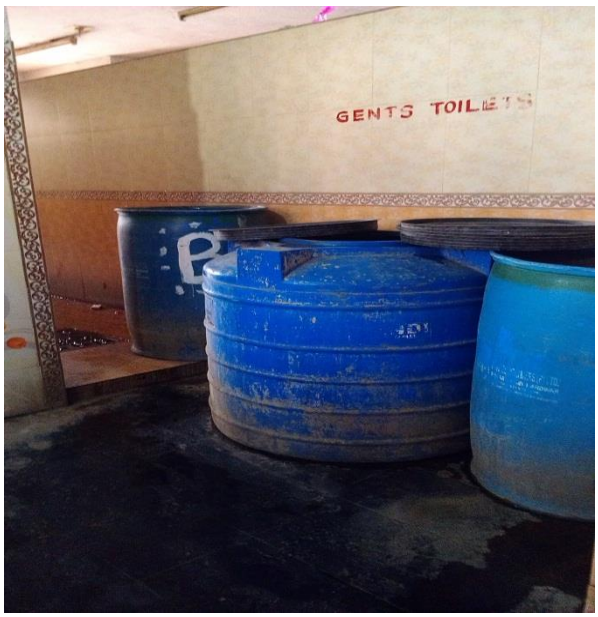
should also be noted that Sulabh appears to have favourable contractual arrangements in the city, and has managed to restrict its presence to high footfall areas, for extended concession periods and without any revenue sharing or cross-subsidization arrangements to offset its potential gains from the toilet stock it currently manages. The absence of standards in terms of quality (in design, construction and maintenance), monitoring and enforcement appears to be adversely impacting the management of remaining toilets in the city.






TOILETS
మరుగుదొడ్లు
கழிவறைகள்
శౌచాలయ
కౌతాలయం


TOILET RS-1:00
APSRTC


GENTS TOILETS

Box 2: Observations of major private sector sanitation operators in TMC

Component	Sulabh	Suvidha
Market presence	Pan-India	Primarily in Andhra Pradesh, in Hyderabad, Secunderabad, Chittoor
# of toilets managed in TMC	BOT – 2 Maintenance Contracts - 9	BOT – 3 completed, 2 in pipeline Maintenance Contracts - 0
Approximate daily footfall in each toilet complex	300-400 users/day	500 users/day
Minimum daily footfall expected in BOT projects	300 users/day	Minimum collection of Rs. 1000/day
Typical CAPEX & OMEX per block	CAPEX - Rs. 5 lakhs for blocks with 5-6 seats , 2 urinals and 1 shower OMEX – Rs.30,000 – Rs. 40,000 per month (includes water purchase)	CAPEX - Rs. 7-8 lakhs for blocks with 6 seats, 1 urinal, 1 shower OMEX – Rs. 20,000 per month (not include water purchase)
Concession period	25-30 years for BOT Minimum of 5 years for MCs	25-30 years for BOT (10-15 years is an acceptable period)
Business model	Not in favour of open tender process. Typical model is to assess demand and directly approach city with expression of interest to undertake projects in demand areas. Demand centers around OD/open urination areas, market areas, unserved areas	Same as Sulabh
Preference for BOT/MC	Open to both	Open to both
Cross-subsidization	Open to same. Currently in practice – Sulabh handles O&M for Kumarathopu community toilet for free	Open to same provided city funds construction and operator needs to handle only O&M
Maintenance protocols	No defined protocols. Cleaning frequency is site specific, governed by usage. Cleaning 3-4 times/day, fully at night Employ caretakers and cleaners	No defined protocols. Typically cleaned 2-3 times a day and fully at night. Caretakers handle cleaning as well. Cleaners are engaged separately only for toilets with very high footfall.
Monitoring	City based supervisor who monitors performance and attends to maintenance requirement in each toilet in the city	District based supervisor who monitor performance and attends to O&M requirements
Technology adoption	Open to adopting technologies that are economically/financially viable. Can use solar panels, etc. if city fund expenditure.	Open to undertaking technology improvements needed by the city, subject to viability
Measures to prevent open urination/defecation	Beautification of surrounding areas. Caretakers are required to monitor OD/urination does not happen around the block.	Caretaker responsible for controlling OD/urination around toilet block.
Perceived demand in TMC	Primarily in pilgrim corridor, transit areas (railway station, bus stop)	Near passport office, SV Maternity Hospital, Annalayya Circle, Thiruchanur Road
Perceived advertising potential in TMC	No potential for revenues through advertising	Not carried out a review

Contracts review

Our review of public toilet management practices in Tirupati makes apparent the role of private participation in sanitation service delivery. The O&M for 62% of the toilets in the city have been outsources to private contractors as maintenance contracts. 23% of toilets in the city are under the BOT model. There is no information available on 15% of the toilets. The shift towards BOT model of public toilet construction and management appears to be fairly recent in the city. Six out of the nine toilets constructed in the city since 2010 are under the BOT model. All BOT contracts address supply only in the pay-and-use public toilet category and do not cater to community users.

Some of the critical challenges in asset management of public sanitation facilities in Tirupati can be traced to gaps and inconsistencies in the contracts award and structuring process. A review of the contract agreements between the TMC and private vendors reveal the following issues:

- No standardization of contract agreements between the different vendors
- Absence of design specifications, protocols and standards for materials use
- Inconsistent concession terms (concession periods, advertisement revenue sharing, etc.) between the different vendors which promote monopoly and unfavourable conditions for encouraging competition for successful PPPs
- Poor risk-reward allocations between the public and private sector, offering private sector a greater financial advantage:
    - Award of several high revenue potential areas to the same contractor
    - No requirements for cross-subsidization
    - Inordinately lengthy concession periods (~25-30 years), diluting accountability
- Lack of clarity in terms pertaining to land transfer/acquisition and necessary clearances
- No procedures and modalities for contract supervision and enforcement, specifically in:
    - Setting and modification of tariffs
    - Norms and prescriptions for recommended service levels
    - Oversight of contract adjustments
    - Oversight of service levels and performance
- No penalties for non-compliance

Open urinals

All 14 open urinals (cater only to men) are owned and constructed by TMC. The construction year of these urinals is unknown. There is very limited spatial dispersion of these urinals, 10 out of the 14 urinals located in revenue ward 13. Open urinals are free. There is no water supply. None of them have caretakers and no maintenance is undertaken on a daily or even regular basis. All urinals are in a dilapidated condition, structurally worn, urine bowls stained, with heavy odour and aesthetically unappealing. Open urination is a fairly common occurrence even within close proximity of these urinals.

Since these urinals are located in highly commercial or tourist areas, they present a significant opportunity for the city to improve its sanitation services. Patronage of these urinals can be improved by converting the existing open urinals into covered urinals and where land is available, the urinals can be converted to public toilets. This retrofit can also be monetized through advertising on the walls of the urinals and levy of user charges on those converted to public toilets. Maintenance of closed urinals can be bundled up into the contracts of service providers of public toilets in the vicinity.

Summarizing supply

In view of the considerable gaps and inconsistencies in service provision, it is imperative for TMC to commit to desired outcomes from public sanitation facilities that focus on quality, improved public health and environment.

- *Create clean, safe, accessible public sanitation facilities where there is a need*

- *Define and enforce service standards that uphold quality in order to ensure sustained use and to safeguard public health*
- *Provide facilities at a reasonable cost to users*
- *Create facilities that minimize environmental impact*

To ensure that these service outcomes are effectively achieved, the city must identify and facilitate critical performance inputs and put in place mechanisms to measure corresponding outputs and outcomes.

Table 5 Supply side success factors

Success Factor	Performance measures/inputs	Minimum requirements
Access	# Toilet seat per 1000 population	1 toilet seat per 100 users, 1 urinal unit per 200-300 users[3]
	Distance to walk	1 km
	Time taken to walk	5 minutes
	Gender access	50:50
	Disabled access	Mandatory
	Institutional (parks, buildings, markets)	
	Toilets open 24 hours	Based on location demand: Yes – transit areas, slums; No – commercial, residential
Quality	Cleaning frequency (sanitary ware, floors. fittings, wash basin, walls, doors, windows)	# of times daily/weekly/monthly (based on usage levels)
	Age of facility	18 years
	Design, construction, maintenance	Standardization across city[4]. Guidelines to adapted to location
	Continuous water supply	24 hours
	Electricity	24 hours
	Waste management	Mandatory septage/sewerage connection
	Monitoring	Standard guidelines across city
Contracts	Contracts structuring process	Standardization across providers
	Bid process	Transparent, open bid process
	Provision for cross-subsidization	Mandatory
	Duration of concession	10-12 years
	Tariff	Standardization across city
	Performance mandates	Mandatory
	Penalties for non-compliance	Mandatory
	Packaging of contracts to achieve scale	Mandatory
Institutional	Standards of provision	To be included in regulatory framework
	Funding	Annual budget commitment
	Functionaries	Clear roles and responsibilities for public toilet planning and asset management
	Asset information	Create and maintain database
	Monitoring and enforcement	Committed resources
	Awareness generation	Strategies targeted to user groups

Demand Assessment

Detailed city-wide surveys were carried out to obtain inputs on issues of access, user satisfaction with quality of service, gender perspectives and willingness to pay for improved services. Around 1000 users of public sanitation facilities in the city were surveyed. The users were uniformly distributed across three user typologies (tourists, commercial, general) and interviews were conducted along

[3] The Guidelines for Community Toilets, 1995, MoUD, GoI

[4] Standards given in National Building Code of India (Building Materials, Construction Practices and safety), Indian Standards prescribed by Bureau of Indian Standards

important tourist and commercial corridors in the city. To ensure that gender perspectives and issues are adequately captured, 50% of the sample interviewed was women. Slum households were not surveyed as part of the study; MEPMA Socio-economic survey data (2010-11) was relied upon to assess demand in slums.

User satisfaction

The survey sought to understand user satisfaction with respect to quality of service, as measured by wait time, cleanliness and privacy. While there are no benchmarks for these concepts, for the purposes of the study:

- Cleanliness was defined as an absence of water non-availability, water logging, foul smell and bad condition of toilets.
- Privacy is important from a gender perspective and refers broadly to condition of doors, whether they lock etc., which ensures privacy of the respondent.

A majority of users of public toilets in the city did not appear to have any complaints about wait time in the toilet. About 74% respondents in the survey said there was no wait time, 15% of respondents said they had to wait 5-10 minutes. In the commercial corridor, 73% respondents stated that 7 am to 12 noon was the time facilities were most crowded. There does not appear to be a "peak time" in tourist/transit hubs.

In terms of access (measured by walking distance and/or time taken to walk), over 43% of respondents had to walk at least 1km to the nearest toilet and 17% had to walk 0.5km to access a toilet. At least 31% of those who had to walk 1km or for 10 minutes are from the commercial corridor. There is also a high prevalence of open urination observed in the commercial corridor, underscoring our earlier finding that public toilet supply is limited in key commercial locations.

About 60% of respondents who used public toilets in the city gave a cleanliness rating as *fair to poor*. Almost 65% of them gave a privacy rating of *fair to poor*. Public toilets received an overall satisfaction score of 50%, with reasons for dissatisfaction involving:

- Lack of water
- Water logging
- Odour
- Cleanliness
- Poor infrastructure
- Poor maintenance
- Privacy

Along the tourist corridor, user satisfaction was particularly high (80%) with the pilgrim amenities complexes maintained by TTD in comparison to other facilities. Over 50% of respondents at the other facilities in the tourist corridor indicated that the facilities were either "dirty" or in "passable" condition.

Gender perspectives

Approximately 66% of the women respondents stated that the facilities lacked privacy and about 58% women respondents felt the facilities scored poorly or passably in terms of cleanliness. Almost 42% of women stated that they were dissatisfied with existing facilities and cited reasons for

Gender-based Service Criteria

- *Location (accessibility, safety, security)*
- *Visibility (external signage)*
- *Privacy (separated from men's toilets, door locks)*
- *Infrastructure (water, lighting, door)*
- *Cleanliness*
- *Access for Children*

Service Criteria for the Disabled

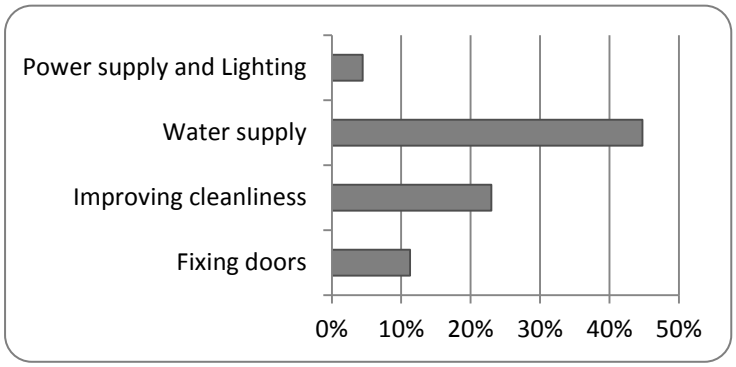
- *Accessibility (ramp design)*
- *Infrastructure (door, hand rests, disabled friendly WC)*

dissatisfaction as: no water, bad odour, water logging and lack of privacy.

Among the general population interviewed, **58% of women ranked the cleanliness of the facility as poor, while 67% felt that there was no privacy.**

When women were questioned about the nature of infrastructure improvements that are needed to improve the condition of public toilets, they expressed a strong demand for uninterrupted water supply, cleanliness, privacy and electricity. Other necessities expressed were minor infrastructure improvements such as replacement of buckets, tubs and mugs, provision of hand-wash, using ordinals, room fresheners and phenyl inside bathrooms. A few respondents also expressed to have separate toilets for men and women or at least separate entrances, underscoring the fact that privacy in public sanitation facilities is a key concern for women. And a few respondents expressed a desire to have female caretakers.

Figure 2 Gender perspectives on infrastructure improvements



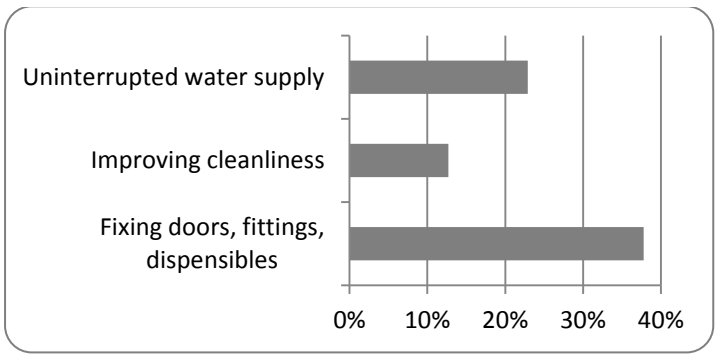
Willingness to pay

39% of respondents felt the amount charged was appropriate for the services rendered, while 32% felt it was too much. When inquired about willingness to pay for additional improvements, a stark majority (61%) declined, with only 22% respondents expressing willingness to pay more. There appears to be a perception that any increasing user charges will not necessarily result in improvement of the condition of public sanitation facilities. Notwithstanding the limited willingness to pay for improvements to the facility, with more than three-fourths indicating a lack of WTP, it is important to note, that a majority of respondents felt that the use of the toilet complex should not be free[5]. One plausible reason for this is that people feel that public utilities and services in general are better maintained both by the user and the public authorities, if a payment is involved. Certain respondents also suggested that public toilets can be made free for women, children and disabled.

Infrastructure improvements

Water supply, cleanliness and other improvements such as replacement of doors, sinks, and taps emerged as the key areas of concern for user of public toilets in the city. There are differences across gender with regards to improvements needed for the toilet complex. For male respondents, 85% felt that there needs to be infrastructural improvements (replacing of doors, windows, sinks, mugs etc.), whereas women wanted the water supply situation to be improved first, followed by replacing the door (to increase privacy).

Figure 3 User preferences for infrastructure improvements in Tirupati



Respondents also came up with suggestions to improve cleanliness, hygiene and odour, including increasing cleaning frequency, increasing use of cleaning supplies such

[5] 36 respondents felt that women, children and differently abled should have to pay no user fees.

as phenyl, acid, room fresheners, providing hand wash, soaps and towels, etc. When questioned about the type of toilet that would be preferred in a public toilet, a majority of respondents indicated that they would prefer the existing "Pour and flush" latrine variety.

Summarizing demand

Key inferences from demand assessment are – toilets managed by TTD provide a better user experience than the toilets managed by TMC. Usage patterns vary according to demographic influences and water supply, clogging and general cleanliness emerged as key causes for concern. To this end, the critical demand outcomes TMC must strive fulfil will be:

To provide quality user experience in the form of toilets that is clean, well-maintained, safe, hygienic and conveniently located

Table 6 Demand assessment findings in TMC

Category	Nature of demand	Demand locations identified by users
Tourist	Increase supply No identified "peak times" Facilities needed 24*7 Improve quality of existing facilities to better user experience Improve water supply Improve gender, disabled access	Any increase in supply or improvement in existing facilities will be welcomed along this corridor
Commercial	Increase supply where there is a need Peak time – 7am to 12 noon (Cleaning and access to be tailored around peak usage times) Improve gender access Provision of shower not essential	Annamayya Circle, Bandla Street, Beriveedi, Opp. Fish market, Tirumala Main Road, Tilak Road, Near Saibaba Temple, Gandhi Road, Near Hanuman Temple on KT Road, Karnala Road, Netaji Road, Gandhi Circle, Prakasam Road
General	Increase supply where there is need Improve gender, disabled access Improve privacy for women Address issues relating to water supply, clogging Improve user experience – focus on cleanliness, odour, hygiene Shower facilities needed based on demographic and usage (proximity to slums etc)	Alipiri, Balaji Colony, Bhavani Nagar, Chenna Reddy Colony, Chintakalaya Street, Gandhi Circle, Korlagunta, Near Group Theatres, Sai Nagar

Gaps and Actions

As next steps, a detailed gap analysis can help corroborate the demand areas identified by users, effective supply in the user corridors and identify the "sanitation hotspots" in the city so as to effectively plan for improving facilities along deficient areas. To this end, the team carried out a detailed exercise of spatial and non-spatial analysis of access along the city's primary demand corridors.

Tourist areas

Based on discussions with the TMC officials, the tourist corridor in the city was identified as an approximately 2 km road distance, spanning the city's Railway Station in Ward 14, Vishnuvasam Pilgrim Amenities Complex in Ward 14, the RTC Bus Stand in Ward 13 up to Srinivasam Pilgrim Amenities Complex in Ward 13.

The CSP identifies a daily floating population in the Tirupati city as 55,000 persons per day. According to the MoUD norm of 1 toilet seat per 250 floating population, the public sanitation requirement to cater to the daily floating population along the tourist corridor in Tirupati is 220 toilet seats. The effective supply by the city along this corridor is just 74 toilet seats (not including the 144 urinals catering to men and toilets located inside the Railway Station, and the 138 toilets seats in the pilgrim amenities complexes). Clearly, this supply is much below even normative standards. Further, as revealed by demand surveys, the quality of supply of public toilets along this corridor is quite poor. Open urinals in these areas are in very poor condition. Further, there are a number of smaller commercial establishments in this area as well as low income areas which place an additional demand on public sanitation facilities. Hence, there is a pressing need to improve both the quantity and quality of public sanitation facilities in this corridor.

Actions

- *Owing to higher user catchment near the Railway Station or RTC Bus Stand, construction of additional toilets based on land availability*
- *Refurbish existing public toilets near both locations to meet required quality norms and plug service gaps*
- *Adhere to design and construction standards in new stock and strictly enforce O&M standards/protocols in new and existing stock*
- *Footfall in all locations along corridor justifies BOT models or Maintenance contracts*
- *If contract awarded to private sector, explore opportunities to cross-subsidize against service provision in low income areas*

Commercial areas

While assessing supply, access to public toilets (as measured by walking distance and time taken) is a key concern from a user perspective. The demand surveys along this corridor indicated lack of supply as well as quality deficiencies in existing supply. Thus, for purposes of increasing supply (access) along this corridor, the primary spatial and non-spatial indicators of evaluation include:
1. Commercial establishment density, 2. Proximity to Public Toilets, 3. Proximity to Urinals

Roads that have high commercial density and farthest away from public toilets/urinals or with toilets in very poor condition should be prioritized for sanitation planning purposes. Based on an assessment of the commercial corridor along these indicators, the following action items are recommended in this corridor.

Actions

- *Construct new toilets on Prakasam Road (ward 1,11), KT Road (ward 18), Rayalcheru Road (ward 19), AIR Bypass Road (ward 19)*
- *Adhere to design and construction standards in new stock and strictly enforce O&M standards/protocols in new and existing stock*
- *Footfall (approximately 200- 500 persons per day) in most locations along corridor justifies BOT models or Maintenance contracts*
- *If contract awarded to private sector, explore opportunities to cross-subsidize against service provision in low income areas*
- *City should continually assess demand along this corridor, identify locations and construct toilets in unserved areas*

General areas

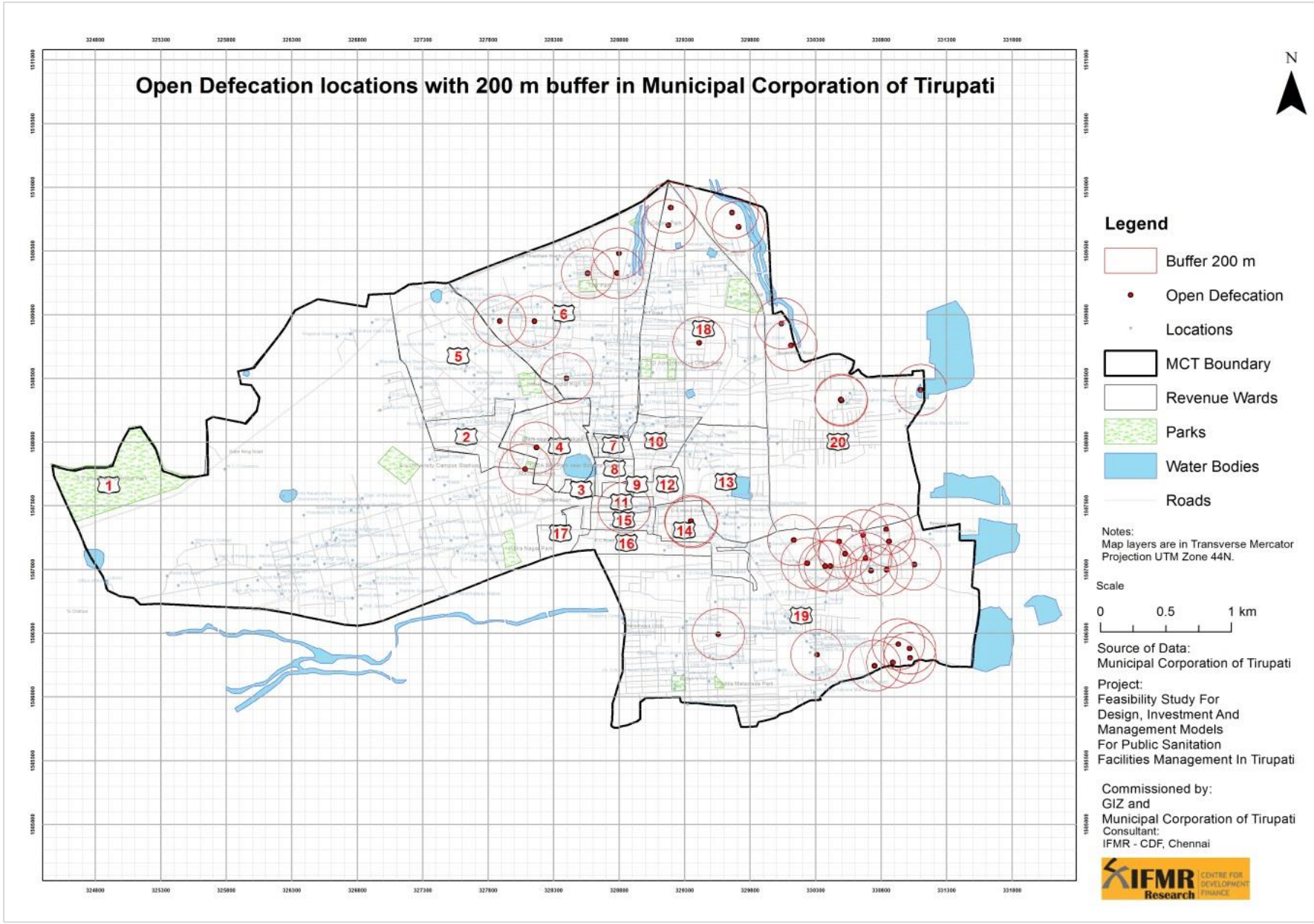
As explained earlier, for the purposes of the study, a ‘general’ user is defined as a person who is not a tourist or working in a commercial area or residing in a slum settlement. By this definition, a general user is one that is a resident of Tirupati, possibly with access to sanitation at the household level, but

relies on public sanitation facilities when in public places. Catering to this user profile would thus require an understanding of the demographic profile of wards, and targeting wards that contain:
1. High population densities, 2. Low coverage of household level facilities, 3. Low coverage of public toilets, 4. Public spaces, 5. Institutional areas, 6. Areas with high prevalence of OD/urination

Since household coverage at ward level is unknown, an assessment of wards along the remaining parameters was carried out and the following immediate interventions are recommended. Based on reconnaissance visits carried out, a number of locations were identified as having a high prevalence of open defecation/urination. In the city's efforts to achieve ODF status, these locations require highest priority in terms of sanitation intervention.

Actions

- *OD/urination areas – IS Mahal Talkies Road (ward 4), Near IRCTC Reservation counter (ward 14), Behind Bhooma Theatre (ward 19), Near Pratap Theatre Complex (ward 13), Near Passport office (ward 19)*
- *Construction of new toilets in wards 18 and 19 which have high concentration of commercial areas as well as slum locations but no public toilets*
- *Wards 8 and 12 have high population densities but no public toilets and hence require intervention at the next stage*
- *Adhere to design and construction standards in new stock and strictly enforce O&M standards/protocols in new and existing stock*
- *Where possible, carry out retrofit of existing toilet/urinal stock across the city to meet quality standards and user needs*
- *Management model to be decided based on footfall in selected location. BOT or MC can be adopted in high footfall areas, cross-subsidization with BOT/MC provider can be considered in areas of low footfall*
- *Annexure 2 provides a city-wide list of sites that require public sanitation improvements*
- *Other city-wide strategies include conversion of open urinals into covered urinals or public toilets where land is available*


Open Defecation locations with 200 m buffer in Municipal Corporation of Tirupati
N
Legend
Buffer 200 m
Open Defecation
Locations
MCT Boundary
Revenue Wards
Parks
Water Bodies
Roads
Notes:
Map layers are in Transverse Mercator Projection UTM Zone 44N.
Scale
0
0.5
1 km
Source of Data:
Municipal Corporation of Tirupati
Project:
Feasibility Study For Design, Investment And Management Models For Public Sanitation Facilities Management In Tirupati
Commissioned by:
GIZ and
Municipal Corporation of Tirupati
Consultant:
IFMR - CDF, Chennai
IFMR Research
CENTRE FOR DEVELOPMENT FINANCE

Slum areas

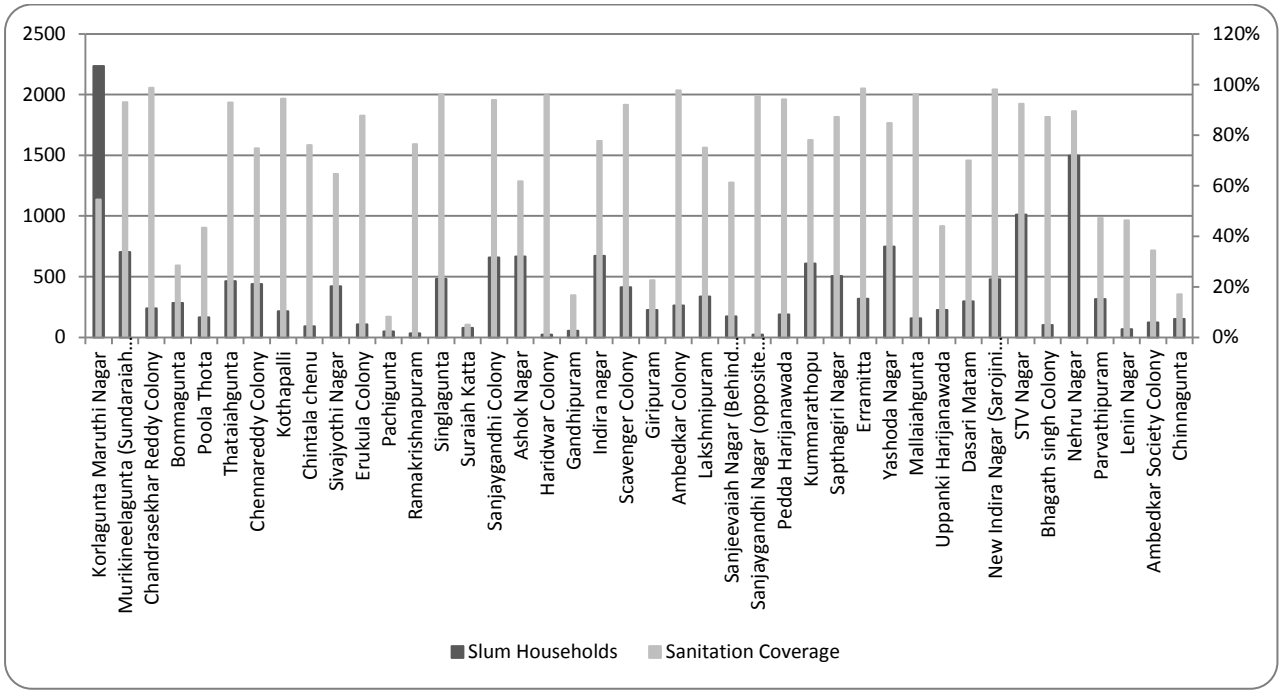
TMC boasts of a high level of sanitation coverage at the household level across its slums - out of 16308 slum households, 10773 households appear to have own toilets for their household use (66% coverage). These toilets appear to be of the pour-flush/flush variety and connected to septic tanks.

Slum areas with more than 80% coverage of own toilets connected to a septic tank facility include: Sundaraiah Nagar, Chandrasekhar Reddy Colony Thataihgunta, Kothapalli, Scavenger Colony, Ambedkar Colony, Sanjaygandhi Nagar, Pedda Harijanawada, Sapthagiri Nagar, Yasodha Nagar, New Indira Nagar, STV Nagar, and Nehru Nagar. On the other hand, slums such as Bommagunta, Pachigunta, Ramakrishnapuram and Suraiah Katta record coverage of less than 10% of own toilets connected to septic tanks.

About 10% of total slum households in TMC (1608 households) have access to shared or community toilets which are of the flush variety and connected to septic tanks. The following chart indicates the total number of households in each slum and the extent of sanitation coverage in those slums. Slum households are represented in numbers while coverage is expressed in percentages.

Increasing household coverage is the most appropriate long-term strategy even in low income areas. However, this strategy is contingent upon land availability and solutions may not be immediate. Providing shared access to sanitation is an effective near-term strategy which can go a long way towards improving the quality of health, hygiene and environment in these neighbourhoods.

Figure 4 Sanitation coverage across slum households in TMC



Source: MEPMA Socio-economic survey (2010-11)

Planning for shared access must target slums with the following characteristics:

1. High population densities, 2. Low household coverage, 3. High prevalence of Open defecation/urination, 4. Access to other services such as water supply, sewerage, 5. Proximity to closest public or shared/community toilet

The table below provides an overview of population densities and service coverage across all slums in the city. The slums have been prioritized as "High" and "Low" for improvement of sanitation facilities based on the slum satisfying a majority of the characteristics/criteria listed above.

Table 7 Population densities and Service coverage across slums in TMC

	Slum	Population Density	Sanitation coverage	Open Defecation	Distance to PT (km)	Water Supply	Sewerage	Priority
1	Gandhipuram	1947	17%	81%	0.43	Fully Connected	Fully Connected	High
2	Uppanki Harijanawada	746	44%	52%	0.67	Fully Connected	Partially Connected	High
3	Parvathipuram	5041	47%	30%	1.80	Fully Connected	Fully Connected	High
4	Lenin Nagar	951	46%	3%	1.80	Fully Connected	Fully Connected	High
5	Sivajyothi Nagar	1195	65%	9%	1.75	Fully Connected	Not connected	High
6	Poola Thota	8608	43%	3%	0.05	Fully Connected	Partially Connected	High
7	Giripuram	5941	23%	0%	0.09	Fully Connected	Fully Connected	High
8	Kummarathopu	6225	78%	2%	0.35	Fully Connected	Fully Connected	High
9	Korlagunta Maruthi Nagar	3962	54%	0%	0.90	Fully Connected	Not connected	High
10	Bommagunta	1955	28%	0%	0.05	Fully Connected	Fully Connected	High
11	Suraiah Katta	3790	5%	0%	1.20	Fully Connected	Fully Connected	High
12	Pachigunta	2075	8%	0%	0.87	Fully Connected	Fully Connected	High
13	Sanjeevaiah Nagar	1314	61%	2%	0.30	Fully Connected	Partially Connected	High
14	Dasari Matam	5311	70%	4%	0.51	Partially Connected	Fully Connected	High
15	Bhagath singh Colony	3564	87%	6%	0.97	Fully Connected	Fully Connected	High
16	Ambedkar Society Colony	429	34%	0%	0.53	Fully Connected	Fully Connected	High
17	Chinnagunta	2418	17%	0%		Partially Connected	Fully Connected	High
18	Murikineelagunta (Sundaraiah Nagar)	1011	93%	0%	0.80	Fully Connected	Fully Connected	Low
19	Chandrasekhar Reddy Colony	314	99%	0%	1.27	Fully Connected	Not connected	Low
20	Thataiahgunta	5479	93%	0%	0.26	Fully Connected	Fully Connected	Low
21	Chennareddy Colony	1256	75%	1%	0.72	Fully Connected	Fully Connected	Low
22	Kothapalli	1724	94%	2%	1.60	Fully Connected	Not connected	Low
23	Chintala chenu	928	76%	21%	0.85	Fully Connected	Partially Connected	Low
24	Erukula Colony	240	88%	9%	0.08	Fully Connected	Fully Connected	Low
25	Ramakrishnapuram	1837	76%	0%		Fully Connected	Fully Connected	Low
26	Singlagunta	2983	96%	1%	0.89	Fully Connected	Fully Connected	Low
27	Sanjaygandhi Colony	1186	94%	1%	0.93	Fully Connected	Partially Connected	Low
28	Ashok Nagar	537	62%	0%	0.27	Fully Connected	Fully Connected	Low
29	Haridwar Colony	2085	96%	4%	0.41	Fully Connected	Fully Connected	Low
30	Indira nagar	1325	78%	1%	0.19	Fully	Fully	Low

	Slum	Population Density	Sanitation coverage	Open Defecation	Distance to PT (km)	Water Supply	Sewerage	Priority
						Connected	Connected	
31	Scavenger Colony	2363	92%	3%		Fully Connected	Fully Connected	Low
32	Ambedkar Colony	1185	98%	0%	0.52	Fully Connected	Fully Connected	Low
33	Lakshmipuram	2092	75%	5%	0.90	Not connected	Not connected	Low
34	Sanjaygandhi Nagar	331	95%	0%	0.93	Fully Connected	Fully Connected	Low
35	Pedda Harijanawada	2019	94%	0%	0.82	Fully Connected	Fully Connected	Low
36	Sapthagiri Nagar	2074	87%	0%	1.01	Fully Connected	Partially Connected	Low
37	Erramitta	989	98%	0%	1.12	Fully Connected	Partially Connected	Low
38	Yashoda Nagar	748	85%	1%	0.79	Fully Connected	Fully Connected	Low
39	Mallaiahgunta	924	96%	3%		Fully Connected	Fully Connected	Low
40	New Indira Nagar	5600	98%	0%	0.91	Fully Connected	Fully Connected	Low
41	STV Nagar	2958	92%	2%	0.84	Fully Connected	Fully Connected	Low
42	Nehru Nagar	1030	89%	0%	0.36	Fully Connected	Fully Connected	Low

Source: MEPMA Socio-economic survey (2010-11), Secondary research IFMR-CDF

Based on an evaluation of coverage and related access parameters, recommended action items for low income areas are as below.

Actions

- *Construction of shared toilet facilities (shared by 5-7 households) in – Sivajyothi Nagar, Gandhipuram, Giripuram, Kumarathopu, Uppanki Harijanawada, Dasari Matam, Parvathipuram, Lenin-nagar, Ambedkar Society Colony*
- *Explore mobile toilet options where demand is high but land is scarce*
- *Phased efforts towards household coverage by leveraging schemes such as RAY*
- *Adhere to design and construction standards in new stock*
- *Subsidize construction and maintenance*
- *TMC to ensure water supply, sewerage, electricity connections and subsidize monthly charges for the same*
- *Shared access between fewer households eliminates need for caretaker and creates ownership in maintenance. Households to have keys to control access. Cleaning and daily maintenance can be shared between households that use facility. TMC to devise protocols for the same. Involve community groups/SHGs in slums to facilitate process*
- *TMC to promote this strategy only after extensive stakeholder consultations with users at all slums where interventions are considered. Discussions between our team and users in the slum Uppanki Harijanawada revealed that users are not inclined towards shared or community toilets. When user acceptance is not present, the toilet strategy is likely to fail. Hence, it is imperative for the city to obtain the buy-in of users and incorporate their requirements into the planning done by the city*

Box 3: Case study- Uppanki Harijanwada, Revenue Ward #19

Based on discussions with MEPMA officials, the team visited Uppanki Harijanawada. The team was informed that this slum settlement, with about 300 households, has only 50 households that have access to toilets. The rest of the households resort to open defecation near the railway track area. One woman mentioned that there were a few government employees (retired and currently employed) living in Uppanki Harijanawada, and these were the households that had individual toilets. The team were also shown one shared toilet, housed with a building shared by nine families.

The team walked through the settlement and conducted a Focus Group Discussion (FGD) with 5-6 women. An overwhelmingly large proportion of households in the slum, rely on daily wage labour as their only source of income. There are SLFs (Slum Level Federations) and sixteen SHGs have been formed under MEMPA to provide members with savings facilities and access to credit. When asked what women members used loans for, they said largely to meet consumption expenditure requirements.

There are about nineteen water taps and one hand pump (located along the main streets) installed by the municipality. One woman informed us these taps were installed less than a year ago, and before this, the slum was entirely dependent on water tankers that were sent by the municipality. Several persistent requests by community members finally made the municipality install the same. This water is used for washing and bathing. On alternate days a water tanker visits the area to supply drinking water. Members of the community were happy with the quality of drinking water. With regards to solid waste management, once a week a collection truck is sent from the municipality. However, there is no one place where all waste is collected. The team were told (also visual verification) that household waste and plastic was thrown in vacant plots within the slum and along the railway track. Often times waste was burnt. The women members felt that there was an urgent need for community dustbins. Most houses in the slum were *kuccha* houses, which were converted to *pucca* houses under the VAMBAY (*Valmiki Ambedkar Awas Yojana)*. Information on the same was collected by the team in a meeting with the deputy executive engineer.

According to the MEMPA who accompanied the team, loans were given by MEPMA under the "INDIRAMMA" (Integrated Novel Development in Rural Areas & Model Municipal Areas) scheme. The scheme launched by the State in 2006, aims at integrated rural development by providing basic infrastructure like housing, individual sanitary latrines, drainage, road facilities, medical care etc. In urban areas, the amount earmarked per house is INR 42750, which includes INR 2750 for building toilets and INR 40,000 for construction of house. As of 2012, under INDIRAMMA programme, in AP 90,000 houses were without toilet facility. In a move to ensure sanitation facilities for each house, the State has instructed the officials from the Housing Department not to make payments for the roof construction to the beneficiaries of the Centrally sponsored Nirmal Bharatiya Abhiyan (NBA) who fail to build ISLs (Individual Sanitary Latrines) in their households. When asked why households then did not built toilets, the women said that the money provided under the scheme for the construction of toilets was insufficient, and the entire money was utilised in building rooms and bathrooms. There are a few families who have constructed toilets, with funds from the ILCS scheme outside their homes where vacant area is available. These toilets are used usually, by just one household. These are pour and flush type toilets connected to a septic tank. As the tank is never cleaned, it overflows during the rainy season.

V. Policy and Institutional Frameworks

At the national level, the National Urban Sanitation Policy provide a pan-India policy framework for sanitation sector development and offers guidelines and strategies to states and cities to achieve their sanitations goals. However, NUSP recognizes that sanitation is a state subject and requires strong city and state level institutions and stakeholders to promote the necessary developmental outcomes in this sector.

The NUSP recommends that states and cities can explore a range of options in achieving sanitation goals, including using existing provisions with regard to sanitation in municipal and other Acts to promote compliance and Amending municipal Acts, framing of bye-laws and regulations (e.g. building and construction bye-laws) to promote sanitation by public and private agencies. In Andhra Pradesh, the AP Municipalities Act, 1965, confers statutory responsibilities relation to regulation of sanitation on Urban Local Bodies in the state. The Act is however open-ended, inexplicit and less stringent about the functions of municipalities in so far as provision of public sanitation.[6]

Policies are typically implemented through legal frameworks (e.g. municipal acts), regulations (e.g. technical standards, tariff settings, building codes, planning regulations), economic incentives (e.g. penalties, subsidies), and assignment of institutional roles and responsibilities to implement policy priorities.[7]

Andhra Pradesh has taken considerable steps to improve its institutional framework in sanitation by framing State Sanitation Strategies. Tirupati has also prepared its City Sanitation Plan. In order to effectively drive change through its state level policies and strategies, the state and city need to focus on creating well-defined regulatory mechanisms, appropriate economic and financial incentives to fund the change and ensure clarity in institutional roles and responsibilities.

Table 8 Institutional Responsibility Matrix for service delivery in TMC

Sanitation Services	Planning	Execution	O&M	Tariff fixing/ collection
Public and Community Toilets	Multiple	TMC/TTD/APSRTC/Private/Other	TMC/TTD/APSRTC/Private	TMC/Private
Sewerage	PHED	PHED	TMC	TMC
Water Supply	PHED	PHED	TMC	TMC

The present institutional arrangements in Tirupati with its multiplicity of agencies pose problems in terms of diffused accountability. An absence of monitoring mechanisms further compounds the poor service delivery outcomes. Planning for the construction of public sanitation facilities are handled by multiple agencies (TMC, TTD, APSRTC, etc.) based on demand perspectives, funding mechanisms and land availability. There is lack of co-ordination between TMC and PHED at different levels and since TMC is responsible only for O&M, there is inadequate involvement and capacity within TMC towards planning, structuring and successful management of projects in the sanitation.

While TMC is responsible for O&M, its entire toilet stock has been outsourced to private contractors for maintenance and management for reasons such as lack of funds and lack of capacity within TMC to provide O&M services of acceptable quality. Despite outsourcing management to private sector for quality considerations, the poor condition of existing toilet stock is reflective of failed investments that do not meet current or future demand effectively and are not conducive to long-term sustainability of service provision.

[6] According to the act, *"the Municipal Council shall as far as the funds at its disposal may permit, provide and maintain a sufficient number of public latrines and urinals".*

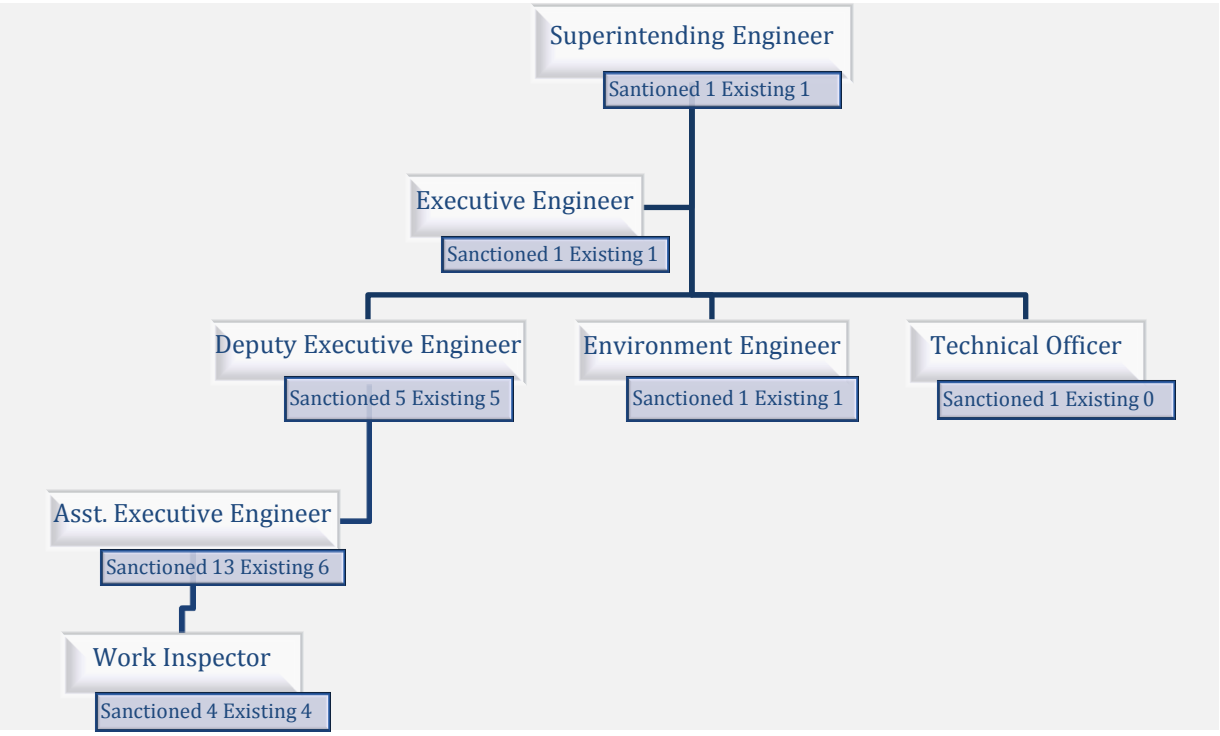
[7] Sanitation, Hygiene and Wastewater Resource Guide, The World Bank

To plug these gaps and ensure seamless service delivery, the state must confer full and final responsibility for city-wide sanitation on the city of Tirupati and consolidate the authority by devolving power, functions, functionaries and funds to the city. While the overall responsibility rests with the city, the city should be required to work closely with the City Sanitation Task Force and other institutional providers in sanitation in order to effectively implement its goals and strategies.[8]

Specific to improvement of public and community toilets, the city must be made responsible for:

- *Demand-driven planning for improving public and community toilets access in the city*
- *Identification/ear marking of municipal and govt. assets for public sanitation facilities and safeguarding the identified land from encroachments*
- *Financing for asset creation and O&M (where appropriate)*
- *Asset creation and retrofit and O&M arrangements (either on its own or facilitate the process for external service providers by providing the requisite framework and incentives)*
- *Ensure O&M sustainability through appropriate user fees, tariffs, incentives (standardized user fees aimed at cost recovery, parameters for cross-subsidization, and incentives for private sector)*
- *Adopt standards for service delivery (design and construction standards, cleaning and maintenance standards)*
- *Build capacities of internal functionaries in all aspects of service provision – planning, execution, O&M and Monitoring*
- *Monitoring and Enforcement (develop monitoring protocols, devise appropriate penalties for non-compliance)*

Figure 5 Existing Institutional Framework for Public Sanitation Delivery: Roles and Sanctioned Posts



To this end, the city must carry out a responsibility mapping exercise to assign specific responsibilities to its functionaries. The required number of resources must then be allocated to carry out clearly assigned sanitation related functions. The following table captures some of the potential functions and responsibilities that can be assigned to city officials in order to effectively plan,

[8] Guidelines from the NUSP, GoI, to assist cities and states in the process to achieve 100% sanitation

implement and monitor sanitation projects in the city. The following observations are to be noted with regards to the existing institutional framework for sanitation delivery in TMC:

- The role of Technical Officer – sanctioned for purposes of contracts structuring and management – is currently vacant for the city. Appointing a suitably qualified person in the position is critical to ensure that contracts issued to a third party for any public works (including sanitation) undertaken in the city is appropriately structured and managed and risks are clearly understood and appropriately assigned
- The number of existing posts for AEE is much lesser than that sanctioned. The AEE works directly at ward level and has an understanding of ward level gaps and needs, inputs which are critical to planning for and enforcement of public sanitation issues in the city. Hence, it is imperative to fill up these vacant posts at least to the extent that has been sanctioned

Table 9 TMC Engineering Department: Roles and Recommended Responsibility Matrix for Sanitation Planning, Implementation, M&E

Role	Proposed Responsibilities
Chief Engineer	
Superintending Engineer	Planning, Setting guidelines and protocols, Project sanction, Budget sanction
Executive Engineer (Municipal Engineer)	Assist SE in Planning, Standards setting, Provide planning inputs for annual and long-term planning process
Deputy Executive Engineer	Coordinate across other stakeholder departments (TTD, PHED, APSRTC, Railways) and the private sector to evaluate demand-supply gaps Ensure compliance and enforcement of contracts with private sector Adhoc supervision of facilities
Environment Engineer	Monitor sanitation outcomes, health and environment linkages
Technical Officer	Assist SE in contracts structuring and management for public sanitation works Manage any delays in project implementation and facilitate necessary clearances for private sector
Assistant Executive Engineer/Sanitation Supervisor	Monthly supervision of facilities Monitor demand and escalate issues of service gaps Monitor user perceptions about service provider
Work Inspector/Sanitation Inspector	Weekly supervision of facilities Monitor adherence to construction and service norms by providers Ensure public grievance redressal Review sites of OD/urination in ward

VI. Financing Options

According to the Sanitation, Hygiene and Wastewater Resource guide of the World Bank, *financing for sanitation hardware* includes the costs of sanitation marketing, capital investment and operations and maintenance. In this section, we will explore financing strategies specifically to improve access to public sanitation hardware.

Assigning costs

The primary costs for improving access and quality of sanitation facilities are capital costs for construction and operations and maintenance costs. Costs for construction include costs for design, material and labour. Material costs vary according to the technical model and design, primarily driven by type of superstructure, water closet, doors and fittings, connections for water supply, sewerage and electricity, signage. Labour costs depend on availability of economical labour locally and on the type of expertise required in labour.

O&M costs comprise of manpower (wages & overheads for caretakers/cleaners), electricity, water charges, water purchase, treatment charges, cleaning supplies, daily supervision, repairs and maintenance, administration and back office expenses.

Table 10 Typical Cost Heads for Public Sanitation related CAPEX and OMEX

CAPEX		**OMEX**	
1.	Structural Cost	1.	Manpower
	Civil-Superstructure (Cement/Sand/Brick/Fibre-reinforced Plastic, Tiles, etc.)		*Caretaker*
	Plumbing – pipes		*Cleaner*
	Electrical – wiring		*Supervisor*
	Bore-well w/pump	2.	Water charges
	Septic Tank	3.	Power charges
	Rain-water harvesting	4.	Waste disposal & treatment charges
	Painting (Material and Labour)		*Sewerage*
	Labour - Civil		*Septic tank*
	Labour - Plumbing		*Any other*
	Labour - Electrical	5.	Consumables
2.	Fittings		*Cleaning supplies (soaps, phenyl, acid)*
	Sanitary Fittings (water closet/taps/wash basin/urinals)		*Cleaning equipment (sponges, scraping sheets, brooms, brushes, floor wipers, gloves)*
	Doors	6.	Repairs and Maintenance
	PVC Water Tank		*Containers (buckets, mugs)*
	Mirrors		*Mechanized cleaning equipment (compressed cleaners, choke removal tools)*
	Exhaust		*Apron*
	Solar Panels		*Identity card*
	Lighting, switches		*Provision for repairs and replacement*
3.	Service Connections	7.	Overheads (~10% of above)
	Water supply		
	Sewerage		
	Electricity		
5	Signage		
	Total CAPEX		Total OMEX

Sources of finance

Typically, there are a range of sources that can be utilized for purposes of funding public sanitation hardware.

- Central government
- State and municipal governments
    - Grants related to state/local schemes
    - Conditional and Performance linked grants and loans
    - Tariffs, Surcharges, Cross-subsidies
- Private sector
- Users (pay per use, monthly fees)
- Advertising revenues
- Donor agencies

In Tirupati, all above sources have been leveraged for funding various components of public sanitation promotion. Funding through central government schemes such JnNURM, UIDSSMT, IHSDP, ILCS and more recently, RAY have been utilized for sanitation infrastructure improvement in the city, particularly in strengthening infrastructure (construction of shared/community toilets, water supply, sewerage, solid waste management, etc.) in low income areas.

Private sector funding, both from large providers such as Sulabh and smaller contractors, has met some of the capital expenditure requirements in public toilets. Cost recovery on these BOT models is primarily through user fees. User fees are structured to meet both the capital and operating costs and generate an acceptable return for the private participant during the concession period.

As indicated earlier, TTD contributed to public sanitation inventory by providing land and in the financing and management of two public toilets in the pilgrim corridor.

Till recently, construction of public toilets appears to have largely been undertaken through municipal budgets. Review of TMC annual budgets however reveals that TMC budget allocations for public toilet construction was less than 1% of the total capital expenditure during the year 2008-09 and 2009-10. In the subsequent three financial years, city budgets show no allocation of funds for public toilet construction. Instead, a large portion of the city's capital expenditure in the past three years is towards construction of UGD networks.

Table 11 TMC Budget allocations for Public Toilets

Year	Public Toilets CAPEX (Rs. Lakhs)	Total CAPEX (Rs Lakhs)	PT CAPEX/ Total CAPEX (%)	Total Capital Income (Rs. Lakhs)	PT CAPEX/ Total Capital Income (%)	UGD CAPEX/ Total Expenditure (%)
2008-09	2.31	1,501.00	0.15	473.00	0.49	0
2009-10	11.71	1,924.00	0.61	1.318.00	0.89	0
2010-11	0		0		0	96.77
2011-12	0		0		0	66.67
2012-13 (BE)	0		0		0	1.61

This is also the period when the city appears to have a made a shift towards BOT models for public toilet construction, reflecting the city's changing financing strategy towards public sanitation. Public sanitation delivery, especially in areas with high demand and potential for cost recovery, does present adequate opportunities for private sector participation. However, in order to meet and sustain the growing demand for improved sanitation facilities, committed funds are required from the public

sector and adequate institutional mechanisms and incentives need to exist to attract private sector funding.

Table 12 TMC Budgets: Revenue and Capital accounts (amounts in lakhs)

Head/Years	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13
Revenue Account						
Income	2,528	3,080	5,140			3157.77
Expenditure	1,955	3,034	4,914			2526.51
Surplus/Deficit	**572**	**46**	**226**		**672.85**	**631.26**
Capital Account						
Income	416	473	1,318			543.60
Expenditure	549	1,501	1,924			1,043.38
Surplus/Deficit	**(133)**	**(1,029)**	**(606)**		**(198.28)**	**(499.78)**
Overall Surplus/Deficit	**439**	**(983)**	**(379)**	**365.93**	**1184.01**	**131.48**

A review of TMC annual municipal budgets for the past 6 years reveals that while the city was riding a budget deficit during the years 2008-09 and 2009-10, the income has increased considerably in the past three years. The city has recoded considerable budget surpluses during this period. However, the public sanitation sector has not received any budget allocations during this period of budget surplus. The city must take measures to address such anomalies in budget allocations and committed funds allocation in the annual budgeting process must be mandated.

There appears to be a lack of clarity in terms of assessing the advertising potential in Tirupati. Private players currently operating in the city appear to share the view that advertising potential is minimal in Tirupati. The city needs to undertake assessment studies to understand the potential and suitably apportion this within the financing model of public sanitation projects.

Actions

Funding opportunities within TMC:

- *Dedicated budget allocation for sanitation in annual budgets*
- *Apportion predefined percentages for sanitation related expenditure from sources such as: Tourist tax, Scavenging tax (Public Health), Collection Charges (Public Health)*

Utilization of State/central and donor funding:

- *Institutional strengthening, Capacity building*
- *Technical expertise and feasibility studies*
- *Awareness generation*

To encourage and mainstream private sector participation in the scale-up of sanitation programs requires resolving inconsistencies in contracts management and unfavourable market incentives

- *TMC to establish demand, facilitate land acquisition, share risks through appropriate project structuring and ease O&M challenges for the private player by facilitating CSR/SHG partnerships*
- *Tighten private sector selection processes to promote a balance between quality and cost considerations*
- *Carry out a review of advertising potential in the city and understand application to public sanitation projects*

VII. Sanitation Awareness Generation

One of NUSP's stated goals is raise awareness on the public health and environmental importance of sanitation and to bring about behaviour change aimed at adoption of healthy sanitation practices. To this, GoI is not only undertaking country-wide Information, Education and Communication (IEC) strategy but has also guaranteed technical assistance and funding support to cities and states for awareness generation and capacity building. The NUSP requires the City Sanitation Task Force constituted in every city to spearhead the awareness generation efforts amongst the city's citizens and other stakeholders.

The City Sanitation Plan of Tirupati takes cognizance of the need to bring about behaviour change with respect to existing sanitation practices in the city. The Plan underscores the need to engage citizens actively to achieve service delivery goals with respect to sanitation and eliminate open defecation and urination across the city. The need for strong awareness generation initiatives is further strengthened by the prevalence of open defecation and urination in the city, particularly around slum pockets, commercial areas and tourist corridors of the city. Consequently, sanitation awareness strategies designed for the city must target each category of users, identifying detailed areas of focus for each category. Caretakers and cleaners of toilets also need to be engaged in the awareness drive.

With the long-term objective of eliminating open defecation in the country, the Ministry of Drinking Water and Sanitation, GoI, has developed a National Sanitation and Hygiene Advocacy and Communication Strategy Framework. This framework lays emphasis on changing existing perceptions among individuals about sanitation and hygiene practices and changing individual behaviour towards eliminating the practice of open defecation. The framework also elaborates on the main communication approaches recommended for achieving the defined communication objectives – advocacy, interpersonal communication, community mobilization, and mass media.

An effective awareness framework identifies the target audience, the communication objective, the activities to be employed with each target group and the nature of communication tools needed to meet the objective.

Figure 6 Recommended Awareness Framework for Sanitation

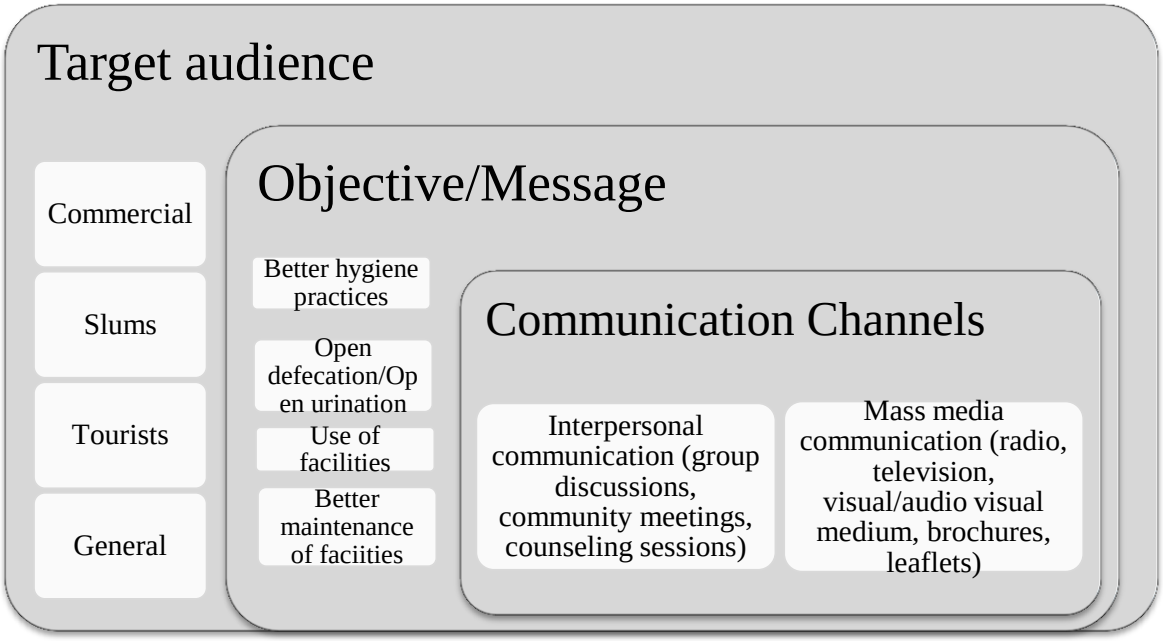


Table 13 Implementation framework for awareness generation

Target Location	Target Groups	Main message	Communication Strategies
Slums	All household members Priority groups women and children	Impart correct knowledge of hygiene practices Harmful effects of open defecation Motivate members to use toilets Repercussions of unsafe disposal of waste water Better septic tank maintenance Benefits of hand-washing Awareness about government programs in sanitation Availability of sanitation options and costs	Interactive Communication • focus group discussions • counselling sessions • campaigns in schools/colleges • carry out frequent sanitation awareness campaigns – twice a month Activate social/community networks • engaging with local SHG/ Municipal representatives/Rotary/Lions club/other voluntary organizations Mass media communication • Pictorial hoardings on benefits of Toilet use, better O&M of facilities, better hygiene practices • Street plays, radio/television dramas
Commercial	Small businessmen Traders Informal workers, Petty shops Fruit vendors	Prevention of open urination, Encourage use of public toilets Maintenance and cleanliness of public toilets Septic tank Maintenance	Interpersonal campaign with support from traders • Tirupati CSP suggests that the MCT (with assistance from other agencies) should develop standardized visual themes (logos, painting and signage) for Public Toilets for effective branding • Orientation sessions for primary toilet catchment on better use of facilities, procedures for reporting complaints, user monitoring of facilities • Orientation sessions for concerned municipal officials to improve coordination with service provider to ensure better maintenance, training on monitoring mechanisms Mass Media communication • Theme visual messages/signage inside and outside toilet for better maintenance of facilities and better use of resources such as water, electricity • Dramas/skits on radio/television • Engage celebrities in communication efforts • Flyers, posters, leaflets
General Areas	All household members	Impart correct knowledge of good	Interpersonal communication • Engaging with Resident Welfare

		hygiene practices Harmful effects of OD, open urination Benefits of better maintenance of toilets, septic tanks	Associations • Campaigns in schools/colleges Mass Media • Audio-visual campaigns in radio/television (dramas, advertisements, documentaries) • Hoardings, flyers, leaflets, posters • Print advertisements, press releases • Celebrity outreach • SMS campaigns • Social media campaigns
Transit Areas - Railway Stations/ bus stand	Floating population – tourists	Harmful effects of OD, open urination Benefits of better maintenance of toilets,	Media • Hoardings, posters, wall paintings, signage inside/outside of toilets

VIII. City-wide Strategies and Action Plan

The NUSP envisions urban sanitation in India to ensure positive public health and environmental outcomes for all citizens, with a special focus on **hygienic and affordable sanitation facilities** for the **urban poor** and **women**. In line with this vision, the City Sanitation Plan of Tirupati seeks to improve the sanitation status of this city by:

Eliminating open defecation through provision of equitable and efficient access to public and community toilet access and by making all citizens sanitation-conscious through sustained awareness effort

To this end, the stated goals for sanitation in the city are:

- *Improving household coverage (100%)*
- *Eliminating open defecation/urination within a planned timeframe*
- *Minimizing access barriers to public sanitation*
- *Facilitating sustainable public sanitation*
- *Providing quality user experience at a reasonable cost*

Key strategies to achieve these sanitation goals are tabulated below:

Category		**Strategies**
City-wide	Institutional	Mainstream responsibility matrix for public sanitation provision
		Include guidelines for – design, construction, materials, O&M, within existing regulatory framework
		Develop strong monitoring mechanisms, performance indicators (output and outcome related), penalties for non-compliance
		Institutionalize planning process for public sanitation provision (Annexure 1)
		Develop mechanisms to continually monitor OD/open urination
		Build internal capacities for planning and management
		Develop contract templates
		Initiate public awareness campaigns
	Financial	Commit funding sources and annual budget allocations for public sanitation
		Explore possibility to tap into sources such as: Tourist tax, Scavenging tax (Public Health), Collection Charges (Public Health) for sanitation related expenditure
		Predetermine source of funding for CAPEX (asset creation/major retrofit), prior to designing concession terms such as duration
		Standardize revenue sharing arrangements for revenues through advertising between TMC/private sector provider
		Develop appropriate risk-reward allocations with private sector depending on choice of location and nature of service provision
	Management	Decide management model based on estimated usage at location. BOT (new asset/retrofit) or MC (new/retrofit/existing asset) can be adopted in high footfall areas, cross-subsidization with BOT/MC provider can be considered in areas of low footfall
		Where private sector is engaged in BOT/MC for public toilets, explore potential to package 4-5 projects to achieve scale and ensure a reasonable mix of usage levels. Build in procedures to ensure cross-subsidization – appropriately package BOT, Maintenance contracts and service provision in slums (e.g. 3 high-to medium footfall: 2 low footfall locations in one package; 3 high-to-medium footfall: 2 open urinals O&M)
		Allow 7-15 year concession periods for BOT contracts, renewable annually subject to performance. 3-5 year periods for Maintenance contracts, renewable annually subject to performance

	Technical	Follow design and construction standards as laid out in BIS. In case the city decides on alternative materials or methods of design, ensure that these are duly approved
		Where possible, explore environmental-friendly alternatives such as solar panels, techniques to minimize use of water, better waste management technologies
		Explore design modifications to existing facilities to improve disabled access
		Adhere to design and construction standards in new stock and strictly enforce O&M standards/protocols in new and existing stock
	Planning	Carry out annual planning exercise and budget allocations for public sanitation provision
		Integrate spatial planning and planning along demand corridors into planning process
		Undertake phased conversion of open urinals into covered urinals or public toilets where land is available
		Develop an action plan to carryout improvements on the city-wide list of "sanitation hotspots" identified in Annexure 2
		Utilize tools for continual monitoring of OD/open urination, to ensure that these sites receive highest priority during annual planning
		Undertake efforts to establish baseline and compliance of sanitation requirements for institutional spaces (hospitals, administrative building, schools, public rooms, parks) and integrate these into planning process
	Monitoring	Carry out functions as proposed in responsibility matrix
		Complex to include register to record user complaints
		Include prominent display of signages indicating user fees and phone numbers for registering complaints
		Sign boards carrying user fees to be altered after every fee revision to reflect latest user fees
		Along with cleanliness message boards for users inside toilet units, also display sign boards encouraging users to pay only displayed fees
		During periodic supervisions, city officials to review the following: 1. Evaluate quality of facility, compliance with contractual O&M obligations 2. Review register containing user complaints/comments 3. Talk to users on user experience, fees, quality, improvements 4. Evaluate footfall/demand
		If possible, carry out periodic review of financials maintained by service provider on their toilet complexes
	Public Awareness	Strategies should aim to bring about hygiene and behaviour changes. Appropriate mechanisms involve IEC campaigns centred around[9]: ▪ Interpersonal Communication (smaller audience, community toilets) - focus group meetings, community and individual discussions) ▪ Mass Media Communication (larger audience, public toilet users) – radio, television, visual and audio visual presentations and other forms like brochures, leaflets and posters
		Focus areas of awareness campaign: 1. Environmental degradation, public health implications of unsafe sanitation - health hazards of open defecation and its economic impact and benefits of safe sanitation 2. Empowerment of community – ownership and management of the toilet facilities 3. Good sanitation practices including washing hands, keeping toilets clean and user/community's role in monitoring 4. Grievance redressal procedures 5. Need for monitoring by user
		Campaign strategy design must be clear on: Target areas (slums/commercial/general/transit), Target Group (household,

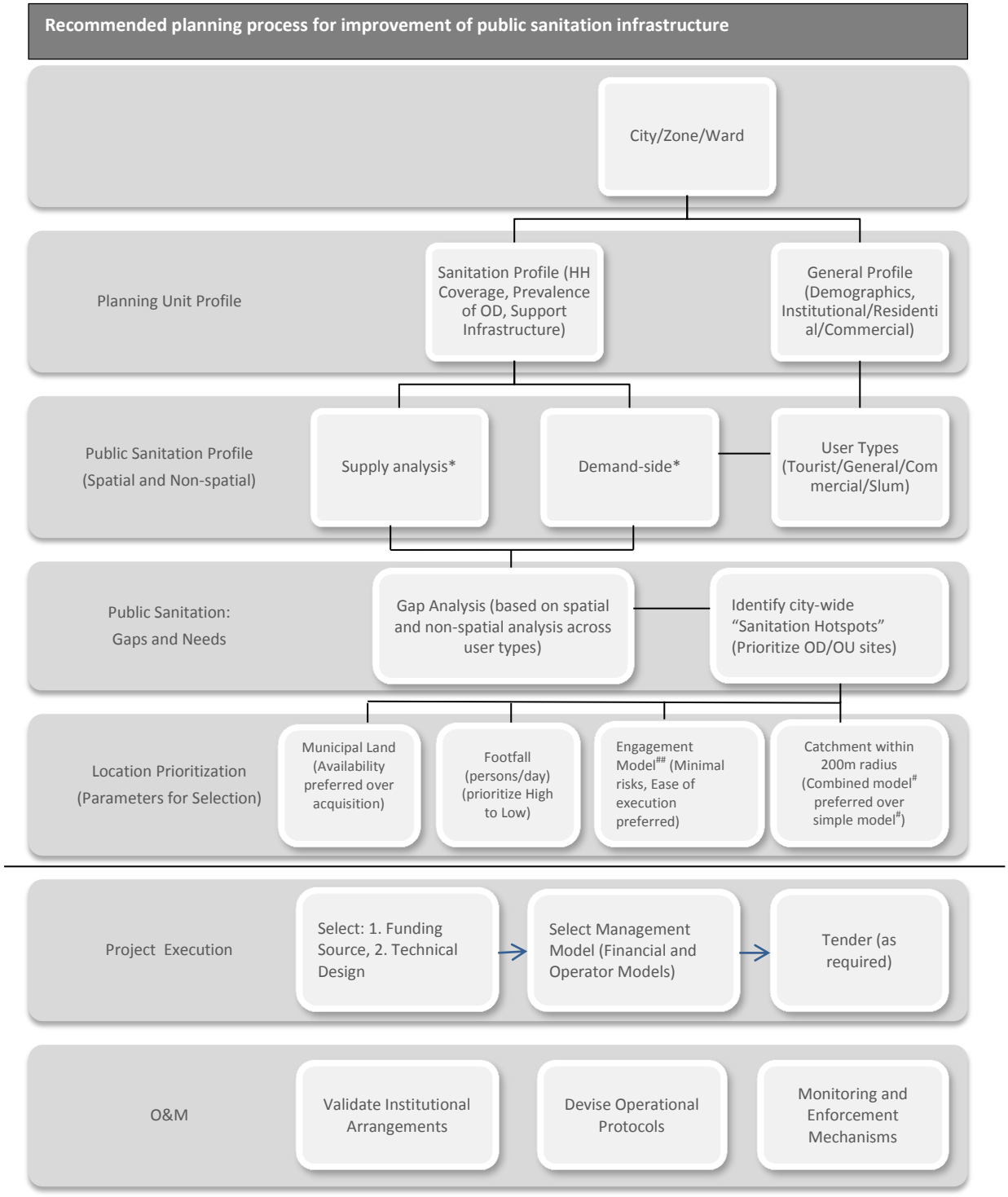
[9] http://www.dorluk.de/hp/iec_manual.pdf; http://www.unfpa.org/emergencies/manual/a1.htm

		women, children, tourists, commercial, tourist), Purpose (prioritized by intended outcome), Strategy (stakeholder partnerships), Intervention (IEC method)
Tourist	Integrate pilgrim movement patterns and demand in transit corridors into public sanitation planning for this corridor	
	Undertake efforts to assess compliance of prescribed sanitation requirements for hotels and restaurants in this corridor	
	Owing to high usage along this corridor, recommended management models include BOT for new assets and maintenance contracts for new and existing assets	
	High usage levels and high revenues can be leveraged towards cross-subsidization in low income areas	
	High usage and demand at the RTC Bus stop and Railway Station necessitate increasing supply and improving quality of facilities near these locations on priority	
Commercial	Continually assess demand along this corridor, identify locations and construct toilets in unserved areas	
	Undertake efforts to assess compliance of prescribed sanitation requirements for shops, commercial offices, hotels, restaurants, warehouses in this corridor	
	Footfall (approximately 200- 500 persons per day) in most locations along corridor justifies BOT models or Maintenance contracts	
Slums	Undertake phased efforts towards household coverage by leveraging schemes such as RAY	
	Explore mobile toilet options where demand is high but land is scarce	
	Conduct extensive user consultation and buy-in prior to planning for sanitation at a non-household level, involving a community or small group of households. This will ensure sustained use	
	Where land is available but not at household level, effective mid-term strategy would be to create shared facilities, where household control access, cleaning and maintenance	
	In mobile toilets, community or shared facilities, TMC to ensure water supply, sewerage, electricity connections and subsidize monthly charges for the same	
	Subsidize construction of any facilities in these areas through its own budget, central/state schemes	
	Community or mobile facilities can serve restricted households as well, with a payment of a minimal monthly charge, which will cover O&M expenses	
General	Any strategies for expansion of public sanitation across the city must be demand-driven, based on an understanding of ward profile, sanitation coverage and requirements	
	Prioritize areas with low coverage and high OD/open urination	
	Management, Operator and financing model will be influenced by estimated usage levels and user characteristics	

Public Toilet Action Plan Period for TMC: 2013 -
Year 1: 2013-2014
1. Modify regulatory framework to include:
i. Responsibility matrix for planning/management of public sanitation facilities
ii. Annual planning and budget allocations for public sanitation facilities
iii. Guidelines and templates for design and construction
iv. Maintenance protocols, performance indicators for management
v. Funding sources for public sanitation expenditure (CAPEX, OMEX)
vi. Contracts templates
vii. Performance monitoring and enforcement mechanisms
2. Prepare DPRs prepared for 5 locations (#1-5 in Annexure 2). Located primarily in tourist and commercial areas, these DPR sites have a potential for high usage. Consequently, it is recommended to group them as 2-3 different project packages, with adequate provisions in contract for cross-subsidization (e.g. packaging of contracts such that 2 high footfall sites can be bundled with O&M on 3 open urinals or O&M on 2 facilities in low income areas)
3. Build internal capacities for planning, project management, monitoring through trainings, workshops
4. Initiate exercise to map household level toilet coverage in order to identify wards with low coverage
5. Initiate public awareness generation activities
6. Implement tools to assess usage levels and demand to serve as inputs for planning in the next year
Year 2: 2014-15
1. Implement the 5 DPRs prepared during 2013-14 (#1-5 in Annexure 2)
2. Identify land and prepare DPRs for priority areas identified in Annexure 2 (#6-14). All locations exhibit potential for high usage since they are primarily along the tourist and commercial corridors. Hence, potential to include cross-subsidization aspects can be explored within the management option arrived at for these locations
3. Prioritize and undertake expansion of sanitation coverage in slums with highest demand - Sivajyothi Nagar, Gandhipuram, Giripuram, Kumarathopu, Uppanki Harijanawada, Dasari Matam, Parvathipuram, Lenin-nagar, Ambedkar Society Colony
4. Evaluate possibility to increase public toilet stock in wards 18 and 19 which have high concentration of commercial areas as well as slum locations but no public toilets
5. Initiate exercise to assess fulfilment of sanitation requirements by institutional areas
Year 3: 2015-16
1. Explore areas of intervention in wards 8 and 12 which have high population densities but no public toilets.

IX. Annexures

Annexure I: Public Sanitation Planning Process



#Combined model: *Multiple catchment (Slum/Commercial/General/Tourist)*, Simple model: *Single catchment*
##NGO/ Communitv/ BOT/O&M/Other Institutions/Schemes)

Annexure 2: Site selection matrix for TMC

S No	Location	Category**	Catchment category	Field & CSP findings	Improvement type	Potential footfall (persons/day)	Land availability	Remarks	TMC Prioritization*
1	Opposite Kences Hotel (existing toilet)	Combined model	Tourist, Transit hub	Open urination	Retrofit	1000	Municipal land	On the storm water drain	High (Year 1)
2	Gandhi Road	Direct model	Commercial	Open urination	Retrofit	500	Municipal land	Road margin	High (Year 1)
3	Krishnapuram Tana, behind SV café	Combined model	Commercial, general	Open urination	New asset	500	Municipal land	Side margins of existing commercial complex	High (Year 1)
4	Urinals adjoining Rail reservation Counter and toilets inside reservation center premises	Combined model	Tourist, Transit hub, commercial	Open urination	Retrofit	1000	Requires acquisition		High (Year 1)
5	Raithu Bazaar at juncton of AIR Bypass Road & RC Road	Combined model	Commercial, Slum. General	Open urination	New asset	500	To be clarified	Located in TUDA jurisdiction	High (Year 1)
6	Old TPPM School (Behind proposed multi level car parking site)	Combined model	Commercial, Tourist	**Open urination & defecation**	New asset	500	Municipal land		High (Year2)
7	APSRTC Bus Stand (inside)	Combined model	Tourist, Transit hub	Open urination	Retrofit	1000	To be clarified		High (Year2)
8	Behind Bhooma Theatre (scavenging lane)	Combined model	Commercial, General	**Open urination & defecation**	New Asset	300	To be clarified		High (Year2)
9	Adjoining Group Theatre	Combined model	Commercial, Tourist	Open urination	New asset	300	To be clarified	Road margin	High (Year2)
10	KT Road, front of MORE Supermarket	Combined model	Commercial, general, Slum	Open urination	New asset	300	Municipal land	On the storm water drain	Medium (Year2)
11	Rayalcheru Road	Combined model	Commercial, general	Open urination	New asset	300	To be clarified	Near Palani theater	High (Year2)
12	AIR Bypass Road	Combined model	Commercial, general	Open urination	New asset	300	To be clarified	On the storm water drain	High (Year2)
13	Gandhipuram	Combined model	Slum, general	**Open defecation**	New asset	300	To be clarified	Inside the school	Medium (Year2)
14	Chenna Reddy Colony	Combined model	General, Slum	**Open defecation**	New asset	100	To be clarified		Medium (Year2)
15	IS Mahal Talkies Road	Combined model	General, Slum	**Open defecation**	New asset	200	To be clarified		Medium
16	Giripuram	Direct model	Slum	**Open defecation**	New asset	300	To be clarified		Medium
17	Uppanki Harijanwada slum	Direct model	Slum	**Open defecation**	New asset	100	To be clarified	Inside the school	Medium
18	Sivajyothi Nagar	Direct model	Slum		New asset	100	To be clarified		Medium

S No	Location	Category**	Catchment category	Field & CSP findings	Improvement type	Potential footfall (persons/day)	Land availability	Remarks	TMC Prioritization*
19	Ambedkar Society Colony	Direct model	Slum		New asset	100	To be clarified		Medium
20	Parvathipuram	Direct model	Slum	**Open defecation**	New asset	100	To be clarified		Medium
21	Lenin Nagar	Direct model	Slum	**Open defecation**	New asset	100	To be clarified		Medium
22	Kumarathoppu, behind Police Quarters	Direct model	Slum		Retrofit	100	Municipal land		Medium
23	Dasari Matam	Direct model	Slum		New asset	100	To be clarified		Low
24	Chintalachenu	Direct model	Slum	**Open defecation**	New asset	50	To be clarified		Low
25	Indira Nagar slum	Direct model	Slum		Retrofit	100	To be clarified	On the storm water drain	Medium

*Based on discussions and field knowledge, ** Category refers to user/catchment profile – Direct model caters to a single user type (slums or commercial or tourists or general); Combined model refers to multiple user types within catchment (Slums+commercial+tourist+general)