iP
TOILET

INTELLIGENT
PUBLIC
SANITATION

Keep dignified..
Always...

Inadequate sanitation takes a tremendous toll on the quality of peoples' lives, the environment, and the economy. Without effective sanitation, there is a high risk of epidemic diseases such as cholera, pollution of water supplies and contamination of the surroundings.

The requirement for public toilets is increasing exponentially with the economic development, urbanization and floating population. Without proper maintenance, public toilets are useless and a health hazard to the public. People normally keep less hygiene inside public toilets than their personal toilets. Unmanned self cleaning public toilets are the answer for today's public sanitation requirements. Its cost and failure rate in the past was very high and people were reluctant to use this technology. However, the developments in the ICT and automation technologies have solved the operational bottle necks, and have created more interest in self cleaning public toilets. Online monitoring and sensor technologies used in IPToilets have made them one of the most cost effective systems for public sanitation.

> **The economic impact of inadequate sanitation is substantial. It costs India a staggering 2.4 trillion each year – equivalent to 6.4% of its GDP.**

Returns on sanitation investments are also high. Worldwide, it is estimated that, for every US dollar invested in sanitation yields $5.50 in return in terms of economic benefit. Yet this sector in India remains largely neglected.

> **By 2030, 590 million people (twice the population of United States today) will live in Indian cities. According to UN, this will Cause a demand for one Public Toilet per 2,500-3,000 persons and one every 300-500 meter on busy streets, or every 750-1,000 meter in other streets.**

Intelligent Public Toilets

IPToilets or E-toilets are maintainable public toilets which have self-cleaning mechanisms. Even if the user forgets to flush the toilet, the toilet will get flushed automatically. In addition, a floor and wall cleaner will function automatically after four to ten visits. Fans and lights will start functioning only when the toilet is in use. There is also an automatic pre-flush when a person enters inside. IPToilets in common will have automatic sensor taps and dustbins. It has power and water backup for its users in case of sudden power outage or water discontinuation. The toilets will be disabled for any new entry when the backup or water gets depleted. The entry to the toilets can be restricted with coins or smartcards or more generally, using button press. Women friendly IPToilets will have women-friendly features such as napkin vending machine, incinerators to destroy used napkins, baby stations for changing diapers and the like.

> **IPToilets: Portable, stainless steel self-cleaning public toilets with low operational costs.**

IPToilets save cost in operation and maintenance almost 90 percent by employing state of the art service methods. Effectiveness of the IPToilets can be attributed to its unique micro-controller based electronic circuitry, vandal proof design, luxurious interiors, and high level of hygiene and low operational costs.

Hygiene and Dignity	Remote Monitoring
Environement Friendly	Low Operational Cost

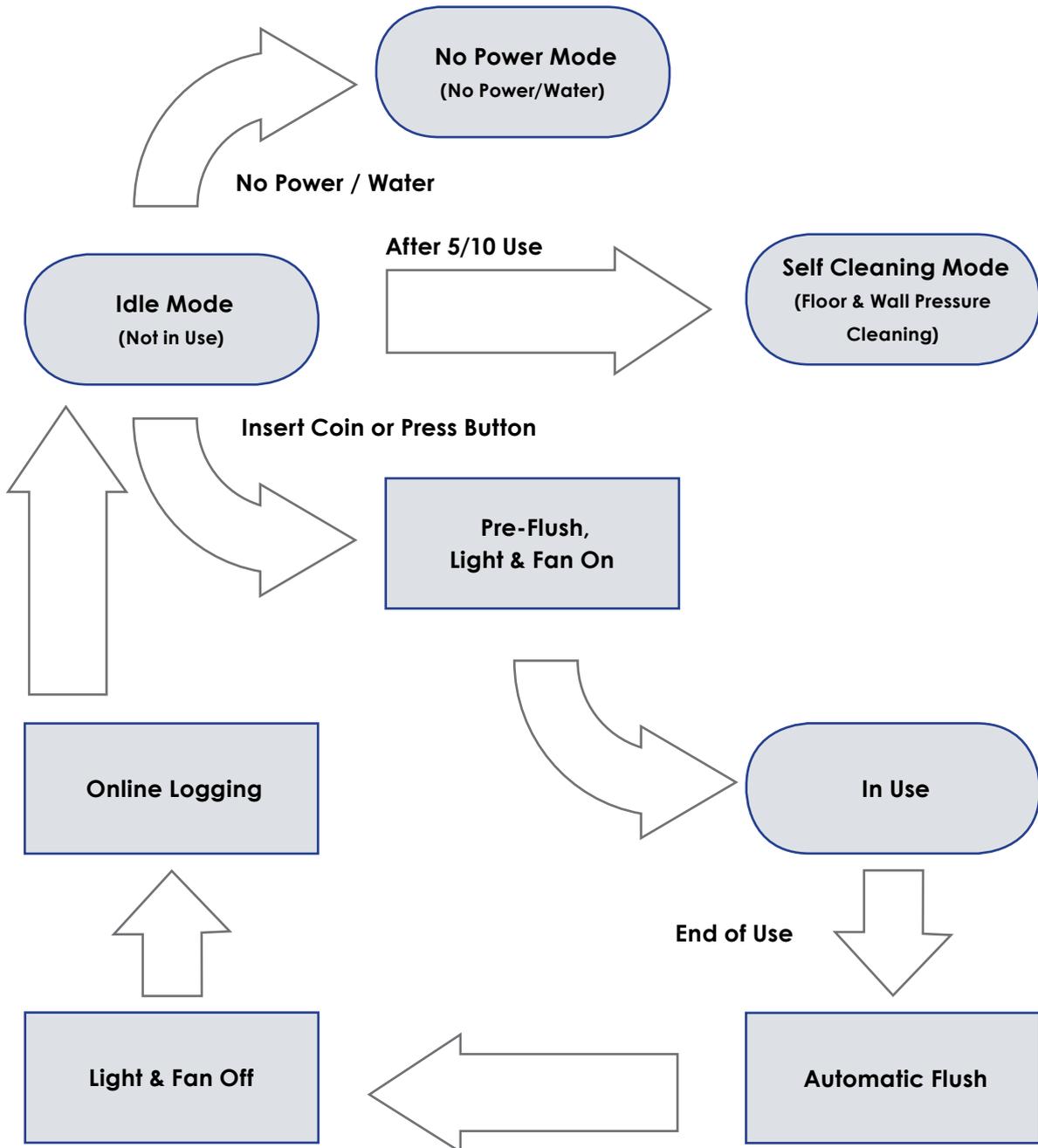IPToilet
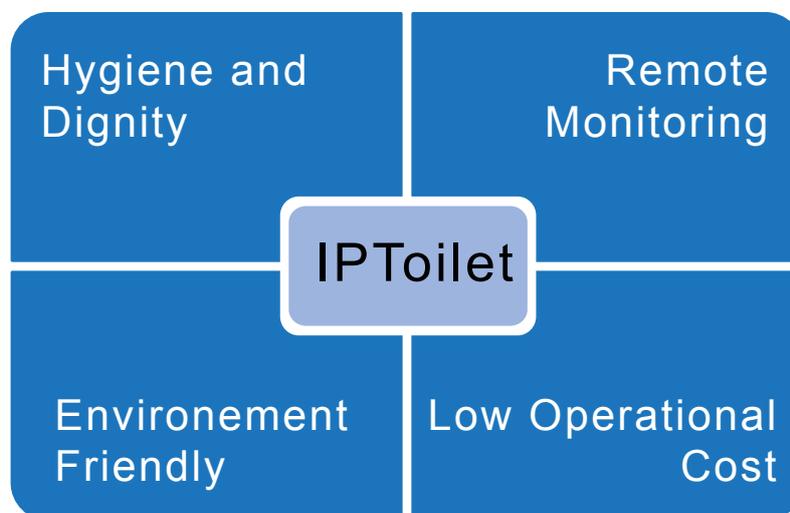
Where it can be installed

The highways, malls, airports, railway stations, general hospitals, stadiums, prepaid taxi counters, camping and training sites, tourist places, military camps, construction sites, beaches, check posts and public offices, to name a few.

Maintenance

Altersoft will provide toilet units with life time service and maintenance. Altersoft has developed a web based software to control and monitor the status of the IPToilets, ensuring the proper service of each unit during its service time. One or two service persons can easily maintain a cluster of IPToilets installed in and around a city or municipality. Apart from these, Altersoft provides a dedicated service vehicle named Intelligent Service Vehicle (ISV) which can maintain a cluster of IPToilets easily. It has provisions for uniformed service persons, pressure cleaning facility, mobile incinerator and service parts required for the maintenance and daily cleaning of installed IPToilets. It just takes 5 to 10 minutes to clean one IPToilet. Public can send SMS or MMS to a toll free number to register issues or complaints and it will be addressed within no time.

Workflow

No Power Mode
(No Power/Water)

No Power / Water

After 5/10 Use

Self Cleaning Mode
(Floor & Wall Pressure Cleaning)

Idle Mode
(Not in Use)

Insert Coin or Press Button

**Pre-Flush,
Light & Fan On**

Online Logging

In Use

End of Use

Light & Fan Off

Automatic Flush

Major Features

The intelligent public toilets have been designed keeping in mind specific groups of users for whom safe and hygienic sanitation is important - like women, on-site workers, city commuters, travelers, campers, etc. It is basically designed to have a clean and unattended public convenience facility.

Highly hygienic: IPToilet with its intelligence, keep hygiene even with improper usage of occupants. IPToilet has luxurious interiors and touch-free operations and as such gives a world class experience of hygiene in public toilets.

Floor hygiene concept: The unique technology in toilet design we have took is in its floors. The major importance is given for its highline is clean and hygiene public toilets. Keeping in mind, the IPToilet floors has two layers. One upper layer has 3mm thick 316 grade stainless steel sheets with 5mm perforation. It supports 1.5mm SS sheets underneath with proper ventilation and slanting for easy removal of waste water. It ensure all the grime from foot wears does not remain on the floor surface and thus periodical water jet cleaning of walls and floors are more effective.

> **IPToilets: Installed with automatic cleaning mechanisms to ensure cleanliness.
> Designed to operate with minimal touch.**

Pressure cleaning: This unique feature of pressure cleaning with specially designed spiral nozzles ensures that the water jet can clean every nooks and corners of the toilet floor and walls with reduced water usage.

Pre-flush mechanism: Most of the times, toilet hygiene is compromised since users may not wet the toilet pan before using it. Our IPToilet employs pre-flush mechanism that wets the pan before every use automatically.

Self cleaning using pressure jet spray: We never fail to maintain toilet hygiene at our home, but that is not the case in public toilets. On top, is the acute shortage of labour for cleaning lavatories. The timed pressure sprayers, perforated floors, auto-flush and the stainless steel body helps in self-cleaning of our toilets.

Automated for minimum user contact: It is commonly observed in public toilets that the people tend to spoil the door handle, switches, tap knobs, or flush knobs by rough use. By automating these operations, there is no need for any manual intervention except manually bolting the door from inside. This ensures minimum user contact and thus maximum hygiene.

Rugged and long lasting material: In addition to resisting stains, the design is tamper proof, corrosion free, and lasts for a lifetime.

> **IPToilets: Advanced microchip controlled electronic circuitry and specially designed algorithms to ensure smooth working.**

Never locked inside: Once got inside the user will have to manually bolt and unbolt the door by himself. So there is absolutely no chance that a user can get stuck inside.

Protection from vandalism: The IPToilets are designed to operate without manual intervention during its operations in public places. Fasteners used are Allen key and flower key stainless steel socket screws. Sensor taps, lights and fans are fitted as tamper proof.

Provision for revenue generation: The outer elevation can be customized to offer advertisement if requested. Further the entry can be restricted by coin insertions which can be used as a revenue making system. There is a possibility like a small utility shop or ATMs in areas where it requires.

Very cost effective in operations: The self cleaning toilets having pressure cleaning facility require regular monitoring and attention, but with less frequency per unit. This will save considerable labor and material cost in operations.

Waste treatment options: The waste is usually connected to the sewage line provided by the local authorities. However in places where there is no scope of any sewage line, we provide bio-membrane tanks which can separate fecal matter into bio-waste and completely odorless grey water.

Online control and monitoring: We offer software for supervisory control over all installed IPToilets. A GPRS system installed inside the toilets can transmit data like its usage, cleaning, sensor status, to a remote computer. This in turn can be monitored using the web interface we provide. This can be used by supervisors or municipal authorities to ensure proper operation. They can remotely on or off the system to prevent unwanted usage.

Mobile application: The public will have a downloadable mobile application to find out and navigate to working toilets nearby and also can report any complaints found.

> **IPToilets are eco-friendly; conserves water and electricity.**

Optional features

- Solar panels

- Biomembrane tank / sewage treatment plants

- Air conditioners

- Napkin incinerator and napkin vending machines

- Audio/video systems

- Advertisement displays

- Aromatic dispensers

Structure and Fabrication

At most care has been taken to design and fabricate the body tamper proof and rust proof. It is portable in whole or packed to install at site. Our toilets are made using stainless steel on the inside and aluminum composite panel outside. The stainless steel interiors, in addition being resistant to stains, it is also tamper proof, corrosion free, and lasts for a lifetime.

The interior of the toilet is stainless steel 304 grade 1.5 mm thickness wall and top cladding (facade) and floor is made up of 316 grade stainless steel 3mm perforated sheet. Outside usually is made up of aluminum composite panel with 4mm thickness. The life expectancy of these public toilets is 15 to 20 years after which it may require an overhaul to be reinstated.

Models:

IPtoilet 1020 Double: This model provides two cubicles in a single frame. Typically, one can be used for gents and the other for ladies. It is highly advisable in Indian context. It has 120cm*120cm inside floor area with 240cm height and thus can be used with dignity without touching the walls. There is service corridor in between the cubicles. The outer size is 13 feet * 5 feet. And thus it requires only 65 sq. ft. area to install the IPToilet on a wayside.

IPtoilet 1010 Single: This is single seated toilet with the cubicle size of 120cm*120cm inside floor area with 240cm height and thus can be used with dignity without touching on walls. The service area is attached to the toilet outer cladding.

IPtoilet MINI Single: This model is a cost effective one with space saving for school children usage. It has all common facilities except touch free wash basin. The inner size has 100cm*100cm with service area kept along with outside fabrication.

General information of IPtoilet Variants

	Specifications/Model	IP-1020	IP-1010	IP-MINI
1	**Exterior area**			
	Width	3520 mm	1300 mm	1100 mm
	Length	1380 mm	1880 mm	1680 mm
	Height	3110 mm	3110 mm	3110 mm
2	**Weight**	1400 kg	750 kg	650 kg
3	**Outer Colour**	On request	On request	On request
4	**Inside Area**			
	Width	1200 mm	1200 mm	1000 mm
	Length	1200 mm	1200 mm	1000 mm
	Height	2440 mm	2440 mm	2440 mm
5	**Service Area**			
	Width	1300 mm	1300 mm	1000 mm
	Length	1000 mm	500 mm	500 mm
	Height	2570 mm	2570 mm	2570 mm
6	**Structure**			
	Frame	G I profiles	G I profiles	G I profiles
	Floor	SS AISI 316 3mm perforated & non slippery	SS AISI 316 3mm perforated & non slippery	SS AISI 316 3mm perforated & non slippery
	Inside Wall	SS AISI 304 1.5mm	SS AISI 304 1.5mm	SS AISI 304 1.5mm
	Outside wall	ACP 4mm	ACP 4mm	ACP 4mm
	Door	SS AISI 304 1.5mm	SS AISI 304 1.5mm	SS AISI 304 1.5mm
	Inside Top	SS AISI 304 1.5mm	SS AISI 304 1.5mm	SS AISI 304 1.5mm
	Roof	ACP 4mm	ACP 4mm	ACP 4mm
	Locks	Electric door opener	Electric door opener	Electric door opener
	Ventilation	Door has a gap on the bottom for air ventilation	Door has a gap on the bottom for air ventilation	Door has a gap on the bottom for air ventilation
7	**Appliances**			
	Vandal proof Indian style SS toilet pan	yes	yes	yes
	Mirror	yes	yes	yes
	SS hand washer touch free	yes	yes	no
	SS waste bin with push door	yes	yes	yes
	Push button SS water tap	yes	yes	yes
	SS bolt from inside	yes	yes	yes
	Handle / handrail SS	yes	yes	yes
	Bag holder SS	yes	yes	yes
	SS Cup with chain	yes	yes	Yes
	Water pressure cleaning system	yes	yes	yes
	Coin mechanism	yes	yes	yes
	Pre-flush system	yes	yes	yes
	Automatic flushing after use	yes	yes	yes
	Manual flushing option	yes	yes	yes
	Self cleaning of floors and walls	After every 5/10 use	After every 5/10 use	After every 5/10 use
	Online monitoring of operations	yes	yes	yes
	Napkin incinerator	Optional	Optional	Optional

Space required installing an IPtoilet unit:

Intelligent public toilet installation requires minimum space for a single unit plus foot step plus shield or small walkway. Customers can choose outer design as per their customization. Sizes for single seated unit, double seated unit are shown below with its Width (mm) × Breadth (length) (mm) × Height (mm).
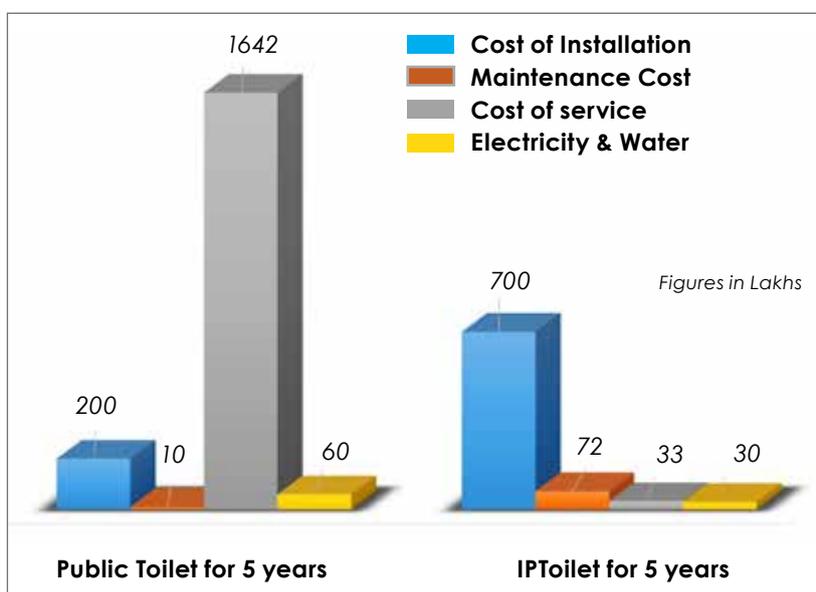
Inside	W 1200 × B 1200 × H 2350 mm
Outside	Single unit: 1600 × 1950 × 3100 mm
Outside	Double unit: 3400 × 1500 × 3100 mm
Door	600 × 24 × 1950 mm
Cantilever	450 × Width of the unit
Foot Step	450 × Width of the unit × 250 mm
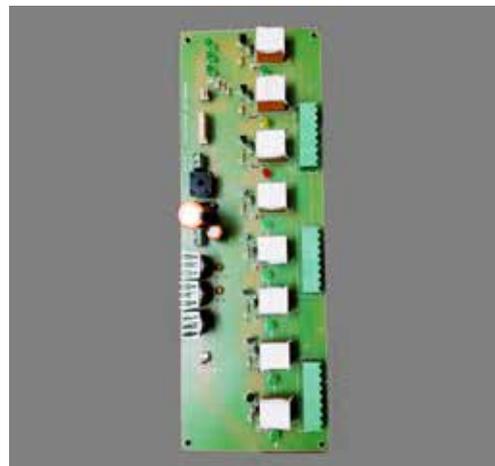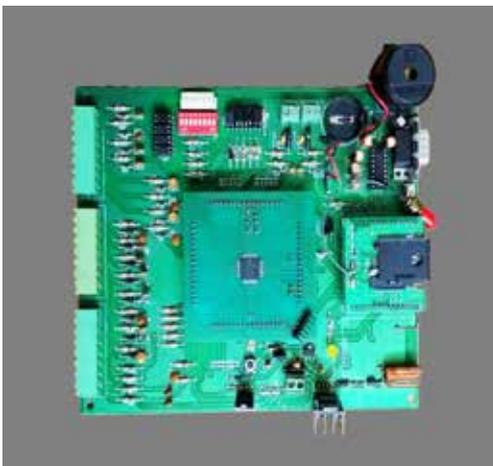
Cost effectiveness

The self cleaning toilets having pressure cleaning facility require regular monitoring and attention; but with less frequency per unit. This will save considerable labour cost if we take 5 year duration. The administrators of the cities find it difficult to manage and costly to operate public toilets in nooks and corners of the city. A cluster of IPToilets in a city or nearby areas can be operated with less than 5% of the cost of manned normal toilet operations.

Cost of Public toilet and IPtoilet for a 5 year period

Legend:
- Cost of Installation
- Maintenance Cost
- Cost of service
- Electricity & Water

Figures in Lakhs

Public Toilet for 5 years: 200, 10, 1642, 60
IPToilet for 5 years: 700, 72, 33, 30

Comparison chart of IPToilet's operational cost with normal public toilets

	Normal Toilets for 5 years & 50 locations (in lakhs)	IPtoilets for 5 years & 50 locations (In lakhs)
Cost of Installation	200	700
Maintenance cost	10	72
Cost of operation	**1642	**33
Electricity &water	60	30
Total for 50 toilets for 5 years	1912	835

*Cost is calculated considering 50 dual toilet installations with in a city limit of 25 kilometers
**Rs. 600×365×3 persons×5 years×50 locations. 3 Labor to work 24 hours per location per year
#Rs.600×365 days×3 persons for all 50 location× 5years

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