

Public Toilets in Nepal:
A Guide to Better Plan, Design and Management



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Preface

In Nepal, several cases on the status of public toilets have revealed that the effective management of this public amenity is more challenging than constructing one. Lack of proper management and lack of regular monitoring by the authorized body have led to most of the public toilets in Nepal in poor condition. The insufficient resources and the users' behavior are other key factors for making the situation worse. The other reasons are being poor layout, improper planning and social issues. And most of the public toilets, which are in operation, have failed to address the standard technical specifications as well as environmental, health and gender issues.

This document is intended as a guide to initiate the public toilets and for their smooth operation giving insight on the rationale of incorporating technical, management and social aspects of public toilets during designing and planning. Therefore, this document can be taken as a reference by any institute who would initiate to construct public toilets and plan for their regular maintenance.

This guideline covers technical and non technical aspect of the public toilets such as designing, materials, hygiene, environmental, social factors as well as the management part in order to set up the technically sound, hygienic, environmental friendly, equitable, accessible, and socially acceptable public toilets in Nepal.

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Disclaimer: This document should only be used as a guide, not as a technical manual

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Abbreviation

CCTV: closed circuit camera

DWSS: Department of Water Supply and Sewerage

FSM: fecal sludge management

ITP: International Training Program

MHM: menstrual hygiene management

NGO: non-governmental organization

ODF: open defecation free

PV: Photovoltaic

PVC: polyvinyl chloride

SUWAS: Sustainable Urban Water and Sanitation

TS: total sanitation

UV: ultra violet

WC: water closet

WHO: World Health Organization

Chapter I: Introduction of a Public Toilet

A toilet which is used by more than two people from two different families or from different areas is known as public toilet. A public toilet is a publicly available small sized booth or block or rooms with all kinds of toilet facilities including urinal and defecation units with the hand washing stations. Conveniently located in the places such as streets or in the market, schools, colleges, government offices, corporate houses and service oriented buildings where the flow of public is high, these vital components are focused for the general public, tourists, customers, students, employees or any other kind of visitors. More specifically, public toilets are those placed in public spaces, especially near bus stations, parks, tourist areas and market centers to serve mobile population. Public toilet users are generally people passing through the area and are not necessarily people who live nearby. Public toilets are also available and essential in the mass transits such as airplanes and trains. Just like other public amenities, public toilets are considered as one of the essential components in the urban areas as people need to have easy access to take the services from this vital public amenity at anytime, anywhere.

The public toilets are basically have separate male and female sections with the specially consideration of providing additional facilities in the female section such as menstrual hygiene management units. Increasingly, public toilets are accessible to people with disabilities as special consideration have been made in most of the public toilets these days such as installation of ramps and handles to make them access and use the facilities conveniently.



Public toilets are known by many other names depending on the country. Examples are: restroom, washroom, bathroom, water closet (W.C.), comfort room, ladies'/women's room and gents'/men's room etc. Some public toilets are free of charge while others charge a fee. In the latter case they are also called pay toilets and sometimes have of a coin-operated turnstile. Public toilets are generally operated and maintained by special group of people assigned by the relevant department or under the authority granted by the local government.

Interestingly, mobile toilets or portable toilets are also being promoted in the areas where the construction of public toilet is technically difficult. They are also available in the areas where large outdoor events such as festivals, sports or any social events take place.

In Nepal, after the nationwide movement of open defecation free (ODF) campaign and nearly a successful achievement by the mid 2018, the promotion of public toilet in the public areas has been considered as one of the major plans of the post ODF movement which is technically known as total sanitation (TS). In other words, public toilets are vital to control the open defecation free movement. In the major urban areas and metropolis, the presence of a public toilet in each ward has been considered as a must. This should also be noted that the provision of safe and accessible public toilets is an important function of local government and, after the local election; many local authorities (municipalities and wards) have initiated the planning and construction of this public toilets.

Chapter II: Components of a Well Planned and Designed Public Toilet

Any toilet which is technically sound, hygienic, environmental friendly, equitable, accessible, affordable, and socially acceptable and user friendly can be considered as a well designed and planned public toilet. Therefore, a public toilet should not only be technically correct, but should also consider social, health and environmental issues of this vital public amenity to make them operate smoothly and sustainably. Therefore, while planning and designing public toilets, all these key components must be taken into consideration.

1. Technical Component

1.1 Layout

The layout plan should begin with the number of users on the daily basis as it determines the number of male and female units required. There should be separate male and female units. An assessment on the user numbers and the nature of use, therefore, is recommended. The layout plan begins with the entrance of the public toilet. Special consideration should be taken to ensure that the paths of the users do not cross each other and the entrance is wide enough. Therefore separate entrances of the male and female units are preferred provided there is more space. While designing units, the privacy of the users should be considered, especially at the urinal sections. There should be proper ventilation and flow of light within all the units. The door should be made open from outside. Avoid entrances opening onto a wall surface with the mirror reflecting the urinals.

The ratio of fittings in male and female toilets should be 1 W.C & 1 Urinal for male: 2 W.C.s for female. As far as possible, fixtures such as urinals and W.C.s should be fitted back-to-back with common pipe ducts in between. All public toilets should be mechanically ventilated. Small public toilets should be fitted with an exhaust fan as minimum. Water storage tanks should be integrated into the toilet design. Avoid sharp corners or edges to avoid the possible injuries in case of accidents. Coved tiles or PVC strips should be provided along these edges as far as possible.

A small closet as a store room to keep the cleaning gears is recommended while preparing layout plan. Also, in the external public toilet, it is recommended to keep in the plan a small cell or the closet for the care taker.

In the institutional public toilets, the number of unit is defined by the ratio of 1:40 (boys) and 1:25 (girls)

Disabled-Friendly Water Closet

A ramp, with minimum ingredient possible, should be in the layout plan to access the facility for the people with disability. Special considerations should be made while designing disabled friendly water closets. The door should be a minimum of 30 inch. There should be two handles in the door as shown in the picture below. Handles in the walls and closed to the pan should installed. The following diagrams may be helpful in defining some essential technical specification.

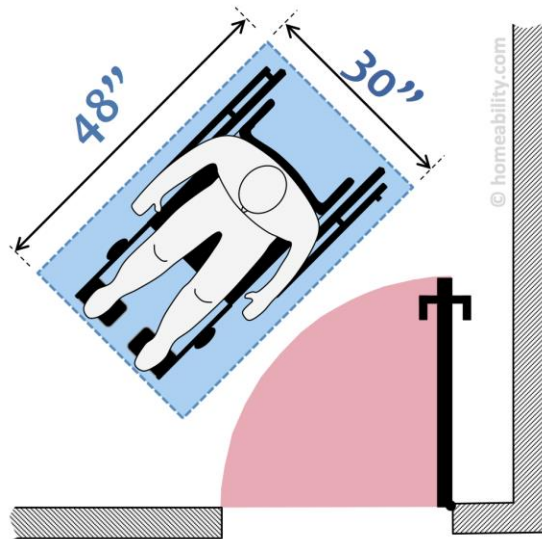


Fig: an average wheelchair size

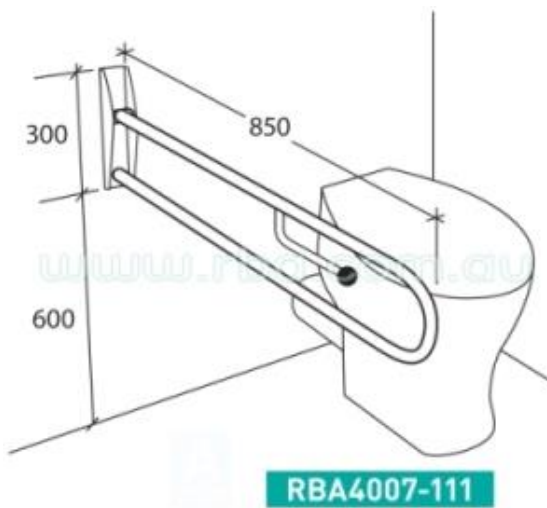
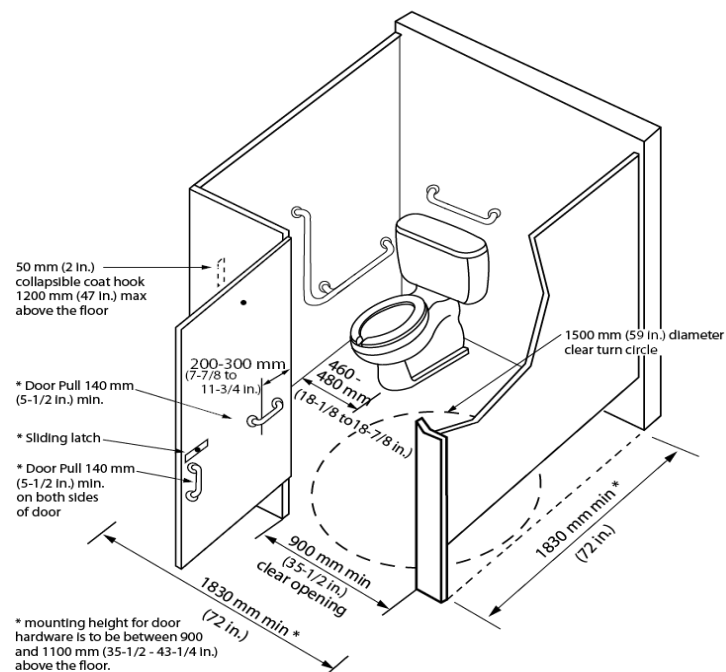


Fig. Handle near the pan



A2: Specification Plan for the Disable-Friendly Cubicle (WC)

1.2 Lighting

Lighting is another key technical component. A well-designed lighting system will save electrical energy and improve the appearance of the toilet. Poorly designed fixtures with discolored diffusers go a long way to make a toilet dingy. Dark and shadowy, off-colored lighting can create the impression that a toilet isn't clean. Natural lighting can be used to help create a softer, friendlier environment. Harsh lighting can create a cold and unwelcoming air while being inappropriate for the tasks being performed. It can also highlight hard-to-clean areas. All public toilets should be provided with warm-color lighting for general lighting as well as down lights above the wash basin/mirror. The minimum general lighting level is 300 lux. Warm-color lighting aids in creating a better ambience in the toilets, which in turn encourages more care and responsibility from the users.

1.3 Materials

The materials used in the public toilets should be durable and resistant to vandalism and neglect. The following are some of suggestive options of the materials to be used in the various sections of a public toilet.

The tiles used in the surfaces floors should be non-slippery, fully vitrified tiles with epoxy grouted, or broom finished concrete ones or the natural stones. It has been found that the tiles that provide slip resistance via raised surface pattern are easier to clean than grit-surfaced tiles and maintain better slip resistance when wet.

As of wall, light and bright surfaced tiles are preferable as they are easy to clean and give additional light within the water closet units.

a. Wall ceramic tiles, natural stone, homogeneous tiles, stainless steel, enameled steel panels, glass block, aluminium panels, phenolic cladding.

b. Ceiling mineral fiber board, fibrous plaster board, aluminum panels or strips

1.4 Plumbing fixtures and water supply

All pipe works should be concealed, except for final connections to the fixtures. All plumbing fixtures and fittings should be selected, installed and managed with whole-off life costs and water conservation as a priority. WC pans should be fabricated from heavy gauge of 304 stainless steels with integrated toilet seat and should have shroud to conceal drainage and water supply pipe work. Basins should be wall-mounted or free standing, fabricated from a heavy gauge of 304 stainless steels wall-mounted with integrated shroud to conceal drainage and water supply pipe work. Vanity basins and surfaces are not to be used except where part of an integrated stainless steel multi-basin unit with integrated shroud.

1.5 Water supply

The toilet cisterns should be supplied by adequate roof water wherever possible. Taps should be supplied with potable water where available or at least water should be biologically and chemically safe.

The external water storage tanks should be well covered and should not provide hiding places or climbing access to the roof or other areas of the toilet block. This also controls the mosquito breeding.

Since overhead or roof water storage tank can hold the water for months, there should be provision of an underground water storage tank.

1.6 Urinals

All Urinals should be fitted with a flush valve and a manual or an automatic flushing device. The fixture should be concealed for easy maintenance and to avoid vandalism. Urinals should be individual wall hung units, more than 300mm wide, and the lip of the collection area should project from the wall by at least 300 mm. The width of the urinal section should be minimum 70 cm. Urinals should be separated by modesty boards of not less than 300 x 800 mm (Height). If 2 or more urinals are installed, one should be installed at child's height. Installation of all the urinals at child's height is also suggestive (as in the adjacent figure).



1.7 Water Closets (W.C.)

All water closets should preferably be wall hung and should be fitted with a flush valve and an automatic flushing device with a manual bypass. In Nepal, the squatting pans with spray are preferable from the hygienic and cultural perspective. Bucket and jug provision is not recommended.



The fixture should be concealed for easy maintenance and to deter vandalism. W.C. cubicles should be 850mm (min) x 1500mm (min). All W.C. cubicles should be fitted with drum roll toilet paper dispensers. Coat hooks (double hooks) should be affixed behind the cubicle doors. A platform or foldable shelf could be installed in the cubicles for putting personal items. Cubicle partition board should be of rigid design and wall or ceiling hung, where practical, without leg support for easy cleaning of the floor area. An ablution tap coupled with hose and a spring-loaded nozzle should be installed in at least 1 W.C compartment in male and female toilets. Floor trap should be provided within the W.C. where it is fitted with the ablution tap. The flooring of W.C. cubicles should be properly graded towards the floor trap so as to keep the floor as dry as possible. That particular cubicle should have signage displayed for easy identification.

1.8 Wash Basins

Wash basins should be substantial in size. The basins should have a minimum size of 500mm in length and 400mm in width. The space around wash hand basins should be minimum 20 cm. All wash basins should be installed into vanity tops, and located beneath the vanity. Vanity tops should have backsplash

and apron edges. All wash basin taps should be provided with PUB-approved aerators. As an effort to conserve water, electronically controlled taps can be considered. Sensor controlled taps with their precise flow settings and positive shutoff characteristics, offer effective means for providing adequate water flow when it is required.



Further to this, it will minimize hand contact. The water pressure and tap/wash basin position should not cause water to splash onto user's body during activation. Where there are 2 or more basins, one should be installed at child's height. In order to keep the floor dry, the vanity top-cum-wash basin should be installed outside the toilets for common use by all users. A free standing or the wall mounted liquid soap dispensers, paper towel dispenser or hand dryer and litter bins should be installed adjacent to the wash basins.

1.9 Provision of Facilities

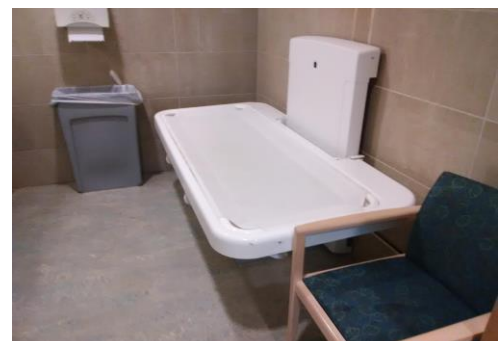
All public toilets should be fitted with: (a) Waste bins or sanitary disposal units inside each male and female toilet and outside toilets located directly below or in close proximity to the washbasin vanity. (b) Either paper towel dispenser or hand dryer, directly above or in close proximity to the washbasin vanity. (c) Sanitary disposal bins in female toilets (d) Suitable air fresheners to promote a fragrant, pleasing environment. It should spray away in non-traffic directions or upwards. (e) Sanitizers in each W.C bowl/ urinal fitting. (f) Wash areas should also be provided outside public toilets serving wet markets and beaches. (g) A slop sink and it should preferably be housed in a separate compartment.



The female sections should cater for menstrual hygiene management (MHM) and other hygiene requirements. In each cubicle, there should be a small space or compartment to keep the personal belonging such as wallet or purse and mobile. There should be hangers or hooks at the inner side of the door to hang the coat or bags.

Diaper changing station/unit

A free standing or wall mounted (concrete or plastic or wooden) diaper changing unit at the lobby of the public toilet is recommended. The unit should be accessible to both male and female as they both may need to change the diaper of their babies.



Shower/wet room facilities

Shower facilities can be popular, particularly in areas that attract campers, walkers, cyclists and urban water scare areas, all of whom will happily pay for the opportunity to freshen up. Wet room facilities can be incorporated into disabled toilets without much additional space required.

1.11 Ventilation System

Proper ventilation of a public toilet is one of the highest priorities. Ineffective ventilation can make a public toilet unbearable, even if it is well designed. Effective ventilation ensures that vitiated air is quickly extracted, and helps to avoid dampness and subsequent growth of mould on floors and walls. The toilet air should be extracted to the outside by a mechanical ventilation system at a rate not less than 15 air changes per hour. The mechanical ventilation system of exhaust fans and, where applicable, ventilation ducts and grilles should ensure that every part of the toilet is within 3m of the fan inlet or an intake grille, measured horizontally.

Preferably, intake grilles should also be provided at low levels near the W.C.s to enable foul-air to be extracted quickly before diffusing into other areas of the toilet. Where service access ducts are provided, these should be connected to the toilet exhaust ducts to extract air at a rate of 5 air changes per hour. The make-up air to the service access ducts may be taken through extract grilles installed at low level on the walls between the W.C. compartments and the access duct. The exhaust air should be discharged to the exterior of the building at a position at least 2 m above the pavement level and at least 5 m from any window or fresh air intake. Replacement air should be supplied to the toilet to make up for the exhaust air. The replacement air may be taken directly from the exterior, or from adjacent spaces that are permanently air-conditioned or naturally ventilated. The replacement air may be drawn through louvers in the doors, cuttings under the door, or other openings. If replacement air is taken from the exterior, the quantity shall be lower than that of the exhaust air so that a lower pressure is created in the toilet, which minimizes the possibility of vitiated air entering the adjacent spaces. Replacement air should preferably be discharged close to the floor level near the wash basins to help keep the floor dry. Air locks should be incorporated to separate the toilet areas from food consumption or preparation areas.

1.11 Additional Features

The ambience of public toilets can be enhanced further by:

- (a) Introducing easy maintenance plants inside the toilets as well as surrounding the public toilets. This will make the toilet a homely feeling and welcoming.
- (b) Placing of wall pictures and illuminated with delicate lighting on them.
- (c) Placing of ornaments or sculptures at the 'dead' corners of the toilets.

2. Hygiene Component

Personal hygiene is a key concern while using public toilet facilities. Public toilets should be designed to minimize hand contact as far as possible for hygienic reasons. The hand washing units should have cleaning soaps or sanitizers. The handle of the taps should be pushed type. If possible, the automatic taps functioning with electronic sensor is preferable. Each water closet units should have flush valves with water supplied by roof top tanks rather than stored water near the facility. The products such as flush valves and faucets require minimum maintenance but offer enhanced operations that promote sanitation and perceived cleanliness because of hands-free operations. In the water closets units, the squat type defecation units with spray are preferred. It is essential to keep the floors dry all the time as it not only keeps the germs off from the surfaces but also prevents any accidents. As of hand washing agents, it is recommended to install liquid soap dispenser (free or mounted, as mentioned already) to minimize the hand contamination. Similarly, to drive the contaminated and stale air out from the block, the installation of proper ventilation system should be taken care of. In the cubicles or the WCs, it is recommended to install the spray rather than tap-bucket system.



Fig. Wall mounted liquid soap dispenser



Fig. Free standing liquid soap dispenser



Fig. Light sensed faucet

As of female cubicles, there should be proper management of collecting sanitary napkin and proper disposal facility. Incinerator is not recommended unless it is fully internal combustion one or the one with the tall chimney and if the public toilet block is not in the densely settled area.

3. Environmental Component

The public toilet should be located in the area where the environmental impact of the public toilet is less. The black and grey water produced should be well managed. In some cases decentralized waste water treatment system can be planted. This consists of anaerobic baffle reactor with or without constructed wetland. In case of septic tanks, they should be located in the area where the groundwater contamination is less or zero. If not possible, the pit holes are recommended with the provision of regular evacuation of sludge by the local FSM service provider. In case of incinerator, especially in the female section, special consideration, such as installation of tall chimney, should be taken to ensure that the smoke or affluent gases cause no adverse effect to the nearby neighborhoods.

If possible some greenery should be promoted around the toilet block as it not only helps maintain the surrounding environment, but also adds the aesthetic value and makes the toilet welcoming.

In order to make the public toilets climate resilient and environmental friendly, some of the following features can be includes.

3.1 Renewable Energy

For the electricity, photovoltaic (PV) panels can be considered to provide electricity to the site, especially useful if the facilities are off grid. For those that are on the grid, it will support to run toilet independent of grid electricity and save electricity bill.

Solar thermal panels can be installed to provide hot water requirements of the facilities to reduce running cost. This is especially beneficial if shower and/or laundry facilities are also provided creating additional demand for hot water.

The sludge in the septic tank can have multiple usages. The digested sludge produce a certain volume of methane gas in the regular basis and it can be used up one or more families. The dried sludge so produced can further be used as composting as well as soil conditioner.

3.2 Rainwater Harvesting

Using rainwater instead of municipal water within toilet facilities can help deliver some of their environmental outcomes and reduce their carbon footprint. It is also a useful consideration for toilet facilities that are situated far from the municipal water supply.

Rainwater can be collected from the roof of the toilet building, filtered and stored. It can then be used within the building in toilets as well as for watering plants and outdoor amenity areas. It is not, however, suitable for hand washing or drinking, unless a UV filter or any bio-filter unit is installed. The main environmental benefit is the reduced use of mains water. Mains water is environmentally costly to produce in terms of the energy and chemicals used in its treatment and distribution. The resulting water is of drinking quality which is an unnecessarily high standard for use in toilet flushing. The harvested water in excess can be recharged into ground.

Rainwater harvesting can also reduce pressure on drainage systems which can contribute to the reduction of urban flooding and pollution and erosion related to heavy run-off. This can be an important consideration if seeking planning permission for construction or renovation of toilet facilities.

4. Social Component

Public toilet should be for all, whether it is a local or visitor or a foreigner or whether it is man or a woman or a child or an old-aged or people with disabilities or third gender. It should be welcoming and

gender friendly. While designing the location, special consideration should be given for the people with disabilities such as ramp and handles on the walls for the handicapped or the brailled quoted information boards for the blinds. Some urinals in the male section should be low for the children.

While selecting the location, the consultation with the local neighborhood is suggested. Location of toilets should not be too remote from main traffic area to avoid long distance walking for the aged with weak knees. It has to be clearly visible from the all side and should be easily accessible for those with urgency and for better personal safety for the user. It should be easily visible and accessible. Signage about the location and position of the public toilet should be in the appropriate places. Signage used should show contrast of dark solid figure against a white background and significant to be seen by the visually handicapped and the aged. Both word signage such as 'Male', 'Female', 'Man, 'Woman' (in Nepali and in English) and pictorial based signage should also be kept as all people may not be literate. Confusing signage such as king or queen should be avoided.

Decorating the public toilets with natural plants, porcelain artifacts, wall posters and photos in and outside of the block not only make them attractive and convincing, but also persuade users to maintain neatness and cleanliness. If possible gardening around the block is highly recommended.

Safety is another important concern in the public toilets. The doors of the WCs should have bolt system from inside. The lock system from outside of the WCs is not recommended as it may pose unsafe to the user.

User education is another key part for the regular maintenance of the public toilets. The main purpose of user education is to address specific behavioral concerns such as littering, careless aiming or the flinging of water everywhere.

Having public education messages in the toilets can help persuade users to do their part in keeping toilets clean and well maintained. The public messages should be practical and convincing. In order to be effective in persuading people to do their part, a message has to be attended to, assimilated and remembered (for future action). The messages should be readily visible, simple and uncluttered, attractive and eye-catching. The language of public education has to be kept simple. Some pictorial messages should also be considered for the users who cannot read. Subtle humor, through cartoon characterizations, can be used to deal with the personal and sensitive issues surrounding toilet use.



Chapter III: Operation and Maintenance

Operation and maintenance is the key part of public toilets. Design and specification decisions need to be made with lifetime management in mind to ensure the long term sustainability. The smooth operation of the public toilets is all based on the proper maintenance of the public toilets. The public toilets are generally maintained by the relevant institutes such as schools or government sectors. But in case of the public toilets in the streets, for example, a person or group is authorized for its regular operation and maintenance. A contract, with clear terms of reference, should be provide to the operator by the relevant authority. Besides, an operational manual should also be developed and be handed over to the operator.

3.1 Management, Maintenance and Security Issues

The following issues should be addressed at this stage:

- Clear opening and closing hours: The time should be as per appropriate to local demand and activity patterns. For public toilets that have an open and closing time, it is advisable that these should be displayed clearly at the side entrance of the toilet premise
- Security measures: All the closets should have inner locking system. The outer locking system in closet is not recommended. CC TV surveillance devices should be provided outside the entrance of the public toilet premise for the security reason
- Information and communication (public and staff); such as signage showing opening hours, emergency numbers, gender designation, the use of surveillance and mechanisms to report critical incidents
- Cleaning and building maintenance: arrangements for cleaning and maintenance routine

3.1.1 Sequence of Cleaning

General cleaning should be carried out in daily basis. It should follow a systematic sequence to avoid areas, which were previously cleaned from becoming wet and soiled again before the cleaning process is completed. The general cleaning should be divided into spot and thorough cleaning. Spot cleaning refers to the process whereby only specific areas are cleaned (i.e. those that are soiled). Thorough cleaning refers to the cleaning of the entire restroom and is usually carried out once a day. The sequence of cleaning should follow this checklist:

- (a) Replace all expendable supplies
- (b) Pick up litter and sweep floor
- (c) Clean and sanitize commodes and urinals
- (d) Clean and sanitize basins
- (e) Clean mirrors and polish all bright work
- (f) Spot-clean walls, ledges, vents and partitions

(g) Wet-mop floors

(h) Inspect work and correct any errors

An inspection card should be used in the supervising and monitoring of the daily maintenance of the toilet. This card should have name and signature of the cleaner and the date and should be placed at the back of the entrance door to the toilet with s.

3.1.2 Schedule Cleaning

Scheduled cleaning should be carried out periodically on a weekly, fortnightly or monthly basis (different surfaces, wares and fittings require different cleaning periods to maintain their cleanliness). Scheduled cleaning should be carried out during off-peak hours to avoid inconveniencing the user. The periodic cleaning schedule should be adopted.

3.1.3 Timing and Frequency of Cleaning

The timing and frequency of cleaning should be determined by the crowd flow. Cleaning should be done more often during peak hours and less during off-peak hours. Frequency of cleaning is usually determined by expectation and standard of maintenance required by the management of the property and also the budget available for the maintenance of toilets. The frequency of cleaning should vary for different building types. Shopping centers will require more frequent cleaning than condominiums.

The recommended frequency of cleaning toilets (the entire cubicle) is as follows:

Type of Toilet	Frequency of Cleaning
Single House	Once a day
Shared Latrines in Housings	Two to four times a day
Official Buildings	Four to six times a day
Restaurants	Four or five times a day
Commercial buildings	Six to eight times a day
Hospitals and other service providing institutes	Four to six times a day
Markets and other crowded areas	In every two hours

(Source: DWSS)

3.1.4 Basic Equipment and Supplies

Different equipment for different joints and corners, as well as different disinfectants, should be used in the cleaning of different sanitary wares and fittings. To carry out proper toilet maintenance, cleaners should have the equipment listed. Cleaning materials such as brush, bucket and disinfectants should be readily available for care taker. Besides, protective materials like gloves masks, boots, apron and cap should also be available for the care takers.

Each public toilet should also be equipped with the basic maintenance supplies/service tools for the minor maintenance such as screw driver, pipe wrench, putting, pliers etc.

3.1.5 Performance-Based Contracts

The continuation or the termination of the contract should be based on the performance of the operator. A set of indicators should be developed based on which the operator's performance is evaluated. The authorized body should also make schedule for the monitoring. Sometime unscheduled and uninformed monitoring visits give even a better picture of the public toilets.

3.2 Financial Management

3.2.1 Business plan and tariff fixation

The key source for the sustainable operation and management of the public toilets is the fund granted or generated. In some cases, for example institutional public toilets, the regular budget is provided by the relevant institute. In some cases, the public toilets are operated without any tariff raised as in the cases of the public toilets in the tourist areas where the entry ticket fees include such services. However, in most of the public toilets in the public open places, the certain amount of service fee is charged as the source of income that covers the expenses and salary for the caretakers.

The amount of tariff may be fixed by the relevant authority based on the quality of services. The fee, however, should be reasonable and affordable.

3.2.2 Advertising

The space on the back of a toilet door can be valuable advertising space as it communicates to a captive audience with time on their hands to read whatever is put in front of them. Local businesses may be interested in paying for the use of this space, or your own community groups might use it to promote forthcoming events and activities. The amount you can charge will depend on what value the advertiser places on the space, so it will be important to have a realistic idea of footfall to indicate the likely size of the audience. Wall space elsewhere inside and outside the building can be used for similar purposes. External walls are useful places for public notices and in rural areas with few other facilities they can become the information hub for the community. A map showing the next nearest public toilet or Chemical Disposal Point is always a helpful addition too.

3.2.3 Use of outdoor space around the building for amenity value

The outdoor space around the facilities can be used to make the premises look attractive, safe and welcoming. It's this space that gives the first impression to customers. For local residents it can turn the facility from a public eye sore and embarrassment to a real community asset. Linking up with local community growing initiatives can increase local buy in and create that important sense of local ownership. As well as attractive amenity planting, outdoor seating can be installed to provide a waiting area and a social spot – potentially encouraging sales from that coffee vending machine.

3.3 Monitoring and Evaluation

The authorized body should make schedule for the monitoring and evaluation. Sometime unscheduled and uninformed monitoring visits give even a better picture of the public toilets. A check list or the monitoring form should be developed to monitor and ensure every aspect of public toilets are in order.

For the effective monitoring and evaluation, a check list can be developed. A form developed by Department of Water Supply and Sewerage (DWSS) on the same can be taken as a reference. It is available in the annex

3.4 Public Toilet Operation and Management Models

The three most common management models for public toilets include public authority management, Leasing and private sector management, and private sector investment and management.

3.4.1 Public Authority Management Model

In this model toilet blocks are built by government agency, especially municipality. They are owned and managed by the municipal agencies. Usually, certain charge is levied on users. Due to lack of real obligation or incentive for caretakers to maintain a good service, cleanliness and maintenance are generally poor in this management model.

3.4.2 Leasing and Private Sector Management Model

Toilet blocks built by government or NGO are operated by private contractors or individuals or NGOs through leasing agreement by municipalities. In this model, private sector is responsible for regular operation and routine maintenance and charge user fees. The municipality may provide water and power supplies free of charge, and take certain responsibility for structural repairs.

3.4.3 Private Sector Investment and Management Model

This model is based upon build - operate -transfer financing mechanism. The toilet blocks are constructed by private sector, with their own investment, usually on land provided by the municipality. Then toilet blocks are operated and managed by the private sector. User fees apply. Under Build, Operate, and Transfer contracts, the ownership of the premises transferred to the municipality after lease period finished. The lease period would be for five or ten years based upon the location of public toilet.

Chapter IV: Business Plan for Public Toilet

4.1 Introduction

4.1.1 The Problem

One has to go to the public bathroom when the nature calls. Wait in queue, open the toilet stall and one is not too happy with what is seen there. One has to respond to call of nature, but it is happening in an unpleasant, uncomfortable and unhygienic environment. If only one had a clean toilet, something that could turn the situation around or to help relieve feelings of environmental discomfort.

4.1.2 Purpose of Business

Our first purpose is to make public toilet safe, clean and comfortable environment. People use them all day long and they do not get cleaned after every user's visit. Survey does not show the proper cleaning calendar nor has it been monitored by the responsible units. Existing public toilets lack quality and quantity of cleaning materials. Our business plan is to propose transparent and monitored cleaning calendar and mechanisms for instant availability of cleaning materials.

Our second purpose is to have a small shop where toilet supplies like tissues, feminine products and soaps are available for purchase. A shop annexed to the toilet will make available toilet supplies so that toilet visitors have easy access. For operator, it will be alternative revenue generation. However, the owner cannot sell restricted items such as food and liquor. (Survey shows public toilets in market areas are not strictly following it. Operators who run public toilet and shop have good business return)

Our third purpose is to operate public toilet for social benefit rather than profit making. The cost raised in public toilet will limit to the cause of sustainability and an attraction for public toilet entrepreneurs. The operator will not only run public toilet but also runs the shop annexed with the public toilet

Our fourth purpose is to address needs of public toilet target users who are shop keepers, exhibition visitors, market visitors and persons working or visiting offices within the vicinity. We will have hence locker system which can be used for different purposes. We see here two types of visitors – regular and non-regular visitors. We propose that operator can fix different means of tariff for regular visitor (Survey result shows some public toilet operators have successfully implemented this).

Our fifth purpose is to guarantee availability of sufficient quantity of water and reliable power supply along with periodic maintenance and replacement of assets such as taps, light bulbs, sink and flush (Survey result shows many public toilets are in bad shape)

Our sixth purpose is ways of doing things differently. This includes training of operators, awareness campaign to users, Health and safety of operators by providing health insurance and health checkup. (Survey result shows none of the public toilet operators, KMC and SWC have this provision so far)

Our seventh purpose is to make model marketable. Public toilet visitors can register their satisfaction and complain by mobile apps.

Our ninth purpose is to make this public toilet a research model. SWC can assign interested and qualified organization who can conduct training of operators and/or do case study research.

4.2. Market analysis:

We have interesting case studies and information from 16 public toilets which are;

Case #1: Case study of Bhrikutimandap

Location: Bhrikutimandap; Latitude: 27.6858771; Longitude: 85.3428559

Ayete Deula has been looking after the public toilet at the Bhrikutimandap since last 21 year. His family has been looking after the operation and maintenance of the toilet. There are about 200-250 people visiting the toilet daily however, the design and the sanitary facility at the toilet does not seem to be enough for good service. Even though the toilet is gender friendly however due to the improper placing of the sign board, visitors often gets confused which toilet to use. The internal structure of toilet is also not so satisfactory. With Broken locks, taps and no enough lightning provision toilet is not satisfactory in terms of safety of females. There are no dustbins for the disposal of menstrual hygiene waste. In that toilet there are also disable visiting over there, however the toilet does not have any tactile, ramps or spacious design for the disable people. About Rs.2500-3000 is collected everyday as revenue which is hold by the operator himself. Regarding the expenses monthly payment of Rs.4150 is made by the operator to the Social Welfare Council. Besides the charge to SWC, other expenses includes purchasing of sanitary materials, water and maintenance cost. His family members though are not trained for this purpose still they are engaged in this profession so; no other staff has been recruited for the cleanliness work. This public toilet within few minutes of walk from the National Association of Disable Federation, still there are few disable visiting this toilet. With its poor infrastructure , This toilet needs further improvement in its operation.

Case # 2 .Bhrikutimandap:

Latitude: 27.6858771; Longitude: 85.3428569

Name of the operator: Sanila Deula

The public toilets over the business area of Bhrikutimandap have been constructed by the social welfare council for which monthly tariff has to be paid by the operators over there. There are about 3 public toilets inside the business area which is mostly used by the shopkeepers over there. The condition of the toilets over there doesn't seem to be satisfactory since most of them lack proper door and lock system, enough lightning and ventilation. Furthermore due to the lack of water and provision for waste disposal the toilet seem to be dirtier and was smelling stench. According to the operator over there, most of the visitors over there are the shopkeepers about 150 in numbers. These shopkeepers pay monthly charge of Rs.60 for the use of toilet. Beside these shopkeepers there are about 50-100 visitors from outside daily visiting that toilet; however the number varies in festival season. There are also some disabled people visiting toilets however the toilet lacks structure for their convenience. The charge for using toilet is Rs 5 for short toilet and Rs10 for long toilet where as there is no provision for the bathing. The operator holds all the revenue generated and has to pay monthly charge of Rs 4500 to SWC for operating toilet at that place. Beside the monthly charge to SWC, other expenses include water and sanitary materials. The monthly charge of the electricity used was found to be Rs.33 per unit. The operator who has not taken any training was found to be responsible for the cleanliness and other repair and maintenance work. There was no any monitoring mechanism for the cleanliness of the toilet.

The operator has not been provided with any TOR for running toilet over there and handles it according to his way. The condition of the toilet looks like it needs further renovation and other facilities for its proper operation.

Case # 3.Ratnapark:

Location: Latitude: 27.6858771; Longitude: 85.3428559

Name of the Operator: Barkha Poda

This public toilet has been constructed at the midst of busy place at Ratnapark with continuous flow of people from 5 am to 8 pm. The toilet has been constructed by the municipality but not as per the standard design since it lacks proper ventilation, enough lightning, door lock, spacious design, and with other disabled friendly structures. Even though the toilet has been specified as gender friendly with separate toilet for boys and girl however, the condition of ladies toilet seems pathetic. In absence of proper dustbin facility for the disposal of waste, sanitary napkins were seemed to be dispersed everywhere at the corner of the toilet, which was also clogging toilet. Furthermore, the water storage provision at ladies toilet seemed to be of strange one since, vehicle oil storage tank was used for the water storage purpose. The doors seemed to be missing lock which also raise question about the safety of women since, of the average 200-300 visitors per day half of the visitors are female. Regarding the revenue generation Rs. 2000-3000 is collected daily which is hold by the operator. Beside the monthly payment for the staff over there, 4500 liter of water has to be purchased which is stored in a tank over there. About 20litre of phenol and 15 liter of acid is also purchased monthly for the cleanliness purpose. Upon the inspection of toilets the sanitary aspect was observed to be lacking as there was no provision of soaps, also the cleanliness part of the toilet rest upon the staff working over there and they are not provided with any training for it. The frequency of cleaning toilet, its maintenance and repairing

depends on the need as there is no any monitoring calendar. The fecal sludge of the public toilet goes to the drain so there is no any problem for its management. Regarding the service provided by the public toilet, they only provide short toilet and long toilet facility, no any bathing service due to the water problem. The lockers over there are used for the storage of the stuffs from the street vendors.

Considering the types of the visitor at the toilet, most of them are street vendors, pedestrian, tourists and some disable people. The toilet seems to be busy with higher flow of visitor at the day time and seem to have enough revenue generation however; it still lacks proper facilities for better and inclusive services.

Case # 4: Thimi:

Location: Latitude: 27.67350908; Longitude: 85.38490143

Name of the operators: Nani Chori Deula

The public toilet at Thimi was constructed by the Mini Bus Samiti at 2012 since then Nani Chori Deula has been operating it. Even though the toilet has been constructed at the highway the flow of visitor is minimum may be because it's located at height and not much visible. Most of the visitors over there are staffs from the samiti and bus drivers and conductors who usually don't pay for the service. Beside these there are few others who pay for the service so the daily tariff collected is Rs 200-300. The operator has not been provided with any TOR and don't need to pay any charges for it. The water for the toilet use is collected at the storage tank at the Chowk and then pumped to a tank for the use. The only expense for the operators is the purchase of cleanliness materials. There is no any provision of the waste disposal and the fecal sludge goes to the drain. Stairs have to be used while reaching toilet so it is not feasible for the wheelchair users however, visually impaired people used to visit the toilet. According to the operator, most of the bus drivers and conductors visit the toilet after 8 when they are not over there and use water for bathing even there is no provision of bathroom and throw their clothes randomly. Sometimes these clothes even clog toilets. The responsibility of cleaning toilet and maintaining it falls on the operators and they have been doing it as per the need. The revenue collection from this public toilet seems to be low comparing other toilets at Kathmandu Valley.

Case # 5 Kamalbinayak Bus Park

Location: Latitude: 27.6845871; Longitude: 85.3480228

Name of the operator: Gurun Deula

Public toilet at the Kamal Binayak buspark constructed by the municipality seems to be in pathetic condition since it lacks even the basic infrastructures like door, taps and dustbin. The toilet is not even gender friendly since there are very few toilets i.e., 3 and three urinals only so, the toilet with door is used for long toilet and that not with door for short toilet. According to the operator it's been 18 yr that he has been operating the toilet however there is no any written contract or TOR. With the miserable

condition of toilet, there is no any higher flow of visitors. Most of the visitors are bus drivers, municipality staff who usually refuse to pay any charge and few other pedestrians. The charge for short toilet is Rs2 and for long toilet is Rs 5 so; there is no any higher revenue collection. On average daily revenue collection is Rs 100-200. For water use 500 liter of water is purchased at Rs 250 and stored in a tank which lasts for 4-5 days. Toilet is cleaned everyday with water and sometimes with acid. Operator himself cleans the toilet and repairs and maintains it but the condition of toilet is not good. Besides expense on water and sanitary materials, operator doesn't need to pay any charge for running toilet. The fecal sludge of the toilet is drained into the river. The toilet is very poor in its condition and is not feasible for normal people leaving behind people with special needs.

Case #6 Lagankhel Buspark:

Location: Latitude: 27.6662593; Longitude: 85.3250911

Name of the operators: Ratna Maya Deula

Public toilet at Lagankhel is located at the buspark, constructed by the club called Buddhi Bikash Mandal. The operator has been looking after the toilet since its construction at 2053. The toilet is open from 4am to 9pm and has higher flow of visitors. The status of toilet was quite satisfactory with water facility and cleanliness; still there was not enough provision of soap, dustbin and adequate lightning. The toilet is not disabled friendly though there are many disable visiting the toilet. There is no any service of bathing, just toilet use only. There are 500-600 people visiting daily and both male and female visit equally since the toilet is gender friendly. The revenue generation is higher and the operator has been paying salary of Rs7000 for 25 cleaning staff over there per months. TOR has been provided by the municipality to run the toilet but time period has not been mentioned. For the cleanliness, repair and maintenance purpose operator and her two other family members have been working over as per the requirement. They have been purchasing 6000 liter water of Rs 1600 daily for the toilet use. The revenue generated has been used to pay the tariff of electricity, cleaning staff, sanitary materials, water and for the operation of toilet. The challenges while operating of the toilet includes stealing of taps & sanitary materials, water scarcity, load shedding for pumping of water etc.

Case # 7 Koteshwor Public toilet:

Location: Latitude: 27.6876388; Longitude: 85.3504042

Name of the operator: Arati and company

Public toilet at Koteshwor has been constructed by Arati and company at 2015 and it has been running this toilet with 3 staffs looking over at. The toilet demonstrates good example of revenue collection with better service. There is one disable friendly toilet for wheel chair user however for the visually impaired person there is no any provision of tactile. The toilets over there are gender specific and have good provision of doors and locks though it lacks enough lightning. It also has facility of dustbin for the waste disposal, continuous water supply and sanitary materials. There is staff for continuous cleaning and repairing purpose. The toilet seems much cleaner and sanitized with dettol. There are about 400-500

people visiting toilet daily and male and female visitors comes in equal proportion. There is also provision of bathing where hot water costs Rs 100 and cold water costs Rs 50. Charge for using toilet for short toilet is Rs5 and for long toilet is Rs 10. On an average daily revenue of 4000-4500 is collected which is hold by the Aarti and company. The staffs are paid Rs12000 per month and other expenses include water purchase, sanitary materials, electricity, gas etc. There is also provision of lockers for visitors. With better service , public toilet of Koteshtwor demonstrates good revenue generation and toilet maintenance comparing other public toilets.

The case study is supported by quantitative survey as well. The duration of operation extends from one year to fifty years. Public toilet designed 50 years before has not gone any major rehab and maintenance. We also found that nearly 63% of public toilets are designed following the standard of public toilet guideline. Interestingly, the operator in many cases is not aware of design standards. We found the operators have no systematic record keeping of public toilet visitors, income and expenses. However, a very rough conservative estimate of income, expenses and saving is presented as follow: We also noticed that income is also underreported so also the actual expenses must have been to be higher than the current expenses if the standard cleanliness and maintenance to be done.

The implication is the need of change in mindset both from operator and KMC/SWC/Donors and supporting organizations the purposes of public toilets

Table 1: Annual income and expenses of public toilets

Toilet No (a)	Location (b)	Estimated Annual number of users per week (c)	Tariff per week (d)	Total tariff per annum= column d*54 (e)	Total expenses per annum (f)	Saving per annum = (e-f)
Ratnapark (2)	Ratnapark	2,100	11,000	594,000	300,000	294,000
Santibatika	Bir hospital	1,400	7,000	378,000	120,000	258,000
Bhrikutimandap (3)	Bhrikutimandap	1,500	8,000	432,000	114,000	318,000
Koteshtwor	Koteshtwor	3,500	20,000	1,080,000	600,000	480,000
Thimi	Thimi	800	4,000	216,000	24,000	192,000

Kamalbinaya k Bus park	Bhaktapur	750	2,100	113,400	20,000	93,400
Chyamangsin gh	Bhaktapur	1,050	6,000	324,000	100,000	224,000
Kamal binayak	Bhaktapur	700	4,000	216,000	96,000	120,000
Mangal Bazar	Lalitpur	1,400	8,000	432,000	250,000	182,000
Lagankhelbus park	Lalitpur	3,150	18,000	972,000	60,000	372,000
jawlakhel	Lalitpur	420	3,000	162,000	40,000	122,000
Kalanki petrol pump	Kathmandu	1,400	9,000	486,000	130,000	356,000
Swoyambhu	Kathmandu	1,200	10,000	540,000	151,200	388,800
Total				5,945,400	2,005,200	3,400,200

4.3 Financial plan

Cash Flow:

We estimate following revenue and expenditure annually.

Spending Estimate

- i. Remuneration- We will depute two persons (one male and one female) @ Rs 17,000 per month for 13 month a year (including One month Dashai bonus). Annual salary payment is NPR 442,000 with 5% salary hike per year
- ii. For health safety reason, we will have health insurance @ Rs.5000 per annum person and @ Rs 7,500 medical expenses per son per annum
- iii. Water billing consumes the largest share. We allocate Rs.560,000 water bill (=Rs1550 per day)

- iv. Material cost such as bucket, soap, hand sanitizer, cleaning items is expected to be at Rs.75,000 per annum
- v. Maintenance is another critical component. Regular maintenance of light bulbs, taps and other amenities will be done @ Rs, 40,000 per annum.
- vi. Total estimated spending is around 1.2 Million Rupees per year.

Revenue Estimate

- i. We will assign Rs5 for short toilet and Rs10 for long toilet. Daily average visitor is expected to be 550.
- ii. Operator can fix different monthly tariff rate for regular users.
- iii. We will provide locker system for deposit of commodities with additional surcharge per visitor.
- iv. Total revenue estimated from above three sources is about One Million rupees per annum
- v. Provision of shop will be another source. Estimated revenue from shop is @ rate @Rs 20,000 per month

Saving Estimate:

- i. Annual saving is estimated @Rs48,000 per year for the base year.
- ii. Above saving estimate does not include operator training cost and monitoring cost.
- iii. SWC is expected to be supported by external agencies for operator training and post follow up activities.

Expansion of services:

- i. If Rain Water harvesting is installed and @ 50% water demand met by RWH, about Rs. 200,000 can be saved on water billing per year.
- ii. Bio gas installation will generate additional revenue to make Public toilet more profitable.

Cost details

We cannot attain breakeven point within ten year time if infrastructure cost 4.5 million is accounted. We consider the infrastructure as grant and not to be returned then breakeven point will be reached within ten years.

Table 2: Ten years cost analysis

	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
NON-RECURRING COSTS											
Infrastructure	4,500,000	-	-	-	-	-	-	-	-	-	##### ###
Furniture and Fixtures	75,000	-	-	-	-	-	-	-	-	-	75,000
Planning (upon Approval)	-	-	-	-	-	-	-	-	-	-	-
Procurement	-	-	-	-	-	-	-	-	-	-	-
Contract Negotiations	-	-	-	-	-	-	-	-	-	-	-
Training of Employees (Pre-Implementation)	-	-	-	-	-	-	-	-	-	-	-
Post-Implementation Reviews		50,000			50,000			50,000			150,000
TOTAL NON-RECURRING COSTS	4,575,000	50,000	-	-	50,000	-	-	50,000	-	-	4,725,000

RECURRING COSTS											
staff from operators (2 persons)	442,000	464,100	487,305	511,670	537,254	564,116	592,322	621,938	653,035	685,687	5,559,429
Insurance	10,000	10,500	11,025	11,576	12,155	12,763	13,401	14,071	14,775	15,513	125,779
Health Check up	15,000	15,750	16,538	17,364	18,233	19,144	20,101	21,107	22,162	23,	188,668

										27 0	
Material costs	75,000	78,750	82,688	86,822	91,163	95,721	100,507	105,533	110,809	11 6,3 50	943,342
Electricity bill	25,000	26,250	27,563	28,941	30,388	31,907	33,502	35,178	36,936	38, 78 3	314,447
water bill	560,000	588,000	617,40 0	648,27 0	680,684	714,718	750,454	787,976	827,375	86 8,7 44	7,043,620
maintenance and replacement	40,000	42,000	44,100	46,305	48,620	51,051	53,604	56,284	59,098	62, 05 3	503,116
User Training	-	-	-	-	-	-	-	-	-	-	-
Other	25,000	26,250	27,563	28,941	30,388	31,907	33,502	35,178	36,936	38, 78 3	314,447
TOTAL RECURRING COSTS	1,192,000	1,251,60 0	1,314, 180	1,379, 889	1,448,88 3	1,521,328	1,597,39 4	1,677,2 64	1,761,1 27	1,8 49, 18 3	14,992,84 8

TOTAL COSTS	5,767,000	1,301,60 0	1,314, 180	1,379, 889	1,498,88 3	1,521,328	1,597,39 4	1,727,2 64	1,761,1 27	1,8 49, 18 3	19,717,84 8
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QUANTITATIVE BENEFITS	YEAR 1	YEAR 2	YEAR 3	YEAR 4	YEAR 5	Year 6	Year 7	Year 8	Year 9	Year 10	TOTAL
REVENUES											
tariff	1,000,000	1,050,00 0	1,102, 500	1,157, 625	1,215,50 6	1,276,282	1,340,09 6	1,407,1 00	1,477,4 55	1,5 51, 32 8	12,577,89 3
Shop rental	240,000	252,000	264,60 0	277,83 0	291,722	306,308	321,623	337,704	354,589	37 2,3 19	3,018,694
TOTAL REVENUES	1,240,000	1,302,00 0	1,367, 100	1,435, 455	1,507,22 8	1,582,589	1,661,71 9	1,744,8 05	1,832,0 45	1,9 23, 64 7	15,596,58 7
Total Saving including non	(4,527,00	400	52,920	55,566	8,344	61,262	64,325	17,541	70,918	74,	(4,121,26

recurrent cost	0)									46 4	1)
total saving without non recurrent cost	48,000	50,400	52,920	55,566	58,344	61,262	64,325	67,541	70,918	74, 46 4	603,739

vii. We do consider that non recurrent cost including training to be borne, breakeven can be reached in ten year time.

viii. 8. Expansion plan

ix. We see following potential expansion plan

x. Installation of Rain Water Harvesting. This is expected to ensure water availability and reduction of water bill.

xi. Installation of Bio Gas Plant and bio gas power. Our public toilet can have additional revenue and expenses saving

xii. If Bio Gas plan installed, fecal residue can be used for composting

xiii. Exploring potential of urine fertilizer production.

Annexes: Sample of form for monitoring and Evaluation of a Public Toilet

A1. शौचालय निरीक्षण फाराम

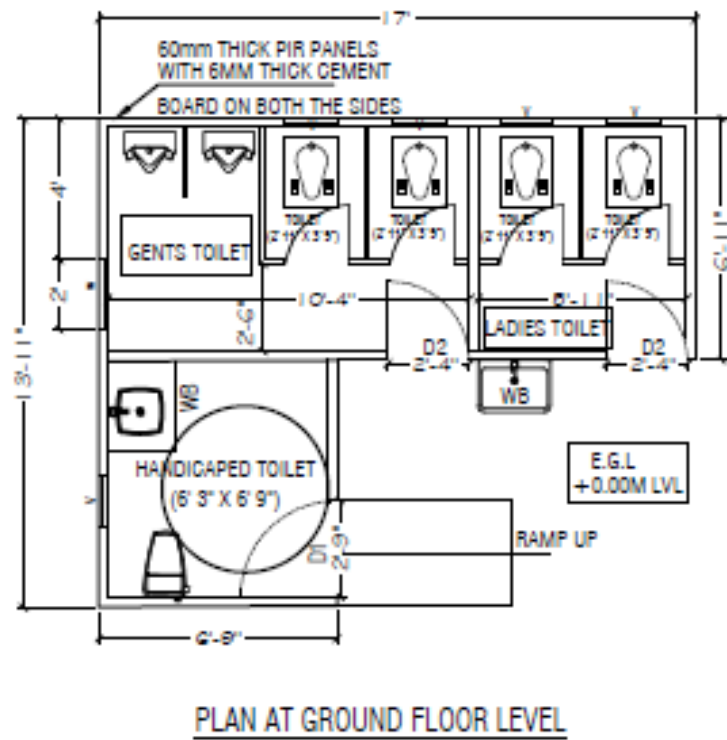
निरीक्षण मिति:

निरीक्षकको नाम:

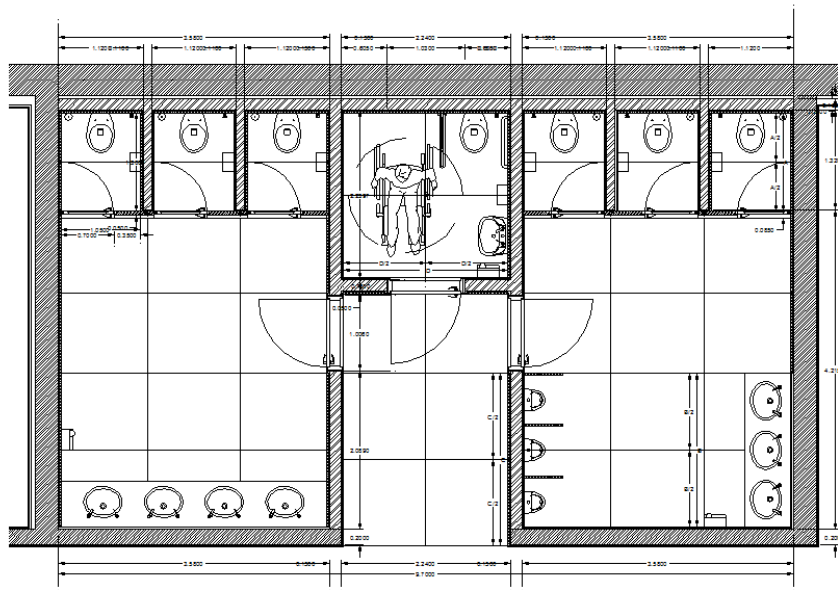
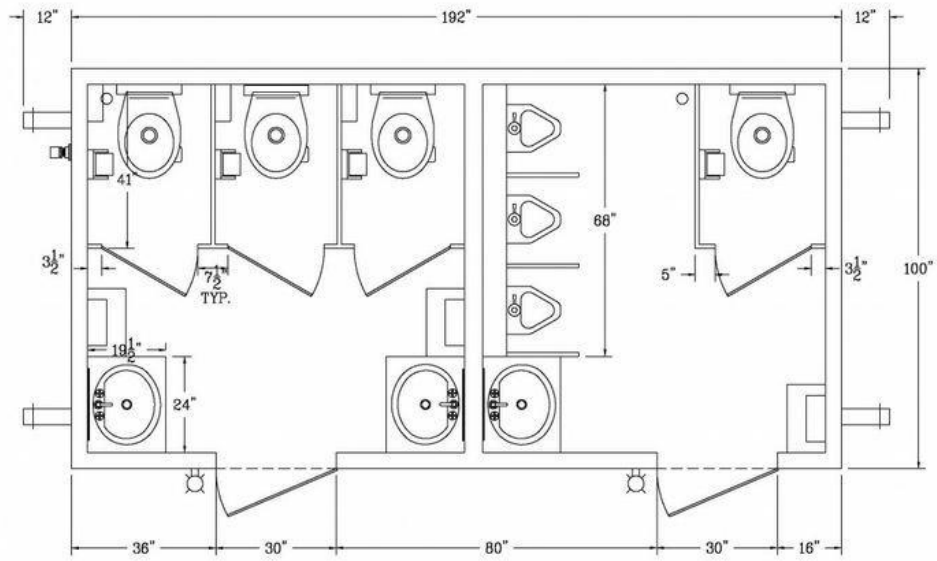
शौचालयभएको स्थान:

शौचालयको संरचनावा जडान गरिएका सुविधाहरु	निरीक्षण गरिएको विवरण	अवस्था - (टिक)	देखिएका समस्याहरु	सुधारका लागि गर्नु गर्ने कार्यहरु	सुधार गरिएको मिति:
बाहिरी ढोका	शौचालयको संकेत चिन्ह / प्रष्ट र यथा स्थानमा टाँसिएको				
	सजिलै खोल्न बन्द गर्न सकिने				
भित्रको ढोका	टुट फुट				
	ढोकाको चुकुलचालु अवस्थामाभएको				
भ्याल	सजिलै खोल्न बन्द गर्न सकिने				
	सिसा चर्केको				
	पालिस उप्केको				
ऐना	कुनै टुटफुट नभएको				
हातधुने ठाउँ (वेसिन)	कुनै टुट फुट नभएको				
	धाराहरुमापानीभएको				
	धारा चहिने				
	पानीको निकासमाअवरोध				
	फिटिङ्ग दुरुस्त भएको				
पिसाब फेर्ने स्थान	टुट फुटनभएको				
	दागधब्बा रहित				
	फलस सजिलै हुने				
	पानीको सहजनिकासभएको				
प्यानवाकम्मोड	टुट फुट नभएको				
	सजिलै फलसिङ्गहुने				
	पानीको सहजनिकासभएको				
	दागधब्बा रहित				
बत्ति	बत्तितथा स्वीचहरु सुचारुअवस्थामाभएको				
भित्ता	भित्तातथा टायलहरु नचर्केको बानफुटेको				
	रंग रोगन नबिग्रिएको				
अन्य सामग्रीहरुको उपलब्धता	पर्याप्तपानीभएको				
	हातधुने साबुनभएको				
	रुमालतथा टोईलेट पेपर भएको				
ढल निकास	फोहर पानीको सुरक्षितव्यवस्थापन र विसर्जनको व्यवस्थाभएको				
सरसफाई	शौचालय र शौचालय परिसर सफाभएको				
	फोहर फ्याँक्नको लागि बिन राखिएको				
	शौचालय परिसरमा हरियालीभएको				

A.2 Some samples Public Toilet Layout Plann



Courtesy: Covestro (India)



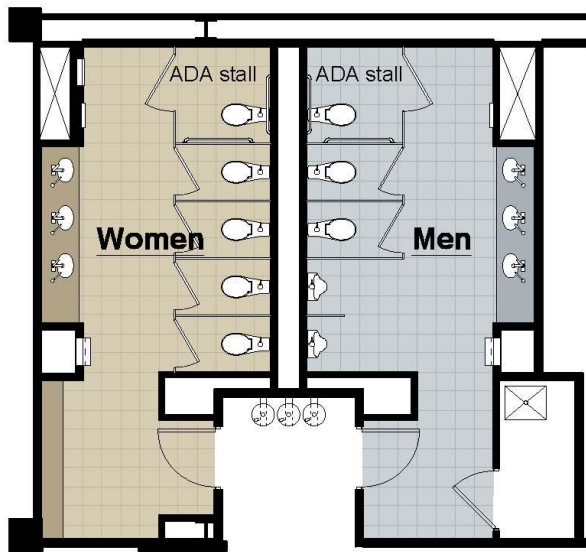


fig. a

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