

# Effect of change in design on improving the behavior of urban equipments' users

## (A case study of public restrooms in Tehran, Iran)

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### ABSTRACT

Principal goal of this study is to determine how design affects public restrooms users' behavior, likelihood of vandalism, social abuses, hygienic quality and the elements that deter some groups of society such as women and children from using public restrooms. The results were obtained from a broad-based survey which has been done during 2002 to 2007 in Tehran.

In first phases of study, an observation of different user groups with wide range of age, gender, social and cultural classes was conducted throughout 73 public restrooms in Tehran to obtain information about incorrect behavior such as misuse, vandalism and socially disapproved user behavior caused by design problems. This was primarily undertaken in order to reach a practical solution by means of design.

In Phase two, Conformed to compiling design checklist, the main principles of design were identified with the general intention to change attitude, and thus improve the user's behavior. These hypothetical principles are: 1- Respect to user's requests improves the users' behavior. 2- Automation decreases the social crimes and vandalism. 3-Automation improves the efficiency of public facilities.

Some new equipments were designed or redesigned to meet the expectations of improving users' behavior and 62 automatic public toilets (598 units) have been found during 2003 to 2005.

Phase three was the Assessment of efficiency and viability of new generation APTs When newly-designed public restrooms have been used for one year. This study indicated that more than 85 percent of pre-defined purposes of improving users' behavior and changing the attitude of unwilling groups toward public restrooms have been reached.

**KEYWORDS: Urban facilities, User behavior, Public restroom, APT (Automatic Public Toilet)**

## INTRODUCTION

The issue of improving the quality of public restrooms was introduced through a research and design project in February 2002. Through this project, some studies were conducted regarding the public restrooms users behavior, the failures of current situation, and the needs and demands of users in order to achieve an acceptable rate of quality and efficiency. These may be undertaken by addressing the problems and deficiencies, designing the new public restrooms, and evaluating the rate of success in the new project. Thus, this process can be divided into three phases.

**First Phase:** To study the needs of citizens and the initial condition of public restrooms throughout Tehran<sup>1</sup>, and to review the other existing samples in the world and derive a list covering the design specifications (2002-2003).

**Second Phase:** To design the new public restrooms based on the results obtained by the first phase and compiling design specifications, and to construct the new restrooms named new generation (2003-2005).

**Third Phase:** To assess and evaluate the efficiency and viability of newly-designed public restrooms by comparing the achieved situation and the initial one, and finally to expand results for future projects (2005-2007).

## FIRST PHASE: STUDIES

## MATERIAL & METHODE

The studies have been conducted within two main categories:

- 1- Library Studies
- 2- Field Studies

## LIBRARY STUDIES

In the very first part of studies, data collection was conducted using written resources, Internet and the studies presented in the databases of the Municipality of Tehran. In this case, the results of each part were compared and transacted on the continuously and weekly bases. The orientations of studies were corrected based on the latest weekly recorded achievements in order to avoid any deviation. In the library studies:

- 1- The different data resources were collected.

2- The collected data were classified and the applied information was drawn separately in each chapter in the form of "design checklists", and finally their feasibility were assessed and evaluated.

Among the main data collected and analyzed in the library section, the following elements are some of the most important ones:

- Climate
- Environment and public restrooms interaction
- Hygienic issues
- Cultural, social and religious issues
- Vandalism
- Ergonomy and Anthropometry
- Green design
- Urbanization
- Environment psychology and urban perspective

## STUDY THE EXISTING SAMPLES

Public restrooms in Tehran are mostly located in parks and squares and some of them are underground (Fig. 1). They are typically independent buildings. They are a part of free social services that are found and maintained by Tehran municipality.



Figure 1: A- Khazane Park, B- Sanat Sq., C- Resalat Sq. underground public restroom

These restrooms consist of two separated male & female parts with quite separated entrances. Each part consist a public space and private units. The details are shown in figure 2 and 3.



Figure 2: Samples of public spaces

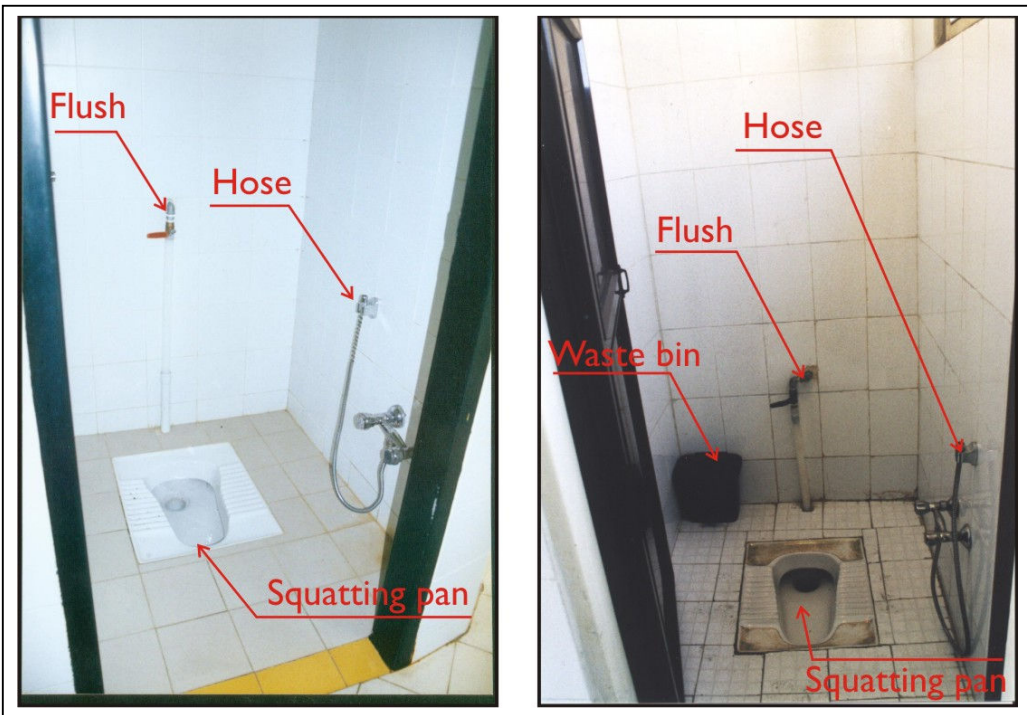


Figure 3: Samples of private units and details

## FIELD STUDIES

To identify the users' behaviors and needs in the current public restrooms.

This section formed through following methods and analyzing the results.

- A) Direct Observation of Behaviors
- B) Observation of the Consequences of Behaviors
- C) Questionnaire
- D) Interview

To conduct these field studies, some sites were selected as pilot points of study (i.e., as the representative points of all samples in Tehran), and the results were generalized into the whole subject.

## SELECTING THE PILOT POINTS OF FIELD STUDIES:

In order to reach a complete and accurate spatial pattern demonstrating all user groups of public restrooms in the city, it was necessary to carefully select the pilot points of field study. To do so, the following indices were drawn to select the pilot points including the current public restrooms located in different points of city and their users:

1- Population: It implies that the concerned points were selected in the locations with different population congestions, so that the effect of frequent uses in public restrooms on the behaviors could be identified.

2- Income level: the level of individuals' income was supposed to tangibly influence how they used the public restrooms. Thus, the points were selected in such a manner that the various social groups could be totally captured based on the revenue. (Iran statistical center database 2000)

3- Neighborhoods: A public restroom being located near a residential area may have more various users than one in an educational or administrative area. (Tehran municipality statistic data base 2001)

4- Social class: the level of education and social class of public restrooms' users play a major role in the form of their behaviors within public places. Thus, the culture parameter was considered as one of the main factors.

5- Age Condition: Since the users of public restrooms have different needs and capabilities within different ages, for example the elder and the children have needs which are different from those of the adults; the difference in the average age of users was considered as one of the indices for choosing the pilot points.

6- Gender: Males and females show different needs in the case of using the public restrooms, especially within the Iranian culture.

7- Age and Quality of the restroom building in the current public restrooms structure: Since the behavior of users was supposed to be different in satisfactory and unsatisfactory atmospheres, we tried to select the structures from both kinds to be studied.

NOTE: Obviously, the handicaps and disables had to be concerned with special consideration as a specific social group in this case. However, since there were not any special facilities in the current public restrooms for these groups, it was not possible to choose any point to study the

difficulties of these groups. Thus, this case was put under interview tasks, and were treated based on the standards available in the literature.

Totally, 343 of males' and 229 of females' public restrooms locating on 73 points in the city were selected and studied.

#### **A) DIRECT OBSERVATION:**

The most accurate information can usually be acquired via the direct observation of users' behaviors and record of details. We conducted a consistent observation and frequent photography within the same intervals during different hours of day, for all days of week, in different months of year in the pilot points and their neighborhoods. In this way, we recorded the details of users' behaviors in public parts of restrooms- as it was impossible to observe users' behavior in private places of restrooms. We also recorded the user specifications which were the point selection indices such as age, gender, disability, social group and class (based on the general appearance). By classifying these data into different groups of pilot points, some theses about the criteria of selecting the pilot points were proved and justified and some others were rejected.

#### **B) OBSERVATION OF THE CONSEQUENCES OF BEHAVIORS:**

Since, in some cases including the issue of public restrooms, it is impossible to observe every stage of use directly, and some parts of the use process are so private, It would be necessary to study the after use-witnesses and proofs in order to obtain the data regarding the behavior of users<sup>2</sup>. Thus, the accurate photography and note-taking processes were performed frequently before and after use of the public restrooms by individuals (Fig. 4). Meanwhile, the process of laboratory sampling was performed using variety of bacteria, which may be present in different parts of the public restrooms, in order to identify behaviors leading to spread the diseases. The results obtained through these studies were presented in the form of some design methods to decrease the disease transmission factor in the public restrooms.

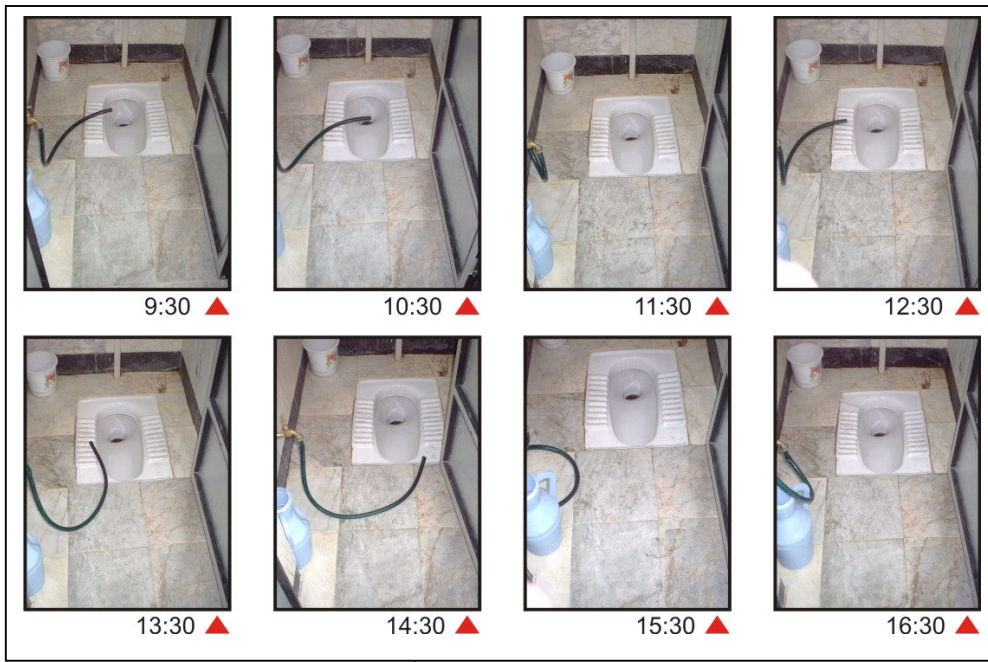


Figure 4: Consequence of use – May 14<sup>th</sup> 2002, Haft-e tir Sq., Tehran – Different hour of a day

### C) QUESTIONNAIRE:

In designing the questionnaires, we tried to reflect all demands of users and to prevent wrong answers and incorrect information (e.g., asking a direct question about the behavior which is not acceptable in the society will encourage the individual to answer with incorrect information). For this purpose, a number of separated forms were handed over to the different user groups as follows:

1. The male users of public restrooms
2. The female users of public restrooms
3. The males who do not use the public restrooms.
4. The females who do not use the public restrooms.
5. The parents who use the public restrooms with their children.

The users (groups 1 and 2) were asked about their expectations from a public restroom, the priority of each matter, the problems and deficiencies of current public restrooms, and also their suggestions to improve the quality. Also those who did not use the public restrooms (groups 3 and 4) were asked to determine the reasons for their hesitation, the problems with the current services based on their own ideas, the methods to overcome the services failures, and also their expectations from an ideal public restroom. Then, the priorities and preferences of both groups were determined using a statistical data analysis and total interpretation. Also the parents (group 5) were asked to answer some questions about the problems with using the public restrooms with their children (in different ages) and

about the facilities and equipments they need. Totally, 1487 Questionnaire were distributed and the data were drawn from them. (Parstarh design and engineering council, Tehran public restrooms: An extensive study 2003)

## D)INTERVIEW

Since it was not possible to receive the complete and total ideas from individuals using questionnaire, and also due to the inability of some social groups (e.g., elder people, children, and workers of the cleaning and maintenance of public services sections), an alternate method of interview was used to get their data. In these studies, 86 individuals were interviewed. It was clear that the interviewee were selected based on the pilot points selecting criteria (p.3). Also some interviews were performed from the disables with different physical disabilities (e.g., mobility and visual impairment) to identify their expectations and demands.

The data obtained from the field studies were analyzed continuously and the results were compared consistently with those of the library studies and discussed in the group meetings.

## RESULT OF FIELD STUDIES ANALYSES:

### **1) Identification, classification and exploration of the needs of various contributing groups:**

The following groups were classified based on differences in their needs and use processes (in a complete application period).

A) Users

B) Cleaning workers and guards (in all observed cases, an individual had both guard and cleaning positions simultaneously).

C) The maintenance and services personnel.

### **2) Hygiene and related instructions:**

These studies attempted to identify the factors, behaviors and physical phenomena which caused disease transmission through the public restrooms. The behavior of various user groups were studied and identified. Some of them mentioned “I prefer to open the door of unit with my foot, it’s disgusting to touch handle and tap” or “Some times I avoid washing my hands after using toilet! I feel it is much harmful to touch tap.”



Samples of all parts within the internal atmosphere of the public restrooms were taken, and the concerned bacteria were planted in several different groups in order to identify the most polluted parts of those services. For instance, door handles and water tabs were determined as the most polluted areas.

### **3) Cleaning, Maintenance & Repairs:**

It was indicated through field studies, and referring to the Maintenance Planners of Tehran Municipality, that the maintenance, protection, and repair are counted as the bottlenecks in the public restrooms. It implies that the social plights of the public restrooms are often resulted from the lack of protection and many environmental problems such as unpleasant odor and pollution caused by insufficient maintenance, and also the increasingly worn-out and damaged parts due to the lack of repair works in the long-term periods.

### **4) Vandalism:**

Different instances of vandalism observed in the studied restrooms were documented carefully by photography and note-taking process, and thus the different kinds of vandalism were classified into three groups:

#### **1) Social abusing**

- Using by the addicts for using the drug (Fig. 5)
- Hiding drugs
- Using by the homeless for sleeping and taking bath
- Using as a shelter by the girls who escaped from their home<sup>3</sup>
- Illegal sexual actions<sup>4</sup>



Figure 5: Heroin Syringe in unit

These actions cause a long occupation (Fig. 6) of restrooms and make an insecure feeling for other users. This issue often makes some daily conflicts between the cleaning or protecting workers and offenders (social abusers).



Figure 6: Due to the mentioned abuses, the restrooms especially male services often had a small window on the top of door where the guard could see the interior if there was a long occupancy.

## 2) Destruction

The actions such as writing graffiti, scratching with pointed objects, breaking the mirrors and flush tanks and burning the plastic objects with lighters or cigarettes, which are almost common all over the world, were determined and classified. These kinds of destructions are mostly classified as vindictive and malicious vandalisms (Cohen, Vandalism 1973). The interesting point was the relationship between the quality of public restrooms facilities and rate of damages. It has been proved that the location is effects the likelihood of being damaged by vandals. (Vandalism in Tehran, Mohseni Tabrizi 2002) But it implies that even in the same area, the worse condition has a restroom regarding the quality of atmosphere, aging, odour and etc, the more rates of damages are observed. This indicates that the already damaged objects encourages vandals more than the new and intact ones.

## 3) Robbery

It is found that some portable parts or the elements which can be easily demontaged (such as waste container or flush valve) are more likely to be robbed. Studies showed that the probability of burglary is related directly to the social level of the target location. The rate of robbery is 52%, 28%, and 20% in poor, medium, and rich regions respectively. (Diagram 1)

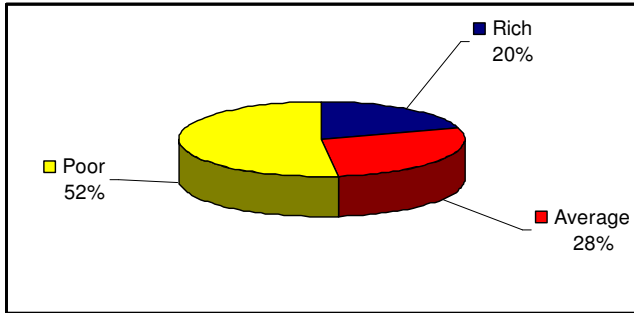


Diagram 1: Distribution of robbery by economic level of urban zone

## STATISTICAL ANALYSIS AND RESULTS OF QUESTIONNAIRES & INTERVIEWS

In a random interview, 18% of males and 53% of females declared that they had never used public restrooms. (Parstarh design and engineering council, Tehran public restrooms: An extensive study 2003)

They admit that they often tried to reach their home. Diagram 2 shows the main reasons of their unwilling to use the public restrooms. According to these people, the following facilities and qualities in the public restrooms can increase the quality, and encourage them to use these facilities:

- 1- Privacy
- 2- The hose (the Islamic Taharat<sup>5</sup> equipment).
- 3- Appropriate Ventilation (Elimination of the odor)
- 4- Soap
- 5- Door lock and security<sup>6</sup>
- 6- Sufficient light and warm water (almost in the same rates)
- 7- Hand drier

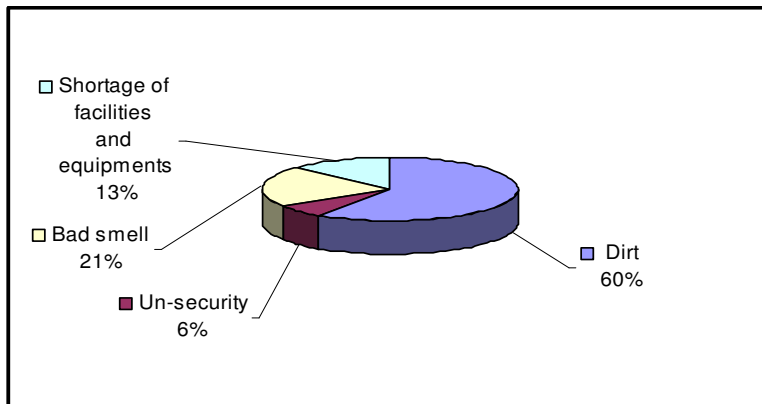


Diagram 2: The main reasons of not using (male and female non-users)

Diagrams 3 and 4 show the main problems with the current public toilets according to the male & female users.

Most of users admit that public restrooms are so dirty and they blame other people for making this dirt! They also complain about appropriate facilities sufficiency.

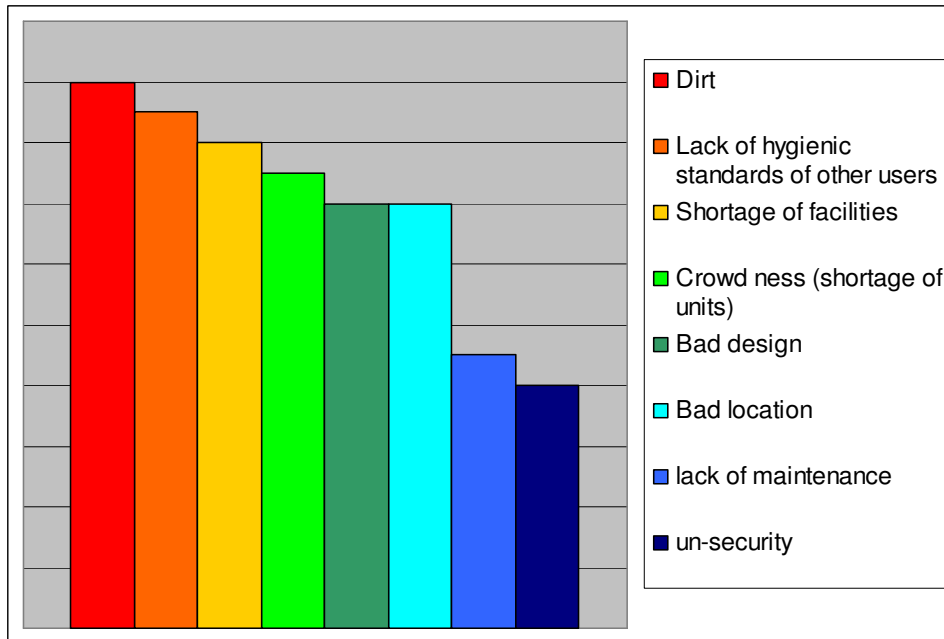


Diagram 3: Principal problems of public restrooms (Male users) (Scale: percent of all)

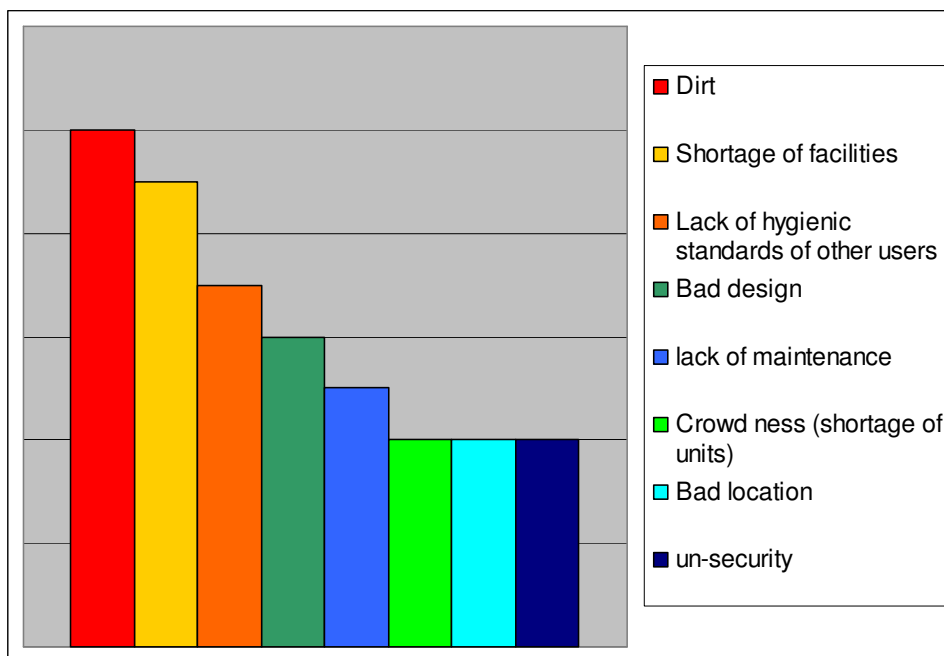


Diagram 4: Principal problems of public restrooms (Female users) (Scale: percent of all)

Diagrams 5 and 6 indicate that the importance of privacy is considered differently by the male and female users. The male users consider the soap and the hose as the most important parameters, whereas the females give the priority to privacy and ventilation.

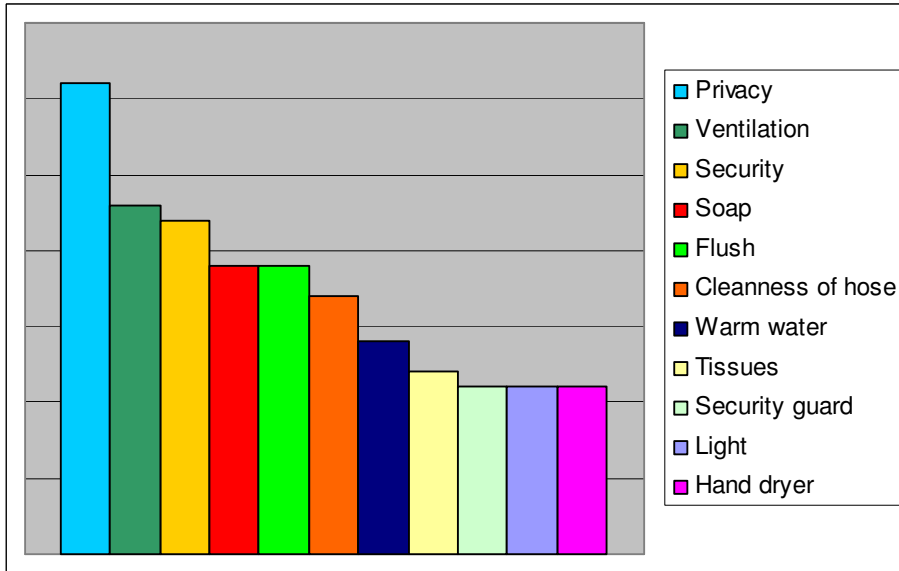


Diagram 5: Priority of public restroom's facilities (Male users) (Scale: percent of all)

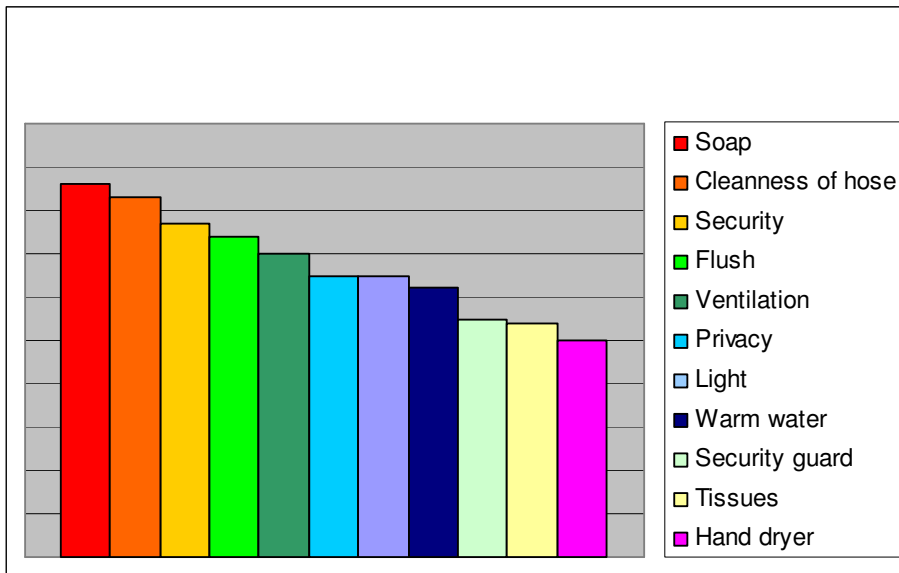


Diagram 6: Priority of public restroom's facilities (female users) (Scale: percent of all)

## SECOND PHASE: DESIGNING & BUILDING THE NEW GENERATION PUBLIC RESTROOMS

### DESIGN

The Design process of the new generation public restrooms began in April 2004 through the results of previous studies. In the first stage, the design specifications were determined based on the results of research and the main principles of design were identified with the general procedure of *changing attitude* and thus *improving the user's behaviors*. Relying on these principles, the expectations from the project were determined and then the equipment designed to grant these expectations.

### DESIGN PRINCIPLES

#### 1- Mutual Respect:

If the users and their rights are well respected, their expectations are fulfilled by proper facilities and information. Then, they will interact with the equipment more carefully and respectfully and less vandalizingly.

#### 2- Automation and decline in social crimes & vandalism:

Declining the human interference (declining conflicts between the guards and offenders) and removing the crime potentials from the product can decrease the rates of crime by users. Thus, the product is not likely to be a target of vindictive and malicious vandalisms. Because the offenders do not consider the product as the reason of undesirability and do not feel the imposed social and legal restriction.

#### 3- Automation and efficiency:

The automation and decrease in the consciously interference of users can increase the quality and better the efficiency of services and thus the intentions of users to use them.

### DESIGN FOR IMPROVING THE USER'S BEHAVIORS:

Through determining the design principles, it was possible to explore the expectations from the project. These expectations contain some points that considering them can improve the sustainability of project, encourage the users' mutual respect, fulfill their expectations and

convenience for a wide range of users, and thus decreases the maintenance costs. These main points were extracted as below and given priority in designing new generation public restrooms:

- Meet the users' expectations which indicated in interviews and questioners such as security, privacy, good hygienic standards and etc.
- Convenience in using (by avoiding the complicate equipments usage)
- Decrease the need to cleaning, protection and repair works
- Decrease the conflict between the cleaning and protection agents and users, or among the users themselves
- Make theft and vandal proof
- Avoid the abuse of public restrooms
- Enhance the hygienic issues through automatic washing devices and contact less devices
- Resistant in critical conditions
- Use the green energies.

## INTRODUCING THE DEVICES DESIGNED TO IMPROVE THE USERS BEHAVIOR:

### *HOSE WINDER:*

One of the problems in the restrooms was falling hose on the floor or into the toilet which caused bacteria transmission from the toilet or the floor to the hose. A product called the hose winder was designed. Using this new product is so easy and reliable.



Figure 7: Hose winder

*SMART ENTRANCE & EXIT SYSTEM INCLUDING THE AUTOMATIC COUNT DOWN DOOR, DISPLAY, COIN SYSTEM (OR ENTRANCE KEY) & COMPLEMENTARY SOUND SYSTEM:*

In order to remove the problem of misuses such as addicts, the homeless and etc, their behaviors were studied completely. It was found that the main difference in their behavior leading to the disorders in the public restrooms, appears as occupation of the restrooms for a longer time than ordinary users (According to observations, the average time of 5' 15" for an ordinary user was determined using the restrooms), and it cause conflict between cleaning and protection agents and this abusers.

For this purpose, the Access Controller System was designed with specific conditions. It implies that the Automation is mostly applied in order to remove the excess cost of human resource and to obtain the revenue from the Automatic Public Toilets (APT) in the western countries. However, since these services are in the form of social service and generally free of charge in Iran, the method of applying this system must be considered differently. In the commonly used western automatic public toilet systems, the door is in the Normally Closed Mode and can be opened by charging a coin (because the purpose is to obtain revenue). But in the newly designed system, the purpose appears as avoiding the social misuses instead of obtaining revenue. Thus, the normally open mode of door has been altered which opens outward (towards the public space of restrooms) (Fig. 8). To use the service, the user has to hold his or her hand in front of an Electronic Eye which has replaced the key in order to decrease the physical contacts (in the Contact Less Mode), or he can throw a coin into the box. Now, the door is open and will not be closed without doing so manually, and the light of unit is on (Fig. 9). If the user closes the door, it will be opened automatically after 10 minutes or whenever the user wants to do so. The occupation of service is announced to the other people with a red light externally and the user inside has 10 minutes using the toilet. The user informed by the count down timer display internally. The user can open the door automatically holding his hand in front of the contact less Electronic Eye whenever he wants. In this condition, the automatic flush also activates simultaneously and the light is turned off. Thus, in this way, the contact of the user with door and handle is eliminated. But if the user does not want to leave the unit, the sound and visual alarm



Figure 8: Normally open doors



Figure 9: Smart entrance system



signals will be activated frequently and the door opens externally after 10 minutes. Obviously in this way not only all opportunities of misuse are eliminated but also the suitable situation to commit the crimes is removed. Meanwhile, it eliminates the contact of the user with flush and door handle. The automatic function of flush will also decrease the odor and increase the hygienic quality which has been among of the main demands of users and aims of the project (Fig. 10)



Figure 10: Internal count down timer and exit switch

Table I reflects the newly-designed devices and the design expectations they meet.

Since this new equipments have not already been available, their design has been assumed to be vandal proof.

<p><i>Hose winder</i></p>	<ul style="list-style-type: none"> <li>- Meeting the users' expectations</li> <li>- decreasing the need to cleaning, protection and repair works</li> <li>- Enhancing the hygienic issues through automatic washing devices and contact less devices</li> </ul>
<p><i>Smart entrance and exit system</i></p>	<ul style="list-style-type: none"> <li>- Decrease the need to cleaning, protection and repair works</li> <li>- Decrease the conflict among people</li> <li>- Avoid the abuse of public restrooms</li> <li>- Enhance the hygienic issues through automatic washing devices and contact less devices</li> </ul>

Table I: Newly-designed devices and the design expectations they meet

## INTRODUCING THE DEVICES REDESIGNED TO IMPROVE THE USERS BEHAVIOR

### *AUTOMATIC FLUSH:*

Automation of flush and its physical disappearance from the restroom (built-in application) removes the need of drawing users' attention and remember them to use flush after using toilet, via writing messages. The lack of attention or forgetting does not cause pollution and odor.

### *ELIMINATION OF SECRET ANGLES:*

In the new restrooms, there is no invisible point or place to hide or cover drugs or syringe.

### *PLATFORM AND COAT HANGER:*

The observations of current restrooms show that the users have often problems with hanging their sack or bag. Some gave their equipments and devices to someone outside the restroom and some kept them with themselves -that is not easy at all. As an answer to this problem, a coat hanger and an interior platform was added to the interior.

### *HAND DRIER:*

As the current public restrooms have no hand driers or paper tissues (because they are consumed rapidly, stolen or destroyed by vandals) and since the existing hand drier devices are too vulnerable and weak to be used in a public place, a kind of vandal-proof and anti-impact hand drier system was designed and built-in internally.



Figure 12: Hand drier

### *SOLAR WATER HEATER:*

Since the furnace is not financially viable to be used to heat the water in the public restrooms, most of previous public restrooms used only the cold water. This, especially in

the cold months of year, made some users to consider the hygienic issues many leas and avoid washing their hands. The solar water heater removed this problem through using the green and sustainable energy (Fig. 13). Since Tehran has a sunny sky about 3030 hours annually. (Tehran average sunny hours per year, Mehr-Abaad synoptic station information 1951 - 2000)



Figure 13: Solar water heater

Table 2 reflected the redesigned devices and the design expectations they meet.

<i>Automatic flush</i>	<ul style="list-style-type: none"> <li>- decreasing the need to cleaning, protection and repair works</li> <li>- Enhancing the hygienic issues through automatic washing devices and contact less devices</li> </ul>
<i>Elimination of secret Angles</i>	<ul style="list-style-type: none"> <li>- theft and vandal proof</li> <li>- Avoiding the abuse of public restrooms</li> </ul>
<i>Platform and coat hanger</i>	<ul style="list-style-type: none"> <li>- Meeting the users' expectations</li> <li>- Convenience in using</li> </ul>
<i>Hand drier</i>	<ul style="list-style-type: none"> <li>- Meeting the users' expectations</li> <li>- theft and vandal proof</li> <li>- Enhancing the hygienic issues through automatic washing devices and contact less devices</li> </ul>
<i>Solar Water Heater</i>	<ul style="list-style-type: none"> <li>- Meeting the users' expectations</li> <li>- Using the green energies.</li> </ul>

Table 2: redesigned devices and the design expectations they meet.

## COMPLEMENTARY RESEARCHES

Since the studies conducted in the first stage dealt with the basic issues of restrooms in Tehran, some complementary issues such as technical specifications of structure, materials to be used, accurate topography, the relationship between the building and the surrounding urban landscape and the urban identity and establishments had to be also studied carefully.

These studies lasted about 3 months. This part of the studies is mostly related to the technical issues. In other words, the aspects and effects are more experimental and technical than methodological. Therefore, we avoid dealing with them here.

### SPACE DISTRIBUTION OF NEW GENERATION RESTROOMS:

These restrooms consist of two separated male & female parts with quite separated entrances. They were designed and built through models of 4, 7, 9, 11, 13 and 20 units. The different parts and spaces of each building are as follows:

- Exclusive part: The constituents of this unit include a platform for bags or sacks, coat hanger, waste bin, squatting pan, ventilation system, lighting, hose winder, and electronic complex of display and contact less exit key (Fig. 14).



Figure 14: private unit details

- Public space of hand washing bowel: this unit includes the washing sinks, liquid soap and faucet, hand driers, the place for changing the children clothes (just in the ladies), and mirror (Fig. 15).

- Guard room

- JC room



Figure 15: Public area of new generation restrooms

## CONSTRUCTION:

The construction process of new generation restrooms began from November 2004 and lasted to December 2006. During this period, 62 APTs (598 units) were built in different parts of the City which were exploited gradually during the period.

- The aforementioned equipments were installed in all restrooms.
- The solar water heaters used to supply warm water at 58 points.
- The APTs were equipped with tanks of 2500 liters capacity to be supplied at the time of emergency.
- All buildings were designed and constructed due seismic-resistant codes.
- The systems were equipped with emergency electricity (UPS) and also able to switch to manual mode.
- The doors could be also used manually without electricity supply.
- The JC rooms were equipped with showers to be used in emergency situations and by the guards commonly.
- The APTs were equipped with strong ventilation systems in each unit, and automatic perfume distribution systems were installed inside the public spaces.
- The sound system informs the users regularly about using new systems, advices them with hygienic messages and encourages them to be responsible to the public properties while broadcasts a soft music.

## THIRD PHASE: ASSESSMENT OF EFFICIENCY AND VIABILITY OF NEW GENERATION APTS.

## MATERIAL & METHODE:

By exploiting the new APTs, some studies were conducted on the success of project and addressing the specific expectations. The method of conducting this part of study is the same as first phase to some extent:

- A) Direct Observation of Behaviors
- B) Observation of the Consequences of Behaviors
- C) Interview

For conducting this focus group study, 15 new restrooms located in different parts of the City (observed in the first phase) were considered as the pilot points for study, and the users' behaviors were recorded and the results were generalized to the whole project. (Parstarh design and engineering council, Design studies of new generation APTs for Tehran city 2004)

## RESULTS:

Some problems were identified with the human behaviors in the first phase, and were summarized in Table 3 with the design solutions and results in terms of improved behaviors. It is clear that there are also some problems regarding the technical issues masonry of materials, and etc which were identified and removed, but this discussion is not the right venue to deal with them.

<b>Problem</b>	<b>Method of identification</b>	<b>Suggested solution</b>	<b>improved behavior</b>
transmission of bacterial pollution caused by hand contact with objects, and by avoidance of washing hands after using the restroom	Bacteria culture Direct observation	automation of entrance & exit electronic faucet hand drier Warm water	Washing hands
Using the restroom for drug abuse Using the restroom	Direct & Indirect observation	Automatic entrance & exit controller Time limitation of use	Decrease in Misuse and vandalism

for sleeping or changing clothes Using the restroom for sexual abuses			
Not using by parents due to the lack of facilities	Interview	Create a proper place	Used by mothers to change and wipe infants
Being Insecure for young children as the parents uses the restroom	Interview & direct observation	create a direct vision from the guard room to public part of restroom	Used by parents with better feeling of security and safety for their children
Property destruction & robbery	Direct & indirect observations	Vandal-proof design Voice message to encourage the developed treatments Respect for users	97% decrease in vandalism
Covering drugs in hidden angles of restrooms	Direct observation	Elimination of hidden angles	Complete elimination of this misuse
To forge or being unwilling to use flush	Direct observation	Automatic flush	Complete elimination of this problem
odor as a deterrent	Direct observation interview	Elimination of odor via automatic flush & strong ventilation system	Willing to use and being more responsible for keeping the place clean

Table 3: problems, design suggestions and results

## REAPRAISAL CRITERIA

Hygienic

Privacy & security

Decrease in vandalism

Convenience in using for different users groups

Consideration of disable people

## CONCLUSIONS:

### EXPANSION OF DESIGN INSTRUCTIONS TO OTHER URBAN EQUIPMENTS & FACILITIES

Regarding the results exploited through the new generation of APTs studies, it can be affirmed that the basic principles of design are true and the following cases can be modified and generalized on other resemble cases.

- If the users and their rights are well respected, their expectations are fulfilled by proper facilities and information, and then they will interact with the equipment with more carefully and respectfully and less vandalizingly.
- Declining the human interference and potential of being abused by addicted and homelessness and other vandal groups can decrease the rates of crimes by users.
- The automation and decrease in the consciously interference of users can increase the quality and better the efficiency of services, and thus the willing use. The systems and devices should be understandable and user friendly.

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## NOTES

<sup>1</sup> Tehran, the capital city of Iran by 594 square kilometers area has over 8 million populations, consists of 22 urban zones. (Tehran municipality statistic data base 2003)

<sup>2</sup> To scrutinize the studies, we submitted an application to the related authorities to design and build infra-red camera to observe the whole movements without appearing the face of individuals within exclusive space of several restrooms as pilot which was not approved by them.

<sup>3</sup> The escaped girls (this phenomenon is found mainly in the paternalist societies) are those who escape from their home due to different motivations including the pressure imposed by the family. These girls usually move into the large cities, became attracted to the offender's bands gradually, or provide their own livelihood through prostitution. In the societies like Iran where this action has been forbidden socially and legally, these girls have no shelter and supporter and thus move into the public places like parks and public restrooms.

<sup>4</sup> In the Iranian society, having sexual relationship beyond the marriage is forbidden legally. This makes the young people of some social groups (mainly the poor) move into the restrooms as a secure place.



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<sup>5</sup> - In Islamic tradition, there is an action called religious purification (Taharat) which means washing with water. For this purpose, a hose is installed into the restroom services.

<sup>6</sup> Due to the mentioned abuses, the restrooms especially male services often had a small window on the top of door where the guard could see the interior if there was a long occupancy. This is done mainly to prevent the addicted people who fall over the unit surface after injection of drugs. Unfortunately, in these cases since most doors open internally, taking the addicted person out of the restroom was very difficult.

## BIBLIOGRAPHY & REFERENCES :

Cohen, S. (1973), Vandalism, London

Design studies of new generation APTs for Tehran city, (2004), Parstarh design and engineering council, Iran

Iran statistical center database (2000), Iran

Mohseni Tabrizi (2002), Vandalism in Tehran, Iran

Tehran average sunny hours per year (1951 - 2000), Mehr-Abaad synoptic station information, Iran

Tehran municipality statistic data base (2001), Iran

Tehran municipality statistic data base (2003), Iran

Tehran public restrooms: An extensive study (2003), Parstarh design and engineering council, Iran