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Adaptation Methods of Official Buildings for Disabled People in Iran

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Abstract: People with physical and movement disabilities must be able to fulfil their own requirements through barrier-free access to official buildings. Adaptation of official buildings and up-grading of accessibility situations is now considered as the most important priority in building improvement projects. The official buildings must be gradually adapted according to the requirements of disabled people. Adaptation is defined as removing the existing physical, architectural and traffic barriers in the spaces and also to improve the environment in a way that all people can move freely and safely in the environment.
The present paper is carried out the results of a research project "***Adaptation Methods of Official Buildings for People with Physical and Movement Disabilities***". The project is accomplished in Building and Housing Research Center (BHRC), which is based on field surveys, literature studies, and participant observation.
The basic approach is to search for the building obstacles that cause barriers for disabled people. In another words, due to expectations from existing official buildings, the problems and shortages facing visitors are identified. Some official buildings which are visited by many people every day are selected for field studies. This part of project was done by asking the disabled to fill up questionnaires about their accessibility problems.
The main objective of this paper is adaptation and organization of the present situation of official buildings for all, specially disabled people. Consequently, these groups of people would be able to obtain a reasonable rate of social independence.
Keywords: Disabled, official buildings, adaptation, accessibility.

1. Introduction

Based on the estimation done by United Nations, more than 15 per cent of the world population is facing some kind of disability. For different reasons such as war, earthquake, accident and sickness, the society is facing ever-increasing number of disabled people. In addition, there are other groups such as elderly, children, mothers carrying prams, pregnant women and also those who get caught by temporary disability states, who lose their free mobility and usual participation in environment because of barriers and access obstacles.
A scanning of the conditions in official buildings shows that access and usage of persons with disability in and out of these buildings have not been given much attention. A survey of the barriers access in urban spaces and public buildings helps urban designers and managers to search the reasons of problems, and to exclude these types of obstacles from future projects. On the other hand, studying, investigating and presenting the solutions would provide possibilities for removing the barriers in existing conditions.

2. Adaptation objectives

According to the World Health Organization (W.H.O.) disability is the result of impairment in respect of person with disability and his environment, and when it's occur that physical and social obstacles cause to inaccessibility of disabled people to different social systems.

In new definitions of disability and disables, they try to define disability as a limitation apart from human personality not as his identity. According to the issue of human right commission of the united nation in 2003 and exchange of the word (disable) to (people with disability) they emphasis that they are similar to other people of the society and their rights and conditions.

The concept of adaptation of the environment has gradually changed in the past few decades as its range has expanded. This concept was initially intended to remove physical barriers from environment and to make "barrier-free design". The concept was further expanded in the 1980s with increasing accessibility in buildings and urban environment by prevalence of "accessible design". In 1990s the issue of "universal design"

was presented, which largely expanded the adaptation concept so as to cover everyone's use, irrespective of their abilities or limitations. The basic principles which should be applied in design and adaptation of the buildings and urban spaces so as to increase compliance with the environment as follows:

Reach: It should be possible to reach all places and public buildings.

Enter: It should be possible to enter all public buildings.

Use: It should be possible to make use of all public facilities and environmental arrangements.

3. Adaptation Laws in Iran

In 30th article of fourth law program of Islamic republic Iran it is: «For identify to the city and village face and to improve the environment of them the state should proceed the below acts: To improve the urban and village places for physics and move disables and do these laws in public and governmental building and places up to the end of the fourth program».

The Islamic parliament in 2004 approved the complete law about the aid of disables rights to provide the disable rights and suitable condition. To implement the article 2 of the general law of aid of disable rights, implementation procedure of adaptation approved that according to it, all places, pathways and public buildings should be adapted.

3.1 Design Criteria for Disabled People in Iran

In the year of 1989 pursuant of some studies in the field of the available and suitable space design for disables in Building and Housing Research Center (BHRC), provide and approved in urbanism and architecture council. The aim of the provide of these laws, to offer the correct technical scales and law necessities to provide the reformation in pass surface and the quality of available in current position and future developments and include desirable urban place design laws and general law of the design of public buildings disabled people.

The edition of the second said laws in 1999 was approved in urbanism and architecture council and after that the approval and its attachment was the replace of previous. The review approval provides and codified in ten clauses and its attached selection of laws in two chapters and five clauses. In first chapter, the urbanism standards had been offered for disabled people. Second chapter reserves for architecture design laws for disabled people and represent for public and residential building design.

3.2 History of Adaptation in Iran

The survey of the current condition of built places shows that disabled people aren't able to use public available spaces regarding to their objectives. Urban places, public and residential buildings that should available for staffs, users and habitants built without spot of the needs of disables in some position.

On the other hand in some occasions it seems that to need of access provide in some places that not only the snags not removes but also makes a new snags to prior snags. Different samples from ramps with high slope, narrow width and slipper surface, long way without handrail that sets a lot at the entry of some buildings and some other occasions explain that with the necessity of remove this disorder, the results offers unusable and undesirable.

4. Case studies and identity of existing situation

In «***Adaptation methods of official buildings for people with disabilities***» project, case studies with the aim of identify and preference of current condition complete by implement continuous studies and direct respect to the official buildings. In this review the current problems were survey with view, talk to people, and stand in disables position. At the same time to give the users ideas they give questionnaires about the condition of official buildings that need more to provide the access. The basic purpose in these two steps was to control implementation of «Design Criteria for Disabled People».

4.1 Questionnaire studies

To give the project needs data, questionnaires were provided in three pages that include multi switch questions in below domains: personal specifications of the answers, reasons of the respect to administration buildings, type of the respect building; problems in each, access and entrance to the building; problems of the moving and doing purposes and duties in the building; and current problems in using facilities and equipments in official building.

This questionnaires were run with the assist of the relate councils and organizations. The result of the questionnaire studies comprised and measured about the current problems in three parts of entry and access, activity and moving in official building, and using facilities and equipment.

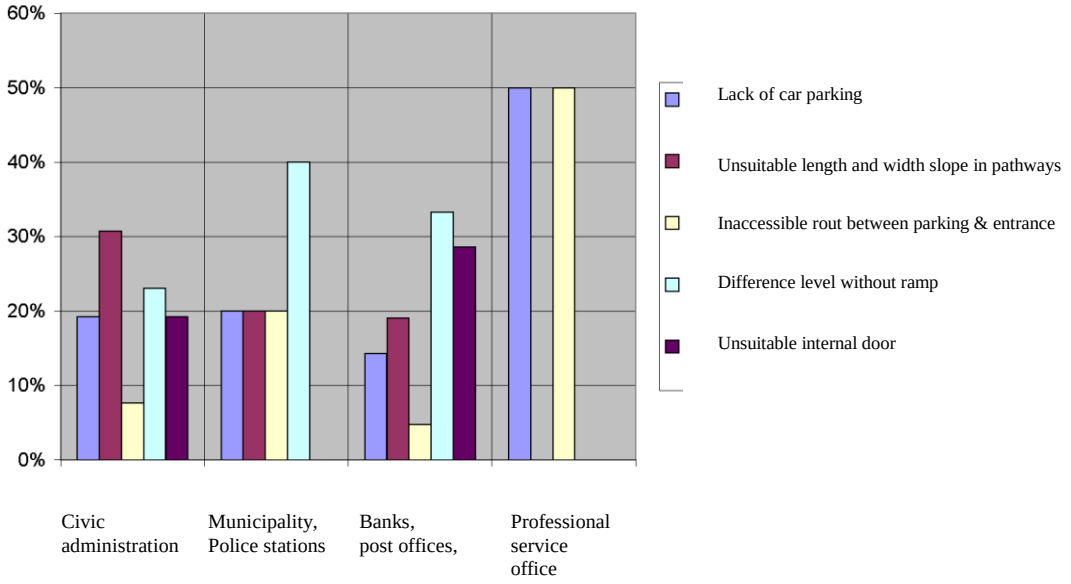

Figure 1: Access and entrance problems in official buildings

According to the table 1 and figure 1 most of the problems about the entrance and access of the official buildings cited that, «variation in entry surface and the lack of ramp», «unsuitable internal door» and «unsuitable length and width slope in access pathway».

Table 1: Access and entrance problems

Type of official building	***Lack of car parking***	***Unsuitable slope***	***Lack of suitable pathways***	***Difference level in entrance and lack of ramp***	***Unsuitable entrance opening***
Civic administration	*%19.2*	*%30.8*	*%7.7*	*%23.1*	*%19.2*
Municipality, Police stations	*%20*	*%20*	*%20*	*%40*	*%0*
Banks, post offices, professional service office	*%14.3*	*%19*	*%4.8*	*%33.3*	*%28.6*

According to the figure 2 problems of move and activities in internal space of official building includes « unsuitable relation between stories», unsuitable equipment like «the counter and elevator controls» and «the lack of audio alarm and tactile marks in elevators».

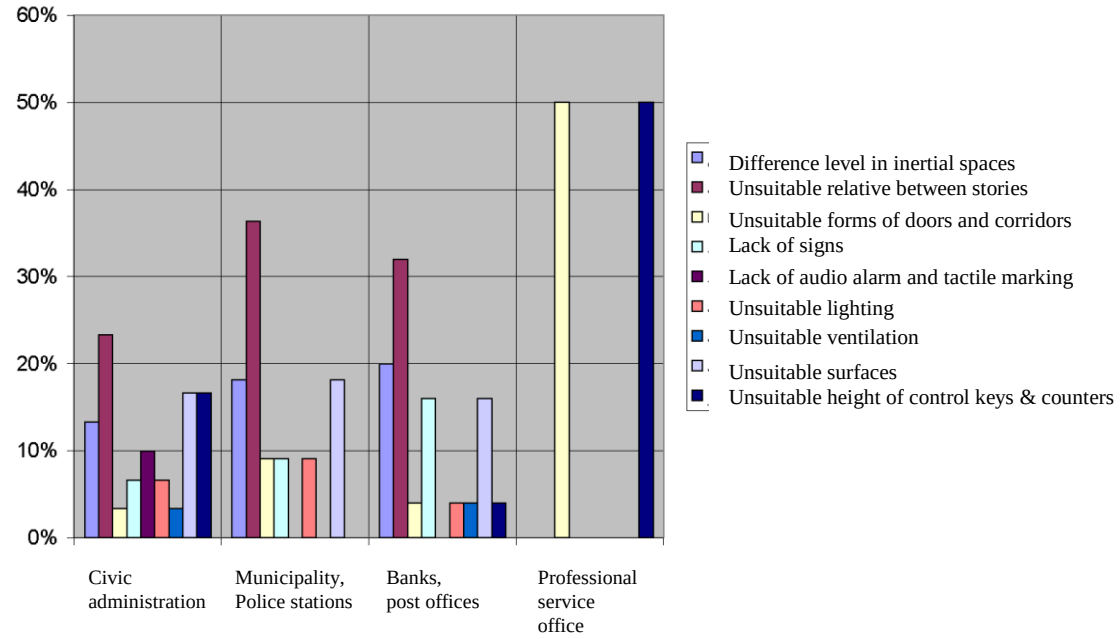

Figure 2: Problems in doing activities and purposes in official buildings

According to the figure 3 the problems of the use of possibilities and lateral services in different groups of official buildings it shows that in this part the important problems are «the lack of suitable toilets for disabled people» and «the lack or unusable equipment and facilities like public phone».

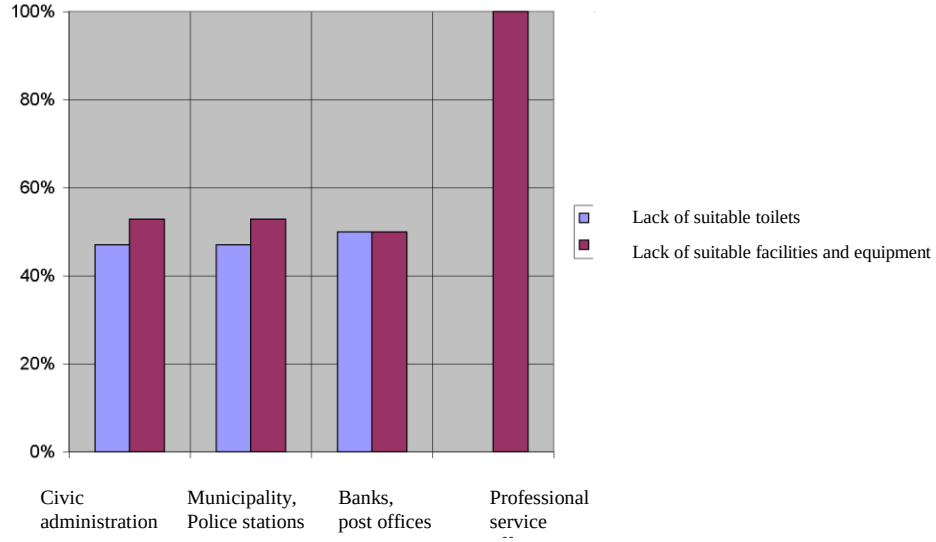

Figure 3: Problems to using facilities and equipment in official buildings

4.2 Measuring studies

In these studies the access condition of disabled people were measured in these buildings that many people would respect there daily. At the first step of the running studies for select the official buildings first public survey implement according to prior experience and studies and run new observations. The building that have more respects the public problems that most of these buildings are encounter, the variety of the usage, stand in position, different group of respect are the perspective among agent in this study.

For assemble of conjunct data, the visit check list codified in this step. In running study with the use of wheelchair they controlled and measured the problems of the disable pass of the snags in personal respect to the official buildings.

4.3 The results of the case studies

The results of these studies project, problems and snags in the study of the buildings, divided in three parts of reach and access to the buildings, activity and doing purposes in buildings and the use of facilities and equipment.

4.3.1 Access problems

The most important problem to access a wide number of official buildings is the difference between the level of the building and sidewalk, without concerning proper ramp.

Figure 4: Access and entrance to the building

In the case of having ramp, some properties like non-standard slope, not using of handrails, having jagged surfaces in paving of the ramp are not according to standards.
Due to having elevator in basement of the official buildings which are specialized to parking application it would be possible for disabled people to reach to different floors of the building, but it is essential to get agreement with officials of the organization

4.3.2 Problems in plying and doing activities in building

Most of the problems in buildings are vertical ply .i.e. using of the elevator. Since most of the elevators in the official buildings which were analyzed, have non-standard size and unsuitable openings with narrow width. Sometimes the height of banks and post counters is more than the standard size and makes it impossible for clients to access to them.

Figure 4: Access to the counter

Some of stairs in buildings which were analyzed have had high steps without handrails. Width of the openings in some cases was less than 80 centimetres which prevented to access and use of the areas.

4.3.3 Problems of using facilities in official buildings

The most important issue in using official buildings is the situation of toilets. Insufficient width of the openings and unsuitable size inside area of toilets, lack of non-standard thresholds in opening of the toilets are some of the problems that have been existed in all of the buildings.

In existing stool-type toilets, the doors are locked and it's not possible for clients to use them. Only certain people can use them who are staffs of that organization .The height of dial in public phones, ATM, control bottoms of the elevators, and post boxes in some cases are not suitable and don't fit with standards.

5. Adaptation Methods

The determinant approach in this research project is to search disabilities in buildings, and in fact recognizing it as a disabled unit. The main objective is thus identification of disabilities in the official buildings. In other words, due to expectations from existing official buildings, the problems facing visitors are identified. To present the methods of adaptation, some tables are offered. The structure of these tables Begins with physical explanation of the different moods for building and main component in adapting.

5.1 Entering and accessing the building

The first phase to get into an official building to carry out expected tasks and duties is to have access to it. The measures taken to adapt access path to the building entrance include: adaptation and widening of the passageway and removal or transfer of the barriers, installing the accessible connecting bridges and upgrading the pedestrian crossing on the street.

Different states of entering and accessing to the building is affected by the location of a building standing on the same level as the street. In order to resolve the existing problems and remove barriers, it is necessary to adapt the building entrance spaces and make them accessible. This action would be possible by improving the ramps and steps, optimizing flooring of the steps and ramps, installing handrails, replacing the revolving doors with usual or automatic doors, usage of openings with proper width, increasing depth of the space in front of the entrance, installing handles or door knobs on the doors, removing the barriers and door thresholds and improving the flooring of the building entrance.

Setting the crowded sections and the much referred departments on the ground floor and installing lifts at the entrance level is also one of the offers.

Table 2: Check list of problems survey in access to official buildings and offering solutions

Access degree	***Problems***	***Problems solving approach***
Access and reach from pathway to building	*Lack of a good location for car parking beside of the building*	*-Car stop location should be provided inside of the building* *-The location of the car parking should be considered as near as possible* *-With deletion of the obstacles that exist in frontage, car parking provides* *-With changing of the urban structure, a location between roadway and building is offered for car*
	Different level between street and entrance floor without any ramp	*-With changing structure, entrance ramp should be provided inside of the building* *- The parts with mess clients transfers to ground floor* *- Lift should be install in entrance*
	Inappropriateness of the sidewalks: *- Unsuitable slope* *- Insufficient width of sidewalks* *-Obstacles in sidewalks* *- Unsuitable paving* *-Unsuitable level difference between sidewalk and roadway*	*-Reach way to the building entrance is motivated due to the existing facilities* *-Paving and widening of the road* *-Deletion or movement of the obstacles* *-Installing achievable connecting bridges* *-Improvement of the passing location of the pedestrian in roadway*

Table 3: Check list of problems survey in access to official buildings and offering solutions

Access degree	***Problems***	***Problems solving approach***
Access and entrance to building	*Difference between road level and entrance floor*	*-There must be access possibility for wheelchair as much as possible* *-At least an achievable entrance should be provided*
	- Lack of handrails at the extremes of the stair or ramp *- Existing unsuitable handrails* *- Narrow size of the landing* *- Entrance ramp with high gradient and low width* *-Slipperiness of the paving of ramp and stair* *- Stairs with high steps low width and depth*	*-Entering area should be accessible* *-Structure and physical improvement of ramps and stairs* *-Improvement of stair and ramp paving* *-Installing handrails according to standards*
	- Undistinguished entrance *-Inappropriateness of the kind of gate* *-Low width of the door* *-Low depth of the front area of entrance* *-Inappropriateness of the door handle* *-Heaviness of the door and unsuitable opening* *- Existing of obstacle on the floor* *-High threshold of the gate* *-Slipped and inappropriateness of entrance paving*	*- Entering area should be motivated and accessible* *-Designing clear entrance* *-Replacing rounding, turning and sliding doors with normal or electronic doors* *-Opening with standard width replace with narrow doors* *-Increasing of frontage depth* *-Using of the lever handle for doors in suitable height* *-Installing handrail on doors* *-Deletion of the obstacles and thresholds* *-Improvement of paving of building entrance*
	-Unsuitable size of the entrance platform for ply *-Insufficient space between two gates* *-Opening direction of the gates*	*- By changing structure of the entrance floor, suitable dimension is provided for entrance* *-The direction of the door opening becomes up to standard*

5.2 Activity and doing purposes and duties

The solutions offered for adapting the level difference in the internal spaces of official building is to design standard ramps right next to the steps or to install lift entrance on the ground floor for easy access.

Table 4: Check list of problems survey in access to official buildings and offering solutions

Access degree	***Problems***	***Problems solving approach***
Activity and doing purposes and duties	*-Different levels in a floor without any ramp* *-Lack of elevator in a building with stories* *-long height of the counter or unsuitable shape of the counter to settle wheelchair* *-Slippery and polished paving* *-unsuitable carpet*	*-The ramp should be install beside of the stair in the entrance floor with suitable slope and paving* *-Instilling lift in accessible location* *-by changing of the building structure, elevator is located* *-It would be essential to replace counters with suitable height and blank space for feet with existing counters* *-Some parts of the existing counter change to accessible counters* *-changing of paving by no slippery materials*

	-unsuitable setting of the furniture which makes narrow path *- Lack of signs and guidance* *-unsuitable height of the settling signs* *-using bad and inappropriate colours for people with blindness*	*-deletion of carpet with long nap* *- distance between chairs becomes according to standard* *-international signs for disable people should be used in accessible places* *- guidepost should be installed in building entrance and main place to give information to clients* *-signs and guideposts should be located in standard height* *-to guide people with blindness should be done by using opposite colours* *-visual and audio alarming systems should be installed in buildings* *-electrical and mechanical controls should be accessible and installed in proper height* *-tactile marking should be installed to alarm obstacle, stair and ramp*

In adapting the building it is necessary to adapt the height and specifications of the equipment according to criteria, to use international signs in accessible places, to inform clientele by installing guiding signposts at the entrance and at main spaces of the building. For guiding the people, signs with contrasting colours should be posted, audio-visual alarm systems be installed in building, electrical and mechanical controls be accessible and located in a proper height from the ground. Also, tactile marking to warn against steps and ramps should be installed.

Table 5: Check list of problems survey in access to official buildings and offering solutions

Access degree	***Problems***	***Problems solving approach***
Access in corridors	*-existing stair and level difference in corridor* *-narrow width of the corridor for wheelchair ply*	*-Ramp is installed beside of the stair in the corridor with suitable slope, width and paving* *- If possible width of the corridor increases by deletion of the partition walls* *- Partitions should be used instead of wall by changing structure and replacing open system in office*
	-obstacles in the corridor *-sloppy of the paving* *-long nap of the carpet* *-lack of the touch or sound signs* *-lack of the handrail* *-narrow width of the doors* *-heaviness of the doors* *-high thresholds* *-unsuitable height of the handles* *-unsuitable height of the windows*	*-movement and deletion of the obstacles in the corridor* *-improvement of the corridor paving* *-deletion of the unsuitable carpet and improvement of the floor* *- using of tactile marking and sound alarm in corridors* *-Installing handrails in proper place* *- replacing unsuitable doors by standard doors* *-replacing heavy doors with standard doors* *- deletion of thresholds* *- installing handles in standard height* *- providing sufficient view by installing windows in proper place*

Table 6: Check list of problems survey in access to official buildings and offering solutions

Access degree	***Problems***	***Problems solving approach***
Access in stair and elevators	*-lack of elevator*	*- elevator or lift should be provided in proper place*
	- inappropriateness of stairs *-insufficient width, depth & height of the steps* *-Lack of handrails and tactile marking*	*-motivating of stairs should be done according to standards* *-Improvement of paving of stair surfaces and landings by installing handrails and tactile marking*
	-insufficient width of elevator door *-unsuitable size of the elevator room* *-unsuitable height of control panel* *-lack of audio alarm* *-slipperiness of the floor* *-insufficient waiting place front of elevator*	*-the door with narrow width should be replaced with proper door* *-the room with standard dimension replace to existing room* *-control panel inside and outside of the elevator should be located on the standard height* *-audio and brail signs should be used to give information* *-bottom should be covered by non slippery surface* *-necessary space in front of the elevator should be made by some changes in corridor or other places*

5.3 Using facilities and equipment

In providing comfort facilities and utilizing the equipment in official buildings, the first step is to install the proper toilet for disabled people. By replacing one or two of the existing toilets with appropriate ones for disabled people in an accessible place it can be solved the problems.

Replacing doors with suitable width with existing ones, changing the direction of openings outward, adapting the dimension of the toilets, installing handrails and providing facilities at a properly accessible height, in accordance with standards, are among the proposed solutions.

Table 7: Check list of problems survey in access to official buildings and offering solutions

Access degree	***Problems***	***Problems solving approach***
Using facilities and equipment	*Lack of the proper toilets for disabled people* *Impossibility to access to services*	*A proper toilet should be placed for disabled people* *Two services replaced with on usable service for disabled people by changing structure* *Thresholds should be deleted*
	-Narrow width of the toilets opening *-Unsuitable direction of the opening to inside* *-Unsuitable size of the toilets* *-Lack of the handrails* *-Unsuitable height of the equipment*	*-Doors with suitable width replaced with existing doors* *-The direction of the openings should be changed to outside* *-If possible, the dimension of the toilets should be motivated* *- Handrails should be installed in proper place* *-Equipment with standard should be installed in proper place*
	-Unsuitable height of water cooler *-Unsuitable place of the equipment* *-Unsuitable height of public phones* *-Proper location of the post boxes*	*- Equipment with standard properties should be installed in official buildings* *- Required equipment should be located in proper and accessible height*

6. Conclusions

In this paper, after studying the evolution of adaptation in last decades, new definitions of disabilities, objectives and requirements of adaptation, international activities and national regulations in this field are presented.

In order to obtain information about the status of accessibility in official buildings, the results of a field work are submitted. The buildings which are visited by many people everyday are selected for field studies. This part was done by filling up questionnaires and surveying existing situations of official buildings in Iran.
The most important part of this paper is allocated to the methods and solutions for adaptation of official buildings. In this regard, some tables are presented. The problems in access, doing activities and purposes, and using facilities and equipment in official buildings have been surveyed and applies solutions are recommended.

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