

# Research on Optimization Design of Maternal and Infant Room in Commercial Buildings in Nanning

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**Abstract:** With the opening of the two-child policy, baby boom is growing all over the country with a strong momentum. Excellent maternal and infant facilities play a more and more significant role in commercial buildings. At the same time, although the current urban construction has made great progress, the construction of maternal and infant facilities is still lagging behind and lacks relevant design theory and research. There are many problems to be solved, which results in the inefficient use of the maternal and infant rooms in some commercial buildings. Most of the rooms even perform no function. Through field visits, mapping and questionnaire surveys, this paper takes the maternal and infant room in the commercial buildings in Nanning as the research object, delves the key point of the optimum design, analyzes the quantity, location, area, marking, functional facilities and interest of the maternal and infant room, discusses the demand of the user to the maternal and infant room, and obtains a feasible optimum design of the maternal and infant room in the commercial buildings. Though this research only takes Nanning City as an example, it is applicable enough for the design and analysis of maternal and infant room and can be more widely used in the whole country, making commercial buildings a place full of humanistic care.

**Keywords:** Nanning, Commercial Building, Maternal and Child Room, Optimization Research

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## 1. Introduction

With the popularization of the advantages of breastfeeding, especially the launch of the national second-child policy in 2016, more and more women have joined the army of "back-to-milk mothers". At present, despite the rapid development of domestic urban facilities, the construction of maternal and child facilities is still lagging behind and has not kept pace with social development. With the promulgation of the normative document "Guiding Opinions on Accelerating the Construction of Maternal and Infant Facilities" (National Health Guidance [2016] No. 63), improving maternal and child support measures and accelerating the construction of maternal and child support facilities have become urban civilization construction. New requirements. As the capital city of Guangxi and the host city

of the China-ASEAN Expo, Nanning is also the core city of the Beibu Gulf urban agglomeration. Its urban economy has entered a period of rapid development, and large-scale commercial buildings are row upon row, but its maternal and child support facilities are far less than domestic. The other first- and second-tier developed cities are complete, which is also a common problem in most cities in China. In this regard, we use the maternal and child rooms of the major commercial buildings in Nanning as the research entry point. Through the field visits to these maternal and child rooms and the investigation of the needs and feelings of users, we can sort out the problems and put forward the feasibility. Optimized design. It is hoped that this research will enable the mother and baby room to be standardized and popularized, and help the improvement and optimization of the domestic maternal and child room facilities.

## 2. Investigation on the Current Situation of Maternal and Infant Room in Commercial Buildings in Nanning

After investigating the setting of maternal and infant rooms in commercial buildings in Nanning, we found the following problems:

### 2.1. Improper Location Selection, Small Quantity and Single Design Style

In the field investigation, we found that the location planning of maternal and infant room in the commercial buildings in Nanning is generally unreasonable. For example, some commercial buildings set the maternal and infant room at the corner of the stairwell, which is hidden and difficult to be found; the maternal and infant rooms are inadequate in most commercial buildings, and the distribution of each floor is uneven, which cannot meet the actual needs of mother and child. Some other maternal and infant rooms are combined directly with the disabled toilet, bring great inconvenience to the use of both. Meanwhile, according to the results of the questionnaire, 57% of the parents think that the maternal and infant rooms in

the commercial buildings in Nanning are located in unmarked location, so it is difficult to find them. The lack of accessibility and convenience leads directly to the low utilization rate of maternal and infant room. 33% of the parents who think that the maternal and infant room should be placed in a conspicuous position be position rather than by the toilet. For convenience, it is recommended that the room be set up at the maternal and infant supplies counter, which is closely linked to their shopping activities. Nearly 83% of the parents think that the existing style of maternal and infant room in commercial buildings is single and lack of childlike. The design of children's interest should be integrated into the space design, so that children can solve physiological problems and play in a pleasant atmosphere.

### 2.2. Inadequate Supporting Facilities and Unreasonable Layout

After the author's on-the-spot investigation, it was found that in addition to the small number and uneven distribution of the maternal and child rooms in commercial buildings in Nanning, the facilities and facilities were different. See Table 1 for details of the existing maternal and child room facilities in some commercial buildings in Nanning.

**Table 1.** Table of supporting facilities for maternal and child rooms in some commercial buildings in Nanning.

	Guomao Center	Xiguan Xintia-ndi	Yuehui Square	Parkson Yuehui Store	Qingxiu Wanda
Care station	√	√	√	√	
trash can	√	√		√	
table		√		√	√
Sink	√	√		√	√
hair dryer		√		√	
Power outlet	√	√		√	
sofa	√	√	√	√	√
Baby seat		√			

It can be seen from the above table that the supporting facilities of mother maternal and infant rooms in most commercial buildings are not humanized and the equipment is not perfect enough, which brings great inconvenience to the use of the room. According to the field investigation of the supporting facilities and the layout of the maternal and infant room, we can conclude that existing maternal and infant room in commercial buildings in Nanning can be divided into the following types:

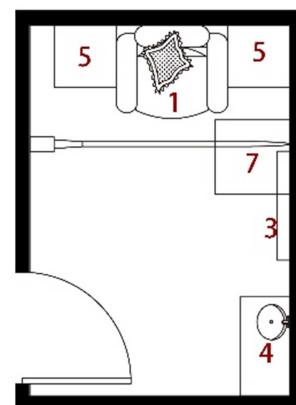
(1) Spacious and high configuration type - Xiguan Xintiandi (Figure 1): The indoor space is relatively spacious, the location is next to the female guard, the facilities are relatively complete, and there is a curtain in front of the sofa to protect the privacy of the user.

(2) Large and simple type - Qingxiu Wanda (Figure 2): The indoor space is large, but the facilities are relatively simple, there is no nursing station. Indoor wires and machines are faintly visible.

(3) Remote location type - Yuehui Square (Figure 3): Located on the second floor of the underground parking lot and shopping mall. The facilities are relatively simple and there is no air conditioning and ventilation in the underground car park.

(4) Insufficient space - Guomao Shopping Center (Figure 4): The space is small and can meet the basic needs of users.

(5) Compact and perfect type - Parkson Yuehui store (Figure 5): This layout is compact and the equipment is relatively complete. The distance between the sofa and the nursing table is only 1 tile width, which can only accommodate one mother. Operating inside, the supporting facilities are relatively complete.



**Figure 1.** Xiguan Xintian Map.

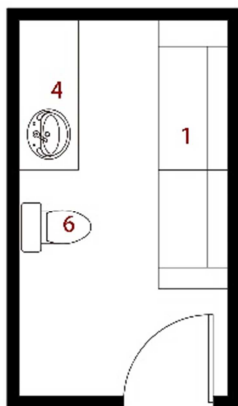


Figure 2. Qingxiu Wanda.

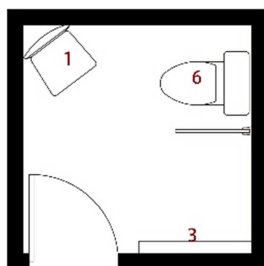


Figure 3. Yuehui Square.

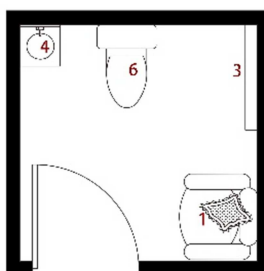


Figure 4. Guomao Center.

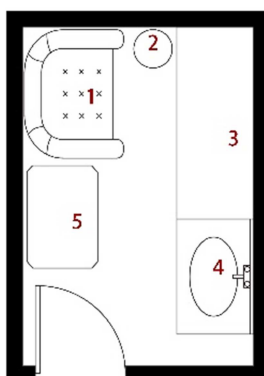


Figure 5. Parkson Yue Club.

- 1 sofa
- 2 trash can
- 3 crib
- 4 care table
- 5 table
- 6 toilet
- 7 baby chair

### 2.3. Lack of Humanized Design in Detail

(1) The guidance of maternal and infant room is not clear, which makes it more difficult for parents to find the room, and its low accessibility and convenience directly lead to low utilization rate. The questionnaire survey shows that 74% of the parents think that the reasonable setting of maternal and infant room sign in commercial buildings will greatly facilitate the user to address and reduce the difficulty of obtaining information.

(2) At present, it is common that the maternal and infant rooms are arranged in the same area as public restroom. It is easy to cause poor indoor air quality and environmental quality if not properly set up, which will have adverse effects on the health of mother and child.

(3) The lack of separation in some indoor spaces and the poor sound absorption performance of indoor decoration materials make multiple groups of families interfere with each other in sharing the maternal and infant room, bringing poor spatial experience to the users.

(4) The light source distribution is not even light enough in the maternal and infant room; the material of interface that contact with infant is not decorated with soft package.

It can be seen from the research results above that the location planning of the maternal and infant room is unreasonable, the space function is single, the facilities are insufficient and the management and the sanitation condition is poor. The emergence of these problems not only brings inconvenience to the use of maternal and infant room, but also brings negative feelings and reduces the consumption enthusiasm of mother and child groups. Therefore, it is very necessary to optimize the design of the maternal and infant room in the commercial buildings of Nanning, whether from the point of view of the use of mother and child or the business.

## 3. Maternal and Infant Space Optimization Program in Nanning

A humanized maternal and child space can provide important support and commercial added value for commercial buildings. After field visits and questionnaire surveys of existing commercial buildings in Nanning, we put forward the following design suggestions in combination with relevant literature research to form a feasible maternal and child room optimization design

### 3.1. Location Selection, Quantity Distribution and Design Style of the Maternal and Child Room

(1) The position of the maternal and child room selected in the commercial building is related to whether the mother's breastfeeding, infant cleaning and other needs are met. We recommend that the maternal and child rooms be placed in the same area as the public restroom for overall design, and a maternity and child supply marketing counter should be placed near the maternal and child room. The advantage of this design is that the maternal and child room share the drainage pipeline with the toilet, so that the water area is

relatively concentrated. At the same time, the toilet in the commercial building is generally concealed, which satisfies the requirements of the privacy of the maternal and child room; secondly, with the indication of the bathroom, additional The maternal and child room guidelines mark allows parents to quickly locate and orient, quickly find the maternal and child room; in addition, this arrangement can also increase the source of customers for the sale of maternal and child supplies.

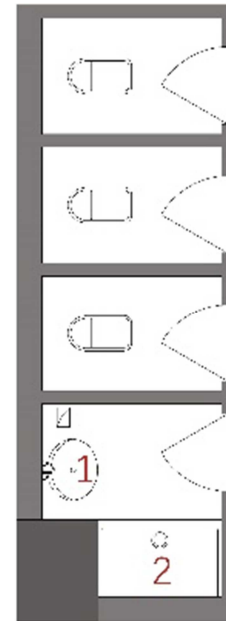
(2) The size of the maternal and child rooms should be determined according to the size of the commercial building and the type of business in each layer. For larger commercial buildings, maternal and child rooms can be set up on each floor; commercial buildings with smaller or less people flow can be arranged in separate compartments; or they can be set according to the commercial functions of each floor. Infant room. For example, a layer of infant and child play area in a commercial building can be equipped with a larger, more functional maternal and child room, and the remaining layers can be provided with a smaller maternal and child room.

(3) The internal space style of the maternal and child room should be consistent with the commercial culture and corporate image of the building, and give full play to the characteristics of the business, forming a unique highlight in the design style, bringing a sense of freshness to the user while attracting Retain customers. At the same time, as a space serving the mother and the baby as a main group, maintaining a novel and child-friendly space style can give users a better space experience. For example, in the maternal and child's room, the theme decoration is enhanced, and the maternity room on each floor of the shopping center is decorated with different themes, which can give users more freshness.

### 3.2. Planar Layout of Maternal and Child Space

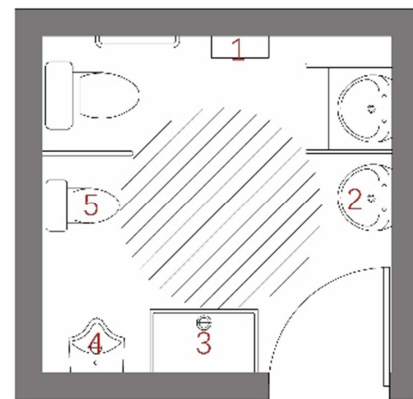
The maternal and child rooms can be divided into several areas, such as breastfeeding, diaper changing, and auxiliary facilities. For the mother and baby room with limited area, it should include space for maternal and child lactation and diaper change; the larger maternal and child room can accommodate multiple groups of lactation rooms, diaper cleaning rooms, and public spaces for families to rest. In the above investigation, it was found that more maternal and child rooms have the same place in the diaper change area and the maternal and child lactation area, lacking separation, and causing many inconveniences to the user in terms of smell, cleanliness and privacy. We try to adjust the optimal design in two ways to enhance the applicability of maternal and child space design in commercial buildings.

(1) The original design of the original commercial building is limited, and it is impossible to design an optimized design for the independent maternal and child room.



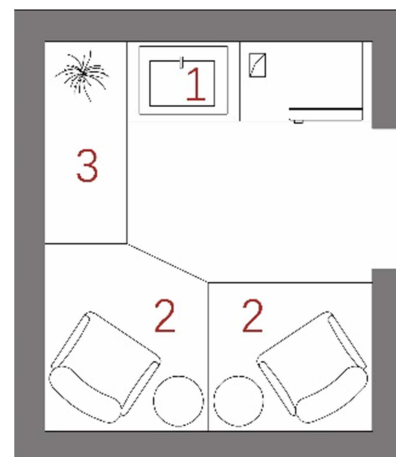
1 wash basin 2 baby changing station

**Figure 6.** The diaper changing area is placed in the sanitary compartment.



**Figure 7.** The third bathroom placed in the nursery facility.

1 folding baby seat 2 baby sink 3 folding baby changing station 4 baby urinal  
5 baby toilet



1 wash basin 2 lactation room 3 shelf

**Figure 8.** The diaper changing area is placed in the sanitary compartment.

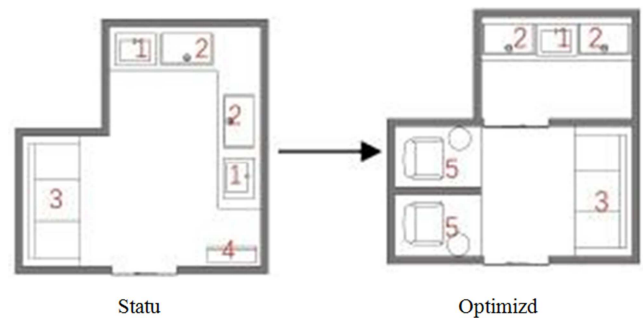
When the area of a commercial building is limited and the size of the arrangeable maternal and child room is small, the maternal and child lactating area can be set separately from the diaper changing area. The area where the baby diaper is changed is placed in the compartment of each floor of the bathroom, and the maternal and child room is only used as a place for mother to breastfeed and rest. In a sanitary compartment that provides a washable baby diaper, it should include a hand basin, a baby changing station, hooks and shelves for placing bags and clothing, and necessary facilities such as a container for placing waste on one side of the sink. Such an independent and intimate diaper changing space can be achieved by occupying only two or three square meters (Figure 6). The baby changing station can also be placed in the third bathroom, and the function of the mother and baby room is appropriately dispersed to form a model of the family bathroom. In the third bathroom, children's toilets, baby chairs, changing tables and other baby-care facilities are added. While improving the versatility of the barrier-free bathroom, it also expands its usability and reduces the problem of low barrier-free toilet usage in reality. (Figure 7). In the separate lactation room, there is a wash basin with hot and cold water, a wide shelf, a microwave oven and other furniture. The breastfeeding compartment has built-in facilities such as comfortable tables and chairs, folding baby seats, etc., providing a good and good mother. Comfortable breastfeeding space (Figure 8).

(2) Optimized design proposal for the larger maternal and child room in the original commercial building with conditional setting

Different sizes of maternal and child rooms can achieve different functions. In such maternal and child rooms, the basic maternal and child room should contain space for breastfeeding, diaper change, etc., such as area and surplus, can accommodate more breastfeeding rooms and diaper changing rooms, and can increase the space for parents' lounges and infants to play. In areas where mothers are breast-feeding, separate small enclosed spaces should be formed to meet the requirements of privacy and non-interference. The diaper change area should be effectively separated from other areas to reduce the air and environmental quality of the diaper to infect the outside relatively clean space. Therefore, the maternal and child room is kept in a relatively clean and hygienic state, and the user has a good experience. Let us take the current situation of the arrangement of maternal and child rooms in a commercial building in Nanning: the area is large, there is a sofa in the room, two baby changing stations and two wash basins, which can meet the needs of multiple parents to breastfeed and change diapers at the same time. However, due to the lack of separation in the indoor space, users interfere with each other during use. To this end, we have made adjustments to its original design, dividing the original space into three parts: the lactation room, the diaper changing room and the parent restroom. The partitions are separated by a partition or a light partition to ensure the user. Relatively independent in the process of parenting, comfortable, clean

and tidy space, see Figure 9.

The design of the maternal and child room on the plane should also take into account the situation in which the father or the older child is waiting outside while the mother and baby are in use. For the mall, it is a business opportunity to make clever use of the public transition space between the maternal and child rooms and the commercial area to create an area where parents can wait for their children to rest and play. It can be considered to combine waiting area with advertising or baby goods vending machine, which can wait for the waiting family to wait patiently and achieve the purpose of strengthening advertising and promoting commodity consumption.



**Figure 9.** Optimal layout of maneral and infant room in a Commercial Building in Nanning 1 wash basin 2 baby changing station 3 seat 4 dustbin 5 lactation room.

Maternal and child indoor facilities include doors, appliances, hand washing and drying facilities, which meet the user's human scale to ensure the comfort of the "comfortable" maternal and child room. The door of the entrance to the maternal and child room can be automatically inductive, and the net width should not be less than 900mm. It is convenient for parents to push the stroller with one hand and the purchased goods can be directly accessed in one hand. In addition, the breastfeeding compartment in the maternal and child's room is recommended to use a louvered door to increase the permeability of the small space, while allowing outsiders to know the use of the compartment and to find it in an emergency. The decorative materials in the maternal and child interior should be kept in bright colors to satisfy the infants who do not like the dark, lighter atmosphere. Green plants can be introduced into the maternal and child room, which plays a decorative role and also has a certain optimization effect on the indoor environmental quality. The use of artistic ornaments such as paintings and wall hangings can make the space more decorative.

### 3.3. Other Designs of the Maternal and Child Room

The maternal and child rooms can be divided into several areas, such as breastfeeding, diaper changing, and auxiliary facilities. For the mother and baby room with limited area, it should include space for maternal and child lactation and diaper change; the larger maternal and child room can accommodate multiple groups of lactation rooms, diaper cleaning rooms, and public spaces for families to rest. In the

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Through field research, questionnaires, etc., we know that in the actual use of the maternal and child rooms, we can re-optimize from the following aspects to achieve the humanized design of maternal and child space in commercial buildings:

(1) The logo is obvious. Logo is a symbol indicating the characteristics of things. It is more intuitive and easier to understand than simple patterns and words. Effective logo setting will help users to address in unfamiliar spaces. A clear maternal and child symbol in a commercial building can be a means of rapid positioning and orientation by parents. At the entrance of the commercial building and the indoor plane navigation at each level of stairs, if there is a clear and intuitive logo, parents can quickly find the maternal and child room.

(2) Odor treatment. In the survey, many parents believe that the scented maternal and child room will have a better experience. Therefore, when the space in the maternal and child's room is cleaned, a fragrance spray can be added to keep the indoor atmosphere fresh and elegant.

(3) Sound processing. According to the theory of infant psychology, newborn babies prefer soft and high-pitched sounds. Soft, melodious and rhythmic music can cause a positive emotional response. As a result, some gentle and soothing music played in the room can ease the infant's mood and develop the hearing. At the same time, the impact of noise caused by other babies' crying during the use of other families is moderately mitigated, so that the users can maintain a better spatial experience.

(4) Light source processing. The suitable indoor light stimulation will lay a good foundation for the development of infant's perception and cognition. A warm light source with soft light should be placed in the maternal and child's room. The light source combined with the high purity color arrangement on the wall makes the infant's vision stimulated by light and color, so as to improve the visual sensitivity. The top light source is mostly made of energy-saving lamps to illuminate the interior space of the maternal and child room. The maternal and child's room can be adjusted according to the seasons, and the indoor light source can be changed according to different seasons, which makes people feel warm.

(5) Detail processing. In order to avoid problems such as bruises and scratches when infants and young children are exposed to indoor furniture, in the details of the maternal and child's interior, materials that are more round and smooth should be used, and soft packs can be used.

## 4. Conclusion

This paper studies the problems existing in the maternal and child room of commercial buildings in Nanning from the location selection, quantity distribution, design style, layout and other design aspects of the maternal and child room. Combining the research results and related theories, the maternal and child in commercial buildings is obtained. The feasibility of the room is optimized. Although this study only takes Nanning as an example, it has sufficient applicability for the design and analysis of maternal and child space, and can be widely spread to the whole country, making commercial buildings a place full of human care.

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