

AicE-Bs 2012 Cairo  
ASIA Pacific International Conference on Environment-Behaviour Studies  
Mercure Le Sphinx Cairo Hotel, Giza, Egypt, 31 October – 2 November 2012  
“Future Communities: Socio-Cultural & Environmental Challenges”

## Entrance and Circulation Facilities of Malls in Surabaya: A universal interior design application

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### Abstract

The entrance and circulation facilities as one of the spatial elements in public facilities are also elements that need to be studied and applied with universal design approach. Surabaya, as one of the largest cities in Indonesia with many public facilities particularly shopping centres truly needs to consider universal design applications. The purpose of this research is to study, identify problems of the application of the entrance and circulation facilities as well as to produce alternative solutions to those problems with an approach to universal design in the shopping centres around Surabaya. Qualitative research is used for the study and production of solutions. The design thinking method is used in this research.

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Selection and peer-review under responsibility of the Centre for Environment-Behaviour Studies (cE-Bs), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.

*Keywords:* Entrance; circulation facilities; universal design; design thinking

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### 1. Introduction

#### 1.1. Entrance and circulation facilities of public space-building

Entrance facility of public space-building is a space forming element of space-building that is applied to the activity entry into the public space-building. The facility of an entrance can include door, elevator, stair and etc. The Entrance facility of public space-building is part of the representative area of that public space-building. Visual aesthetically, it is also became part of the composition of the facade design of

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public space building. In the case of space-building in the form of malls, the entry facility also became a point of interest, aiming to draw people in.

Circulation facilities in public space-buildings is a space forming element that is applied to accommodate the needs of users' movement, both in horizontal circulation (circulation within the floor) and vertical circulation (circulation between floors). Horizontal circulation facilities in the mall space-building, can be flat (or with very gentle slope) corridor as well as a bridge that uses different types of material. Vertical circulation facilities in the mall space-building can include stairs, ramps, lifts (elevators), escalators, and others. In the case of mall space-building, the circulation facilities (both horizontal and vertical) can also become part of the building structure and composition of the aesthetic elements in space malls.

Entrance and circulation facilities are required to be used by all visitors in the public space-buildings, including the mall. It is because the mall is a public space-building with most public characters inside. Mall is a public facility with a variety of commercial activities, social, recreational, relaxation, exercise, and even worship can be done in the mall. This means that the mall can be visited by anyone with no exception at all to do a variety of activities.

The physical environment in buildings and public spaces are media (facilities) to accommodate the activities that apply to the public. This obviously requires the applied consequences of physical space-building facilities which are universal, or inclusive; these are the physical space-building facilities that could be used by everyone as visitors of space-buildings. Physical space-building facilities with a universal approach (inclusive) as a consequence of these public space buildings have not become commonly applied in Indonesia. Many of the physical space building designs that are mostly applied have not considered the needs of the certain sides that have physical limitations, the range of certain age, and also the difference between the sexes equally. The paradigm stating applied universal or inclusive design is an expensive application causes insufficient efforts for the application and development of the universal or inclusive design. Whereas the universal applied design will indirectly ease all users of the facility without exception. Thus, productivity of all users can be improved to produce investment if it experiences degradation in age or physic.

Besides the development of legislation and public awareness of the facilities and universal design, access for user groups with special needs also receive less attention in the world of design practitioners. Although the standard rules of construction applications have stated about the applied design facility that can be accessed universally, universal design concepts and methods are not (yet) generally taught in design school. The head and manager of design studies program is often lacking in awareness, sensitivity, information and skills to teach students about disability issues, minimum versus optimum standards, and the state of the art in accessible design (Greer, 1987). It also includes the lack of learning about the entrance and circulation facilities on a public space-building with universal design approach.

Therefore, we are doing the studies of applied physical entrance and circulation facilities on the public space-buildings (in this discussion is the mall) in terms of universal design. The Identification of mapping the applied facilities will be equipped with proposed solutions of universal design that can be applied to any malls. Surabaya, was chosen as a model city for applied research object and universal design solutions as fairly representative as big cities in Indonesia, which is trying to develop public facilities (including the mall).

### *1.2. Problem, purpose, and objective*

The entrance and circulation facilities as one of the spatial elements in public facilities are also elements that need to be studied and applied with universal design approach. Surabaya, as one of the largest cities in Indonesia with many public facilities particularly shopping centres truly needs to consider

universal design applications. How the entrance and circulation facilities of malls in Surabaya have been applied and the solutions to the existing designs become the issues (problem) of this research paper.

The purpose of this research is to study, identify problems of the application of the entrance and circulation facilities as well as to produce alternative solutions to those problems with an approach to universal design in the shopping centres around Surabaya.

The objective of this research is determined the mapping of applied physical entrance and circulation facilities in malls in Surabaya and proposed a design solution with universal design approach. Applied mapping and proposed design solution can be a suggestion that can be followed up with an agenda of a sustainable community service activities.

## **2. Universal Interior Design: Entrance, Circulation, and It's Parameter**

Universal design is a design approach for products and elements of building-space facilities that could be used by every person without exception. This approach is truly needed particularly in public building facilities so that every user can perform his activities independently, easily and optimally. Unfortunately, physical building-space facilities with a universal (inclusive) approach as a consequence of a public building-space has not yet become a basic application in Indonesia. The entrance and circulation facilities as part of the spatial elements in public facilities are also elements that need to be studied and applied with universal design approach.

A good design and a design that is equipped with the attention to the issues of the users can be a key in solving the problem of universal design. These human factors issues are related to human physical conditions in the use of the design product, and have become standard principles in universal design approach. The principles of universal design by Story (1998: 34-35) are as follows:

- **Equitable Use:** The design is useful and marketable to people with diverse abilities.
- **Flexibility in Use:** The design accommodates a wide range of individual preferences and abilities.
- **Simple and Intuitive Use:** Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.
- **Perceptible Information:** The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.
- **Tolerance for Error:** The design minimizes hazards and the adverse consequences of accidental or unintended actions.
- **Low Physical Effort:** The design can be used efficiently and comfortably and with a minimum of fatigue.
- **Size and Space for Approach and Use:** Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.

A building entrance may be required to serve potentially conflicting functions, such as to permit controlled access by staff or residents but to deny access to unannounced callers, as may be the case in some private offices or residential premises. Other entrances may provide unrestricted access to all to the extent that doors are held fully open during the day, such as in some large retail stores. Some entrance doors will permit unrestricted access but will remain closed in order to conserve energy and to reduce the intrusion of traffic noise. The design of an entrance must acknowledge these and other requirements whilst ensuring that everybody who is likely and entitled to enter a building is able to do so conveniently and independently. Similarly, internal doors provide a means of enclosing a room or providing an effective barrier between adjacent areas for reasons of privacy, noise reduction, fire safety or security. However, they must also be designed to permit easy passage for people to allow them to access facilities and to exit a building safely.

Checklist entrance and circulation parameter for universal design in this paper will be adopted from Building for Everyone: A Universal Design Approach, booklet 2-3 ([www.universaldesigns.ie](http://www.universaldesigns.ie)). Bellows are checklist entrance and circulation parameter for universal design that has been simplified and adjusted to the needs of research at malls in Surabaya:

### *2.1. Checklist entrance parameter for universal design in Surabaya's malls*

- Entrance is clearly visible and prominent.
- Design of the Entrance is universally designed.
- There is an adequate space inside and outside entrance doors.
- Threshold to entrances are level or no greater than 10mm with chamfered, pencil rounded or ramped profile.
- There is a canopy or door recess for weather protection.

### *2.2. Checklist horizontal circulation parameter for universal design in Surabaya's malls*

- The layout is logical and direct.
- No changes of level within a storey.
- Access routes through open-plan area are well defined.
- Seating at regular intervals in the walkways.
- Corridor wide enough (min 2000mm clear).

### *2.3. Checklist vertical circulation parameter for universal design in Surabaya's malls*

- The stair's design is universally designed.
- The ramp's design is universally designed.
- The passenger's lift design is universally designed.
- The travelator's design is universally designed.
- The escalator's design is universally designed.

## **3. Methodology**

Qualitative research is used for the study and production of solutions. Design thinking become the chosen approached methodology that will be applied in this study with adopting design thinking from some of the literature (Riverdale & IDEO, 2011:4; Lockwood, Thomas, 2010:50; Tim Brown, 2009:16; Ambrose, Gavin and Harris, Paul, 2010:12; Lawson, Bryan, 2005) and adjusted with the research's steps. The design thinking method is used in this research with the following work sequences:

- Exploration is comprehension and empathy as the mall's visitors to observe and documentation to the object entrance and circulation facility.
- Identification is definition, selection and synthesis problems in physical approached on entrance and circulation facility.
- Ideation is idea and creation as designer to give alternative's design solution for entrance and circulation facility with approach to universal design principal
- Visualization is model and drawing sketches as alternative media communication design for entrance and circulation facility.
- Evaluation and Persuasion are presentation and feedback for perfection in alternative design solution in entrance and circulation facility.

For this research, there are 15 malls that have been selected as the research objects. The selection of objects is under consideration of mall diversity, location distribution, establishment distribution, and the popularity of malls.

#### **4. Findings**

Surabaya, as one of the major cities in Indonesia with a lot of shopping center public facility, need to pay attention to universal design apply. The malls in Surabaya itself, has a unique definition and its own characteristics. Here is a short description of the uniqueness of these malls. Marina Plaza, the plaza formerly known as Fountain Court is an exclusive shopping center in the South Surabaya and also has sports facilities such as a swimming pool. Royal Plaza is a family mall concept to provide all the needs of the family in one place. Surabaya Town Square (or commonly abbreviated SUTOS) is a mall that was founded in 2008 and consists of 4 floors with tenants - tenants who are known as large companies both nationally and internationally. Then there is also Tunjungan Plaza (or commonly abbreviated TP) which is a largest shopping center in Surabaya, as well as the most popular plaza in the city of Surabaya, was founded in 1986 and has four main buildings are interconnected (Tunjungan Plaza East, Center and West). THR Mall is a Computer Sales PC / Notebook is the most complete in Surabaya is located in Jalan Kusuma Bangsa. Pakuwon Trade Center and Supermal Pakuwon Beautiful is a shopping center located Jl. Raya Puncak Indah Lontar 2 West Surabaya with the concept of "one stop servicing all matters". Ciputra World Surabaya is a superblock built by Pt. Ciputra Surya Tbk which is in the area of Jl. Mayjend. Sungkono, Surabaya. Superblock has 2 towers used for apartments by the name of The Via & The Vue (V2), have 1 mall a number of floors 6 floors and currently they are also building hotel Ciputra. Grand City Surabaya is the largest shopping center in Surabaya, and also have the Grand City Convention and Exhibition Hall with area of 21.000 square meters. Pasar Atom and Pasar Atom Mall Surabaya located North Surabaya region with a land area of over 6 acres. Pasar Atom is a shopping center with its distinctive interesting icons where the visitors do not just come for window shopping rather than shopping buyers, where they come to shop. The average rate of visits per day is 20,000 to 30,000 people per day for weekday and more than 50,000 people per day to weekend. Galaxy Mall was established in the East Surabaya. This mall consists of 5 floors with tenants - tenants who are known as large companies both nationally and internationally. Surabaya Plaza shopping center in Surabaya is located in the heart of the city, located adjacent to Submarine Monument and very close to the Surabaya Plaza Hotel. Previously, or Delta Plaza or Surabaya Plaza is the location of the historic Hospital Dr. Soetomo time. However, now converted into a shopping center that has 6 floors with a magnificent building features spacious flats parking both below and above. WTC Surabaya is located adjacent to the Delta Plaza, is well known as a shopping center mobile phone (cell phone). City of Tomorrow (CITO) is a shopping center located at the entrance and adjacent to the city of Surabaya Juanda airport.

Exploration of the entrance and circulation facilities of malls in Surabaya has been done by observation and documentation. Researchers apply as a visitor or user of the facilities, so it can be more objective in the process to find and use the entrance and circulation as needed. Here is the documentation of the exploration facility entrance and circulation on the mall in Surabaya:

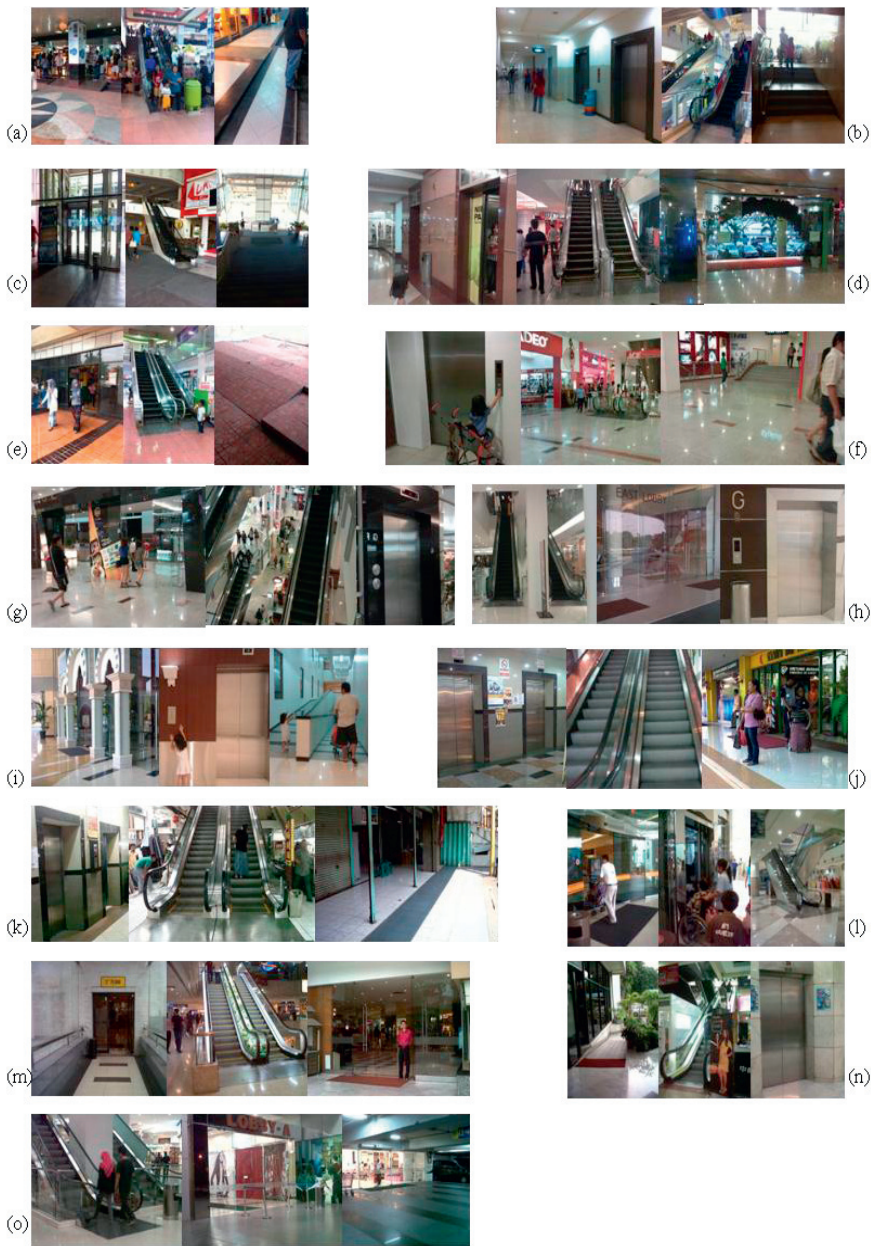


Fig. 1. Documentation of entrance and circulation facilities of malls in Surabaya (a) Plaza Marina; (b) Royal Plaza; (c) Surabaya Town Square; (d) Tunjungan Plaza; (e) Hi-Tech Mall; (f) Pakuwon Trade Centre; (g) Supermall; (h) Ciputra World; (i) Grand City; (j) Atum Mall; (k) Pasar Atum; (l) Galaxy Mall; (m) Plaza Surabaya; (n) World Trade Centre; (o) City of Tomorrow

The observations and repeated observations in documentation file produce identification in physical condition at entrance and circulation facilities in the mall in Surabaya. Observations of applied physical

entrance and circulation facilities at mall in Surabaya proposed with the checklist table using parameters that have been adjusted as follows:

Table 1. Checklist of entrance parameter for universal design in Surabaya’s malls

	Plaza Marina	Royal Plaza	Surabaya Town Square	Tunjungan Plaza	Hi-Tech Mall	Pakuwon Trade Center	Supermall	Ciputra World	Grand City	Atum Mall	Pasar Atum	Galaxy Mall	Plaza Surabaya	World Trade Center	City of Tomorrow
Entrance is clearly visible and prominent	■	■	■	■	■	■	■	■	■	■	□	■	■	■	■
Design of the Entrance is universally designed	□	□	□	□	□	□	■	■	■	□	□	■	□	■	■
There is an adequate space inside and outside entrance doors	■	■	■	■	■	■	■	■	■	■	□	■	■	■	■
Threshold to entrances are level or no greater than 10mm with chamfered, pencil rounded or ramped profile.	□	□	■	□	□	□	□	■	■	□	□	■	□	□	■
There is a canopy or door recess for weather protection	■	■	■	■	■	■	■	■	■	■	□	■	■	■	■

Table 2. Checklist of horizontal circulation parameter for universal design in Surabaya’s malls

	Plaza Marina	Royal Plaza	Surabaya Town Square	Tunjungan Plaza	Hi-Tech Mall	Pakuwon Trade Center	Supermall	Ciputra World	Grand City	Atum Mall	Pasar Atum	Galaxy Mall	Plaza Surabaya	World Trade Center	City of Tomorrow
The layout is logical and direct	□	■	■	■	□	□	■	■	■	□	□	■	□	■	■
No changes of level within a storey	■	■	■	□	■	■	■	■	■	■	□	■	□	■	■
Access routes through open-plan area are well defined	■	■	■	■	□	■	■	■	■	■	□	■	■	■	■
Seating at regular intervals in the walkways	□	□	■	□	□	□	■	■	■	■	□	■	■	■	□
Corridor wide enough (min 2000mm clear)	■	■	■	■	■	■	■	■	■	□	□	■	■	■	■

Table 3. Checklist of vertical circulation parameter for universal design in Surabaya’s malls

	Plaza Marina	Royal Plaza	Surabaya Town Square	Tunjungan Plaza	Hi-Tech Mall	Pakuwon Trade Center	Supermall	Ciputra World	Grand City	Atum Mall	Pasar Atum	Galaxy Mall	Plaza Surabaya	World Trade Center	City of Tomorrow
The stair’s design is universally designed.	■	■	■	■	□	■	■	■	■	■	□	■	■	■	■
The ramp’s design is universally designed.	□	■	■	□	□	□	■	■	■	□	□	■	□	□	■
The passenger’s lift design is universally designed.	-	■	■	■	□	□	■	■	■	■	□	■	■	■	-
The travelator’s design is universally designed.	-	■	-	-	-	-	■	■	-	-	-	-	-	-	■
The escalator’s design is universally designed.	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■

Notes:

universally designed : clear landing, handrails, bright enough, step edge is visually highlighted, etc.

- : applied and as universal design’s criteria
- : applied, not the same with universal design’s criteria
- : No application

The results’ checklist of applied physical entrance checklist suggests that aspects ‘entrance are clearly visible and prominent’, ‘there is an adequate space inside and outside entrance doors’, and ‘there is a canopy or door recess for weather protection’ are aspects that has been applied optimally in most mall. Aspect ‘design of the entrance are universally designed’ and ‘threshold to entrances are level or no greater than 10mm with chamfered, pencil rounded or ramped profile’ has not been optimally applied (about 60% of the mall in this research). Malls which have applied all aspects of universal design entrance criteria optimally are Ciputra World, Grand City, Galaxy Mall, dan City of Tomorrow. Mall with all aspects of universal design entrance criteria but not optimally applied is Pasar Atum.

The results’ checklist of applied physical horizontal circulation checklist suggests that aspects ‘access routes through open-plan area are well defined’ and ‘corridor wide enough (min 2000mm clear)’ are aspects that has been applied optimally in most mall. Aspect ‘seating at regular intervals in the walkways’ has not been optimally applied (about 50% of the mall in this research). Malls which have applied all aspects of universal design horizontal circulation criteria optimally are Supermall, Ciputra World, Grand City, Galaxy Mall, and World Trade Centre. Mall with all aspects of universal design horizontal circulation criteria but not optimally applied is Pasar Atum..

The results’ checklist of applied physical vertical circulation checklist suggests that aspects ‘the stair’s design is universally designed’ and ‘the escalator’s design is universally designed’ are aspects that has



been applied optimally in most mall. Aspect ‘the travelator’s design is universally designed’ are not applied in most mall (only 4 malls with this aspects). Malls which have applied all aspects of universal design vertical circulation criteria optimally are Royal Plaza, Supermall and Ciputra World.

At this stage, the identification of physical application in entrance and circulation facility produced a map of universal design issues. This map of issues will be followed up in the discussion and analysis for the proposed solution to the universal design approach.

## 5. Discussion and Analysis

Research has been done on the mall entrance and circulation facilities in Surabaya conducted from the perspective as mall visitors. Observations conducted by researchers’ direct experience as a mall visitors who use or pass the entrance and circulation facilities. Constraints due to the not optimally or not exist applied universal design at the entrance and circulation facility of the findings based on the orientation of the users’ orientation (target main mall users). The process is also part of the post occupancy evaluation of the mall. The result could be one of the considerations for the development of physical facilities mall.

The stage of discussion and analysis stated with a discussion of design thinking stages of ideation and visualization. At this stage, all the physical mapping applied entrance and circulation facilities sorted and responded according to the characteristics of the problem. Applied Physical Problems entrance and circulation facilities related to universal design approach is divided into two characteristics, which is what the application of universal design approach but not optimal, and there is no universal approach applied to the design of physical

Problems on the object space-buildings that have applied physical entrance and circulation facilities with universal design approach but not optimal, solved by given the design’s solution with adjustment and following the criteria of universal design. Adjustment of universal design criteria performed primarily in terms of the physical dimensions of the entrance and circulation facilities, which is related to the width of the entrance and circulation facilities, high rise floor elevation and slope angle on the horizontal and vertical circulation path. Other adjustments made to the entrance and circulation support facilities, such as hand railings, signage, and others.

Here are some examples of design solutions with a sketch directly on the pictures in the entrance and corridor that have problems by not optimally applied universal design:



Fig. 2. Sketches of universal design solutions in multiple object instances that do not conform to the criteria of universal design

The proposed design of the universal design approach is presented directly on the image documentation applied object. Directly sketch solution on that object is the principle of universal design's solution as ideas that can be developed in more detail if it will continue in practice improvement activities, adjustments and additions to the object. Details that can be developed on objects facility entrance and circulation are related to the shape, dimension / size, material, and also the object surface finishing. Details will affect to the achievement of optimization applied at entrance and circulation facility in accordance with the criteria of universal design

The data findings of applied physical entrance and circulation facilities identified in the previous checklist, then attempted to compare and analyze the data description of the identity of each mall in Surabaya. The result is that the mall had been built (over 10 years) has many problems of applied physical entrance and circulation facilities with universal design approach. While the mall is still relatively new (about 5 years) the entrance and circulation facilities have been applied with a good approach of universal design. Correlation can be stated is that the old mall does not have an attention by applying the entrance and circulation facilities with universal design approached. Mall that is relatively new, it already has an orientation and concerned with universal design's issues applied in the entrance and circulation facilities.

In addition, the findings applied entrance and circulation facility that complies with the standards of universal design or not, can be correlated with the target market in each mall. Mall which has a target market of middle to upper was more concerned applying the entrance and circulation facilities with universal design approach. Although the mall is old establishment, but because it has targets upper middle market and is ideally located in the center of city, the mall development progressing and regularly follow the trends and issues of ecology and social-design.

## 6. Conclusion and Recommendation

The conclusion from the research with the interior universal design approached in the object of entrance and circulation facility is as follow:

- Applied Physical entrance and circulation facilities at mall in Surabaya with universal design approach still has many problems, especially in the aspect of design of the entrance and threshold to entrances.
- Mall in Surabaya who still lack in physical applied entrance and circulation facilities with universal design approach is Pasar Atom.
- Solution design with universal design approach that can be offered is the customization design with universal design standards, particularly in terms of dimensions (on objects that have applied universal design but not optimal) and provision of physical facilities, entrance and circulation with universal design standards (on the object has not yet applied to the entrance and circulation universal design standards).

Recommendations for further similar research is continuing research 'Kajian dan Usulan Solusi Universal Design pada Bangunan Ruang Fasilitas Publik di Surabaya' ('A Universal Interior Design Study and Suggestion for Solution on Space-Building of Public Facilities in Surabaya') with the object commercial public space-building facilities (other than entrance and circulation), and non-commercial space-building facilities. Some of the non-commercial public space-building facilities are transportation service space-building (airport, train station, bus station), cultural and conservation space-building (museum, art gallery), information space-building (city library, tourism information centre), and recreational space-building (city park, zoo) in Surabaya. That public space-building research, complementary research of public space-building in Surabaya as a whole, so that the applied physical mapping with universal design approach will be completed. The mapping of the universal design physical's problem applied in Surabaya public facilities can be follow up with the community service activities involving faculties, students, and industries.

## Acknowledgements

This paper is part of the multi-year research titled ‘*Kajian dan Usulan Solusi Universal Design pada Bangunan Ruang Fasilitas Publik di Surabaya*’ (‘A Universal Interior Design Study and Suggestion for Solution on Space-Building of Public Facilities in Surabaya’). That research was funded by *Direktorat Penelitian dan Pengabdian kepada Masyarakat, Direktorat Jenderal Pendidikan Tinggi Kementerian Pendidikan dan Kebudayaan Indonesia* (Directorate of Research and Community Service, the Directorate General of Higher Education, Ministry of Education and Culture of Indonesia) from *Penelitian Hibah Bersaing 2012* (Competitive Research Grant 2012) program. For the motivation support and financing, we would like to say thank you.

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