



# Developing a viable model towards the management of pedestrian spaces in Asia

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## ABSTRACT

The management of pedestrian spaces is considered as one of the strategies in improving mobility as well as ensuring the sustainability of street space as reflected in user loyalty. A three-point approach is put forward by the author as a viable framework that would pave way towards sustainable sidewalks considering a balance in ecology, culture and user. The user-centered framework became a viable model in sustaining the presence of pedestrians within a given public space such as sidewalks given that it bases its management strategies on needs and desires of users and ensuring that such needs are satisfied. Given that street use is culture-bound, culture takes on the responsibility of influencing spatial use and formation. Through the implementation of intensive review, visual analysis of historical materials and street user surveys, a cross-case analysis of streets in Tokyo and Manila was examined with respect to its three dimensions, namely: pedestrian behavior, street sociology and the corresponding street morphology. Furthermore, the paper's thrust is on the conceptualization of policies on the feasibility of pedestrian street design and management concepts that would facilitate sustainable ends. To conclude, viable solutions and recommendations towards an improved Asian street environment will be provided along with some conclusions and perspectives for future research.

## 1. INTRODUCTION

Pedestrian facilities refer to areas relegated for the use of pedestrians which include sidewalks, parks, playgrounds, crossings, overpasses, among others. A pedestrian is defined as a person who travels by foot. A review of past literatures on pedestrian behavior focused on walking speed, density and distance. A number of studies dealt with facility-specific design, pedestrian crossing behavior, route choice and scheduling, simulation of macro and micro behavior flow of pedestrian crowds which aimed to achieve efficient flow and mobility of pedestrians. Other aspects of pedestrian studies included way finding, factors affecting path selection (Kamino, 1971; Funahashi, 1979), the influence of pedestrian attributes on walking speed (Gerilla, 2005), crowding simulation, orientating behavior, such as understanding pedestrian crossing physiology, qualitative level of service attributes (Fruin, 1971; Gerilla, 1994), to name a few. While these studies reflect an increasing interest in pedestrians, the focus is mainly on the movement aspect of pedestrians. The paper argues that pedestrian needs are not limited to ensuring mobility but also include other elements which contribute to pedestrian satisfaction such as the feeling of ease, enjoyment, comfort while undergoing movement or utilizing pedestrian facilities. A big gap still remains on studies dealing with the other aspect of pedestrian behavior which is non-movement.



Kamino (1971) stressed that human movement contains both rational and irrational components. Funahashi (1979) describes pedestrian behavior as a complex one and includes a combination of movement and non-movement. Waiting and resting are some examples of non-movement behavior. The paper therefore argues and later on proves that non-movement is a very significant component of pedestrian behavior. Thus, the need to develop friendly designs that simultaneously accommodate people's need for motion as well as static becomes imperative so as to derive a new paradigm in urban space planning. To achieve street renaissance and to revive Asian street culture, there is a need to develop alternative approaches towards effectively managing pedestrian spaces. The paper puts forward the three-pronged approach which considers the interrelationship of ecology, culture and the user, and how these relationships define concepts that can potentially be translated into feasible policy recommendations so as to encourage increased use of pedestrian facilities such as sidewalks.

## 2. METHODOLOGY

Street use is culture-bound, thus, culture takes on the responsibility of influencing spatial use and formation. The social environment, such as the urban street space, served as venue to reflect street user history and values as well as provide a greater understanding of their everyday street life. A combination of intensive review, visual analysis of historical materials and street user surveys were implemented as methodological tool. To further complement and better understand spatial culture, the research introduced a pioneering initiative in the use of spatio-historical survey methodology. The latter utilized historical materials and archival sources to derive insights and understanding of space use and formation within the research locus and later on determining the forest-based culture concept and street user need hierarchy. The cross-case analysis of streets utilized visual materials as data source which were objectively selected through a criteria. These were: (1) portrays street life and reflects a human-scale perspective. A total of 65 pieces of archival materials for Manila and 145 woodblock prints (*ukiyo-e*) and famous places of Edo (*meisho-zue*) in Edo were considered. Direct observation of physical and social attributes ensued. Physical aspect included: street elements present and the overall context and social aspect included: user attribute, group attribute and use groupings. The frequency tabulation indicated most common attributes. Spatio-historical analysis took on ecological/environmental, socio-cultural and sociological/social form. To evaluate the hierarchy of needs, the street user survey was conducted utilizing the AHP (Analytic Hierarchy Process) methodological format. This is a decision making tool to evaluate user preference. This culminated with the findings and conclusion as well as policy implications.

## 3. FINDINGS

### 3.1. Ecosystem-based Framework in Examining Asian Streets

The three-point approach to pedestrian space management suggests that it should consider: (1) overall Ecology, referring to the external, physical environment as well as the social context where an individual lives and moves. Ecology influences individual behavior, types of interaction and thereby street culture. In this case, the forest ecosystem influenced the socio-cultural history of Asian streets. This may serve as potential window to discover the past street culture and provide design recommendations on contemporary street improvement to encourage more users to utilize urban spaces; (2) Cultural aspect, referring to spatio-



historical adaptations, indicates the need to extend the time element not only of the present but also the effects of elements of the past on present use. Knowing and understanding the socio-cultural history and indigenous knowledge of a group is a prerequisite in improving pedestrian transport policy and provision given that different cultures require different space treatment to match with users' needs and desires. Socio-cultural consideration becomes an integral part in the planning, design and implementation process; and (3) the consideration of the street User, both its needs as well as its behavior. User-centric management strategy considers the needs and desires of users and how these can be physically manifested on the sidewalk as movement as well as non-movement behaviors.



Figure 1. The framework reflects the macro-micro relationship between a forest ecology which includes both physical and social context. Spatio-historical aspect refers to the culture of the street that emerged based on a forest-based ecology indicating the socio-cultural value system as well as biological & cultural adaptations. Street user behavior includes both observable and inferred characteristics

The three-pronged framework is developed into a feasible space management methodology so as to contribute towards achieving sustainable sidewalk spaces given the premise that sustainability of sidewalks is determined by user loyalty. The framework is user-centered but respects practices that preserve the functions of ecosystems. Ecosystem approach considers the interaction between living (people and other street users) and non-living (built environment) components. In this case, the forest-based culture may be an appropriate jump off point to discuss how urban ecosystems approach may be useful and applicable towards initiating street renaissance.

### 3.2. ECOLOGY: Forest-based Street Culture

Climate and geography highly affect people's way-of-life and behavior. Thus, Asia, a forest-based region, with its diverse and organic environment and food and shelter availability, influenced the development of a distinct street culture which is different from its Western desert-based counterpart. Among its inhabitants, it encouraged a healthy respect for and harmony with the natural environment, a strong belief of equality among beings, equity and lack of hierarchy as seen in how Asians utilize space treating it as an equalizer among the various classes and among transport modes. Furthermore, the forest contains diverse flora and fauna which translates into increased variation in street use and users; forest-based streets do not segregate but rather integrate its elements; the carrying capacity of a given unit of space is much higher in the forest than in the desert thus the comfort levels of entities within the forest can tolerate higher densities as compared to the desert translating into higher tolerance to crowded spaces within the streets; the flexibility of space is also dictated by a forest-based settlement since a given space may be utilized for different purposes and not necessarily just for a single activity, and may be illustrated in the attribute of verticality wherein segregation



takes on a temporal form rather than physical. The forest also influenced the morphology of settlements wherein road systems reflect an irregular and unstructured pattern due to adherence to the geographic conditions of the site suggesting a low perceived order, human scale urban form of 2-3 level structures which follow the contours of the site, the cacophony of sounds and presence of various elements in a forest is further imitated when streets become a mixed use spatial structure which carries various activity types and mixture of different entities.

A forest-based street reflects a compact and intimate pedestrian-scale urban form conducive for walking. The low-rise, two to three level-structures with a very dense intensively used land mix in Edo and Manila is representative of historic districts within key Asian cities. Its pedestrian scale urban form encouraged walking as the mode of choice thereby imposed relatively short travel distances. Forest-based streets are highly dependent on external orientation points for reference. Such orientation points can either be part of the natural (Tokyo's Mt. Fuji) or built environment (i.e. Manila's church). Because of the hot and humid summers, protection from climatic elements becomes necessary. The street should also be diverse, equitable and sociable reflecting equal opportunities for users and uses as well as encouraging socialization and interaction with smaller individual bubble. The attributes are tabulated and described in Table 1.

Table 1. Attributes of Forest-based Streets

Attributes	Description
Compact	scale is within comfortable levels for a walking person
Intimate	there is a personal and intimate spacing between individuals
Dense	carries higher densities and higher tolerance to crowding
Field-dependent	dependent on external points of orientation
Sociable	social quality of space encourages interaction and groupings
Equitable	allow equal access and opportunities for movement and non-movement activities
Diverse	encourages mixed use activities which are temporally segregated and offers a multiple sensory experience

### 3.3. CULTURE OF SPACE: Spatio-historical considerations

Cultural ecology related how the ecological context or the physical environment molded people's socio-cultural adaptations. These adaptations are manifested in settlement formation, religion, trade, food gathering, transport, language and behavior, among others. In a forest-based culture, a strong Animist tradition which shaped myths and beliefs are still present and reflected on how street users utilize space almost taking place on a daily basis and depicting the celebration of everyday life. This also aided in the evolution of an agrarian society. Thus, contextual appropriateness dictates that pedestrian facility as well as sidewalk design be context-specific. It requires the socio-cultural knowledge of a society to determine appropriateness of the measure. Asian streets are culturally sensitive allowing ritual celebrations for particular animist deities conducted on the streets. The presence of various shrines found along sidewalks in various Asian cities (i.e. Bangkok, Tokyo, Vietnam) is a manifestation of the need for a sacred space for religious exercise. The use of wood, bamboo and palm leaves as common building materials illustrated the permanence in the impermanence of Asian traditional structures. Edo and Manila streets reflect strong traditional knowledge systems especially in the morphological development of its street space. These may provide alternative insights that would reconnect urban design proposals with the cultural context to spatially express localism and diversity.



### 3.4. USER-CENTRIC STREETS

A user-centered approach to space design and management refers to basing management strategies on needs and desires of users and how these can be physically manifested. When individuals interact in a common space, (i.e. pedestrians, vendors in an urban space) shared knowledge and meaning are produced. Thus, the section considered street user needs as well as the relationship of movement and non-movement behavior and the corresponding emergent space. The interaction produces a common culture which is transmitted, learned and shared, thus evolving into a distinct heritage and social tradition. The socio-cultural history of the streets provides a potential window to discover the street culture of the past wherein the latter may provide potential design recommendations on contemporary street improvement so as to encourage user loyalty reflected by increased space utilization. Discussion also focused on the development of walking within the Asian context as well as an overview on the vending culture that is rampant within Asian streets who is oftentimes ignored. In the Asian space, various policies should focus towards encouraging the revival of street culture as well as humanizing of streets within the Asian context. Examples of user-centric strategies include: bringing back the *golodog* in the Sundanese *kampung* to create social spaces, recognize the importance of the *pasar* culture, to name a few. Upon the holistic analysis of all factors, it should be possible to derive potential solutions to effectively manage street spaces.

#### 3.4.1 User Grouping

The most common use was for walking (Manila, 88.89%; Edo, 64%), standing or stopping (Manila, 62.22%; Edo, 44%), and vending (Manila, 53.33%; Edo, 33%). However, in Manila, men in pairs (53.33%), man walking alone (44.44%), a woman walking alone (31.11%) and mixed groups (44.44%) were more commonly observed whereas these variables were rarely observed in Edo. Interestingly, groupings were more homogenous in Edo's case. Women were usually together with other women while men were with other men. Alternatively, only those that implied a family had a mixed grouping of man, woman and children in Edo. Socialization and the need to belong to a group have become general themes in the pictorial representations which reflected the agrarian roots of both the Philippine and Japanese societies. Agrarian societies were organized along tribal kinship patterns which dictated communal cooperation or *pagtutulungan*. The social configuration reflected an extended family which comprised the institutional and cultural fabric (Selmer and de Leon, 2004).

#### 3.4.2 Group Attributes

Street space sociology results from the interaction of individuals within a given space creating shared knowledge and meaning which generates a common street culture. A high occurrence of interaction and movement is implied in both Edo and Manila's visual representations. While dynamism (Manila, 34.29%; Edo, 62%), movement (Manila, 28.57%; Edo, 56%) and personal spacing (Manila, 28.57%; Edo, 54%) among street users were suggested in Edo's representations, intimacy (Manila, 45.71%; Edo, 28%), user diversity (Manila, 57.14%; Edo, 23%) and high level of social interaction (Manila, 34.29%; Edo, 43%) or involvement were reflected in Manila's streets. There were congruent results in the following attributes: intimate spacing (Manila, 22.86 %; Edo, 26%) and crowdedness (Manila, 28.57%; Edo, 27%). Group Attributes in both Edo and Manila reflect higher tolerance to density, while Manila subjects tend to be mixed and diverse (groups, pairs, alone) Edo's are more homogeneous groups. Personal distance is common in Edo while intimate distance is similar to both. Similar to the Japanese society, social acceptance and group membership remain central to the way Filipinos think, believe, feel and act (Jocano, 2001). As such, social norms promoted social relationships such as the respect for elders, deference to superiors, and kindness or tolerance to underlings. Kinship structure puts group pressure not only on its members, but also on other groups who may pose a threat by harming a member.



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### 3.4.3 Individual Attributes

Individual level analysis is important as it points out common cognitive frames to further understand and interpret pedestrian behavior which can reveal motives, goals, mechanisms, emotions and classificatory information that may prove useful in defining attributes of an individual actor to generate behavior. Edo's street users are captured in a dynamic posture contrasted with the generally vertically-positioned street users in Manila. In Edo, high field-dependency has been evidenced by the presence of natural elements in its surroundings serving as orientating points. Furthermore, man is considered as part of one harmonious system. Although Manila individuals were also determined as field dependent, the point of orientation has changed from natural to the built environment (i.e. church). Individual attributes in Edo implies a combination of movement and non-movement activities acted out in short, quick periods while in Manila it is more intimate, highly involved interaction and laid back existence. One hundred percent (100%) of surveyed Edo pictures indicated that the subject (street users) never looked directly at the observer (artist) implying that the captured image reflected a candid view of Edo street. The street users were captured in a state of activity seemingly unaware of the artist's presence. In contrast, more than 50% of pictorial representations of Manila illustrated people looking at the perceiver. The artist was in constant communication with the actors.

### 3.4.4 Street user Needs

The spatio-historical survey revealed that Edo and Manila street users have diverse needs and desires. A needs-hierarchy concept was developed which reflected street user needs that when provided is assumed to increase the level of satisfaction that can influence their loyalty towards the use of a given space. Given that a user-centered approach is prioritized, these can be a viable incentive in changing people's behavior in their use of streets. It becomes imperative for streets to be designed based on user needs - psychologically and sociologically. Figure 2 illustrates the results of the street user need hierarchy survey wherein the initial hypothesis that movement is the most important criterion for pedestrians to utilize the sidewalk was refuted. The survey proved that Protection is the most influential element in the decision of pedestrians to utilize streets reiterating the importance given to physical safety. This is followed by ease which signifies psychological safety and security. The criterion 'equality' has surprisingly garnered a relatively high score specifically on giving importance to the presence of other street users such as sidewalk vendors while 'enjoyment' was the least important.

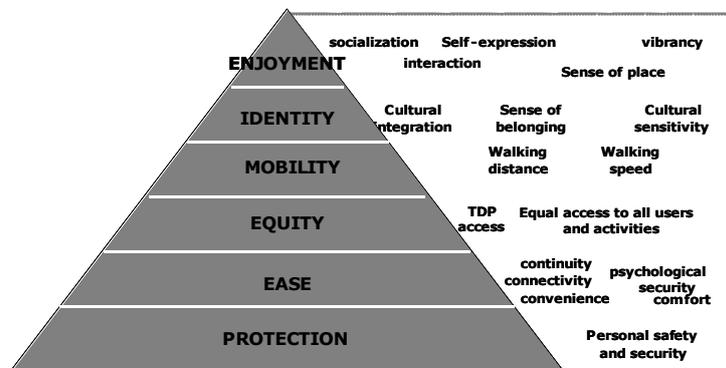


Figure 2. Street User Need Hierarchy. The AHP street user survey determined that protection and ease are the main considerations for pedestrians. This is followed by equity and followed by mobility.



### 3.4.5 Movement and Non-movement Behavior

Non-movement space is a product of the interaction between movement and non-movement behavior (such as sitting, waiting, chatting, to name a few) of pedestrians. Non-movement spaces were common in both Edo and Manila streets in the form of intimate, pocket spaces that served as interaction spaces and blurred movement-non-movement functions, temporary conversion of movement space to non-movement during interaction, *battari shogi* seating spaces in front of commercial shops. This reflected the importance of rest and pause. Some of the potential changes in reintroducing non-movement space include enlivening and revitalizing the sidewalk, improving quality of the environment and more efficient use of space. Factors that may affect the development of Non-movement space may include: the design of intersection, the spatial block arrangement, the interaction of the front and back street sociology, the land use mix, frontage width among others.

Non-movement behavior imposes an equivalent spatial imprint and temporal imprint. Spatial imprint refers to the physical area occupied and the temporal imprint refers to the length of time occupied. These variables are necessary when considering the design of street space. Typically, related activities result in similar spatial imprints. However, the length of interaction defines the temporal imprints. Based from the visual representations, the implied intimacy and higher involvement of Manila subjects with one another translates into longer temporal imprint as compared to Edo subjects wherein the split-second interaction among its street users reflects a shorter temporal imprint. Non-movement behavior is captured in the spatial and temporal imprints of both cities with Manila's spatial imprint becoming fixed due to longer use and more involvement.

## 4.0 Policy Development towards the Management of Pedestrian spaces

Pedestrian mobility management can be introduced as one aspect of sustainable transportation system. It requires the need to address the supply and the demand side. The former being action-based often focusing on hard infrastructure which can be derived from anticipating street user needs and desires while the latter is reactionary in nature, only provided upon an indicative need from present users. As a policy, it can deal with both the soft measures of transport such as awareness campaign, coordination of existing traffic measures so as to complement the provision of hard measures (i.e. road construction). The consideration of the above-mentioned framework leads us to identify potential concepts.

### 4.1 User-Centered Sidewalk Design

The higher crowding tolerance, high level of socialization and interaction, group movement, intimate and personal spacing as well as smaller non-movement bubble dictated the re-evaluation of the typical density-based design approach and introduce a user-centered sidewalk design approach by combining quantity as well as quality-based attributes. An example of its implementation may be the provision of narrower walk-only sidewalk spaces accommodating 2 people while wider sidewalks are more appropriate near pedestrian generators such as schools, institutions, malls, transit-oriented-developments (TODs), shopping streets. In this case, it also becomes imperative to accommodate other users (artists, peddlers) and street furniture.

### 4.2 Flexible Non-movement spaces

Dynamic, short and quick interaction in Edo while longer, intimate and more involved interaction in Manila. Strategically integrate specific pocket non-movement spaces into Manila sidewalk, while in Tokyo, open flexible spaces are more appropriate. Its presence signifies flexibility, encourages social contacts and maximizes interactions. Non-movement



behavior is affected by scale. Large spaces create overwhelming emotion discouraging stops. Thus, structures should be scaled down to elicit a feeling of ease among its users. Visually, the street scale should give the impression of compactness and provide visual cues given the interdependency of people on their surroundings. Edo and Manila streets reflect a compact scale encouraging street use in particular non-movement street use. Examples should include the provision of pocket parks, open non-movement space in Tokyo. Areas under wide crowned-trees may serve as potential pocket non-movement spaces

#### **4.3 Orientating Street Furniture**

The provision of street furniture is desirable in both cities. However, fixed street furniture should be more appropriate in Manila while semi-fixed street furniture in Tokyo. Moreover, eye-to-eye contact in Edo is highly associated with visual irritation. In Tokyo, street furniture should be oriented so as to minimize eye contact while in Manila it should encourage interaction and socialization. As an example, the provision of face-to-face fixed benches can be provided in Manila while back-to-back benches in Edo. This can also be reflected in the strategic placement of benches and the appropriation of vendor space on specific points along the sidewalk encourage social interaction.

#### **4.4 Points of Orientation**

High field-dependence of Edo and Manila street users established the need to integrate the environmental points of references along streets. Furthermore, forest-based roots established the need for sacred spaces and greens. Street trees and greens should be integrated into the sidewalk environment as they provide necessary shade from harsh, tropical elements. Also, implementing a green sidewalk and tree provision as buffer zones become viable options.

#### **4.5 Diversified Sidewalk Space**

Although Manila and Edo street users require smaller personal bubbles, streets are often used by groups rather than individuals, as well as the frequent non-movement activities conducted, justifies the slower walking speed and the demand for the presence of the street economy. In areas with high pedestrian density, encourage diversified activities such as the inclusion of regulated peddling, artworks, performances and other activities as part of a flexi space. The ubiquitous presence of street vendors in Edo and Manila reflects their socio-cultural value and indicates that vending and peddling do have historical roots. It becomes necessary to reinvent the role of vendors given their rampant street presence. From a socio-cultural and historical perspective, there is a need to evaluate how their presence brings relevance to street culture. Thus, proper guidance and regulation should be in place at the national and local level allowing and allotting them space whether within the bounds of public or private space.

#### **4.6 Visual Barriers in Tokyo**

The implication of 'gaze' among Japanese suggests that noise takes on a visual aspect while in Manila, noise is typically associated with the auditory sense. Thus, street barriers can take on a visual form in Tokyo serving as separators while in Manila, separators can be auditory. Moreover, visual cues can effectively provide direction.

#### **4.7 Concept of Segregation**

Segregation is necessary in order to maximize space utilization. However, segregation of activities should take a psychological rather than physical compartmentalization to making it culturally-appropriate to Asian pedestrians. In Edo and to a lesser extent in Manila, the



concept of space is time-dependent taking on a vertical dimension and temporal-based activity segregation. Psychological ordering of street elements is desirable in both Edo and Manila spaces. Segregation is achieved through time-separation. It also becomes unnecessary to provide curbside segregation is not necessary to physically separate elements as well as street users.

#### **4.8 Treatment of Intersections**

The role of intersections in both Edo and to a limited extent in Manila cannot be discounted given their spatio-historical role of being centers of development. Physiological attribute such as walking speeds is higher in Tokyo as compared with other parts of Japan as well as other parts of Asia reflecting the more restless nature of Japanese. To minimize anxiousness, the appropriate combination of activities specifically at intersections should be considered so as to allow a pertinent mix, maximize interest. Also, intersection management should focus on defining and regulating the activities it should carry while analyzing the appropriateness of its external physical area to accommodate various activities, both movement and non-movement.

#### **5.0 Conclusion and Generalization**

The three-pronged points of ecology, culture and users served as a viable model towards the management of pedestrian spaces as it departs from previous emphasis on single issue studies and places emphasis on the environment, spatio-historical context and the user. The paper also provided viable solutions and recommendations towards the improvement of the Asian street environment. Edo and Manila ecologically came from a forest ecosystem, thus justifying the existence of a deep parallelism on how people utilize space giving rise to a distinctly Asian culture of space which may serve as an appropriate jump off point to discuss and initiate street space renaissance. The paper further established that street space is both a space for movement and non-movement, the latter being translated into emergent non-movement spaces. Thus, provision of pedestrian spaces such as sidewalks should take into consideration the following attributes: compact and intimate, dense and diverse as well as sociable and equitable, as well as field-dependent.

#### **REFERENCES**

- Fruin, J.J. (1971). *Pedestrian Planning and Design*. Metropolitan Associations of Urban Designers and Environmental Planners, Inc. New York.
- Funahashi, K. (1979) *An Environment Behavior Studies Perspective on the City. The Wheel Extended*, A Toyota Quarterly Review. Dai Nippon Printing Co., Ltd. Vol.19. No.3.
- Gerilla, G.P. (1995) *Proposed Level of Service Standards for Walkways in Metro Manila*. Journal of the Eastern Asia Society for Transportation Studies, Vol.1, No.3, Autumn 1995
- Jocano, F.L. (2001) *Filipino Prehistory: Rediscovering Precolonial Heritage*. Punlad Research House, Quezon City.
- Kamino, K. (1971) *Human Behavior and Spatial Design. The Wheel Extended*, A Toyota Quarterly Review. Dai Nippon Printing Co., Ltd. Vol.19. No.3.
- Selmer J, de Leon C. 2004. *Management and Culture in the Philippines*. BRC Papers on Cross-Cultural Management. School of Business Business Research Center. Hong Kong Baptist University. View website at <http://net2.hkbu.edu.hk/~brc/CCMP2002.pdf>