

## REDEFINING THE ASIAN SPACE: A COMPARATIVE VIEW OF EVOLVING STREET CULTURE AND PEDESTRIAN SPACE DEVELOPMENT IN BANDUNG, BANGKOK AND MANILA

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### Introduction

Asian streets convey a sensorial experience distinct from the Western model. Traditional knowledge resulting from the environment and sociocultural histories is imprinted on how people use the streets and how these streets are formed. The veneration of nature spirits, as seen by the presence of street shrines along the sidewalks, is an Asian phenomenon reflective of animistic roots. Diverse activities such as street vending and hawking add to the thriving character of the sidewalk, imitating the diversity of the Asian forest and further enhancing the pedestrian experience. However, from a transport viewpoint, the presence of these activities serves as a barrier to smooth pedestrian flow and contributes to the deterioration of the street environment. Moreover, street use has also become a political issue wherein vendor presence has become a symbol of a city's poor economy and, because of its unregulated characteristic, encourages irregular migrants. Streets are also being blamed for hosting other negative activities such as being a haven for drugs and becoming a living space for the homeless.

This study works within the premise that the traditional knowledge systems that evolved throughout a city's history, starting from its forest beginnings to the strong influence of acculturation, may provide a better understanding of pedestrian street culture, and in particular, how the amalgamation of cultures tangibly shaped street configuration and contemporary street use, especially in Asian colonial cities. This may provide inputs to address pedestrian issues and the improvement of contemporary streets.

### Objectives

The objectives of the study are: (1) to examine the spatio-historical development of urban street space and pedestrian culture within three case cities: Bandung (Indonesia), Bangkok (Thailand) and Manila (Philippines); (2) to compare the influence of historical trends, with Bangkok having limited external influence and Bandung and Manila representing colonial cities, and examine how these historical trends affected space morphology, street sociology and pedestrian psychology;

and (3) to identify factors that influence local street culture to further understand street morphogenesis, the interplay of movement and non-movement behavior and street space utilization.

### Methodology

The study analyzed three case cities: Bandung, Bangkok and Manila. Bandung is a colonial city in a mountainous, temperate zone; Manila is also a colonial city but on a plain with a tropical, humid climate. Like Manila, Bangkok also developed on a plain with a tropical, humid climate but, unlike Bandung and Manila, experienced only limited colonial influence.

The study starts with the sociocultural perspective of spatial use as a way of understanding Asian pedestrians and street use. It is descriptive, interpretative and empirical, utilizing culture to define the parameters that sustain people's use of the street environment. Data gathering was conducted through a review of historical precedents on street space use, an intensive review of primary and secondary resources, direct observation and street user questionnaire surveys. The aim was to prove that present space utilization is still a consequence of and reflects the underlying pedestrian culture of the past. An extensive examination of streets focusing mainly on emergent pedestrian spaces, referring to both movement and non-movement, was conducted.

Initially, three types of data collection activities were implemented in Bandung to examine street user behavior: a pedestrian diary, an ocular inspection survey and interviews. However, the low response rate of 15 percent led to a major change in the research process. Instead, a street user need survey was developed utilizing the analytic hierarchy process (AHP), which was introduced by Saaty (1980). AHP is a decision-making tool and evaluation procedure that incorporates both qualitative and quantitative factors. It has the advantage of reflecting the way people think and make decisions by simplifying complex decision to a series of one-to-one comparisons. The survey's goal was to elicit user response on what a positive pedestrian environment is.

English and Thai versions of the survey instrument were

developed, which underwent pilot testing. Aware that this type of study poses the danger of oversimplification and unwarranted generalizations, the author reiterates here that these are inferential concepts and need to undergo more extensive empirical study.

## Findings

The findings illustrate the results of the comparative analysis of Asian city streets to validate the influence of the forest environment within their street spaces. Even with diverse historical trends and the influence of acculturation, a deep and underlying parallelism on how people utilize space gives rise to a distinctly Asian culture of space. The forest-based concept clarifies sociological similarities arising from the similarity in ecological context that produced related sociocultural adaptations.

### ***Factors influencing Bandung, Bangkok and Manila***

Geography and climate have a deep impact on people's way-of-life and behavior. This section discusses various environmental as well as sociocultural factors that influenced the development of the three cities. The Asian region's tropical forest environment serves as an appropriate starting point in discussing the various influences ranging from the physical and social context to socio-cultural adaptations and settlement formation.

#### *Environmental factors: Climate, geography and ecosystem*

In general, Southeast Asia is described as having diverse climatic influences with a naturally dense forest cover, high biodiversity and riverine coastal movements. Bandung is the fourth largest city of Indonesia and the capital of West Java. The southern portion is relatively flat compared to its hilly northern counterpart (Siregar 1990). Thus, typical developments are located in the lower valley. Bangkok lies adjacent to the Chao Phraya River, which is considered the central artery of the whole territory. The average altitude of Bangkok is significantly low, and thus prone to flooding. Similarly, Manila lies on the flat plains of Luzon and developed on the shores of the Pasig River. In the three cities, the river is considered a critical component in settlement development because it facilitates transportation, communication and trade with other areas (Blakemore 1996). Moreover, socioeconomic and cultural development are linked with rivers and streams. The Cikapundung River runs north to south through Bandung, dividing the area into two geographic features with only a single bridge to connect both sides. The Chao Phraya River is known for its role as

an initial point of development. In pre-colonial Manila, the Pasig River and the Canal de la Reina served as a communication route and a distribution network for the produce brought to the city from the provinces (De Viana 2001).

#### *Sociocultural adaptations: Thought development and acculturation*

In the three case cities, the development of polytheistic religious thought was highly influenced by the forest environment and indicates the closeness of religion to the way of life of its inhabitants. Pre-colonial Indonesia and the Philippines practiced animism with a strong emphasis on ancestor worship, while for the Thais, homage and respect was the key feature of their social relations as it is customary to pay their respects towards the land spirit (*chao thi*) of their homes (Askew n.d.). Polytheistic belief was present wherein an ordinary person perceived the natural world to be animated by a vast array of deities who inhabited the trees, rivers and caves (Andaya and Ishii 2000). However, acculturation in the region led to the introduction of Islam by Arabic traders in the 13th century. In the Philippines, aside from Islam, Catholicism was also introduced through Spanish colonization. Ongoing trade with India and China further shaped Southeast Asia's sociocultural lifestyle. The amalgamation of cultures contributes to the evolution of distinct ways in which people utilized their streets. This is further reflected in the contemporary period in the ubiquitous presence of Chinese enclaves: Chinese Camp in Indonesia, Chinatown in Bangkok and Chinese *Sangleys* in Binondo, Manila.

### ***Morphological development in the case cities***

The section discusses the morphological development of the three case cities as a function of their forest-based roots as well as the acculturation process that followed.

#### *Settlement formation*

The oldest reference to Bandung was in 1488 when it was the capital of the Kingdom of Pajajaran. The majority of Bandung's population has Sundanese roots, and the polytheistic beliefs of animism still dominate their present life cycle in congruence with their strong Islamic beliefs. Elements present in the Sundanese urban residential quarter (*kampung*) include a water source, open space (*lapangan*) serving as social venue for its inhabitants, and a rectangular house plan reflecting the democratic characteristic of the village inhabitants (Salura 2006). The pre-Dutch *sunda* village consisted of about 40 families, usually related to each other. When

the maximum number was achieved, another settlement was developed in another area. This practice created sporadic clusters distributed all over the Priangan region. There was a distinguishable absence of material culture while a very high oral culture was distinctly present (Affandy 2006). The *lapangan* served as the inhabitants' venue for socialization while the open square or *alun-alun* became the starting point for major roads and helped establish the town's grid dimension. *Kampungs* have existed since the pre-colonial period. Thus, the contemporary urban *kampungs* are reinterpretations of the traditional village pattern (Geertz 1965) of pre-Dutch Indonesians. Similarly, the Philippine *barangay* reflects the traditional village morphology of pre-colonial Philippine settlements.

Bangkok was originally built in 1782 to succeed Ayuthaya as the national capital. Most commoners lived on floating houses (*phae*) or houses on stilts in rivers or its tributary canals (Askew 1996) to adapt to the physical environment. Typical districts or neighborhoods (*yarn*) were often designated with a specific function or community. However, Thailand lacks the colonial legacy common to its Southeast Asian neighbors, making it stand out from the rest.

Bangkok and Manila are port towns. Both developed adjacent to bodies of water. Prehistoric Manila was a thriving river settlement which took on a *strassendorf* (linear) form (Reed 1978), with the chieftain's house at the center serving as residential palace and venue for other religio-socio-political activities of the village. Rivers, canals and other waterways served as distribution network, public space, market and social space (Iwake n.d.).

Historic districts in Asian cities may be described as conducive to walking as well as other non-motorized transport modes because of their intensive land use mix and compact quality. The typical density is pegged at 100 to 250 people per hectare (Barter and Raad 2000) but could go as high as 600 persons per hectare in the case of Indonesia (Diwiusanto 2006). Low to medium-rise structures dictate the typical urban form, wherein within these enclaves it would be possible to experience the inhabitants' local culture. An examination of a Sundanese *kampung* in Bandung would show the lack of a restrictive social hierarchy among the inhabitants. Community members are considered part of one family. People flexibly adapt to the various changes happening around them.

### *Colonial Bandung and Manila*

In 1919, the North Development Plan was developed and implemented in Bandung with the aim of creating a wholly European district in a tropical country. It was even called the prototype of an *Indische* colonial city. Greenery was an important characteristic in the new development (Soewarno n.d.). In Manila, segregation was enforced during the colonial period with Spanish inhabitants living inside the walls (*Intramuros*) while the natives lived in the surrounding suburbs. This was also true in other colonial cities such as Bandung. Two concepts that physically influenced town building in the Philippines were *bajo de las campana* wherein the *indios* (natives) were allowed to settle within hearing distance of the church bells, thus defining settlement size, while the *cuadricula*, which was lifted from the Laws of the Indies, defined the urban form of the community core as consisting of an open plaza with the principal streets laid out on a grid pattern based from the four sides and corners of the plaza.

### *Development of access ways*

In historic districts, access ways are narrow pathways where only foot traffic can be accommodated. Among the three cities, Manila's street network is the most formal, with an original rectilinear plan reflecting a strong Castilian influence. In contrast, Bandung's road layout, while originally formal, had to be adjusted to conform to the site's mountainous topography while Bangkok's first major road, the New Road, extended south parallel to the river and was built on an old elephant track.

Bandung's pre-colonial roads were not defined clearly and almost all access paths were referred to as *jalan*. This term is still being used at present and may refer to pathways, roads or streets (Siregar 1990). Access ways into *kampungs* were referred to as *gang* and differ from the *jalan* because of their width and the type of transport mode that can be accommodated. *Gangs* can only accommodate pedestrians and motorcycles. Within the *kampung*, alleys fronting the houses are not only considered as access paths but also act as integrators that bring together the inhabitants within the surrounding area. The *kampung* became an extension of living space, a children's play area, a meeting place and a utility space. Bangkok had virtually no roads during its first one hundred years of existence and depended on the network of waterways, creeks and *klongs* (canals), which served as both a distribution and communication network (Fisher 1971). The motive behind road building was to accommodate the building of shophouses, which

proved advantageous in increasing trading activities. At present, Bangkok's *sois* are defined as areas where people live. They recreate a village (Pichard-Bertaux 1999) and still serve as a communication venue wherein a very rich street life culture can be observed. Within Manila's *barangays*, alleys serve as living spaces, common spaces for socialization and spillover spaces where they serve various functions such a place to relax and sit and enjoy recreational activities.



Figure 1: The above photos show pathways along the different enclaves: in Kampung Ciumbuleuit, Bandung where only pedestrians are allowed access (left), in Manila which features elevated wooden planks along esteros (right) and in Bangkok's *soi* where pedestrians are usually greeted with food stalls (center).

The typical inner city dwellings are still present in the three cities. Figure 1 shows three typical access paths within these settlements.

### **Street culture in Bandung, Bangkok and Manila**

The historic parts of the cities of Bandung, Bangkok and Manila reflect strong traditional knowledge systems, especially in the morphological development of their street space. These systems may provide alternative insights that would reconnect urban design proposals with the cultural context so as to be able to spatially express localism. The section reiterates that understanding the socio-cultural history and indigenous knowledge of a group is a prerequisite to improving pedestrian transport policy and provision given that a different culture requires a different treatment of space to be able to match it with users' needs and desires.

### **History of walking**

The walking culture in Asia has a long history and an overview of transport development will prove its presence. The walking period in Asian cities may be defined as the period prior to motorization. The pre-colonial era and the early colonial period in both Indonesia and the Philippines were characterized by a predominantly walking society while the pre-

modernization period of Bangkok was a combination of water-based transport and walking, which influenced the urban pattern of the area. There was a limited number of roads, which were usually narrow and unpaved. Town centers had compact urban structures with very dense, intensively mixed land use. The structures were low-rise (two to three levels), dictating a pedestrian scale urban form. Building materials were made up of impermanent products such as wood, bamboo and palm leaves, illustrating the impermanence of Asian traditional structures. Residences in special quarters were close to each other, located either along the town center or waterways. Travel distances were short. In the 1970s, walking was still a major mode of transport for most of Asia (Barter and Raad 2000). The percent of non-motorized trips in select cities during the last two decades of the 20th century shows that walking still constituted a large percentage of the overall trips in Asia (e.g., 40 percent in Jakarta, 20 percent in Manila) (Barter 2000). However, this percentage is slowly decreasing because of efforts to increase motor vehicle traffic, a lack of pedestrian facilities and a worsening environment.

### **Purpose of walking**

Walking is considered the most basic mode of transportation given that all travels usually start and end with a walking segment. However, similar to other modes, walking is a derived demand given that the decision to walk is highly motivated by achieving a purpose such as to get to a destination or to realize a goal.

Walking may also be considered as a spiritual exercise. In some countries, such as Edo-period Japan, traveling was only allowed if it was for the purpose of spiritual exercise, such as going on a pilgrimage to visit holy places, shrines and temples, oftentimes located in outlying areas. In contemporary Manila, a tradition that has been passed on is the religious procession, which is conducted through walking. The slow pace of walking relative to other modes (i.e., inside a vehicle) provides time to meditate, absorb and commune with one's surrounding environment. This increases the intimacy and involvement of the individual in relation to his/her environs and allows a person to become attuned to his/her humanity.

### **Street space consumption**

Street users may be considered consumers of space as they undergo certain activities. Some of the main motivations to use streets include: (1) utilitarian—to

work, to study; (2) economic—the need to pursue economic activities such as selling, buying, bartering and trading; (3) leisure—activities that contribute to ease and relaxation; (4) socio-cultural—enjoying the cultural assets along streets, whether intangible or tangible, such as street performances; (5) social—the need to be with others such as meeting in a restaurant and chatting with a friend; and (6) personal needs—for example, to provide an outlet for one's personal expression.

Street user behavior is complex and composed of two aspects, namely: movement and non-movement. Walking is considered movement behavior; some examples of non-movement are waiting and resting. The concept of non-movement within Asian streets grew out of the realization that in order to provide sustainable spaces, it is necessary to consider the multitude of behaviors exhibited by pedestrians as well as other street users.

The presence of a diverse group of street users contributes to street liveliness. Asian pedestrians do not differentiate between public and private space, using the communal space as an extension of their living area, a venue for commerce and exchange and a place to socialize. Also, there is a direct correlation between walking and non-movement spaces. An area that attracts high pedestrian volume usually has a greater tendency for non-movement activities. As such, the opportunity to increase sidewalk sustainability requires the reconsideration of non-movement activities in the design of such space.

#### *Non-movement concept*

The concept of non-movement, forwarded by Mateo-Babiano and Ieda (2005), has emerged theoretically based on the premise that streets serve not only as distribution but also as communication networks. The latter refers to streets serving as a venue for the socialization and interaction of inhabitants. It is further argued that non-movement space played a significant role in the evolution of Asian space. Thus, it is within this premise that the perceived non-movement behavior of Asian pedestrians is examined.

To further examine this concept, the study collected pedestrian diaries on September 2006 in Bandung; out of the 200 forms given out only 33 respondents or 16.5 percent of the sample returned the forms. Thus, preliminary results do not allow generalizations. The respondents were requested to record their daily walking activities starting from the time they left their residence.

The average number of daily walk trips an individual underwent in a day was six. Also, the results showed that those taking more than six trips in a day spent a longer time outside per walking trip. Since the study was taken during the Ramadhan period, the distribution of daily walking activity patterns of pedestrians, both movement and non-movement activities, did not reflect the regular pattern of pedestrian behavior. It is common during this period to start the day as early as three o'clock in the morning.

The study of non-movement behavior provides us with the knowledge that Asian space is temporally-dictated. As such, it requires flexibility so as to accommodate various activities that are conducted at different times of the day. For example, a tofu (*tahu*) vendor who sells his product in the mornings and stations himself in front of the community commercial center may occupy the same space which in the late afternoon serves as neighborhood playground for the children and could be the venue for musical performances in the evenings. The temporal segregation of activities and the vertical quality of Asian space should be one of the main considerations in sidewalk design. As an example, pocket-sized activity spaces should be placed strategically along the sidewalk path. The space should be versatile enough to accommodate a multitude of activities. The seemingly disorganized spatial quality of Asian space is one of its unique characteristics that is not encountered in most parts of Europe or the United States. Based on previous studies, the apparent disarray actually contains a measurable hidden order (Rodin and Rodina 2000). Diversity comes from the influence of the forest environment wherein the cacophony of sounds, sights, smells, tastes and touches can be experienced simultaneously within the Asian street space. The perception is further demonstrated by the presence of food vendors. The variety of food sold in Indonesian street shops (*warungs*) and the Philippine traditional restaurant (*turo-turo*) brings forth a combination of visual, olfactory and gustatory sensations which compel passersby to taste their flavors. In most Southeast Asian cities, vending has become an institution in itself, albeit informally. The present approach calling for their total removal from the streets has never been effective and, therefore, can never be a favorable end solution. Furthermore, the pedestrian survey shows the important role street vendors play not only in economic terms but also at the cultural level. A compromise between vending and regulating should be arrived at so as to define the locations most appropriate for such activities as well as improving the aesthetic quality of their presence. Regulation may take the form of permit issuance to allow certain complementary

activities to be conducted within a given radius of an activity generator.

Worth mentioning are the various street elements that have sociocultural roots. As an example, outdoor benches (*golodog*) can only be found within Sundanese settlements. This refers to a 50-cm bench connected to the dwelling unit facing the alleyways where people can sit and talk to each other. This defines the main alleyway as opposed to the back alley. However, in urban *kampungs* where the majority of inhabitants are Sundanese, the *golodog* is still present but has been transformed into a terrace which uses a different material from the original wooden bench (i.e., ceramics) (Rahaju 2006). Although this type of element is not present within Javanese *kampungs*, there is, however, always a specific place provided for the social venue of its inhabitants such as the *alun-alun*, which serves as the local landmark and centralizing element for the Javanese *kampung* (Siregar 1990).

#### *Animistic reflections on the streets*

There are also various street practices that have animistic roots. Animism is the pre-colonial belief of most of the colonial cities in Southeast Asia. Animism was borne out of the forest (Suzuki 1978). In Bangkok, it is often common to see street trees that have colored rope-like fabric going around the trunks. The older the tree, the more of these fabrics going around it. Also, the presence of street shrines and spirit houses on or near the sidewalk is said to reflect the reverence of the present owners towards the spirits who lived on the land. Some commercial establishments bring out food in the morning to offer to the gods so that they will have higher profits for the day. Also, some pedestrians bring out food and offer it to the increasing dog population within metropolitan Bangkok. Thus, indigenous knowledge, both positive and negative, should be

determined, considered and evaluated if the aim is to create a sustainable street space for its users. Figure 2 shows images of spirit houses.

#### *The street market and the informal street culture*

Given that the typical Asian is a social individual who does not go out alone and prefers to do activities together with other people, the Asian street space is transformed into a destination itself, replete with eating places, shopping venues and meeting areas. Within the case cities, the presence of market places reflects the strong Indic-Chinese influence that has evolved into a distinctive *pasar* (bazaar) culture. In Bandung, flea markets and bazaars draw a large crowd, such as the regular Friday bazaar along Ganesha Street in Bandung that has the mosque worshippers as its captive market. McGee (1967) writes that the highly compact and densely populated commercial-residential precinct of Sampeng, which hosted the largest concentration of Chinese-born people in Bangkok, reflected the indigenous Thai city and at the same time served as the great bazaar and provided a hierarchy of commodity and food markets.

However, a major component in street space sustainability is social equity. This refers to the accessibility of the streets to all users such as pedestrians, the informal street economy and other street users. Often, and in various transport studies, informal street users are considered obstructions to pedestrian flow. However, their rampant presence in almost all streets surveyed in Southeast Asia and how the corresponding government deals with them deserves mentioning. As a matter of policy, and in the name of cleanliness and beauty, street vendors are being cleared off of the sidewalks. However, this is often met with low compliance. Again, the concept of street takes on the Western view that it is solely for movement. However, Asian streets do not only distribute people but serve as a market place and trading venue as well. This also has sociohistorical roots.

The informal sector is comprised of those who undertake activities that do not pay taxes, do not submit regular government reports, and at times, routinely violate certain rules or law (Habito 2005). They are a significant presence in most commercial areas. In more traditional districts in the Philippines, they occupy the "five-foot-way" contributing to a unique sidewalk culture. The streets become makeshift marketplaces where the informal economy thrives. Vendors and hawkers display their wares wherein buyers may use the art of bartering to purchase goods and services. Informal activities



Figure 2: Spirit houses in Bangkok complete with flowers, incense, leis and food in the foreground.

continue to proliferate because of the ease of entry and reliance on indigenous resources, family ownership, small scale of operation, lack of regulation and location within a competitive market (Bangasser 2000).

Informal economy agglomerations are generally found near activity generators such as school entrances, in front of shops and stores, churches, shopping malls, access towards train stations and at intersections. This provides them the assurance of a steady flow of customers. The type of economic activity is dependent on the activity generator, usually complementing that enterprise. Snack food vendors are found outside universities and schools, fruit stand vendors are found outside malls, and flower vendors are found outside churches and other places of worship. Most common goods sold by these sidewalk peddlers and hawkers are consumables such as food products. Within the central business districts, the most common stalls are shops providing lunch, snacks and drinks. Sometimes, tables and chairs complete the ensemble creating a distinct street architecture, however inferior the materials used or shabby they may seem to onlookers. The inventive minds of these storeowners allow them to set up and take down these stalls within a few minutes. In the Philippines, the original vendor cart has evolved from the common wheeled wooden pushcart (*kariton*) to the converted bicycle. This shift occurred because of the mobility and flexibility of using bicycles. In Bandung, one may be presented with a multitude of stalls from the fixed *warungs* along the sidewalks to the semi-ambulant and ambulant *kakilima*. Dago Street in Bandung has already banned sidewalk vending. However, daily observations conducted by the researcher show a different reality. The vendors are still present at a lower density; however, they do not vend on the sidewalks but are conveniently accommodated at the front corner of the adjacent commercial shops, sometimes with their wares abutting the sidewalks. This is also true in Bangkok, where Monday is a 'No Vending Day' along Silom Road. Vendor resourcefulness only transfers the stalls from the main Silom Road to the intersecting *soi* where vending is not banned. These are socioeconomic and cultural realities that transport professionals have failed to consider but must be taken into consideration, especially in the design of sidewalk space within Asia.

#### *The need to satisfy pedestrians*

The consideration of pedestrian needs is a significant prerequisite in the design of sustainable street spaces. The basic premise of the need-concept adopted from the area of consumer behavior is that pedestrians behave in a similar fashion to consumers as they utilize space

in a way comparable to consuming a product. Needs and values are the micro-level driving factors of human behavior (Vallacher *et al.* 1994), which are realized through opportunities. The latter refers to products or services that have the capacity to satisfy one's needs (Jager 2000). In this case, opportunity refers to sidewalk attributes such as the ability to provide seamless travel, comfort and convenience, to name a few. These are parameters or attributes that would encourage user loyalty or sustain people's use of the street environment. However, these factors do not influence choice but support or inhibit pedestrian decisions (Mumford 1937). The pedestrian need-hierarchy resulted from an extensive literature review on effective pedestrian environments and was inspired by the human needs theory postulated by Maslow (1954) and Max-Neef (1992). The concept of pedestrian level of service (PLOS) (Fruin 1971) is defined as the elements that attract potential users to the system (Vuchic 1981). At the base of these needs is the desire for movement (mobility). Aside from this, pedestrians have other physiological or psychological needs such as protection, ease, enjoyment, equity and identity. This illustrates the six criteria and the attributes which would fulfill each criterion. The pedestrian need-hierarchy considers both movement and non-movement as contributory towards increasing pedestrian satisfaction.

To define the six criteria: mobility refers to a walking environment that allows barrier-free movement from the point of origin to the destination at a comfortable walking speed with no or limited impedance and ensures ease in orienting oneself within the street network. Protection refers to the state of being free from danger or injury while walking by limiting pedestrian-vehicle conflicts, providing provisions to ensure that accidents will not happen. Ease refers to the quality that makes one feel emotionally and mentally secure, comfortable and stress-free while walking. Enjoyment or leisure refers to the quality of the walking environment which allows access to transport-disadvantaged persons (TDPs), allows equal opportunities for other activities besides walking (e.g., sitting, chatting, eating), and does not limit sidewalk use to pedestrians but allows access to other street users such as vendors and leisure walkers. This environment also creates venues for socialization and interaction. Equity refers to opportunities for self-expression, with the sidewalk serving as a venue for socialization and interaction, providing ways of enjoyment and leisure and adding vibrancy to the place. Identity refers to elements that acknowledge sociocultural needs by creating venues for cultural activities, producing a sense of place and encouraging a feeling of belonging amongst its users.

The author established a preliminary hierarchical order wherein the base need would be movement based on the premise that streets are used as distribution networks. The criteria can be divided into two, personal and social. Personal refers to individual needs while social means population-level needs. Personal needs are near the base while social needs are found on the upper levels. The theoretical basis for this is that in order to increase satisfaction, personal needs should be provided for before population-level satisfaction can be accommodated.

The study then conducted a pedestrian survey in Bangkok, Thailand and Manila, the Philippines to evaluate the order and relevance of the concept of the pedestrian need-hierarchy and the significance of each criterion. A total of 150 and 90 samples were collected in Bangkok and Manila, respectively. A number of alternatives were defined that would potentially fulfill the six criteria. It was assumed that individuals tend to fulfill their personal needs before focusing on their social or group needs, and that pedestrians usually walk to be able to fulfill the need for mobility. Thus, mobility was placed at the bottom of the hierarchy. This reflects that each criterion may be fulfilled by a number of criteria while at the same time each alternative may fulfill a single or more than one criterion.

In general, the results show that the most frequent mode taken by the majority of the respondents was walking. This may be due to the fact that any kind of trip starts and ends with a walk trip. The respondents were informed they should consider walking as a mode if they covered a significant walking distance. In previous surveys, walking was often undercounted. The most common mode choice was followed by tricycle, public bus and private vehicle (e.g., car). Also, respondents were asked about their walk trip attributes referring to the number of times they go out of their building to take a walk. The majority of respondents went outside the building one to three times a day. The purpose most often cited was 'to eat lunch,' followed by 'doing some errands.' Furthermore, those who went out were asked if they stopped temporarily along the way before arriving at their destination. Almost half of the sample answered that they stopped while the other half did not. The reason most cited for stopping was 'to buy from a sidewalk vendor.' This reflects the high demand for the informal sector. With respect to the perception of pedestrians on the hierarchical structure of the need-hierarchy, the survey illustrated that mobility is not the most influential element in the decision to utilize streets. Instead, protection came out to be the main consideration reiterating the importance given towards physical safety.

The criterion 'equity' 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.

### Conclusions and implications

Sustainable street space should address the mobility, protection, equity, ease and identity needs of pedestrians and other street users. In Bangkok and Manila, the most important considerations are protection, ease and equity. The alternatives that could provide such needs were the following: adequate lighting, the installation of monitoring devices and police stands at intersections were determined to provide the highest satisfaction for the need for protection and ease, while for equity, the provision of street vendor areas and encouraging street performances and street art displays came out as the most effective alternatives. However, this was based on people's perceptions and preferences. Such preferences are not absolute and may be substituted for more effective ways of providing a specific pedestrian need. The concept of mobility management was then introduced as a strategy for attaining sustainability in transport. In the sub-field of pedestrian transport, one strategy is to encourage a user-centered approach to space design and management so as to improve mobility. A user-centered approach refers to basing management strategies on the needs and desires of users and how these may be physically manifested. Thus, this paper focused on pedestrians by considering their needs, discussing the spatial environment as dictated by the relationship of movement and non-movement within the pedestrian space and the street culture created by the social interaction of the street users. This shared knowledge and meaning is produced when individuals interact in a common space (i.e., pedestrians, vendors in an urban space). At a higher level, this interaction produces a common culture that is transmitted, learned and shared, thus evolving into a distinct heritage and social tradition. The sociocultural history of the streets provides a potential window to discover the pedestrian street culture of the past wherein the latter may provide us with design recommendations on contemporary street improvement so as to encourage more users to utilize a given space. Thus, 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 but is oftentimes ignored. In the Asian space, various policies should focus towards encouraging the revival of street culture as well as the humanizing of streets within the Asian context. These may be gleaned from the previous sections such as the *golodog* in the Sundanese *kampung*, creating social

spaces, and recognizing the importance of the *pasar* culture, to name a few.

One of the most important key points in this study is the idea of a forest-based culture as a jump off point in the design of sidewalks. The present morphology of Asian settlements, especially within urban enclaves, allows for pedestrian-oriented developments. To give a few examples, pocket-sized intimate spaces should be strategically provided along the sidewalk. Their presence signifies flexibility, encourages social contacts and maximizes interactions. The strategic placement of benches and the appropriation of vendor space on specific points along the sidewalk encourage social interaction. Segregation is also necessary in order to maximize space utilization. However, the segregation of activities should use psychological rather than physical compartmentalization to make it culturally appropriate for Asian pedestrians. To minimize anxiousness, an appropriate combination of activities, specifically at intersections, should be considered so as to allow a pertinent mix. Natural elements which may serve as points of orientation and as sacred spaces as well as provide cover become necessary given forest-based, animistic roots. Implementing a green sidewalk becomes a viable option. The important role played by vendors along sidewalks has been explicit and is further reinforced in this paper. Proper guidance and regulations should be in place at the national and local levels, allowing and allotting these vendors space whether within the bounds of public or private space.

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