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Walkability Planning in Jakarta

by

Ria Sulinda Hutabarat Lo

A dissertation submitted in partial satisfaction of the

requirements for the degree of

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University of California, Berkeley

Committee in charge:

Professor Elizabeth Deakin, Chair
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Abstract

Walkability Planning in Jakarta

by

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Doctor of Philosophy in City and Regional Planning

University of California, Berkeley

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Walking is the main mode of transportation for many of the world's people, particularly those in cities of the majority world. In the metropolitan region of Jakarta, walking in the public realm constitutes the main transportation mode for almost 40 percent of trips—a massive contribution to urban mobility. On the other hand, there is no comprehensive planning for pedestrians in an analogous manner to other modes of transportation. Pedestrian facilities are often dilapidated, damaged, dangerous, or missing completely. Additionally, there is no process for assessing the inventory of pedestrian facilities, planning pedestrian facilities at a region-wide level, or even identifying the location of vernacular pedestrian routes in low-income and informal areas. Provincial pedestrian planning focuses on piecemeal, symbolic spaces such as monumental plazas that serve the nation-building project, but overlooks the functional network of routes that address the daily needs of the city's residents.

This dissertation examines the issue of walkability planning in Jakarta by investigating what matters to pedestrians and how pedestrian space is produced. The research employs mixed methods, including pedestrian network groundtruthing, structured streetscape observations, multimodal traffic counts, pedestrian activity mapping, pedestrian surveys and interviews with policy-makers. Data is analyzed through a combination of in-depth qualitative analysis as well as quantitative and statistical analysis.

Based on this research, six key elements of walkability planning are proposed for Jakarta: multidisciplinarity, ethnography, accessibility, legibility, integrated activity, and shared streets.

A literature review of walkability metrics reveals that walking is a highly multidisciplinary activity, with very different metrics emerging from different fields. In order to effectively encourage pedestrian activity, new *multidisciplinary* metrics should integrate the perspectives of all of these related disciplines and pedestrian planning should occur through inter-agency coordination. In Jakarta, interviews with policy-makers suggested that pedestrian planning is hindered by the fact that there is no lead agency for pedestrian planning, and there is a lack of cooperation between the different agencies that plan and produce urban public space. Pedestrian planning is also hindered by a discursive framework that is both modally and geographically

biased—favoring motorized, long-distance modes of transportation and employing method derived from a Western research and planning norms.

In order to overcome this discursive bias, *ethnography* should become a standard part of urban research, planning and design. The need for ethnography and qualitative analysis was made visible by the mismatch between standard transportation terminology, and prevailing practices observed in pedestrian mapping exercises and raised by pedestrians in on-the-street interviews. For example, standard survey categories do not account for informal or integrated activity patterns like mobile street vending. From surveys conducted with mobile street vendors, it was difficult to separate their pedestrian activities into categories of travel from home to work, business-related travel, and visiting friends and relatives. In fact, it was difficult to even separate their travel from their activities since many vendors carried out business as they made their way through the neighborhood. With a large portion of the population engaged in the informal sector, the discrepancy between assumed and actual behavior severely compromises the quality of transportation-related research that is conducted in Jakarta and many other majority world cities. Ethnographic and qualitative research methods may therefore assist in producing more context-sensitive planning data and outcomes. These context-sensitive methods could include new analytical methods that focus on *integrated activity*, rather than trip-based or activity-based analysis.

In relation to pedestrian activity, context-sensitive planning encompasses new approaches to accessibility that combine the notion of transportation accessibility with disabled access and universal access standards. The need for such an approach was revealed during interviews with policy-makers, who described accessibility in terms of market goods rather than human rights. Within the market for urban public space, ordinary pedestrians were unable to compete with other modes of transportation; within the market for urban impressions, ordinary pedestrian spaces were outcompeted by prominent, symbolic spaces; and within the market for cultural capital, ordinary pedestrians were excluded from planning processes because even the discourse of pedestrian planning was inaccessible to regular residents. In response to this problem of exclusion, *integrated accessibility* may facilitate inclusion in both planning processes and urban spaces within the city. In particular, integrated accessibility would aim to provide comprehensive routes of travel for all pedestrians, rather than isolated pockets of so-called accessible (yet unreachable) facilities.

More context sensitive planning would also be facilitated through greater *legibility* of fine-grained and vernacular pedestrian networks that were missing from standard planning maps. These fine-grained networks represent highly connected facilities that serve much of Jakarta's pedestrian transportation task. While the current synoptic illegibility of these areas may conveniently allow some communities to avoid state intrusion, it also means that low-income populations are chronically underserved with respect to basic urban planning and services. Increased legibility therefore allows for improvement and maintenance of urban systems like safe, functional pedestrian networks, and it may also play a role in increasing tenure security for Jakarta's significant floating population.

In many of these vernacular spaces, new street design approaches would also benefit pedestrians, who tend to use the streets as shared spaces, rather than spaces that are rigidly segregated by

mode. Pedestrian activity mapping revealed that only an overwhelming majority of pedestrians used streets as hybrid spaces, with activity types falling into the categories of surface-sensitive, risk-averse, distance-minimizing and stationary pedestrians. More realistic *shared street* designs would therefore accommodate—rather than ignore—the types of activities that occur along Jakartan streets. Design standards for "great streets" in Jakarta would also emphasize the safe sharing of streets through self-enforcing approaches to speed limits, and the integration of various urban elements like drainage, mobility and public-private interaction.

While walkability planning in Jakarta displays many "wicked problem" features, there is much that can be done to improve, if not resolve, conditions for pedestrians within the region. Recommended strategies for walkability planning in Jakarta include a regional walkability plan and environmental policy developed using participatory planning, reformed governance and institutional arrangements, and a constituency building approach. The strategies also include expansion of road designations and an integrated accessibility strategy that draws upon new data sources from a WikiPlaces network map, an integrated activity study and pedestrian network cost-benefit analysis. In addition to Jakarta-specific proposals, a number of proposals are made to advance discourse on walkability more generally. These approaches include decentered analysis of integrated activity, informal economic activity analysis, vernacular placemaking and Asian shared street design.

Pedestrians and pedestrian plans traverse diverse physical, administrative and disciplinary spaces in cities of the world. Integrated and multidisciplinary approaches are therefore required to understand and accommodate these key users of public space. In Jakarta, walkability planning has potential to improve urban transportation efficiency while contributing to traffic safety, economic vitality, environmental quality and democratic governance. Successful walkability planning in Jakarta may also provide a model for planning in other cities where Western models of planning are unrealistic, inequitable and inappropriate. Jakartan lessons on walkability planning are particularly relevant, and improvements in walkability are particularly powerful, for cities characterized by relatively low median incomes, high land use densities, a substantial informal sector, rapid urbanization and rapid motorization. By improving walkability planning in Jakarta and other cities of the majority world, policy-makers and planners can move toward more sustainable, socially equitable and efficient cities.

Dedication

To Narnia Zi-Nei Lo

盧梓妮

You accompanied me *in utero* in my final field research trip and
together we survived dehydrating walks around the streets of Jakarta,
long bus trips when no one gave us a seat, a polluted journey on a low-emissions bajaj,
pressurized aeroplane travel, a tropical bacterial infection and a swine flu scare.

I thank God for your good health and humor.

Thank you
for your love of life, your insistent playfulness,
your patient friendship and your willingness to focus.
You helped me to simultaneously complete this dissertation and
maintain perspective about what is most important in life
and in the street life of cities.

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Glossary of Terms

angkot	paratransit minibus service (used ambiguously to refer to larger forms of transit also)
angkutan	paratransit; public transit; transportation conveyance
bahasa	language
bakul	basket; informal traveling vendor carrying goods in a basket with a piece of cloth wrapped around the basket and carrier (often for traditional herbalists)
bajaj	three-wheeled taxi service for up to two passengers in half-covered seating
becak	pedicab; pedal-powered taxi accommodating up to two passengers and their bags (banned in many parts of Jakarta)
bemo	three-wheeled minibus service
Betawi	local ethnic and language group originating in West Java or the Jakarta area
Bundaran	Circle
bengkel	workshop; small industrial land use
Cultuurstelsel	Cultivation System (Dutch colonial system of forced labor)
gang	alleyway; pedestrian street
gelaran	mat; informal vendor with goods laid out on a mat (often on footbridges leading to stations)
gerobak	cart (pushed by a pedestrian or attached to a bicycle)
gerobak sepeda	bicycle cart
induk	mother; master (as in master plan)
Jalan	Street; Road; Way
jalan	go; walk; travel; way
jamu	traditional Javanese herbal medicine (often distributed on foot by a woman, but also factory produced for sale in shops)
joki	informal streetside carpooling entrepreneur (picked up by driver to make the vehicle eligible for travel along a "3 in 1" carpool lane)
kampung	rural village; low-income urban neighborhood
Kijang	brand of sport utility vehicle (SUV)
kopaja	midi-bus (medium-sized) bus service
kos	rental accommodation (often inhabited by young professionals)
metromini	midi-bus (medium-sized) bus service
mikrolet	paratransit minibus service (sometimes larger midi-bus vehicles are used)
MONAS	the National Monument in Central Jakarta
odong-odong	bicycle buggy; pedal-powered bus for small children (generally used to transport up to 6 small children between home and school)
ojek	informal motorbike taxi (passenger sits on a cushion behind the driver)
omprengan	private commuter vanpool service
Patas	large bus service

Patas AC	large, air-conditioned bus service
pedagang	merchant (often female and small-scale)
Pembangunan	Development (national political slogan of both Sukarno and Suharto)
perhubungan	transportation; communications (literally: connections)
pedagang kaki lima (PKL)	street vendor with push cart (literally: merchant with 5 legs, or 5-foot merchant)
pikulan	yoke; informal vendor carrying goods from a yoke across the shoulders
rakyat	populace; proletariate
rencana induk	master plan
ROW	street right-of-way; travel right-of-way
rumah	house; home (implies family and roots)
satpam	neighborhood or household guard
superblock	very large city street block (often associated with industrial areas or gated apartment complexes)
tenda	tent (used as an informal outdoor restaurant)
transportasi	transportation; motorized transportation (modern connotations)
tukang	tradesperson; small-scale informal operator
warnet	small-scale internet and telecommunications café (usually low-end)
warung	informal stall; low-end permanent café or kiosk (sometimes in the front room or sidewalk zone of houses)
wayang	Javanese shadow puppet plays (deeply associated with tradition and culture)

Acknowledgments

Chapter 1: Introduction

> I suggest that the streets of the western world,
> particularly those of California,
> are not models for the future streets of the Third World,
> and yet the possibility that they will be seen as such is very high.
> Our streets from a social viewpoint are dead places,
> killed by the automobile for which they were built.
>
> Donald Appleyard (forthcoming posthumous publication)

The Importance of Walking and Walkability in the Majority World

Across the world, walking is the key mode of transportation—frequently representing the main mode for half of all transportation trips in cities of the developing, or majority, world. In addition to trips where walking is the main mode of transportation, walking comprises at least a small portion of all other trips because people become pedestrians when they get out of vehicles or dismount from other modes of transportation.

Despite its prominent role in providing urban mobility, walking is largely neglected in the process of urban planning practice and research for majority world cities. A recent study for integrated transportation master planning in Jakarta, for example, noted that walking comprised 38 percent of trips, yet the study relegated walking to the last priority out of 21 different modes (Pacific Consultants International and ALMEC Corporation 2004: 7-1).[1] When urban planners neglect pedestrians like this, the resulting transportation systems are suboptimal from the perspective of sustainability, multi-modal transportation efficiency and equity. Transportation systems that are only optimized for motorized traffic also impose dangers on those who walk.

Rapid motorization, inadequate traffic enforcement and unwalkable built environments contribute to majority world road traffic injuries, which are now a leading cause of death and disability at a global scale. According to a study published in the British Medical Journal, urban pedestrians are the primary victims of this growing public health epidemic—representing between 55 and 70 percent of road traffic deaths in the developing world (Nantulya and Reich 2002:1139). Developing world traffic crashes, in turn, represent 90 percent of global road traffic deaths and 85 percent of road traffic disability adjusted life years (Nantulya and Reich 2002:1139). In both the West and the rest of the world, a lack of walkable urban design has therefore been cited as a key contributing factor for major public health epidemics—of obesity-related health concerns on the one hand and road traffic injuries on the other (Frank, Andresen and Schmid 2004; World Health Organisation 2009:1-2).

In Western cities, various analyses have been conducted to better understand local pedestrian transportation needs and built environmental factors that encourage more sustainable travel patterns and higher rates of physical activity and pedestrian movement. In majority world cities where most pedestrian activity occurs, however, analogous studies are few and far between. In Jakarta, for example, pedestrian transportation is completely missing from the transportation element of city plans conducted prior to 1998; and more recent pedestrian-related studies are very limited in scale. The latter studies focus on very small geographic sites, with no consideration of walkability in the wider context of urban spatial practices, network connectivity, or urban form. Transportation and pedestrian-related studies or plans are typically also developed without input from those for whom walking is a key activity or mode of transportation.

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[1] This estimate of mode split is based on a household travel survey commissioned by JICA and BAPPENAS. As discussed in this dissertation, such estimates underestimates walking trips since informal activity and undocumented residents of the city are under-represented. Furthermore, the estimate downplays the total role of walking since it does not include many neighborhood walking trips (*jalan-jalan*) as well as access trips, where the long-haul portion of the trip is made by a different mode of transportation.

The Value of Jakarta as a Case Study

Jakarta was chosen as a case study for this research because it is emblematic of many metropolises in the developing, or majority, world. Jakarta is the capital city of Indonesia, which is the fourth most populous nation in the world. While population projections are always uncertain, some estimates of Jakarta's regional growth suggest that the metropolitan region (also known as Jabotabek or Jabodetabek) may be the largest urban area in the world by 2030 (Cox 2008:2).

Figure 1: Map of Indonesia
(Source: Central Intelligence Agency 2009)

Like many majority world cities, Jakarta has an emerging middle class and a high median income relative to the surrounding hinterland. This domestic dominance has resulted in conditions of urban primacy as well as rapid rates of urbanization. Decades of double-digit economic growth also fueled dramatic increases in motor vehicle ownership and usage, which is encouraged by fuel subsidies and car-oriented infrastructure development. The rate of increase in motorbike ownership is particularly high.

At the same time, Jakarta's low median income relative to the West means that cars are financially inaccessible to most residents and walking is still the dominant mode of transportation. Walking is especially important for the city's low-income population and rural residents who commute to the city. With a nighttime population of more than 10 million and population density frequently greater than 130 people per hectare (50 people per acre)[2], walking is highly compatible with Jakarta's land use profile as well as its limited supply of public space, mixed land use patterns and aspiring transit goals (Cervero and Kockelman 1997).

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[2] This population density is an underestimate since Census statistics are based on documented residents (with identity cards) and not the actual number of people staying in the city.

Table 1: Key statistics, Jakarta, 2011

Parameter	DKI Jakarta	Cities of Jabodetabek	Cities and Regencies of Jabodetabek
Census Population	8.9 million (est. 12 million)	18.9 million (est. 20 million)	24 million
Area	664 km^2 (256 sq mi)	1,280 km^2 (494 sq mi)	7,315 km^2 (2,824 sq mi)
Equivalent Density	134–181 ppl/ha (54–73 ppl/acre)	148–156 ppl/ha (60–63 ppl/acre)	33 ppl/ha (13 ppl/acre)

(Source: Brinkhoff 2011)

On the other hand, local urban design and planning has not encouraged walking. Sidewalks, crossing facilities and other pedestrian facilities are inadequate and poorly maintained in most of the city and conflicts over public rights-of-way are frequently resolved in ways that degrade pedestrian space, eliminate urban landscaping, and ignore the reality of prevalent informal activity.
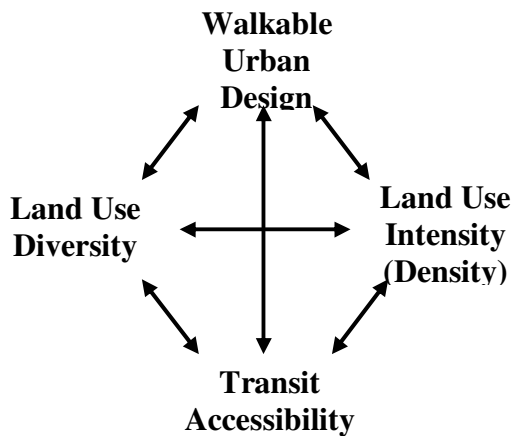
Figure 2: Synergistic relationships between walkable design, land use density, diversity and transit accessibility by Cervero & Kockelman (1997)

Key Research Questions

This study draws upon the perspective of people who actually walk in Jakarta as a basis for understanding pedestrian transportation needs and pedestrian planning methodologies that might be suitable for majority world cities with a prevalence of informality and integrated activity.

In particular, the study seeks to understand how pedestrian public space is produced in Jakarta, and what is important to ordinary pedestrians in this context. Given the problem-solving nature of the city planning discipline, this study also seeks to understand how pedestrian conditions in Jakarta differ from that of the West, and therefore how walkability planning in Jakarta could, and should, differ from Western norms.

Research Methods

This study was undertaken using a number of steps that aimed to elucidate understanding of pedestrian environments, movements and preferences.

Neighborhood scan, site selection and groundtruthing
Past treatises on pedestrian planning have been criticized for ignoring significant regions within the city such as the industrial zones in Western city and informal land development areas in majority world cities. In order to better understand the range of pedestrian transportation needs and planning environments, my field research therefore commenced with a scan of pedestrian facilities in neighborhoods throughout the city of Jakarta. This scan was undertaken on the back of a motorbike over a two week period in 2008. The scan sought to provide a reality-based perspective of the variety of pedestrian environments and facilities that exist across the city of Jakarta.

On the basis of this exercise, pedestrian typologies were developed, and these typologies were used in the process of selecting study sites. Fifteen initial street segments were selected as study sites within four neighborhoods of Central Jakarta: Setia Budi, Karet Karya, Karet Tengsin and Bendungan Hilir. These sites were selected because they represent a range of pedestrian typologies and a diversity of income levels. (Further research might also consider sites featuring a single pedestrian typology and income profile.)

For each neighborhood, groundtruth data was collected regarding the local pedestrian network. This data collection aimed to confirm or correct street-level maps so that they reflected the actual network of pedestrian paths and facilities in the respective neighborhood. Groundtruthing was conducted by systematically walking through each neighborhood and creating hand-drawn maps of all pedestrian facilities that were used in a public manner, regardless of their "official" ownership or access status.

Streetscape observations, traffic counts and activity mapping
Having selected study sites, the next stage of the research provided information on what pedestrians were doing within each street segment and produced high resolution data on urban design features and traffic activity.

For each study site, pedestrian activity mapping was undertaken at 30 minute intervals to represent routes that pedestrians took within the street segment under analysis. This mapping exercise was undertaken by hand, and it differentiated between men and women, boys and girls. It also indicated whether the pedestrians were pushing a cart, where they stopped, and where they sat down along the street segment. The resulting pedestrian activity maps were translated into numeric data on the number of different types of pedestrians moving in various directions (in/out/other), as well as the number standing or sitting pedestrians within the time period. In total, over 9,000 pedestrians were mapped within the study.

Based on the activity maps, calculations were also made regarding the proportion of pedestrians who shared the lanes with traffic for a portion or their entire journey within the particular street segment. A pedestrian activity mapping sample can be seen at Appendix A.

Activity maps were calibrated against count data, which recorded the number of pedestrians crossing a designated cordon in each direction. These pedestrian counts were part of a larger traffic count exercise which recorded all traffic movements across a designated cordon at five (5) minute intervals. Traffic counts were broken down by the following modal categories:

- Pedestrian
- Cart pushing pedestrian [*pedagang kaki lima/gerobak*]
- Pedicab [*becak*], bicycle cart [*gerobak sepeda*] or bicycle buggy [*odong-odong*]
- Motorbike or motorbike taxi [*ojek*]
- Car
- Taxi
- SUV [*jeep/kijang*]
- Mini-bus [*bemo/angkot/mikrolet*]
- Midi-bus [*kopaja/metromini*]
- Small truck
- Bus
- Large truck
- Other including *bajaj*

In addition to activity mapping and traffic counts, detailed streetscape observations were made using walkability measurement instruments that were adapted from the format outlined by Sungjin Park in his doctoral dissertation (Park 2008). As shown in Appendix B, the adapted walkability measurement instruments featured a number of changes to reflect conditions in the Jakarta context. Specific changes to the street segment walkability measurement instrument include the following parameters:

- Type and condition of road edge indicator including white lines, absence of pavement, ditch, raised curb, low curb, or raised sidewalk;
- Length of functional curbing along the street segment;
- Type of stormwater drainage including open ditch, covered culvert sidewalk, or concealed drainage;
- Length of functional sidewalk;
- Sidewalk uses including café seating, street furniture, landscaping, poles, cart pushers, mobile stands and semi-permanent stalls;
- Sidewalk maintenance issues including the presence of weeds, rubble, uneven sidewalk, broken sidewalk, holes by size and depth, and missing segments of sidewalk;
- Environmental conditions including the presence of weeds, rats or stray animals, rubbish, rubbish incineration, black or dirty ditch water, dust or mud, apparent air pollution, noise and heat; and
- Physical obstacles to walking.

Changes to the property frontage walkability measurement instrument include the following parameters:

- Setback uses, which may differ from property uses (e.g. houses with a retail stand in the setback zone);
- Presence of interstitial pathway access between properties; and
- Type of security features.

The above observations of streetscape conditions, traffic conditions and pedestrian movements were made simultaneously on a weekday (Monday through Thursday) between the hours of 7 a.m. and 2 p.m. Results were analyzed visually as well as through multivariate regression.

Pedestrian interviews
Observed conditions and activities were supplemented with stated preference data gleaned from interviews with 120 pedestrians. These interviews were held on different days to site observations in order to minimize surveyor interference, and were conducted with individuals (rather than focus groups) in order to minimize concerns of group dynamics, deference and social difference. The interviews aimed to explore perceptions of walking and parameters that are important to pedestrians. For this reason, the bulk of interview questions were open-ended in nature, in addition to multiple choice questions on variables such as age, income and trip purpose. The pedestrian interview format (for one neighborhood), along with an English translation, can be seen in Appendix C.

Data from the traffic counts, streetscape observations, activity maps and interviews were analyzed through multivariate regression and other basic quantitative techniques. Approximately 20 percent of the interviews were also recorded and, after quantitative analyses, these transcripts were translated and analyzed in depth. The interviews reflect perceptions of low-income pedestrians, because many apparently middle-class people declined to respond and the midpoint household income for respondents in the survey was only 800,000 Rp ($US78) per month, which is less than the city's minimum wage of 819,000 Rp ($US89) per month. This low income level may also suggest that many of the respondents are engaged in informal enterprises or part-time work.

Policy interviews
In addition to interviews with pedestrians, a series of interviews were also held with key government officials with responsibility for pedestrian related matters at the Jakarta Provincial level. These officials represented the Departments of Transportation (*Dinas Perhubungan*), Landscaping (*Dinas Pertamanan*), Public Works (*Dinas Pekerjaan Umum*), Spatial Planning (*Tata Ruang dan Bangunan*) and Development Planning (*Bappeda*). Interviews were also held with the Assistant Governor for Development (*AsBang*), who oversees the above agencies and has specific experience in pedestrian planning, as well as the Vice Governor for Transport, Trade and Industry, who advises the Governor on pedestrian planning matters (among many other things) and has transportation planning experience as a former professor of civil engineering.

These interviews, which were held in the period July–August 2009, were conducted as open-ended and free-flowing conversations based on questions outlined in Appendix D. This list of

questions was used as a guide throughout the interview, and more probing questions were asked as appropriate. After completing each interview, I offered to present my findings from my related research conducted the previous year. Most interviewees accepted this offer—thereby transforming my research from pure policy research to participant observation in which feedback from the research interacted with ongoing policy on pedestrian planning. I am very grateful for the generosity of the many policy-makers and practitioners who made time to talk with me about pedestrian planning in Jakarta.

Prior to this main series of policy interviews, preliminary meetings were also held in June–August 2008 as well as February–March 2006. In these meetings, I met with relevant officials from the above agencies, as well as consulting firms and non-government organizations. I also met with officials from the Department of Cooperatives (*Dinas Koperasi*) and the Department of Culture and Museums (*Dinas Kebudayaan dan Permuseuman*), as well as the Provincial Secretary and Vice Governor in relation to a pedestrianization project in a historic part of Central Jakarta. Material from these earlier preparatory meetings was used to inform later interviews.

Findings on Walkability Planning

A number of findings emerged from this research regarding pedestrian preferences and planning processes in Jakarta. Given the normative nature of planning research, these findings include both the identification of problems, and suggested changes to data collection, urban design, planning and policy approaches. Problems and strategies span six elements of walkability planning for a majority world context. These elements will be discussed in upcoming chapters, and include the following:

- Multidisciplinarity;
- Ethnography;
- Accessibility;
- Spatial legibility;
- Integrated activity; and
- Shared streets.

Multidisciplinarity
In Chapter 2, I discuss the issues and challenges of multidisciplinarity as they relate to majority world planning in general, and walkability planning in particular.

Planning for pedestrians crosses traffic engineering, transportation planning, urban design, landscape architecture, public health and political science. Commentators from each of these fields define walkability differently and hold different goals for walkability planning. In some cases these goals are even contradictory. In the context of a disciplinary framework that is modally biased against non-motorized transportation, disciplinary disunity tends to weaken efforts to plan for walking or walkability. Pedestrian spaces are usually not the primary concern of any single discipline or bureaucratic institution, and are therefore under-provided by all related agencies. In order to address this problem, there is a need for more multidisciplinary planning arrangements and a more consistent definition of walkability between agencies.

In the case of pedestrian planning that is undertaken in the majority world, the challenge of multidisciplinarity is compounded by geographic bias in which planning and design knowledge is developed from a research core in the West and applied asymmetrically to the rest of the world. Scholars from the field of development studies analyze aspects of this asymmetry; however, their work is often unacknowledged in more technical fields such as traffic engineering and urban design. In order to overcome this academic and bureaucratic dilemma, there is therefore a need for research that simultaneously extends development studies to more technical fields, and decenters planning research to encompass a more global range of conditions.

Ethnography
Part of the solution to geographic bias is ethnography, which is discussed in Chapter 3. In relation to walkability planning, ethnography is a tool for increasing the context sensitivity of research, planning processes and design strategies. One aspect of context sensitivity is linguistic consistency. This issue emerges in reference to the diverse meanings of *jalan*, the Indonesian term used to signify streets and walking—which is central to the entire study of walkability. This diversity of meanings became apparent during open-ended pedestrians intercept surveys in Central Jakarta, as well as creolized planning documents on pedestrian planning in Indonesia. In addition to resolving linguistic differences, ethnography and qualitative analysis may help pedestrian planners to recognize and respond to different cultural practices that affect walking. Ethnographically informed methods are particularly important in planning appropriately for majority world populations with a high proportion of pedestrians engaged in informal spaces, informal economic activities and integrated activities.

Accessibility
Another term which is fraught with ambiguity is "accessibility". In Chapter 4, I argue that accessibility—which is defined differently by transportation and disability advocates—should be treated in a multidisciplinary manner when it is considered in relation to pedestrian facilities. In the case of Jakarta, policy interviews suggest that a focus on international standards of universal accessibility to the exclusion of transportation accessibility has resulted in the production of quality pedestrian spaces as a privilege for the elite. In this case, policy-makers argue that limited resources for construction, maintenance and enforcement hinder the potential for system completion thereby resulting in limited, disconnected sites at the expense of more comprehensive network development and total city-wide accessibility. In order to address this concern, I argue for an integrated accessibility approach which emphasizes network completion and self-enforcing design strategies in the incremental process of implementing universal access standards.

Legibility
Many new urban spaces to be address through integrated accessibility are informal urban spaces that are currently transparent to pedestrians by illegible to planners. Urban designers, such as Kevin Lynch and William Whyte, emphasize the importance of transparency and ground-level legibility to good city form. Development studies scholars, such as James Scott on the other hand, highlight the importance and potential dangers of synoptic legibility in the practice of planning and state-making. In Chapter 5, I examine pedestrian conditions from the disciplinary perspective of both urban design and development studies, and conclude that there is a mismatch

between the legibility of Jakarta's functional pedestrian spaces and the synoptic (or plan view) perspective of those who plan the city.

While Scott may argue that this mismatch conveniently allows locals to remain ungoverned, it also means that planning representations fail to reflect the city's fine-grained network of vernacular pedestrian spaces and—by extension—the concerns of the ordinary pedestrians who use them. Narrow pedestrian routes that do not correspond to streets for motorized vehicular traffic are overlooked in Jakartan mapping, data collection and planning efforts even when such efforts are focused on non-motorized transportation. Instead, pedestrian planning resources are spent to improve isolated, monumental public spaces while functional pedestrian networks remain inadequately developed and maintained. In order to address this situation, I argue that pedestrian planning in majority world cities such as Jakarta should have a comprehensive, fine-grained network as its end goal, and those who walk should be involved in the planning process. The latter recommendation requires planners to go beyond the synoptic view of the city and become pedestrians in vernacular spaces. It also means that ordinary pedestrians (not just community leaders and specialists) should be involved in planning through true public participation.

Integrated activity
In Chapter 6, I explore the implications of informality and integrated activity on pedestrian planning in a majority world context. Based on this research, I conclude that standard trip-based analysis is a fundamentally flawed means of understanding transportation in places with a prevalence of informality or integrated activity. Western critics have already argued that trip-based analyses should be replaced by activity and time-use surveys in Western cities with increasingly complex trip-making patterns. The present research goes further, however, in questioning the effectiveness of even activity based surveys in majority world settings. In the case of Jakarta, a sizeable proportion of pedestrians had difficulty not only talking about "trips", but also separating activities into different purposes, and even distinguishing between "trips" and "activities". For example, an informal vendor who purchases supplies, socializes, and sells goods while circulating through the neighborhood does not have distinct trips for the journey from home to work (two supposedly fixed locations), business-related travel, shopping, or socializing. In fact, she does not even have distinct activities that fall into these categories. In order to measure and accommodate the needs of these pedestrians there is therefore a need for new research instruments to understand the level and nature of pedestrian activity in this context.

Shared streets
As outlined in Chapter 7, there is also opportunity for new policy and design approaches that respond to local pedestrian practices in locations such as Jakarta. One practice which became apparent from activity mapping data in Central Jakarta is the use of streets as shared spaces rather than spaces with segregated spaces for motorized and non-motorized traffic. Almost all pedestrians observed in the activity mapping portion of this study used the street as a shared space, with somewhat different walking patterns among what I label as surface-sensitive, risk-averse, distance-minimizing and stationary pedestrians. While the level of shared spatial practice (or walking in the traffic lanes) was greater for streets with poor sidewalk conditions and discontinuous pedestrian facilities, pedestrians also walked along traffic lanes on streets that had

high quality sidewalks, even when there was the danger of heavy traffic. This suggests a combination of both physical and cultural influences with respect to shared street usage.

In order to respond to these issues of spatial conditions and cultural practices, I argue for a number of design strategies for "Great Streets" in Jakarta. These designs for great transit interchanges, great shared streets and great school strategies emphasize the safe sharing of street rights-of-way, the completion of sidewalks, and integrated approaches to drainage and walkability planning.

Walkability planning strategies
A final chapter will summarize cross-cutting strategies to address each of the above aspects of walkability planning in Jakarta and the majority world.

Overarching strategies that are targeted at Jakarta include institutional and governance reforms, participatory planning mechanisms, ethics education, environmental policy, and a constituency building approach to walkability planning. Specific proposals for walkability planning in Jakarta include an integrated accessibility approach and the development of a regional walkability plan, which may draw upon more detailed elements such as cost-benefit analysis of a regional pedestrian network, WikiPlaces network mapping, and new inclusive road designations.

Additional strategies have been proposed with the aim of advancing understanding of walkability and contributing to wider discourse on walkability policy and practice. These proposals include an integrated activity study, analysis of informal economic activity, and exploration of vernacular placemaking and Asian shared street design. These disciplinary contributions would also be aided through decentered and context-sensitive research on urban transportation and public space more generally.

Lessons on walkability planning from Jakarta provide a path to more sustainable, efficient and multimodal transportation systems, as well as enhanced quality of life and social equity in Jakarta. More broadly, however, these lessons and the challenges that underpin them resonate throughout much of the majority world. Issues of modal, cultural and geographic bias within standard transportation research and planning practices are valid in much of the world—from Lima to Shanghai. Likewise, issues of political legitimacy, synoptic illegibility, informal economic activity, undocumented residential status, integrated activity patterns, and shared street practices are more often present than absent in cities the majority world. For this reason, the lessons of walkability planning in Jakarta have potential to reshape the way that was think about cities and produce urban space in not just this city, but throughout the world.

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Chapter 2: Multidisciplinarity: The Production of Pedestrian Urban Space

Substantive problems are best dealt with
not by utilizing one method or confining the discourse to one field,
but by trying to pierce the heavy curtains of instituted and institutionalized
boundaries and by drawing upon as wide a range of resources as are available

(Goody 1986:vii)

Disciplines Ground Discourse

According to Goody (1986), substantive problems for society and the state are characterized by a tendency to cross disciplinary, institutional and jurisdictional boundaries. Such problems therefore require solutions that draw upon the resources of many disciplines and that involve the integration of many institutions. While pedestrian planning is often treated in a simplistic manner by state agencies, the widespread failure of cities to produce *walkability* suggests that it may, in fact, be a more substantive problem requiring planners to transcend institutional and disciplinary boundaries.

Walkability planning is situated at the intersection of various disciplinary discursive spaces including the following:

- traffic engineering discourse on pedestrian flow capacity;
- urban design discourse on sense of place;
- transportation and urban planning discourse on multimodal performance;
- international development discourse on pedestrian planning expenditures;
- political science discourse on the role of public space in civic engagement;
- public health discourse on the influence of the built environment on traffic injury and obesity-related mortality and morbidity;
- disability rights discourse on aging in place and the accessibility of external areas.

Within each of the above fields, discourse is used to advance disciplinary knowledge, and disciplinary boundaries ground discourse within the framework of instituted and institutional theories, objectives and practices. These institutional boundaries, however, are ill-suited to addressing walkability, however, because pedestrians are not usually their primary focus. As a result, urban space is optimized for other goals and pedestrians are under-provided by the network of institutional agencies that produce urban public space.

Disciplinary and institutional boundaries in the planning of Jakarta's streets
In Jakarta, policy interviews (discussed in Chapter 1) revealed that the planning, design and regulation of streets, main roads and boulevards is spatially segregated by agency with sidewalks and medians under the purview of the Department of Landscaping, but traffic lanes planned and designed by the Department of Transportation. This disjointed institutional arrangement for planning is illustrated in Figure 3.

In the Department of Transportation, calculations on pedestrian crossings are conducted using formulae derived from the field of traffic engineering; while planners in the Department of Landscaping tend to adopt landscape architecture approaches to planning parks, plazas and roadside beautification. Having developed disparate plans, neither the Department of Landscaping nor the Department of Transportation has funds for implementation, but rely upon the Department of Public Works for construction and maintenance aspects of street design.

From a pedestrian access perspective, this disjointed arrangement is problematic, because pedestrians cross roads, travel along streets, and use the entire public realm, yet there is no

institutional oversight or effective management of entire streets or pedestrian routes of travel. In fact there is not even oversight of a comprehensive network of sidewalks or street verges. As a result, pedestrian facilities fall between institutional and jurisdictional gaps—with incomplete sidewalk networks, inadequate facilities maintenance, broken linkages at internal jurisdictional boundaries, and discontinuous pathways across streets and roads.
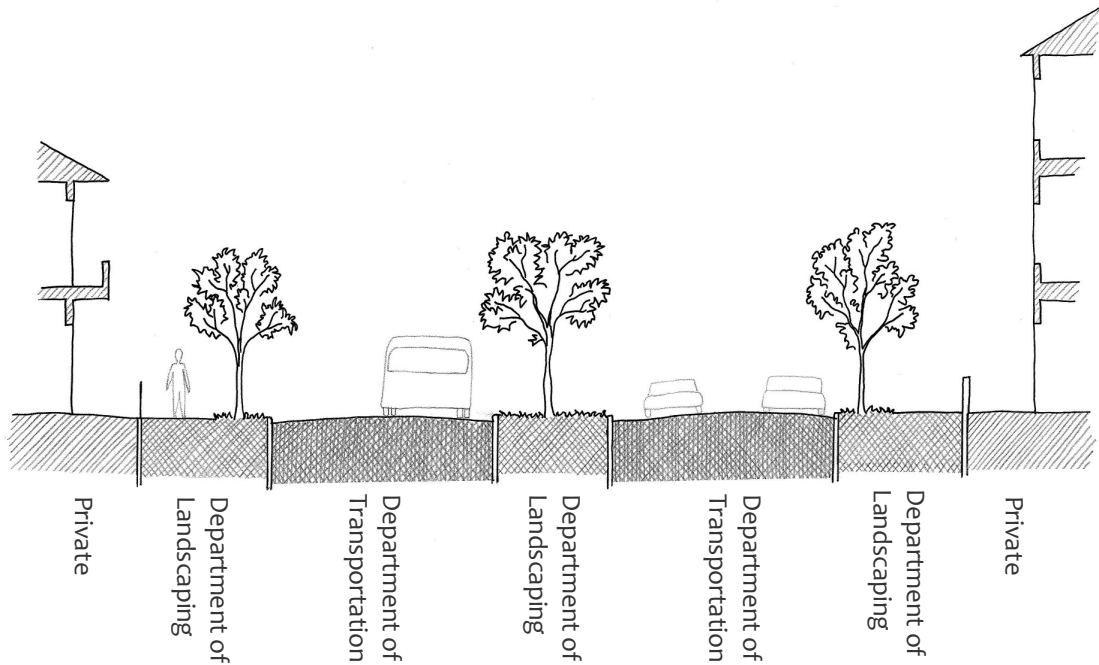
Figure 3: Disjointed planning responsibility for Jakartan street space
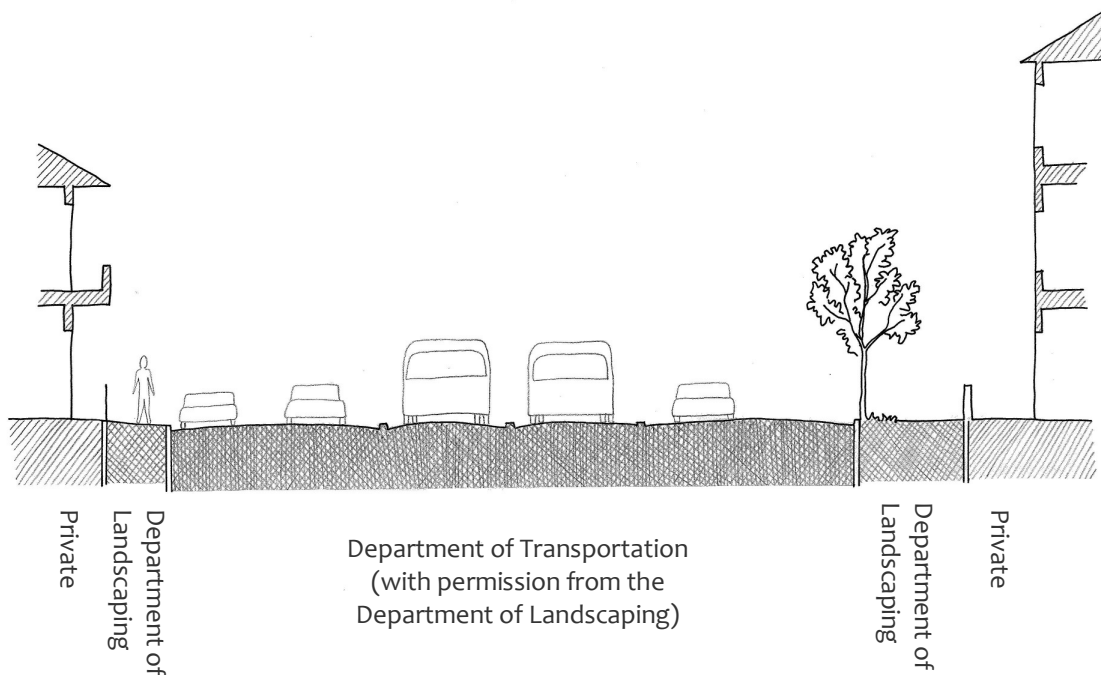
Figure 4: Erosion of urban design perspectives in Jakartan street design with increasing travel demand

As shown in Figure 4, the problem of interdisciplinary and interagency coordination is complicated over time as designated pedestrian public space is ceded for road widening and median development (see Figure 4). In this case, the Department of Transportation takes over the design and planning of the associated space by special arrangement with the Department of Landscaping, which must give "permission" for any alterations to the space. Given the different disciplinary background of the Department of Transportation, this process means that landscape architecture and urban design approaches are gradually replaced with traffic engineering and transportation planning approaches to the design of urban rights-of-way. The casualties of both the original planning process and the new institutional arrangements are pedestrians who use street space as both routes of travel and destinations for a variety of activities.

Unifying discourse in the production of Jakartan urban public space
If there is a unifying discourse in the production of Jakarta's pedestrian space it is the broader political discourse of Jakarta's role in the imagination of national development. This discourse is not static but shifts with prevailing technologies, political ideologies, aesthetic values, and socio-economic conditions. For example, during the *cultuurstelsel* [cultivation system] era when colonial development policy focused on forcibly extracting revenue for the benefit of the "motherland", Jakarta's regional transportation network was developed to facilitate colonial control and the export of raw materials to the Netherlands. Within the city of Jakarta, a "dual" system of governance, land rights and urban services extended urban services to "Europeans", but pedestrian facilities and other services were not systematically provided for "Natives" (Fairlie 1932).[3] Today, the national development discourse has shifted toward decentralization and democracy, and this discourse is echoed at the regional level with the development of "mass" transit services such as the Jakarta Busway. Around mass transit stations, pedestrian networks are then labeled as "feeder" access services but there is still no comprehensive approach to pedestrian movement as a mode in its own right.

This interplay between national political discourse and Jakarta's pedestrian space is illustrated in Figure 5. In this diagram, Jakarta's local pedestrian planning (the bottom row of circles) is situated within the context of regional transportation discourse (the middle row of circles) that is dominated by flow capacity considerations (along the z-axis) to the detriment of other objectives such as sense of place (another point along the z-axis), and this regional transportation discourse is also shaped by a national political discourse (the top row of circles) in which development and modernity are key historical concepts (with historic time moving along the x-axis).

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[3] The dual system was not quite as dichotomous as the term would imply. There were actually three groups: "Natives", "Foreign Orientals", and "Europeans", which encompassed Japanese people and Eurasians who were acknowledged by a European father.
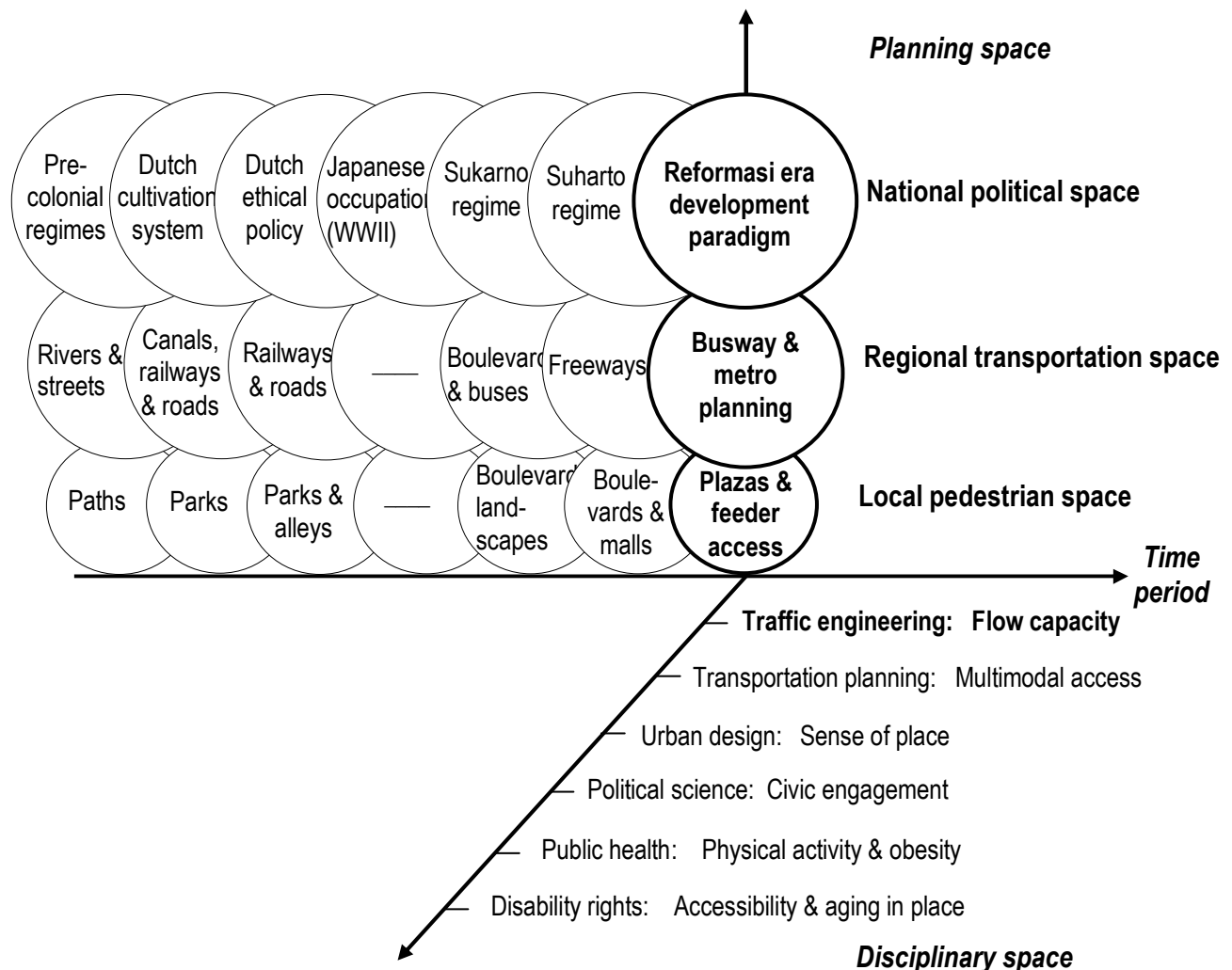
Figure 5: Locating Jakarta's walkability planning at the intersection of discursive spaces

The diagram shows overlapping circles arranged in three rows, with labels on the right side:

Top row (National political space): Pre-colonial regimes, Dutch cultivation system, Dutch ethical policy, Japanese occupation (WWII), Sukarno regime, Suharto regime, **Reformasi era development paradigm**

Middle row (Regional transportation space): Rivers & streets, Canals, railways & roads, Railways & roads, —, Boulevards & buses, Freeways, **Busway & metro planning**

Bottom row (Local pedestrian space): Paths, Parks, Parks & alleys, —, Boulevard landscapes, Boulevards & malls, **Plazas & feeder access**

Axes: *Planning space* (vertical up), *Time period* (horizontal right), *Disciplinary space* (diagonal down)

Disciplinary space list:
— **Traffic engineering: Flow capacity**
— Transportation planning: Multimodal access
— Urban design: Sense of place
— Political science: Civic engagement
— Public health: Physical activity & obesity
— Disability rights: Accessibility & aging in place

Discourse Shapes Knowledge Generation

While multiple discursive frameworks intersect with pedestrian planning, discourse in turn shapes the production of knowledge within each respective field. Once these spaces or clusters of discourse generation are established, knowledge generation within the discipline is mediated through, and confined to, this framework. Discursive biases and absences therefore produce biases and absences in knowledge relating to pedestrian activity.

Modal bias
The disciplinary space of traffic engineering and transportation planning, for instance, is often defined by motorized modes, as evidenced by categories of agencies, organizations and subfields within the discourse. I experienced this categorization while working for the Australian Federal Department of Transport in the 1990s. Within the Department of Transport, official discourse occurred in relation to motorized modes—with Departmental Divisions for road, rail, maritime and aviation interests and no official place for considering non-motorized transport (although I

informally appointed myself as the Departmental delegate to the National Bicycle Council). At the time, some argued that the omission of non-motorized modes was justified by jurisdictional boundaries, and yet Federal programs and funds shape transportation planning at lower levels of government as well as urban transportation systems within which non-motorized transportation occurs. A failure to consider non-motorized modes at the Federal level therefore encourages modal bias against walking and cycling at all levels of government.

Another place where discourse and disciplinary space is seen and perpetuated is at conferences and other information-sharing forums. For example, research panels in conjunction with the Transportation Research Board (probably the largest conference in the field of transportation planning) provide funding for cooperative research on transportation. Respective research panels fall into the categories of highway, transit, airport and freight, with no clear place for the non-motorized modes that constitute a huge proportion of the world's urban transportation. Since research is shaped within the discourse of motorized modes, what we can learn about transportation is mediated by the social space that affects how we already see the discipline.

This discursive framing of knowledge does not mean that we are unable to learn new things since alternative discourses emerge to widen the lens of what is conceivable within a social space. While working as a sustainable transport planning consultant in San Francisco, for example, I noticed emerging discourses on the issues of multimodalism, livability and walkability. These emerging spaces redefine and expand the space of transportation planning, with new areas of knowledge generated and disseminated through alternative forums such as the annual RailVolution conference, the Congress for the New Urbanism and even emerging committees of the Transportation Research Board. Following the legislative changes associated with authorization of the Intermodal Surface Transportation Efficiency Act (ISTEA) and its sequels, these alternative discourses have become increasingly mainstream.

Given the relative newness of discourse on pedestrian transportation planning, however, the sub-field of pedestrian planning lacks the level of basic agreement and understanding that exists for more entrenched areas such as highway planning and pavement-related research. For example, there is substantial disagreement about the basic goals and metrics of walkability, and different metrics seem to reflect more about the discipline of who is asking, than on pedestrian preferences and practices themselves. Many metrics developed in different disciplines even contradict each other.

In Jakarta, planning, research and knowledge generation regarding pedestrians is even more rudimentary than in the United States, despite the fact that walking represents a much larger share of total transportation task (Pacific Consultants International and ALMEC Corporation 2004). The city's official planning discourse explicitly favors motorized modes and their more middle-class occupants as seen in the recent integrated transportation planning study (see Table 2). This study conservatively estimates that walking trips comprise 38 percent of the total regional transportation task, and yet walking is ranked as the very lowest priority for regional transportation or integrated planning efforts. The study even relegates walking—the most sustainable and popular mode—to a lower priority than *becak* (pedicabs), which are officially banned throughout most of Jakarta.

Table 2: Transportation mode share and planning priority, Jabodetabek, 2002

Type of Mode	Transport Mode	No. of Trips ('000)	% Share	Priority of Mode	Priority of Integration (8 groups)	Priority of Integration (3 groups)
Motorized public	Express Train	39	0.1	1	5	2
	Economy Train	434	1.2	2	6	2
	Patas AC[4]	422	1.1	3	3	2
	Large Bus (*Patas*/regular)	1,224	3.3	4	4	2
	Medium Bus	2,012	5.4	5	4	2
	Mini Bus (*Angkot/Mikrolet*)	7,817	20.9	6	4	2
Motorized demand responsive	School/Company/Tour Bus	466	1.2	7	4	2
	Taxi	126	0.3	8	1	1
	Omprengan[5]	295	0.8	9	4	2
	Bajaj[6]	217	0.6	10	1	1
	Ojek[7]	1,073	2.9	11	7	2
Motorized private	Sedan/Jeep/*Kijang*	2,783	7.5	12	1	1
	Colt/Mini Cab	298	0.8	13	1	1
	Pick up	131	0.4	14	1	1
	Truck	33	0.1	15	1	1
	Motorcycle	4,890	13.1	16	2	1
Non-motorized & other	*Becak*[8]	202	0.5	17	8	3
	Bicycle	787	2.1	18	8	3
	Other	8	0.0	19	7	2
	Walking for transfer	14,073	37.7	20	8	3
	Walking to final destination			21	8	3
	Total	37,330	100.0			

(Source: Priority and mode share data are from Technical Report Tables 1.3.2 & 7.1.1 of the Study on Integrated Transportation Master Plan for Jabodetabek (SITRAMP), undertaken by Pacific Consultants International and ALMEC Corporation on behalf of the Indonesian National Development Planning Agency (BAPPENAS) and the Japan International Cooperation Agency (JICA), 2004.)

This bias toward motorized transportation can be seen throughout the course of the city's varied political history as expressed through city plans that span the full range of political paradigms including the following:

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[4] *Patas AC* refers to large air-conditioned buses.
[5] *Omprengan* refers to private commuter vanpool services.
[6] *Bajaj* are three-wheeled taxi services accommodating two passengers in half-covered seating.
[7] *Ojek* are taxi services using regular motorbikes (or bicycles in the case of *ojek sepeda*) with one passenger sitting on a cushion behind the operator.
[8] *Becak* are pedicabs accommodating two passenger in a partially covered carriage in front of the operator.

- the colonial "city plan" of Batavia in 1937;
- the U.N. authored Preliminary Plan [*Rencana Pendahuluan*] of 1957;
- two twenty-year Master Plans [*Rencana Induk*] from the Suharto era; and
- *Jakarta 2010*, the Regional Spatial Structure Plan [*Rencana Tata Ruang Wilayah*], which was published shortly after the fall of Suharto.

In the 1957 Preliminary Plan, walking is completely absent both in terms of policies and survey analysis, even though it represented over 60 percent of trips at the time (Watts 1957:ix; Barter 1999:55). Instead, the plan recommends "very high capital expenditure" of road capacity expansion and highway development "designed to promote free movement" for the small percentage of people who could afford to own and operate motorized vehicles (Watts 1957:16, 26). In the subsequent 1965–1985 Master Plan, pedestrians were similarly not considered as part of either the transportation surveys or the related policies. Instead, policies were outlined to supposedly promote "clarity in relation to patterns of motorized and non-motorized traffic" including a proposal to eliminate *becak* (pedicabs) by 1980 (DKI Jakarta 1967:53). The 1985–2005 Master Plan likewise provided no information, goals or plans for pedestrian facilities. Where walking is absent from the framework of planning discourse, it is impossible to generate knowledge on the role of walking or how to better plan for pedestrians (DKI Jakarta 1985).

In 1999, the city government adopted *Jakarta 2010* as part of the wider movement to replace Suharto-era plans, programs and policies with more democratic documents and processes. This plan was the first one to include walking as a mode of transportation worthy of planning. The plan also espoused the need to adequately accommodate those with disabilities, and to cultivate of a culture of walking for short trips (DKI Jakarta 1999:11, 27). These policy statements suggest a greater awareness of pedestrians in Jakarta's planning discourse, and yet the plan did not provide any information or guidance on how to implement these goals. The plan outlined specific data, guidelines and networks for other modes of transportation but not for walking.

Geographic bias
Part of the reason behind the modal bias within Jakarta's regional development discourse is that most authors within the field are operating within the context of modern, Western cities which have relatively few pedestrians and which tend to be planned in a modally biased manner. Key planning and transportation texts and conferences are so firmly embedded within this geographic framework that exceptions are highlighted as special applications of apparently placeless processes.

The absence of non-Western perspectives is masked within planning discourse by a disciplinary debate that contrasts U.S.-style freeway development with European or industrialized Asian-style mass transit development. The dichotomous nature of this debate tends to create a false impression of completeness that renders perspectives outside this structure invisible. As defined in post-colonial studies, the *subaltern*, or suppressed perspective, in urban transportation planning is that of non-motorized transportation for cities without a substantial middle class. These contexts are viewed from the dominant hegemonic perspective of motorized transportation alternatives and Western methods of planning.

As described by Chakrabarty (2000) and Mbembé and Nuttall (2004), the problem with this approach is Euro-centric or Western bias. In relation to Indonesia, the works of Furnivall (1948), Smail (1961), Scott (1990), Anderson (1991) and Mrázek (2002) provide insight into Eurocentricity and the conception of national space. In particular, Smail explains that this systematic bias:

> [tends] to reduce the general history of modern Indonesia to a kind of history of foreign relations between the Dutch and the Indonesians… if we take *A* to be the general history of Holland, *AB* to be the history of Dutch-Indonesian relations, and *B* to be the history of Indonesia, what we have here in effect is *AB* offered to us as a substitute for *B*, which remains largely unwritten… For the period of greatest Dutch power there is a strong tendency, as we have seen, for historians of all stripes to see "Indonesian history" Europe-centrically. This is more easily understood when we realize that this Indonesian history consists chiefly of the history of Dutch-Indonesian relations; with the Dutch dominant and everywhere taking the initiative in these relations… In the scheme above this would be represented by *Ab*, to denote the dominant perspective… The anti-colonial version of these foreign relations can be represented as *aB*, while the more mixed neo-colonial perspective can be represented as *AB*. In all the literature on modern Indonesian history there is only a handful of works which can be said to be devoted to *B*, the domestic history of Indonesia (Smail 1961:97-98).

While these ideas are now familiar to anthropologists, critical theorists, and area specialists, they have not worked their way into much of the literature on transportation, city planning or urban form. Specifically, an analogous analysis has not occurred in relation to Eurocentricity and the conception of transportation planning as a discursive space. Instead, most transportation planning and urban design is based on assumptions about spatial form and the social space of urbanity that reflect a uniquely European or Western history—what Smail would label as an *A* historiography.

In planning texts and conferences, idealized norms of urbanity are based on Western patterns. For example, idealized norms of transportation development contrast railway- to freeway-based systems while overlooking myriad other processes outside of the West. Idealized norms of state and urban planning assume the regularization of urban spaces and subjects, while dismissing the possible presence of informal or integrated categories of activity and space. And idealized norms of urban design accept or react to conditions in Western cities with little contemplation of what may be lost in translation when applied to cities with low median incomes and few middle-class citizens. These issues are discussed further in Chapter 6.

While globalization has indeed allowed for application of Western planning models in many parts of the world, the resulting urban morphologies have been very different in poorer countries due to differences in the conception of urban space, the prevalence of informal or integrated activity, and the absence of a substantial middle-class. This difference in application is not generally acknowledged in standard transportation discourse that is bounded by the unconscious conception of the West as the whole world (see Figure 6).
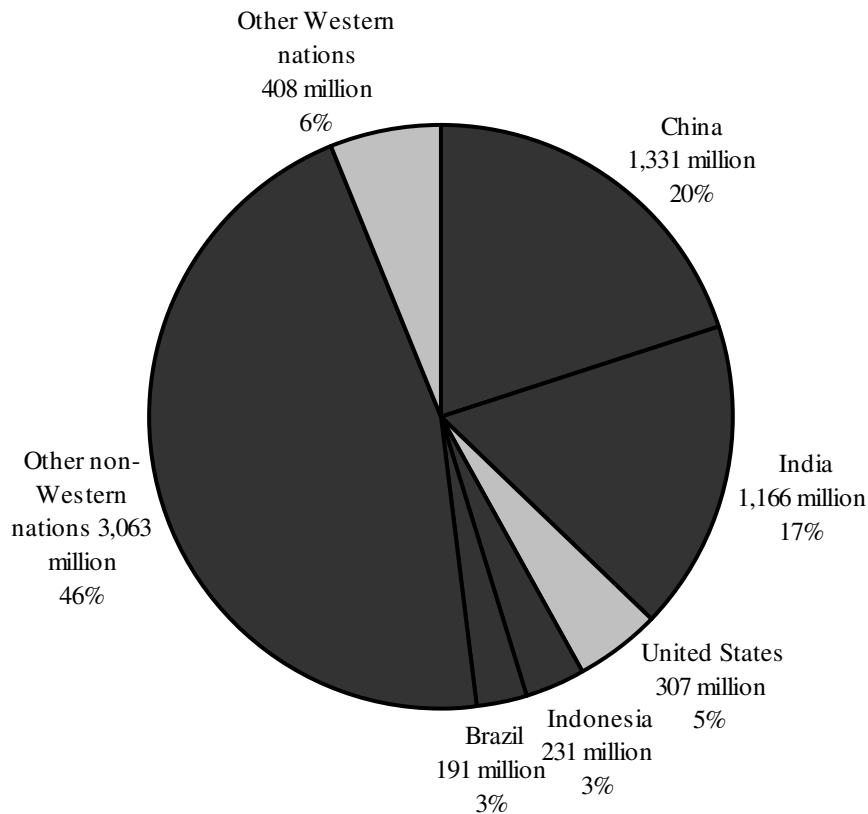
Figure 6: Population of the West versus the rest of the World, 2009
(Sources: China Population Development and Research Center 2009; Government of India 2009; Instituto Brasileiro de Geografia e Estatística 2009; Statistics Indonesia 2009; United Nations Department of Economic and Social Affairs 2009; U.S. Census Bureau 2009)

Knowledge Generation Produces Representations

A modally and geographically biased discursive framework hinders the generation of knowledge on pedestrian planning and walkability, particularly as it relates to planning in the majority world. Knowledge that *is* generated on walkability, however, is not restricted to transportation planning but includes efforts in various disciplines and institutions with a stake in the production of pedestrian space. Splintered discourse and knowledge generation then produces splintered metrics or representations of walkability.

The following sections highlight a range of walkability metrics and representations that have emerged from the fields of traffic engineering, transportation planning, urban design, disability rights, public health and political science. An earlier and more detailed treatment of this material can be seen in a recent article published by the author in the *Journal of Urbanism* (Hutabarat Lo 2009:145–166).[9]

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[9] An earlier and more in-depth version of this section as well as the first section of Chapter 3 were included in an article by the author entitled "Walkability: What is it?" published in the *Journal of Urbanism* © 2009 [copyright Taylor & Francis]; *Journal of Urbanism* is available online at: http://journalsonline.tandf.co.uk.

Pedestrian space as a vacuum
In much of the discourse on street design, walkability is not represented at all, and pedestrian space is implicitly planned through efforts to achieve more dominant and well-defined goals of facilitating vehicle flow, accommodating fire trucks, regulating land uses, and making money.

This de facto planning of pedestrian space is exemplified by the influential AASHTO Green Book, which sets out guidelines for street design elements such as sight distance, design speed, lane width, landscaping and lighting, without acknowledging implicit conflicts with pedestrian function when one considers effects on traffic speed, crossing distance and human scale (see Table 3). Instead of providing design cues to encourage slower traffic and greater social interaction, the Green Book promotes vehicular mobility, and suggests that pedestrian crashes in higher speed environments should be prevented by installing median barriers that make the street impenetrable to pedestrians (Appleyard 1981; AASHTO 2004a:475).

Table 3: AASHTO Green Book recommended practices

Street Type / Parameter	Local Urban	Urban Collector	Urban Arterial	Freeway
Design speed	30–50 kph (20–30mph)	50 kph (30 mph)	50–100 kph (30–60 mph)	≥80 kph (50 mph)
Stopping sight distance	30–60 m (100–200 ft)	Varies with design speed		
Lane width	3.3 m (11 ft)	3.3 m (11 ft)	3.6 m (12 ft)	3.6 m (12 ft)
Number of lanes	2 plus parking	≥2 plus parking, bikes, median	>2 + shoulder, median	>2 + shoulder, median
Parking	Desirable	Undesirable but acceptable	Highly undesirable	Prohibited
Sidewalk	Both sides ≥1.2 m (4 ft)	Both sides 1.2–2.4 m (4–8 ft)	Should be provided	None
Crossings	Curb ramps at crosswalks		Intersection open to peds unless offset by traffic/safety benefits	Ped provision through urban interchanges
Landscaping	In keeping with street character, ped or bike needs, sight distance & clearance guidelines e.g. vegetation <1.0 m (3 ft) in sight triangle		Not addressed	
Lighting	Luminaries mounted at height of 10–15 m (35–50 ft)			

(Source: AASHTO 2004: 291, 390, 392, 400, 430, 433, 470, 472, 478, 503–504, 864–865)

The Green Book allocates 16 pages to geometric design of pedestrian facilities, but the language and ideas in this section are under-developed, lukewarm and non-compulsory when compared to the strident, well-developed and highway-centric character of the rest of the document (AASHTO 2004:96). In its remaining 851 pages, the Green Book recommends that streets be

designed on the basis of *vehicle* function and there is an explicit compromise between traffic mobility and access—with no explanation of how to reinterpret street performance on the basis of *pedestrian* function. This means that if an arterial or collector road is an important pedestrian route due to the fact that it runs through a town center or is a route to schools, transit or housing, the pedestrian function is inherently compromised in the process of designing the street for vehicles (AASHTO 2004a:7-12). This problem is addressed in the ITE Recommended Practice on *Designing Walkable Urban Thoroughfares: A Context Sensitive Approach* (2010) as well as work on Seattle's transit network by Tumlin, Walker, Hoffman and Hutabarat (2005), but these concepts are not yet reflected in the Green Book.
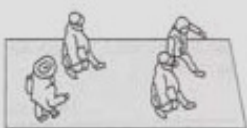
In addition to street design standards, municipal land use zoning and parking requirements also influence the design of spaces in which pedestrians walk. In the United States, these requirements usually encourage segregated land uses, low maximum densities, abundant free parking and cul-de-sac style suburban development (Levine 2006; Shoup 2005:58). The resulting environments are car-oriented, out of human scale and characterized by prohibitively long walking distances between destinations. Fire codes, such as the U.S. Federal Uniform Fire Code, exacerbate these issues by mandating excessively wide streets in newly developed areas. Wider streets provide fire trucks with access and space to maneuver during rare times of emergency, but they reduce everyday pedestrian safety by encouraging higher traffic speeds. Each of these influential U.S. codes and requirements shape the development of streets within the United States and beyond without adequately acknowledging the needs of pedestrians. In effect, they represent pedestrians and pedestrian space as non-existent.

Pedestrian space as pipes
An alternative representation of walkability from the discipline of traffic engineering represents pedestrian spaces as pipes through which pedestrians flow like molecules of liquid or gas. This approach can be seen in the Transportation Research Board's Highway Capacity Manual (HCM), which was first published in 1950 and has since become the authoritative source on transportation planning guidance in the United States and beyond (TRB 2000).

The HCM was originally focused on assessing vehicular and road conditions, with no consideration of public transit, bicycles and pedestrians. In response to concerns about modal bias, the 2000 edition of the HCM was expanded to encompass pedestrians, with level of service (LOS) criteria for evaluating pedestrian facilities in an analogous manner to vehicles (see Table 4). These criteria include variables for sidewalk space per pedestrian; pedestrian flow rate; speed of pedestrian flow; and ratio of sidewalk volume to capacity. These variables were derived from the 1971 dissertation of John Fruin and seem to be more relevant to designing stadium egress routes than public streets and sidewalks (Fruin 1971).

Table 4: HCM Pedestrian Level of Service

LOS / Parameter	Ped space (ft²/p) (m²/p)	Flow rate (p/min/ft) (p/min/m)	Speed (ft/s) (m/s)	V/C Ratio	Description	Illustration
A	>60 *>5.6*	≤5 *<16*	>4.25 *1.30*	≤0.21	Pedestrians move in desired paths without altering movements in response to other pedestrians. Walking speeds freely selected, & conflicts between pedestrians are unlikely.	
B	>40–60 *3.7–5.6*	>5–7 *16–23*	>4.17–4.25 *1.27–1.30*	>0.21– 0.31	Sufficient area for pedestrians to select walking speeds freely, bypass other pedestrians, & avoid crossing conflicts. Pedestrians begin to be aware of other pedestrians & to respond to their presence when selecting a walking path.	
C	>24–40 *2.2–3.7*	>7–10 *23–33*	>4.00–4.17 *1.22–1.27*	>0.31– 0.44	Space sufficient for normal walking speeds, & for bypassing other pedestrians in primarily unidirectional streams. Reverse-direction or crossing movements can cause minor conflicts, & speeds & flow rate are somewhat lower.	
D	>15–24 *1.4–2.2*	>10–15 *33–49*	>3.75–4.00 *1.14–1.22*	>0.44– 0.65	Freedom to select individual walking speed & bypass other pedestrians is restricted. Crossing or reverse-flow movements face high probability of conflict, with frequent changes in speed & position. Reasonably fluid flow, but friction & interaction between pedestrians likely.	
E	>8–15 *0.7–1.4*	>15–23 *49–75*	>2.50–3.75 *0.76–1.14*	>0.65– 1.00	Virtually all pedestrians restrict normal walking speed, frequently adjusting their gait. At the lower end, forward movement only possible by shuffling. Space is insufficient for passing slower pedestrians. Cross- or reverse-flow movements possible only with extreme difficulty. Design volumes approach walkway capacity, with stoppages & interruptions to flow.	
F	8 *0.7*	Varies	≤2.50 *0.76*	Variable	All walking speeds severely restricted & forward progress made only by shuffling. Frequent unavoidable contact with other pedestrians. Cross- & reverse-flow movements virtually impossible. Flow is sporadic & unstable. Space more like queued than moving pedestrian streams.	

(Source: Transportation Research Board 2000)

With a focus on sidewalk capacity, Fruin and HCM 2000 represent pedestrians as mechanistic, atomistic and anti-social "traffic units". Under HCM 2000, busy urban sidewalks are dismissed as undesirable sources of potential "conflict", while empty sidewalks in industrial superblocks, monotonous suburban locations or dark city alleys are ranked as if they provide good pedestrian comfort. The manual therefore fails to reflect research findings on the importance of "safety in numbers" (Jacobsen 2003) or contextual factors such as building form, land use context, street connectivity, amenities or vitality (Pushkarev and Zupan 1971; New York City 2006; Whyte 1980). In majority world settings where public finances and urban space are very constrained, and privacy or individualism may be less culturally valued than in the United States, the HCM metrics for pedestrian level of service are even more inappropriate.

Pedestrian spaces as networks
Research from the fields of urban and transportation planning represent pedestrian space as networks, with walkability measured in terms of buffered networks of pedestrian paths. Much of this research has been undertaken at the local level by planning agencies and influential non-governmental organizations. Frequently cited U.S. examples include:

- Portland, Oregon—a community known for its progressive politics and its integrated transportation, land use and environmental planning;
- Kansas City, Missouri—a city that invested in pedestrian planning after criticisms of poor walking conditions;
- San Francisco—a city that was formerly known for great streets and that recently completed a better streets plan and streetscape master plan; and
- the State of Florida—which commissioned a study to examine factors affecting walking.
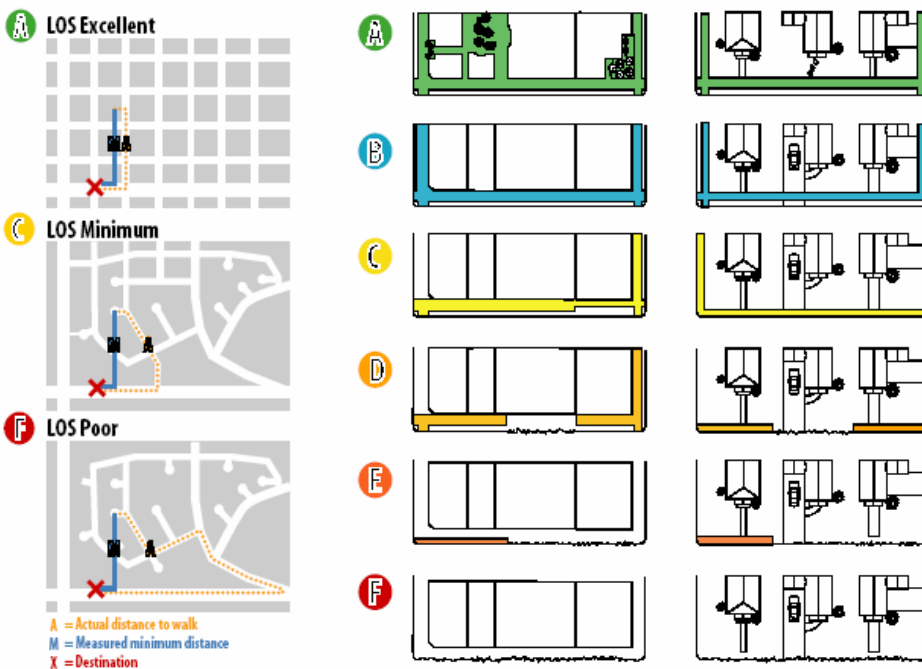
Figure 7: Kansas City pedestrian LOS for directness and continuity
(Source: City of Kansas City 2003)

As shown in Figure 7 and Table 5, walkability metrics from these sources emphasize variables that measure sidewalk continuity; street connectivity or route directness; land use density and diversity; buffering from heavy or high speed traffic; crossing safety; and human scale design (Parsons Brinckerhoff Quade and Douglas 1993; City of Portland 1998:2; City of Kansas City 2003:15-34). In San Francisco and Kansas City, street context is also taken into account, so more walkable conditions are required in streets that are higher priority for pedestrians and transit access (City of Kansas City 2003: 16).

Table 5: Selected walkability indices from urban planning agencies

Source / Parameter	Portland Pedestrian Potential or Deficiency Index (PPI/PDI)	Kansas City Pedestrian Level of Service (LOS)	San Francisco Streetscape Master Plan	Sprinkle / Florida DOT Pedestrian LOS
Presence & maintenance of sidewalks	Not missing sidewalks	Completeness of sidewalk system	Sidewalks on both sides of the street	Presence and width of sidewalk
Universal accessibility	Accessible	–	Accessible pedestrian facilities inc. median refuges	–
Path directness & connectivity	Presence of connected street network based on block length	Ratio of actual to minimum grid distance	Street connectivity	–
Land use density & diversity	Land use density & mix; average parcel size; destinations within walk distance; proximity to schools, parks, transit & shops	Adjacent uses	Adjacent uses & land use context e.g. downtown commercial	–
Visual interest & sense of place	Scale	Pedestrian scale, comfort, attractiveness, design & maintenance	Character & quality of the public realm; intersections as important public space; consolidated utilities, parking meters, street signs and poles	–
Street trees & landscaping	–	Pedestrian comfort e.g. shade	Streetscape elements e.g. trees, plantings & seating	–

Source / Parameter	Portland Pedestrian Potential or Deficiency Index (PPI/PDI)	Kansas City Pedestrian Level of Service (LOS)	San Francisco Streetscape Master Plan	Sprinkle / Florida DOT Pedestrian LOS
Lateral separation from traffic & speed of traffic	Traffic speed & volume	Parking lanes, travel speed, attributes, line of sight, separation from vehicles	Traffic buffers e.g. on-street parking & bikelanes; slow traffic speeds; tight curb radii; traffic calming	Sidewalk width; ped buffers or barriers; on-street parking; width of outside travel lane, shoulder or bike lane; motor vehicle volume, speed & type; driveway access frequency & volume
Crossings, safety & security	Absence of difficult & dangerous crossings based on traffic speed, volume, road width & pedestrian crashes	Crossing type, lane width & number	Visibility of crosswalks inc. lighting & corner parking restrictions; crossing distance, time & exposure e.g. curb extensions	
Other	Topography or slope; Pedestrian-related street classification; Regional land use area	Analysis level Pedestrian-related street context	Transportation context; special street conditions e.g. alleys, shared public ways & paseos	–

(Sources: City and County of San Francisco 2011; City of Kansas City 2003; City of Portland 1998; Landis *et al* 2001)

While most walkability metrics that emerge from local planning discourse employ heuristics rather than scientifically derived thresholds, the Florida Department of Transportation developed a pedestrian level of service index using a scientific methodology undertaken by Sprinkle Consulting (Landis et al 2001). The methodology involved 75 participants who walked an 8-kilometer (5-mile) course in the Pensacola metropolitan area and rated their perceived comfort and safety on a scale of A to F. Based on this work, the authors derived a formula for walkability or pedestrian level of service (LOS):

$$Ped\ LOS = -1.2021\ ln(W_{ol} + W_l + f_p\ x\ \%OSP + f_b\ x\ W_b + f_{sw}\ x\ W_s)$$
$$+ 0.253\ ln\ (Vol_{15}/L)$$
$$+ 0.0005\ SPD_2$$
$$+ 5.3876\ (2)$$

where:
W_{ol} = *Width of outside lane (feet)*
W_l = *Width of shoulder or bike lane (feet)*

f$_p$ = On-street parking effect coefficient (=0.20)
%OSP = Percent of segment with on-street parking
f$_b$ = Buffer area barrier coefficient (=5.37 for trees spaced 20 feet on center)
W$_b$ = Buffer width (distance between edge of pavement and sidewalk, feet)
f$_{sw}$ = Sidewalk presence coefficient = 6 – 0.3W$_s$ (3)
W$_s$ = Width of sidewalk (feet)
Vol$_{15}$ = average traffic during a fifteen (15) minute period
L = total number of (through) lanes (for road or street)
SPD = Average running speed of motor vehicle traffic (mi/hr)
Ped LOS A ≤ 1.5 < B ≤ 2.5 < C ≤ 3.5 < D ≤ 4.5 < E ≤ 5.5 < F

While the Florida pedestrian LOS formula was scientifically derived, the study organizers specifically instructed participants to disregard land use considerations, building form, urban design, aesthetic features, and even intersection conditions in their responses. It therefore lacks any information on contextual variables. Also, since pedestrians used a set course, the data were unable to provide insight on which factors encourage walking or which paths pedestrians would actually take to get to places.

Like the planning heuristics, the Florida DOT represents walkability in terms of buffered networks. While the Florida metric has the advantage of being scientifically derived, it lacks the context sensitive aspects of heuristic walkability measures from other planning agencies.

Pedestrian spaces as funding receptacles
A related but different approach is the World Bank's *Global Walkability Index (GWI)*, which aims to assess pedestrian planning efforts at the level of entire cities rather than specific street segments or facilities. The resulting index treats pedestrian spaces as potential funding receptacles and indicators of Development. This index includes several variables listed in Table 5 but it omits land use variables and their effects on the convenience, directness and connectivity of the pedestrian network (Krambeck and Shah 2006:6). These variables were ignored because the index:

> "only targets those aspects of walkability that can be improved upon in the short and medium terms (e.g. availability of infrastructure and relevant policies), as opposed to those that may only be affected in the long term (e.g. prevailing land uses) (Krambeck and Shah 2006:5).

The GWI therefore prejudges which aspects of walkability can be addressed by local, national or international policies while filtering out elements that were identified by authors such as Pushkarev et al (1971), Jacobs (1961) and the City of Portland (1998) as having a powerful influence on pedestrian behavior and satisfaction. While the GWI was developed with a more global perspective than other indices, the coarseness of its synoptic scale of analysis is not particularly useful or insightful for defining walkability at the fine-grained, street level where walking happens.

Table 6: A walkability index from the field of international development

Parameter \ Source	Global Walkability Index (GWI)
Presence & maintenance of sidewalks	Maintenance, cleanliness & absence of obstacles on paths
Universal accessibility	Quality of facilities for blind & disabled persons
Path directness & connectivity	–
Land use density & diversity	–
Visual interest & sense of place	Amenities e.g. coverage, benches, public toilets
Street trees & landscaping	–
Lateral separation from traffic & speed of traffic	Walking path modal conflict
Crossings, safety & security	Crossing safety & availability, percent road crashes with pedestrian fatalities, perceptions of crime, quality of motorist behavior
Other	Funding, resources & guidelines for pedestrian planning; Enforcement & outreach for ped & traffic safety

(Source: Krambeck and Shah 2006:10)

Pedestrian spaces as places

At the other end of the spectrum, urban designers adopt a high resolution approach to walkability, in which pedestrian spaces are represented as *places*. According to key authors from urban design, good pedestrian *places* have a *sense of place*. Jane Jacobs described good pedestrian places as having an intricate and close-grained diversity of primary land uses and enterprises; buildings that do not turn their backs or blank sides to the street or leave it blind; and sidewalks that are heavily and constantly used by people of every race and background (Jacobs 1961:19, 42, 45, 54). Whyte subsequently reiterated the positive effect of fine-grained urban design features on pedestrian activity (Whyte 1980); and Donald Appleyard demonstrated the negative effect of vehicle traffic on pedestrian activity and social networks (Appleyard 1981). In the 1980s, Lynch also broke down sense of place into spatial identity, significance, structure, congruence, transparency and legibility (Lynch 1984). More recent New Urbanist writers such as Calthorpe and Duany reiterate many of these earlier ideas regarding sense of place in their proposals for designing "pedestrian pockets" and transit-oriented places (Calthorpe 1993:17; Schmitz & Scully, 2006: 16; Southworth, 2005:249).

Table 7: Urban design based walkability indices

Parameter \ Source	Jaskiewicz' Qualitative Pedestrian LOS Factors	Lynch's Performance Dimensions	Jane Jacobs' Treatise	Gehl & Gemzøe
Presence & maintenance of sidewalks	Completeness, maintenance & obstruction of sidewalks	–	Sidewalks that are used	Sidewalks, car-free pedestrian promenades & squares

Source / Parameter	Jaskiewicz' Qualitative Pedestrian LOS Factors	Lynch's Performance Dimensions	Jane Jacobs' Treatise	Gehl & Gemzøe
Path directness & street connectivity	Availability of numerous pedestrian routes including shortest distance routes	Access: Relative cost of reaching people, jobs, housing, material resources, places & information	Short blocks & fine-grained street networks	Network of pedestrian streets, narrow streets
Land use density & diversity			Fine-grained diversity of primary land uses	Pedestrian-oriented shopping areas; high quality urban housing
Visual interest & sense of place	Frequent variation in orientation & character of public spaces, varied shopfront or housing materials & design, enclosure or definition of street edge by buildings & trees, presence of overhangs, varied roof lines, transparency of public-private transition e.g. windows, café seating	Identity: character, familiarity; Structure: how parts fit together; Congruence: match of spatial & non-spatial structure; Transparency: visibility of processes; Legibility: communication via symbolic features; Significance: place as symbol of values, processes, history & nature	Eyes on the street from buildings that do not turn their backs or blank sides to the street; Sidewalks that are heavily & constantly used by people of every race and background	More pedestrians engaging in optional activities (active & passive) than necessary trips; variety of people walking, sitting, lying down and playing
Street trees & landscaping	Presence of shade / street trees		**Lack of** parks & blank spaces	Courtyards & green areas
Separation & speed of traffic	Presence of buffer between sidewalks & moving vehicles; Posted speed limit; Design speed created by lane & street widths, sight lines, corners, street parking & crossing treatment; Street lighting	Vitality: Safety hazards are absent or controlled, & fear of encountering them is low		Traffic calming; reduction in car traffic interference; cycle-oriented traffic policies & infrastructure

(Source: Jaskiewicz 2000:3-8; Lynch 1984:111-235; Jacobs 1961; Gehl and Gemzøe 1996)

While many urban designers do not directly engage in traffic engineering discourse, Jaskiewicz developed a qualitative pedestrian level of service (LOS) index that takes direct aim at the Highway Capacity Manual's LOS standard. Jaskiewicz' index includes various factors that relate to sense of place including enclosure or definition of the street edge, path complexity, building articulation, and transparency. His proposal addresses various criticisms of car-oriented and monotonous American streetscapes, but has an aesthetic bias toward varied elements such as "frequent variation in orientation and character of public spaces" and "varied roof lines". When taken literally, these elements could result in gaudy, cluttered or chaotic streetscapes.

Outside of the United States, European designers such as Gehl and Gemzøe also highlight the importance of sense of place and assert that places with sense of place have more people who stay or make "optional" pedestrian trips (Gehl and Gemzøe 1996). While the ideas of Gehl, Gemzøe and Jaskiewicz share some commonalities with Jane Jacobs, the focus on optional activities (like shopping, sitting in cafés and sightseeing) betrays a middle-class sensibility that prioritizes the activities of those with leisure time and discretionary income and assumes that people's lives are clearly segregated into different spheres like work, home and recreation. Gehl's writings also express the assumption that people's formal economic roles are the only "necessary" or purposeful activities, whereas time spent with family and friends, or worshipping God are classified as "optional". This worldview may not hold true in all cultural contexts. It also fails to represent pedestrian space in spaces of production (like industrial zones), as well as socially-mixed or informal spaces of integrated production and consumption.

Pedestrian spaces as access routes
As discussed in Chapter 4, discourse on disability discrimination and universal access represent pedestrian spaces as part of a package of measures that deliver equality, liberty and rights to those with disabilities. Much of this discourse has been focused on the physical dimensions of pedestrian facilities that are walkable or accessible to those with a range of abilities. Specific dimensions are discussed in Chapter 4, but key aspects include requirements regarding the following:

- lateral clearance for wheelchair passage, passing and turning space along accessible routes or paths of travel;
- vertical clearance and the dimensions of protruding objects along accessible routes and paths of travel;
- gradients and dimensions of ramps, slopes, stairs and changes in level;
- tactile wayfinding cues, warnings, barriers, edge protection and handrails;
- stable, firm and slip-resistant ground and floor surfaces; and
- size, quality and position of accessible signage.

Pedestrian spaces as health spas
In terms of public health, elements of built environment that encourage walking and physical activity have been represented as part of a package of preventative medicine for obesity-related diseases such as cardiovascular disease and stroke (Frank, Andresen and Schmid 2004). These walkable built environmental factors provide "therapeutic spaces" in which health is played out (Frumkin 2003; Smyth 2005).

In establishing a link between built environmental factors and physical activity, recent studies demonstrate that neighborhoods with more four-way intersections (a measure of street connectivity), more diverse land use mix, and higher density of housing are associated with a greater proportion of walking trips (Boer *et al* 2007). They therefore promote urban form and placemaking strategies as potential strategies for improving public health outcomes—or at least, increasing opportunities for self-selectors who might be inclined to live in more walkable environments. While analysis of specific built environmental factors is in its infancy, several authors support the idea that walking activity may be higher in areas with greater land use density and diversity; continuous and connected street networks; buffered sidewalks; and visually interesting design features (Burden 2000; Boer et al 2007; Rosenblatt Naderi 2005).

Table 8: Built environment factors identified as health-related walkability benefits

Source / Parameter	Neighborhood design features associated with walking trips (Boer et al 2007)	Route choice factors associated with walking trips (Rosenblatt Naderi 2005)	Burden's walking level of quality (LOQ) factors
Presence & maintenance of sidewalks	–	Sidewalk width (commuters)	Five-feet minimum sidewalk width; Maintenance of sidewalks
Path directness & street connectivity	More four-way intersections	Street connectivity (commuters)	–
Land use density & diversity	Diverse land use mix; higher density housing	–	Retail & housing density & orientation
Visual interest, sound & sense of place	–	Previous experience & site reputation; Defined spatial edge; Proximity to potable water, sitting places & light; Sound sources like water & music (health walkers)	Attractive edges, good lighting & street furniture
Temperature, street trees & landscaping	–	Appropriate weather, water features & shade trees (health walkers)	Good landscaping
Separation & speed of traffic	–	Removal from traffic (health walkers)	Narrow traffic lanes & slow speed traffic; On-street parking, planters, bike lanes & buffers to the street; Driveways reduced or set back
Crossings, safety & security	–	–	Well marked crossings, curb extensions & pedestrian signals

(Source: Boer et al 2007; Rosenblatt Naderi 2005:161-164; Burden 2000)

Public health researchers remind us that not all pedestrian trips have a transportation purpose. Some pedestrians walk for exercise or recreation, and the design features that encourage these walkers are not entirely the same as those encouraging transportation-related trips. Rosenblatt and Naderi found that, when choosing a place to walk, pedestrians who walk for health-related reasons consider aesthetic and phenomenological factors such as shade, water, noise, seating, lighting, well-defined spatial edges and the reputation of the place (Rosenblatt and Naderi 2005:161-164). By contrast, pedestrian commuters were more likely to consider physical factors such as street connectivity and sidewalk width (Rosenblatt and Naderi 2005:156).

Pedestrian spaces as enfranchisers
Finally, walkability has been raised by authors and activitists in the field of political science have represented pedestrian space as forums for the expression of political rights or civic spaces that facilitate participation in processes of community, citizenship and politics. While research on this relationship is very limited, Mason and Fredericksen (2006) suggested a link between more walkable (pre-WWII) neighborhood design and rates of civic engagement in terms of voting and voluntarism. In Bogotá, Colombia, former Mayor Peñolosa argued that planning and developing more walkable communities creates more democratic and "civilized cities" because pedestrian facilities provide access to a greater portion of the community than that of road or rail improvements (Peñolosa 2000). This argument is particularly relevant to developing world cities where low average incomes disqualify many people from accessing community assets via private automobiles or even public transit. It is also relevant to recent events in the Middle East, where public pedestrians spaces were the physical forums in which social contestations were played out and societal demands were made to political leaders.

Representations Produce Space

As discussed above, walkability planning is largely framed by the discourse in which walkability metrics are generated. In the case of walkability, many different disciplines—including traffic engineering, transportation planning, urban design, disability rights, public health and political science—influence pedestrian planning and employ metrics or representations for walkability. Representations that gain traction most effectively are those that produce pedestrian public space.

According to Lefebvre (1974), all *space* is *produced*. The physical space of urban pedestrian facilities, the intellectual space of planning, and the social space of nations do not just exist. Rather, these spaces are produced by representations (conceived space); spatial practices (perceived space); and the meaning behind lived experience (representational space).

Production of Indonesian national space
Indonesia specialist, Benedict Anderson, explored this process of producing space at the level of nation in his treatise on *Imagined Communities* (Anderson 1991).

In 1945, Indonesia was declared as an independent nation by Sukarno. At that time, the people in whose name he spoke included over 300 different ethnic groups "from Sabang to Merauke", with diverse lifestyles, political histories and over 700 different languages (Gordon 2005).

Before the 1870s, many of these groups had almost no interaction with one another except their common connection to foreign traders in the region.

What made these disparate people a unitary nation in 1945[10] was their mutual connection to the West in the form of Dutch colonial rule. However, this connection varied widely: In Jakarta, as it is now known, the Dutch had a presence since 1619 and the city was chosen as the administrative center of the Dutch East Indies colony since inception in 1800 (Abeyasekere 1987; Osbourne 2004). In Aceh, on the other hand, Dutch invasion did not occur till 1873 and the locals managed to hold off colonization till about 1910. Still other areas, like West Papua, were colonized in a more theoretical sense since only a few hundred Dutch people managed to settle the region, and even these settlers could hardly make their way across the mountainous terrain to exert a presence in the interior.

Given the newness and strangeness of colonization in many parts of the archipelago, the "imagined community" of Indonesia cannot be completely explained by top-down colonial processes across the region (Anderson 1991). Instead, a more Gramscian notion of *hegemony* is needed where ideas of the dominant class gain consent among the population through both education and resistance (Gramsci 1917). Education came in the form of colonial "Ethical Policies" (mostly targeting Java and Sumatra), while resistance included anti-colonial, nationalist movements exemplified by youth organizations—with the youths presumably having being educated by the Dutch as part of the ethical policies. It was the nationalist Youth Pledge of 1928 (reproduced below) that introduced and represented "Indonesia" as a nation with bahasa Indonesia—a standardized, Romanized version of bahasa Malay—as a lingua franca for the archipelago.

> *Kami putra dan putri Indonesia, mengaku bertumpah darah yang satu, tanah air Indonesia.*
> *Kami putra dan putri Indonesia, mengaku berbangsa yang satu, bangsa Indonesia.*
> *Kami putra dan putri Indonesia, menjunjung bahasa persatuan, bahasa Indonesia.*
> [We sons and daughters of Indonesia declare to be of one place of birth, the Indonesian land.
> We sons and daughters of Indonesia declare to be of one nation, the Indonesian nation.
> We sons and daughters of Indonesia revere the language of unity, the Indonesian language.]
>
> Sumpah Pemuda [Youth Pledge] 1928

Colonial maps, archives, roads and rail networks, as well as anti-colonial activities and new linguistic products such as novels and newspapers all reinforced the social space of Indonesia as an "imagined community" (Anderson 1991). Along with other area specialists such as Furnivall and Scott, Anderson argued that the social, mental and physical *space* of nationhood was neither natural nor traditional, but was produced through visual, political and linguistic representations (Furnivall 1948, Scott 1998).

After independence, the notion of nationhood continued to be represented as *normal* through both a top-down *development* agenda of the post-colonial government and bottom-up activities

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[10] Sukarno declared Indonesian independence in 1945, but the Netherlands did not concede sovereignty until 1949.

by government detractors and local communities. With heavy censorship of radical writing during the Suharto New Order regime, some political activists resorted to indirect critiques of the government by publishing ancient Javanese literature. These covert critiques compared the regime to well-known *wayang* characters or to *zaman edan*—the age of madness supposedly predicted by Jayabaya in the twelfth century. According to vernacular interpretations of the Jayabaya prophecies, *zaman edan* is represented by the periods of conflict and upheaval that seem to "inevitably" occur between cycles of Indonesia leadership like the Java War from 1825 to 1830, the Indonesian National Revolution in the late 1940s, the period of extra-judicial killings following 1 October 1965, and the riots and upheaval following the Asian Monetary Crisis in 1998 (see Figure 8). An alternative interpretation of *zaman edan* represented the entire New Order regime was *zaman edan* since fear reigned and law was flouted for the sake of unjust gain (Soesilo n.d.).

| Javanese princes | Dutch colonizers | Japanese occupation | Liberal Democracy & Sukarno's Guided Democracy | Suharto's New Order Regime |

| *Zaman edan:* | Java War 1825-30 | World War II 1942-45 | Indonesian National Revolution 1945-50 | *Gestapu* & killings, 1960s | *Krismon* (Monetary Crisis) 1997-98 |
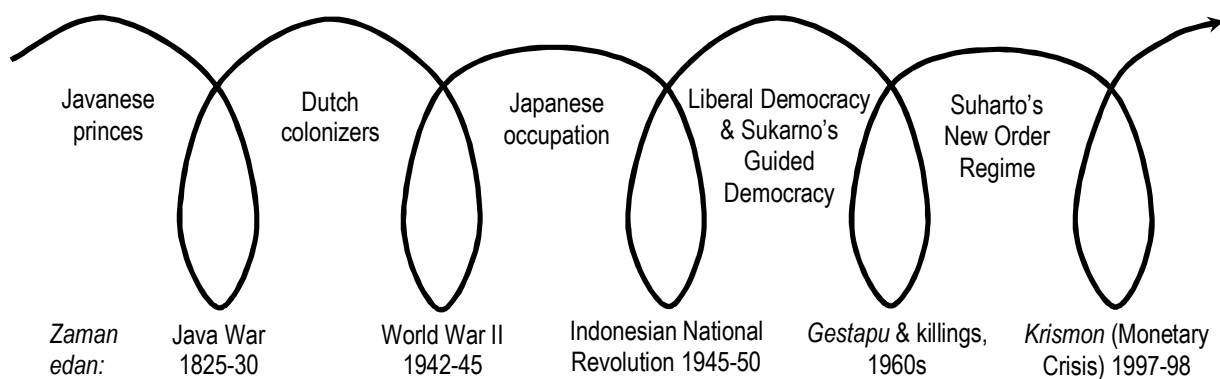
Figure 8: A popular interpretation of Indonesian history based loosely on Jayabaya predictions from the twelfth century

While both of the above interpretations were critical of the New Order regime, they did not question the notion of nationhood itself. Instead, the nation was represented as having a place—albeit a dysfunctional place—within the ancient cycle of national leadership and mythology (Soesilo n.d.).

Production of the disciplinary space of planning
While representations are useful in producing the social space of nationhood, they are also used in the production of disciplinary space, such as that of urban planning. Prevailing practices within these social or disciplinary spaces, then produce "common sense" or customary knowledge regarding what is *normal* within that space. Once knowledge achieves this privileged position of common sense the normalness of the space is rarely challenged. Instead it is perpetuated through ongoing discourse within and around this space.

The disciplinary space of planning is replete with notions of what is normal—as are other social spaces like that of nations and families.

On 17 August 2008, I took a break from my research to celebrate Indonesian Independence Day and visit relatives on the other side of Jakarta. The journey involved several bus rapid transit (BRT) links, a hire-motorbike, and a couple of small local buses, and I reached the neighborhood

in just under three hours. From the entrance to the neighborhood, I made my way across a small river, through boisterous community festivities, and along narrow concreted alleyways to the house of my relatives. When I finally arrived at the house, I was treated to a scoop shower and a hearty meal of several large fish, a small bowl of red meat, vegetable soup, and rice. Tired and hungry from the journey, I filled my plate, pausing momentarily to ask what type of meat was being served. "*Daging biasa* [normal meat]", came the reply, a response I dismissed as incomprehensible or evasive until I later realized that "normal meat" meant black dog meat, a Batak delicacy.

Like in any other social space, the idea of what is normal in urban planning is largely defined by discourse and custom. Just as a nation (as a social space) or the eating of black dog meat may seem normal or commonsensical among people for whom it is customary, transportation planning also has customary norms. These norms represent a sort of common sense constructed through discourse by a particular set of people in response to particular conditions in a particular place. When this common sense is transmitted through words, actions and representations it affects places well beyond its initial intention or application.

During the twentieth century, Western discourse on urban transportation planning customarily focused on big, motorized things that move fast—trams, trains, cars and buses along with their respective corridors and facilities. Motorized modes and images of their associated networks became common sense in urban transportation planning and were transmitted well beyond their sites of initiation. In this way, modally and geographically biased representations of transportation were used to produce urban pedestrian space in places that varied markedly from that in which the discourse was derived.

Production of the conceptual pedestrian space
In addition to the social space of nationhood and the disciplinary space of planning, Lefebvre's theory can also be applied in relation to urban pedestrian public space. In this case, the conceptual and physical space of pedestrians can be seen as produced by:

- representations such as network maps, development plans, and codes that address pedestrian space either explicitly or implicitly;
- spatial practices of development, commercial activity, social interaction, landscaping and walking; and
- representational space such as the symbolism of national development, social status associated with driving or perceptions of safety and security.

As the capital city of Indonesia, Jakarta and its urban public space play a special role in the production of Indonesia as a national space. Urban public spaces such as statues, pedestrian plazas, parks and protocol roads play a political and symbolic role in the national imagination, and Jakarta's pedestrian space frequently function as monumental spaces to symbolize nationhood, modernity and development.

Development (or *Pembangunan*) was a key slogan used by Sukarno in his left-leaning rhetoric on the legitimacy of the post-colonial, nationalist regime. Within the framework of *Pembangunan*, Jakarta was imagined as the glorious capital for a populace (*rakyat*) who

struggled and triumphed over the darkness of colonial domination (Abeyasekere 1987). As a symbol of this triumph, a 132-metre high, gold-plated torch was erected at the center of a 1-kilometre square park in the administrative heart of Jakarta (see Figure 9). The park within which this National Monument (Monas) is located was developed during the Dutch colonial era when it was known as *Koningsplein* (King's Square) but reappropriated by Sukarno as *Lapangan Merdeka*—the Field of Independence (Cybriwsky and Ford 2001:204; Rachman 1995:44).

Figure 9: MONAS: Pedestrian space as a symbolic representation of nationhood

While the political orientation of subsequent regimes differed from that of Sukarno's revolutionary rhetoric, *Pembangunan* has endured as a legitimizing concept for the nation building project. Likewise, symbolic monumentalism—grand spaces for sightseeing, strolling and now shopping—have endured as the focus of the city's pedestrian planning efforts. Recently, for example, 16-foot sidewalks featuring colored pavement, textured wayfinding paving stones, shade trees and street furniture were installed along the city's main "protocol road", Jalan Sudirman. This road represents Jakarta's main commercial spine and is the main route through the city for both the President and international guests. Likewise, luxurious sidewalks with a checkerboard pattern of granite tiles were installed along Mega Kuningan, a prominent circular road that rings a number of high end international hotels (see Figure 10).

While there is nothing wrong with high-end pedestrian facilities, the lack of any such facilities throughout most of the rest of the city raises concerns with respect to social equity and gross asymmetries in the planning and provision of pedestrian facilities. I raised this concern when visiting Jakarta in 2005 to provide input on an upgrade of a historic square in Old Town Jakarta (*Kota Tua*) proposed by then Governor Sutiyoso.

Figure 10: Patterned, granite sidewalk at Bundaran Mega Kuningan

During my meeting with the head of the Department of Landscaping (the city department responsible for pedestrian planning), I suggested that the plaza be connected to transit nodes and local neighborhoods through a comprehensive network of sidewalks that serve the needs of ordinary pedestrians. This proposal was not met with enthusiasm. Instead, the Department Head pulled out plans to discuss another proposal for some very elaborate traffic calming through mosaic-style repaving of a pedestrian crossing within a high-end shopping area abutting Jalan Sudirman. I was taken aback by the high cost and grandeur of this plan that seemed to project an image of conspicuous modernity in an already well-provided area, when basic elements such as walkable sidewalks and crossings were missing just two blocks away. From the conversation, I did not get the impression that decision-makers and planners within the Department were ill-willed: it was simply that everyday spaces were absent from their cognitive and official maps of pedestrian space within the city. (The issue of synoptic legibility will be discussed further in Chapter 5.)

Within Jakarta, the almost exclusive focus of pedestrian planning on monumental and synoptically legible sites, like Jalan Sudirman, Lapangan Merdeka and Mega Kuningan, highlights the conceptual boundaries of planned pedestrian space. Within the disciplinary space of Jakarta's planning, pedestrian facilities are conceived as monumental spaces that beautify the city and serve as symbols of nationhood, modernity and development. What are omitted from this conception of pedestrian space are the functional spaces and routes of travel that are used by the bulk of the city's pedestrians.

Production of everyday physical spaces of walking
A lack of representation or legibility of ordinary pedestrian spaces within Jakarta's planning framework has produced physical pedestrian spaces that are chronically underprovided and undermaintained throughout much of the city. This lack of representation is evident the quality of sidewalks, crossings and public spaces in Jakarta.

Throughout much of Jakarta, sidewalks and pedestrian facilities are often absent or dilapidated: Sidewalks are missing along many congested main roads and neighborhood streets, which forces pedestrians to compete with motorbikes and other vehicles that use the unpaved and uneven shoulder of congested routes (see Figure 11). Sidewalks are also not provided in a systematic manner along many neighborhood streets resulting in discouraging and dangerous conditions for pedestrians. This is particularly true in low-income neighborhoods (see Figure 12) but is even the case in many high-end residential areas where pedestrians share road space with motorized vehicles. In other places, sidewalks were originally installed but are now unusable due to encroachment—sometimes total encroachment—by informal building construction, informal commercial activity, vehicle parking and motorbike riders (Figure 13).

Figure 11: A cart-pusher meanders between poles and competes with motorbikes and trucks using the unpaved shoulder of Jalan Daan Mogok, West Jakarta

Figure 12: Missing pedestrian facilities in a low-income neighborhood of Karet Karya, Central Jakarta

Figure 13: Sidewalk encroachment and damage by vehicle parking in Central Jakarta

Lack of maintenance is also a problem in many parts of Jakarta where sidewalks are made from culvert covers which break or shift out of place as a result of floods or vehicle encroachment. At a minimum, a failure to repair and maintain these sidewalks creates tripping hazards for pedestrians. More usually, it results in dangerous conditions since broken or unstable culvert covers expose a 2 foot drop into often stagnant, garbage-filled and mosquito-infested ditches below (Figure 14).

Figure 14: Broken culvert covers create dangerous sidewalk conditions in Central Jakarta

In addition to sidewalk concerns, crossing facilities are also woefully inadequate throughout much of Jakarta, creating unsafe conditions and social severance of communities on opposite sides of the street. Along some main roads, the city has tried to resolve this situation by installing pedestrian overpasses, which allow vehicles to flow unabated along the public right-of-way while pedestrians are expected to expend energy traveling out of their way, climbing steep stairs and winding up and down ramps in order to cross the road. Those who are unwilling or unable to take use these circuitous, overpass routes face dangerous at-grade crossing conditions. In these situations, at-grade crossing is even less safe due to a lack of other pedestrians, which creates motorist expectations of uninterrupted traffic flow (Jacobsen 2003) (Figure 15).

Figure 15: A pedestrian waits to make a dangerous crossing rather than using an inconvenient pedestrian overpass in West Jakarta

Discourse, Multidisciplinarity and the Production of Unwalkable Space in Jakarta

Like many majority world cities, Jakarta's main mode of transportation is walking—an activity that has different implications in many different disciplines. Walkability is represented in discourse on traffic flow, urban sense of place, multimodalism, international development goals, civic engagement, traffic safety, obesity reduction, aging, and disabled access. Given this multidisciplinary span of walkability, walkability planning is also necessarily multidisciplinary.

By contrast, the production of pedestrian spaces in Jakarta has been largely neglected within Jakarta's planning system and much of Jakarta's public urban space is suboptimal from the perspective of walkability. Jakarta's planning is instead dominated by modally and geographically biased approaches to urban space as reflected in international planning discourse that tends to emphasize Western applications and motorized transportation goals, and domestic political discourse that focuses on modernity and symbolic monumentalism. In order to improve walkability, there is therefore a need for a more multidisciplinary planning process, which draws

upon approaches of multiple disciplines and emphasizes coordination between different agencies within the city.

Multiple discursive approaches to walkability
One of the root causes of a lack of multidisciplinarity or interagency coordination, is cognitive dissonance between physical realities and conceptual notions of public space. Said another way, a lack of multidisciplinarity derives from a disconnection between the function of urban public space, where pedestrians are key users, and planning goals, which focus on motor vehicles and modernity.

This disconnection or cognitive dissonance is not merely a planning issue, but is reflected in the wider political discourse of the city, and even lay discourse on what it means to be a pedestrian. While interviewing pedestrians in Central Jakarta, for example, I became aware that symbolic ideas of nationhood trumped people's own actual experience when it came to how they viewed walking and pedestrian space. For example, one woman indicated that when she thought of walking, she thought of having an "experience" like strolling through Monas:

> *Ya, penilaian saya sih kalau jalan kaki itu kita bisa sambil mencari pengalaman… Ya pengalaman sambil kita olahraga juga untuk kesehatan kita juga. Soalnya saya juga senang jalan kaki… Iya, senang banget apalagi kalau jalan-jalan ke Monas gitu. Kan pada jalan juga gitu.*
> [Oh, what I think of (when I think of walking) is that if we're walking we can have an experience at the same time… Yes an experience that we can have while exercising for our health. The thing is I also enjoy walking… Yeah, I really like it—especially if it's strolling (or going on a trip) to Monas. Everyone's walking (or on the street) there.]

When asked more about her actual daily experience of walking, however, a very different picture emerged. The interviewee confessed that she never took a leisurely walk and never visited Monas, because she spent Monday through Saturday walking through neighborhoods doing her work as an informal entrepreneur. On her day off, she was exhausted and rested:

> *Suka cape sayanya gimana gitu. Tapi namanya orang suka banyak urusan ya saya jalanin aja. Tapi tidak begitu-begitu banget.*
> [Well, walking makes me tired. But that's me – someone who has a lot of work to do, so I just have to do it. But it's not that bad really.]

Though walking was an extremely important part of this woman's life, her most immediate association with walking had nothing to do with her own experience. Instead, it was the powerful vision of grand pedestrian spaces projected by Indonesia's nation building discourse. In a similar way, planning documents and studies (see Table 2 for example) acknowledge walking as the main mode of transportation yet propose motorized transportation strategies that fail to address both present and future walkability.

Walkability and the case for inter-agency cooperation
Studying and planning for pedestrianism is challenging because walking is a multidisciplinary activity and therefore requires multi-disciplinary metrics. At the present time, however, many

walkability metrics presume walking to be a single use movement and suggest metrics which contradict those emerging from other disciplines or from information on the actual needs or expressed desires of pedestrians themselves.

In Jakarta, the result of this disconnection is that planning is represented through the dominant discourse of motorization, modernity and nationhood, with spaces largely produced through a modally biased planning discourse that originated in the West. In Jakarta and elsewhere, funding of research, planning and development for vehicular modes is several orders of magnitude greater than that for pedestrian transportation despite the latter's legacy throughout human history. Many aspects of pedestrian transportation therefore represent a silence within planning discourse, particularly where modernist highway planning has dominated discourse on transportation planning. Instead, Jakarta's pedestrian planning has focused on symbolic spaces rather than the everyday and informal—the *pedestrian* experience itself.

In order to rectify this situation and improve walkability planning within Jakarta, there is therefore a need to address the issue of cognitive dissonance that undermines interagency coordination and multidisciplinary approaches to urban planning. To plan for walkability requires both multidisciplinarity and a willingness to conceive and plan urban space in a more coordinated, inter-agency and multidisciplinary manner.

Checklist for policy-makers:

- Is there an overarching plan for entire pedestrian routes of travel and public space?
- Does pedestrian planning involve inter-agency coordination?
- Are all related disciplines (e.g. engineering, urban design, public health, multimodal planning, international development) reflected in processes and metrics for walkability planning?
- Do transportation plans and metrics include walkability metrics, and not just indices of vehicular flow efficiency?

Chapter 3: Ethnography: Defining Walking and Walkability

Life's but a walking shadow, a poor player
That struts and frets his hour upon the stage
And then is heard no more: it is a tale
Told by an idiot, full of sound and fury,
Signifying nothing.

(William Shakespeare, *Macbeth*, act 5, scene 5)

Hidup seperti mimpi
laku lakon di layar terkelar
aku pemimpi lagi penari
sedar siuman bertukar-tukar

[Life is a dream, something
Played behind a screen, and I,
Now dreamer, now dancer, am pulled
In and out of existence.]

(Amir Hamzah, *Sebab Dikau*,
Poem translated by S.T. .T. Alisjahbana, Sabina Thornton & Burton Raffel)

Language, Culture and Objectivity in Planning

Planning cannot be divorced from language and culture. It is culturally-embedded language that conveys discourse and either deliberately or unknowingly shapes planning parameters such as that of streets, public spaces and even the "design pedestrian" herself. In order to understand and plan for walkability, it is therefore important to consider what pedestrians signify within language, culture, and the discourses surrounding the development of pedestrian space. While it may seem excessive to define something as pedestrian as pedestrians, the linguistic and cultural definition of pedestrians and walking strongly influences how they are accommodated in the design of infrastructure and the urban environment as a whole.

While clarity of terminology is important everywhere, it is even more important when pedestrian planners are designing infrastructure within a creolized language context such as that of Indonesia, where planning incorporates many foreign terms and actors. Without clear definitions of both pedestrians and walkability, those who plan pedestrian space run the risk of engaging in a planning process that is full of sound and fury yet signifies nothing.

What is a pedestrian? Language as a conduit of planning discourse

> **pe·des·tri·an** (pə-dĕs'trē-ən)
>   n.   A person traveling on foot; a walker.
>   adj. 1. Of, relating to, or made for pedestrians: *a pedestrian bridge.*
>   2. Going or performed on foot: *a pedestrian journey.*
>   3. Undistinguished; ordinary: *pedestrian prose.*
>   (The American Heritage Dictionary, 2004)

Since much of the planning field is dominated by English-language texts and actors, the definition of walking and walkability within English has a disproportionate influence on pedestrian planning throughout the world. Within English, the meaning associated with walking and walkability varies widely across the many disciplines that intersect with pedestrian planning.

The Compact Oxford Dictionary (2006) defines a pedestrian as "a person walking rather than traveling in a vehicle". Pedestrian activity is therefore defined as a mode of transportation comparable to vehicular modes such as driving, cycling and catching the train. Pedestrians walk for different transportation-related reasons including getting from origins to destinations (like commuting from home to work); transferring from one mode to another (like at a transit interchange); and accessing destinations (like going between the garage and the house at the end of a trip). This definition of pedestrians is often tacitly adopted by those engaged in the planning of transportation and urban public space.

The American Heritage Dictionary makes no reference to pedestrians as a *mode of transportation*, but simply defines a pedestrian as "a person traveling on foot or a walker", thereby expanding the definition to those walking for non-transportation purposes such as exercise or recreation. This more multifaceted definition is supported by advocates and researchers on the issues of healthy communities, active living and aging in place. According to

these advocates and researchers, both cultural and built environmental factors are needed to promote regular exercise, active transportation and non-automobile access to opportunities for employment, civic engagement and social interaction, especially in minority, low-income and aging communities (Orleans *et al* 2009, Partners 2007).

On the basis of social equity, the definition of pedestrians could be further expanded to include those using wheelchairs or other aids, as supported by legislation such as the Americans with Disabilities Act (ADA) or the Australian Disability Discrimination Act (DDA). Amalgamating the notions of walking and accessibility may be important from an equity perspective and expedient from the perspective of integrated planning for non-vehicular public space. On the other hand, this integration may be seen as muddling linguistic concepts and complicating pedestrian planning, particularly when the ideas are then translated to other planning contexts. While working on a pedestrian planning project in Central Jakarta, for example, one local planner expressed concern over strategies aimed at improving the universal accessibility of pedestrian facilities since these strategies would make it easier for people to ride motorbikes and park cars on the sidewalk—common practices that reduce the safety and amenity of facilities for pedestrians more generally.

Notwithstanding this difference, many policy documents reinforce and implement an inclusive definition of pedestrians. Title 23 of the U.S. Code defines a pedestrian as "any person traveling by foot and any mobility-impaired person using a wheelchair" (§ 217) and transportation agency documents, such as the Wisconsin Pedestrian Policy Plan, defines a pedestrian as "any person walking, standing or in a wheelchair" (Wisconsin DoT 2000:19).

While the inclusion of wheelchair users is widely supported by laws and policies (though sometimes lacking in practice), the status of stationary pedestrians is more ambiguous. Many urban designers and preventative health advocates praise places with large numbers of people walking, using wheelchairs and standing (as well as running, shopping, sitting, working and watching) because of their contribution to street life, eyes on the street, active living and place-making (Jacobs 1961; Whyte 1980). In other locations, however, a person standing in a public area with no apparent purpose is labeled a loiterer, and can be removed or fined for such an act—a policy that potentially works at cross-purposes with urban design for livable and social spaces. Historically, many cities have discouraged the act of standing in public areas in order to prevent unregulated commerce, vagrancy, civil disturbance, criminal activity or the image of the above.

In any case, how pedestrians are defined, both in English and in Western planning discourse, fundamentally shapes how they are accommodated within planning both in the West and beyond.

As discussed in Chapter 2, walkability is understood very differently in different disciplines that shape urban public space, and part of this dissonance is the result of differences in definitions and conceptions of walking and pedestrians themselves. For example, when pedestrians are defined simply as those traveling by foot for the purpose of transportation, pedestrian plans will tend to dismiss the value of urban design approaches to promoting street life, since street life actually impedes the performance of pedestrians as "traffic units". Similarly, when pedestrians are defined to include those who use wheelchairs and other mobility aids, pedestrian plans will tend to emphasize more universal accessibility. The wide variety of definitions for what

constitutes a pedestrian, however, highlights the limitations of language in supporting and clarifying policy on urban pedestrian space. For further detail on varied disciplinary definitions of walkability please see Chapter 2.

What is walking? Language and the uncertain concept of 'jalan'

jalan
> **1.** road, path, street: ~ *Maluku* Moluccas St. ~ *aspal* paved road. ~ *bebas hambatan* freeway. ~ *bentar* bypass, main road. ~ *buntu* 1 dead end, blind alley. 2 deadlock, impasse, stalemate. ~ *butulan* access road. ~*cukai* toll road. ~ *dagang* trade road. ~ *mati* dead end. ~ *niaga* trade route. ~ *pelayaran* shipping lane. ~ *pendek* short cut. ~ *pintas* short cut. ~ *protocol* main road of an area (over which official visitors enter). ~ *raya* highway. ~ *raya cepat* throughway, expressway, turnpike. ~ *samping* access road. ~ *serap/setapak* footpath. ~ *simpang* side road. ~ *singkat* short cut. ~ *tambak* roadway, embankment, causeway. ~ *tembus* thoroughfare. ~ *tikus* tiny path. ~ *tol* rollway road. ~ *ulama* main highway. **2.** course s.t. follows: ~ *air* waterway. ~ *angin* exhaust pipe. ~ *darah* bloodstream. ~ *napas* respiratory tract, trachea. ~ *peluru* bullet trajectory. ~ *perkencingan* urinary tract. ~ *pikiran* train of thought. **3.** way, manner: *dgn* ~ by means of. *Bagaimana ~nya membuat bom atom?* What's the process for making an atomic bomb? *lewat ~ belakang* underhanded, through the back door. ~ *serang* cunning ways. *Itu tdk pd ~nya* That is not proper. **4.** course: *~nya pemeriksaan lambat* the course of the investigation is slow. **5.** be going on, be approaching: *Ia sdh ~ sepuluh tahun* He is going on 10. **6.** lineal family relation: *Menurut ~jalan bapak, saya berasal dr Sumatra* On my father's side, I come from Sumatra. **7.** pass, go: *Minta ~ tuan?* May I get by, sir? ~² (go for a) stroll: *Mari ~* Let us take a walk. **se~ 1.** parallel: *Garis-garis itu ~* Those lines are parallel. **2.** be in accordance, incompliance: *Kelakuannya tdk ~ dgn kedudukannya* His behavior is not in accordance with his position. ~ *dgn permintaannya* in compliance with her request. ~ *jadi* of the same mother. **menye~kan** make s.o. be in compliance or compliance: ~ *program dgn anggaran yg tersedia* Make the program comply with the budget available. **kese~an** being of o. mind: *Ia dan saya ~ tafsir dlm persoalan itu* He and I are of the same mind in the way we interpret the problem. **ber~ 1.** walk: *Jangan ~ di tengah-tengah* Do not walk in the middle of the road. ~ *bengkok* follow the crooked path. ~ *dahulu* 1 precede s.o. 2 predecease. ~ *darat* go overland. ~ *dr pintu belakang* be dishonest. ~ *di atas rel* stick to the business at hand. ~ *empar* walk with toes turned outward. ~ *kaki* go on foot **2.** run (of an engine): *Tutuplah penutup radiator sambil mesin ~* Close the radiator cap while the engine is running. ~ *stasioner* idle (of motor etc.). **3.** run, go, work. *Pekerjaannya ~ dgn lancar* Her work is going smoothly. *Perusahaan yg ~* a going concern. **4.** be going on a certain age: *Ia sdh ~ sepuluh tahun* He is going on 10. **ber~² 1.** take a stroll. **2.** take a pleasure trip. **men~i 1.** walk on. **2.** undergo, endure (an operation, military training, punishment, etc.). **3.** go through a period of o.'s life or certain experiences: ~ *hidup baru* enter on a new life. **4.** travel through s.w. **men~kan 1.** drive (car etc.), operate (machine). **2.** start, put into operation (a car, etc.) make s.t. go *Ia ~ kudanya kencang* She made her horse go fast. ~ *uang* lend out money at interest. **3.** carry out, perform (o.'s duty), put into effect: *Di~kanna peraturan baru itu* He put that new regulation into effect. **4.** serve (prison sentence). **~an 1.** pathway. **2.** road, track: ~ *msk* driveway. **pe~** walker: ~ *kaki* pedestrian. **per~an 1.** trip, journey, tour: ~ *dinas/jabatan* official travel. ~ *tunggal* o.way trip. ~ *perdana* maiden voyage. **2.** course: ~ *bintang* course of a star. ~ *darah* circulation of the blood. ~ *napas* respiratory tract.
>
> (Source: Echols-Shadily Indonesian-English Dictionary 1989)

If the problems of defining pedestrians in English are difficult, they are nothing compared to the linguistic uncertainty surrounding walking in bahasa Indonesia. When doing pedestrian research

or planning in Indonesia, the notion of what is a pedestrian is further complicated by linguistic ambiguity surround the word *"jalan"*. *Jalan* is somewhat akin to the English term "way", but also encompasses the notion of walking or getting something to move.

According to the Echols-Shadily Indonesian-English dictionary (1989), *jalan* is the term for street, road or path; the course that something goes; or the way something is done. *Jalan* also has various verb forms including: *berjalan,* which means to walk, run, go, work, run something or be going on a certain age; *menjalani*, which means to walk on, undergo or endure, go through a period of life, or travel through; and *menjalankan* which means to drive, operate, start, make something go, perform, or serve (as in a prison sentence). There are also other forms of *jalan* such as its repeated forms, *jalan-jalan* or *berjalan-jalan*, which mean to go for a stroll or to take a pleasure trip; *pejalan* or *pejalan kaki*, which means a walker or pedestrian; and *perjalanan*, which means a journey, trip, or course. To add further to the ambiguity surrounding *jalan*, many of the prefixes, suffixes and auxiliary words are dropped in spoken Indonesian – so that someone can use *jalan* when the strict grammatical term is *berjalan* or *menjalani*. There are also various slang forms of *jalan* such as *jalanin*, which means to make something happen or get something done.

What all this ambiguity means is that data collection on walking in an Indonesian language context is complicated by the slipperiness of the language itself. Unless survey or interview respondents voluntarily and distinctly specify *jalan kaki* (walking by foot)*,* it is difficult to know for certain that they are still talking about pedestrians and have not drifted off into one of the multitude of other meanings of the word. This was exemplified in the following excerpt of a pedestrian interview in Central Jakarta:

> - *[Jalan] Sudirman… Ibu suka Sudirman kenapa?*
>   [Sudirman (Road)… Why do you like Sudirman?]
> - *Kalau saya sih memang jarang jalan mba. Kalau saya kan di warung mulu jadi jarang jalan*
>   [I don't walk (or go out) that much, miss. I'm normally in the stall, aren't I, so I rarely walk (or go out or on trips).
> - *Yah misalnya kalau jalan lebih milih Sudirman misalnya?*
>   [Yes (but) for example if you walk (or go on a trip), would you tend to choose Sudirman for example?]
> - *Ya kalau kita mau ke luar kota lewat situ lebih gampang kan*
>   [Yes if we want to go out of town then it's easier via that way.]

At the beginning of this passage, the interviewer is asking the interviewee why she likes to take Jalan Sudirman (Sudirman Road) to which the interviewee responds that actually she doesn't walk very much. The interviewer probes further to ask why she would choose Jalan Sudirman (which she had previously identified as her favorite street for walking in the area) when she walks. To this question, the interviewee reinterprets *jalan* as going on a journey and responds that she takes that route when she's going out of town. By the end of the exchange, the interviewer and interviewee are talking about two completely different things.

The ambiguity of language relating to walking or "*jalan*" (a term that also means going, road, way, operate and path) makes interview data on pedestrian activity fraught with difficulty. This linguistic and cultural difficulty provides a compelling case for using ethnography and in-depth analysis in conjunction with the usual, more quantitative transportation survey techniques. While this particular linguistic challenge is unique to Indonesia, the case for ethnography and qualitative analysis is likely to resonate in many other parts of the world where transportation research and planning methods are largely imported from the West.

Creolized discourse and the production of pedestrian space
As described in the previous section, language can be an obstacle to pedestrian planning in both English and bahasa Indonesia. When planning occurs within a creolized discourse that combines both languages, however, these linguistic difficulties are compounded.

In Indonesia, the official language is bahasa Indonesia, though many policy makers and researchers have some command of English and/or Dutch since they are the languages of university instruction for technical subjects, are needed for reading various documents, textbooks and archives, and are beneficial for interacting with foreign agencies. Since the 1960s, Indonesia was the largest recipient of World Bank funds (due in part to Suharto's staunchly anti-communist stance) and this heavy Western investment resulted in enormous English-language influence in terms of consultants, policy advisors and source documents. As a result, policy development tends to occur in a modern, creolized discourse with many documents originally written in English or Dutch and then translated into a bureaucratic form of formal bahasa Indonesia that liberally incorporates terminology from these European languages.

Once the documents are in bahasa Indonesia, data collection and policy implementation is undertaken in the national lingua franca and regularly summarized and translated back into English for digestion by foreign policy advisors. As a result, policy development for urban infrastructure in Indonesia tends to be characterized by a creolized discourse which goes back and forth between Indonesian and English language concepts without pausing to consider or acknowledge the lack of correspondence in what words represent or the very different associations of concepts in bahasa Indonesia and English.

By way of example, in 2010, I was invited to provide input on Indonesia's draft national guidelines for pedestrian facilities and bicycle transportation implementation in urban regions. When I joined the project, I was initially emailed only the English version of the draft documents to be reviewed by a group of non-motorized transportation specialists from various countries. The documents had obviously been machine-translated with numerous fundamental and glaring errors, as seen in Table 2. In some cases, the translation simply turned the text into amusing but harmless nonsense: "the Roads Act" was translated as "the Law on the Way"; and "developed areas" were translated as "areas of resurrection". In other cases, however, the translation resulted in a complete change or reversal of the document's intended meaning: "non-motorized vehicles and road users" were translated as "motor vehicles and uses not on the road"; and "non-motorized vehicles" were translated as "no motor vehicle". In either case, it is easy to imagine how pedestrian planning concepts, which are already ambiguous, are further befuddled by the linguistic confusion of operating within a creolized planning process.

Table 9: Selected translation issues from the Indonesian Draft National Guidelines for Pedestrian Facilities and Bicycle Transportation Implementation, 2010

Original wording	Correct translation of original wording	Machine generated translation provided to international consultants
kendaraan tidak bermotor	Non-motorized vehicle(s)	no motor vehicle
kendaraan tidak bermotor dan penggunaannya di jalan	non-motorized vehicles and road uses	motor vehicles and uses not on the road
potongan jalan dan rencana jalur sepeda	cross section of the road and bicycle lane	discount plan line road and road bike
tidak sebidang baik sebidang maupun yang tidak sebidang	either at grade or grade separated	either a plot or not plot
Undang-Undang No. 38 2004 tentang Jalan	Roads Act No. 38 of 2004	Law No. 38 2004 on the Way
wilayah-wilayah bangkitan	developed regions	areas of resurrection

This problematic linguistic interplay affects policy development, data collection and analysis on pedestrian planning in Indonesia. Pedestrian policy concepts and data collection effort are complicated by both the non-uniform definition of pedestrians in English, the broad association of concepts with the notion of *jalan* in bahasa Indonesia, and the errors of translating policy documents in a creolized planning process. Like the interviewee and interviewer in the previous example, the probable result of this ambiguity is the mutual communication of information and ideas on urban infrastructure, yet the loss of understanding of what, precisely, is being communicated. The actual meaning of concepts at the heart of discourse on urban pedestrian policy is lost in translation.

Cultural Concepts in Planning Research

In addition to divergent linguistic definitions, cultural differences also affect the validity of planning research that is undertaken in majority world contexts. In this research, for example, in-depth analysis of survey responses—a foreign concept in the quantitative field of transportation planning—revealed that many respondents had "misinterpreted" standard research questions on a number of transportation and demographic markers. These differences brought into question the validity of standard research categories when undertaking planning research in non-western settings or contexts where there is a prevalence of informal and integrated activity. This issue of integrated activity is discussed further in Chapter 6.

Identity, occupation and research assumptions
One example of how culture affects the accuracy of data collection efforts was highlighted in responses to questions on occupational status—a standard socio-demographic variable that relates particularly to work-based travel. As revealed in this research, occupational variables adopt the Western assumption that a person's identity is defined by their occupational or

economic status. This cultural assumption of economic, rather than social, identity is helpful to transportation research design since occupational status explains a lot about people's peak-hour travel patterns, though it could be argued that social relationships also play an equally large role in defining travel patterns, origins and destinations.

In the Indonesian context, however, many of my interview respondents answered demographic questions "incorrectly" from the standpoint of Western research expectations. For example, a number of female respondents identified as housewives (*ibu rumah tangga*) but were clearly engaged in income generating work since they had previously spoken about their work of running a business, operating a *warung*, or even working away from home. For the purpose of transportation or socio-economic analysis, these women were coded incorrectly, but from a cultural perspective their responses were correct because their social roles and responsibilities trumped their employment status.

This mismatch between survey expectations and responses was especially true when people's employment was "non-work" within the informal sector. While Indonesian unemployment is estimated at 8 percent, only 1 percent of those interviewed for this research identified as "unemployed", and 16 percent selected "other". Interview transcripts suggested that these "other" people were in fact informal workers, but informal economic activity did not apparently match the cultural notion of what constituted as "work". As will be discussed in Chapter 6, different cultural assumptions also affected survey responses that related to "home", "work" and related trip categories.

Income estimation and household access
If cultural values made the correct coding of occupational category misleading, data on household income was even more so due to the complexity of many household structures and the intertwined nature of households among survey respondents. One case in point was a nanny who was interviewed near the house in which she lived and worked. When providing household income data, she clearly provided only her individual income, but her stated household size was based on the size of the family she served (which was incidentally spread across two neighboring houses). The reason for this mismatch between household income and household size was likely due to her relationship with both. She was closely involved in understanding and taking care of the people within the household but, as a domestic worker, she was unaware of the entire household budget and certainly had access to only a small fraction of it. Even if she had knowledge of the entire household budget, per capita income would therefore fail to reflect her access to income due to the asymmetrical power and employment relationships within this middle-class household. To further confuse matters, the common practice of sending gifts or remittances to domestic workers' extended family members (by both domestic workers and their employers) complicates the use of income as a demographic variable within the Indonesian context. In this context, household income is neither contained within the household nor distributed evenly among its members. Attempts to use income as a control factor may therefore misinform efforts to understand socio-economic factors and transportation practices by different members of the household.

The Case for Ethnography

Since most transportation research is derived from a research core in the West, many research terms and categories reflect aspects of Western culture that do not apply when the research is conducted in other places. When undertaking research or planning on walkability, a linguistic or cultural mismatch between standard terminology and their local meaning is likely to reinforce geographic and modal bias that already exists within multiple planning discourses (see Chapter 2). In the case of Jakarta, varying definitions of walking as well as different cultural understandings of occupation, income and trip category damage the validity of standard transportation surveys that are conducted in this context. These differences are also likely to produce pedestrian planning outcomes that are modally biased and less than appropriate within the local context.

In order to improve the context sensitivity of walkability planning in the majority world, ethnography and in-depth analysis of interview transcripts should therefore become a standard part of transportation, urban design and planning research. Ethnographic expertise is particularly important in creolized planning contexts where agreement on definition and meanings may be assumed but unexamined. In Jakarta, for example, a creolized discourse reflects the fact that many local policy-makers relate more closely with foreign discourse in their field than with local users of the systems they plan. In other majority world contexts where there are vast social inequalities and a prevalence of informal activity, ethnographic expertise is essential for ensuring that urban research and planning produce meaningful data and outcomes.

> **Checklist for policy-makers:**
>
> - Are low-income members of the community engaged in the research, design and planning process?
> - Are survey instruments ethnographically informed?
> - Are planning documents written in plain language that is free from foreign or technical terms?
> - Are linguistic and cultural specialists engaged in analyzing survey transcripts to ensure that they are being correctly interpreted?

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Chapter 4 Accessibility: Universality, Bounded Rationality and Context Sensitivity

> disability results from the
> interaction between
> persons with impairments and
> attitudinal and environmental barriers that
> hinders their full and effective participation in
> society on an equal basis with others
>
> (UN General Assembly Convention on the Rights of Persons with Disabilities 2006)

Accessibility and Bounded Rationality

In his essay on bounded rationality, Forester (1984) refutes the notion that public administration can and should be conducted using a model of comprehensive rationality. Instead, he claims that bounded rationality is the modus operandi for public policy-making in the real world of complex or ambiguous problems, limited resources, imperfect information, and multiple unequal actors (see Table 10).

Table 10: Condensed version of bounded rationality in planning

Planning paradigm	Comprehensive rationality	Bounded rationality	
		Cognitive limits or socially differentiated	Pluralist or structurally distorted
Agents	Singular rational actor	Fallible actors	Competing, unequal actors
Setting	Closed system	Open system	Complex, power-laden
Problem	Well-defined	Ambiguous, varying interpretations	Multiple
Information	Perfect, complete, understandable	Imperfect and varied	Contested, manipulated
Time	Infinite	Limited and varied	Time is power
Strategy	Optimization	Satisficing, lower expectations & networking	Incrementalism, bargaining, organizing, redistribution

(Source: Forester 1984, p. 29)

This chapter examines the issue of accessibility, which emerged as a complex problem in interviews and meetings with key policy-makers in Jakarta (as outlined in the Research Methods section of Chapter 1). During interviews, *accessibility* was highlighted as a key public policy objective for pedestrian planners in Jakarta. The goals and definition of this concept, however, were unclear and ambiguous—with some referring to international standards of universal access and others referring to accessibility in terms of feeder access to transit. In addition to varied and ambiguous definitions, implementation of accessibility was compromised by limited resources. The various policy-makers who espoused the disability-related version of accessibility highlighted the fact that the City was only able to implement one or two pilot projects due to a lack of funds for more comprehensive planning or implementation. As discussed in Chapter 2, unequal influence and a lack of coordination between multiple agencies involved in street design and planning further complicated planning for both disability-related and transportation-related accessibility in Jakarta.

With inconsistent problem-definition, very limited resources, unique local conditions, and multiple unequal stakeholders involved in its planning, accessibility planning could certainly be described as a "wicked problem" in Jakarta (Rittel and Webber 1973). These wicked problem characteristics contribute to a lack of success in Jakartan accessibility planning, and suggest the applicability of approaching the issue of accessibility in a more boundedly rational manner.

Transportation-Related Definitions of Accessibility

Within the transportation field, accessibility refers to the fit between transportation and land use in facilitating access to various types of opportunities. These opportunities include income, employment, education, medical facilities, food, social interaction, goods, services and information. The ease with which individuals can reach these opportunities by different modes transportation (or even technology) reflects the accessibility of a place.

In recent decades, a growing number of transportation specialists refer to accessibility as the real purpose of transportation, while mobility and traffic flow are simply derived demands in the task of achieving accessibility. In order to quantify this goal, transportation researchers have therefore proposed a number of metrics to measure the accessibility implications of projects or locational settings. These accessibility metrics include the following:

- Isochronic measures of the aggregate number of opportunities within a certain distance, travel time or generalized travel cost (including delay and wait time) of a particular site;
- Gravity-based measures of the aggregate interaction or impedance affecting the movement of people or goods between pairs of sites;
- Utility-based measures of the disaggregate utility to individuals of traveling between pairs of sites (incorporating socio-economic characteristics and preferences); and
- Activity-based utility measures of the disaggregate utility of participating in a range of individual or linked activities within a particular transportation and land use context (Ashiru, Polak and Noland 2003; Dong et al 2006: 165; Chapman and Weir 2008).

While sophisticated models exist for measuring multimodal accessibility at the local and regional scale, the process of measuring pedestrian accessibility is substantially simpler. Isochronic measures of pedestrian accessibility essentially measure one's ability to reach opportunities within a certain travel time via the network of sidewalks, shared streets and crossings. Accessibility for pedestrians is therefore a function of several key factors:

- sidewalk quality and continuity;
- crossing quality, density and type;
- shared street network connectivity;
- street network connectivity;
- land use mix; and
- land use density.

In Jakarta, pedestrian accessibility is important because walking is the primary mode for approximately 40 percent of trips and is the key mode for the poorest members of society. On the other hand, many opportunities that are accessible by car and other motorized modes are not readily accessible by foot due to discontinous and inadequately provided and maintained sidewalks throughout most neighborhoods and main roads. Along Jakarta's main roads, heavy traffic, long blocks, inconvenient crossing facilities, a lack of sidewalks and vehicle encroachment onto sidewalks further reduces pedestrian accessibility and creates severance effects along these rivers of motorized traffic.

Disability-Related Definitions of Accessibility

While transportation-related accessibility has focused on the relatively academic exercise of measuring the time-space-utility performance of various sites or activities, disability-related accessibility has focused on enforceable design aspects of public space and facilities that are open to the public. This focus is underpinned by the *United Nations Convention on the Rights of Persons with Disabilities*, which requires all nations to take appropriate measures to:

> "Develop, promulgate and monitor the implementation of minimum standards and guidelines for the accessibility of facilities and services open or provided to the public; and
> Ensure that private entities that offer facilities and services which are open or provided to the public take into account all aspects of accessibility for persons with disabilities." (UN General Assembly 2006)

Disability-related accessibility therefore represent both physical parameters for urban public space, and a social contract regarding the value of human life and the rights of all people to access spaces or services considered "public". It focuses on physical space, but also encompasses access to the discursive space of information, communication and communication technologies. For example, the U.N. Convention requires states to take measures to provide signage in Braille, forms that are easy to read and understand, live assistance and sign language interpreters, and access to the Internet. Publicly accessible government reports should also be accessible to those with disabilities.

Americans with Disabilities Act (ADA)
In the United States, progress on disabled access is driven by the *Americans with Disabilities Act (ADA)* of 1990 and the subsequent *Standards for Accessible Design* (Department of Justice 2010). These regulations prohibit discrimination on the basis of disability, and require that paths of travel provide continuous, unobstructed ways of pedestrian passage in and around various categories of public space:

- local, state and federal government services, programs, and activities (which are governed under Title II, 42 U.S.C. 12131-65);
- places of public accommodation such as restaurants, theaters, schools, day care facilities, recreation facilities and doctors' offices (under Title III, 42 U.S.C. 12181-89); and
- privately owned commercial facilities such as factories, warehouses, or office buildings (also under Title III).

According to ADA regulations, accessible "paths of travel" encompass accessible sidewalks, streets, parking areas, curb ramps, pedestrian ramps, clear floor paths, elevators, restrooms, telephones and drinking fountains. The law therefore regulates minimum physical standards for the production of both indoor and outdoor urban public space used by pedestrians. To this end, ADA is accompanied by Accessible Design Standards (Dept of Justice 2010) which include details such as:

- stable, firm and slip resistant ground surfaces;
- minimum path widths and turning spaces;
- ramp, lifts, stairways and handrail requirements;
- maximum running and cross slopes;
- minimum vertical clearance, doorway and gate characteristics;
- signage and detectable warning systems;
- parking space and loading zone dimensions;
- bus boarding and rail platform features; and
- seating, play and recreational facility characteristics.

Disability discrimination acts and standards in other countries
In other countries, similar legislation and standards exist to promote disabled access and prohibit discrimination on the basis of disability in employment, services and facilities.

Australia's *Disability Discrimination Act* of 1992 aims to eliminate discrimination on the basis of disability by making it unlawful to refuse "to allow a the other person access to, or the use or, any premises that the public or a section of the public is entitled or allowed to enter or use (whether for payment or not)". This prohibition is not restricted to direct discrimination, but also includes discrimination based on the "terms or conditions on which the first-mentioned person is prepared to allow the other person access to, or the use of, any such premises" as well as "the provision of means of access to such premises". In other words, the legislation makes it illegal for public places, such as public sidewalks, walkways, parking lots, public transport services, public gardens and parks, to be inaccessible to those with disabilities. In order to comply with the law, these places may need modification or "reasonable adjustment" to overcome barriers to accessibility—unless doing so would impose "unjustifiable hardship".

Hong Kong's *Disability Discrimination Ordinance* (DDO) No. 86 of 1995 features some identical wording to Australia's DDA, suggesting that a relationship exists between different national efforts and international discourse on disabled access and accessibility.

The U.K. *Disability Discrimination Act* of 1995 (and the Equality Act of 2010 which supersedes it) also contains provisions for reasonable adjustments that relate to "services" rather than "premises". Therefore, where it is not possible to remove physical barriers to accessibility, the U.K. regulation allows for alternative methods of service provision (such as home visits or internet service) that allow people to participate in public activities and services. Like the ADA Standards, regulations in various countries are accompanied by design guidelines or standards for buildings, premises and external spaces.

Disability regulations in Indonesia
In Indonesia, the *Republic of Indonesia Act No. 4 of 1997 on Persons with Disabilities* emphasizes the right of those with disabilities to participate in community life. This law is supported by a 2006 ministerial regulation on technical standards for accessibility—a regulation which translates many aspects of international accessibility standards into bahasa Indonesia.

Like its international counterparts, Indonesia's accessibility standards outline minimum dimensions for pedestrian lanes, parking areas, doorways, ramps, stairways, street furniture,

signage and other elements associated with "building developments and their environment" (*bangunan gedung dan lingkungan*). By focusing on building developments, however, the standards implicitly omit many public spaces in informal neighborhoods or non-real estate areas since structures in these areas may not be considered as "buildings" (*bangunan gedung*). "Buildings", as defined in building codes, are exemplified by malls, terminals and office buildings. On the other hand, informal and non-real estate developments are more ambiguous and the building codes refer to these structures separately as traditional or semi-permanent buildings (*bangunan gedung adat* or *bangunan gedung semi permanen*). In Jakarta, policy-makers confirmed that accessibility standards exist for various street types but there are no standards or guidelines for the narrow streets of low-income or informal areas of the city (*gang*). The Indonesian accessibility standards therefore appear to be a context-insenstitive translation that fails to embody the inclusive spirit of international discourse on disabled access Himpunan Wanita Penyandang Cacat Indonesia 2007).

Emerging Inclusive Definitions of Universal Accessibility

Since the 1990s, discourse on accessibility as defined within the disability field has shifted from a focus on disabled access, to discussions of aging in place and universal accessibility (see Figure 16). This shift reflects a broadening of discourse toward more positive notions of inclusion and access. It also suggests a more complex ecology of actors and problems than that presented by disabled access.
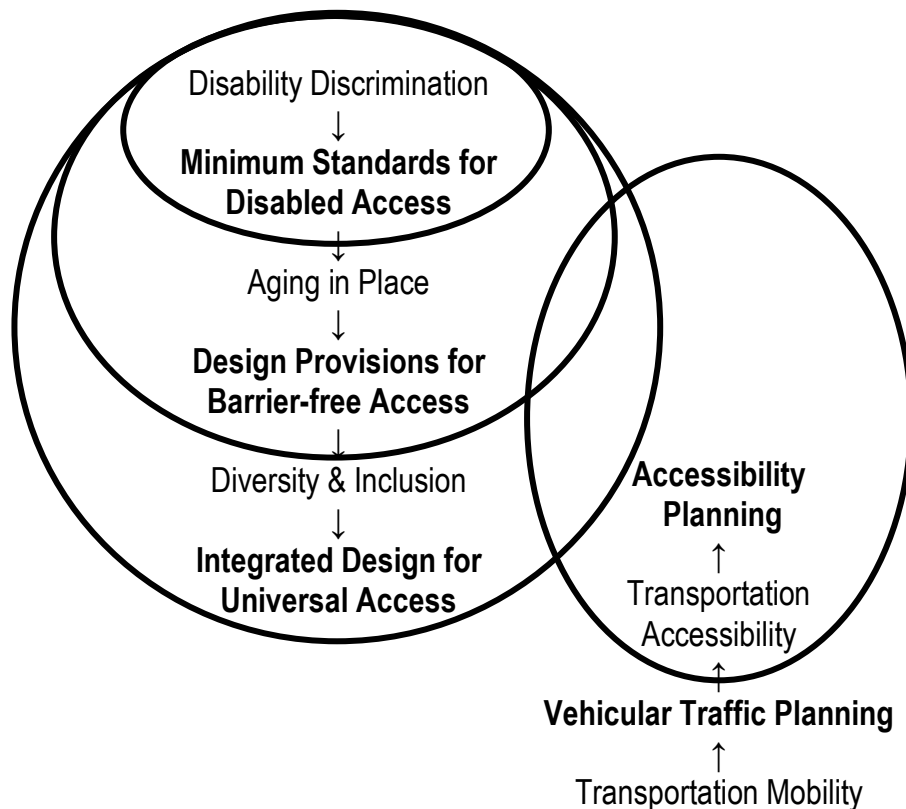
Figure 16: Shifting notions of accessibility

Rather than emphasizing minimum standards and special accommodations for those with severe, long-term physical disabilities, universal design acknowledges that disability is a relative and diverse concept (see Goldsmith's pyramid in Figure 17). Advocates therefore emphasize the need for integrated design to realize the potential participation and contribution of all people. Unlike minimum disability-related access standards which could be implemented in a comprehensive and binary fashion, integrated design represents more of boundedly rational problem where it is difficult to determine when the problem has been "solved".
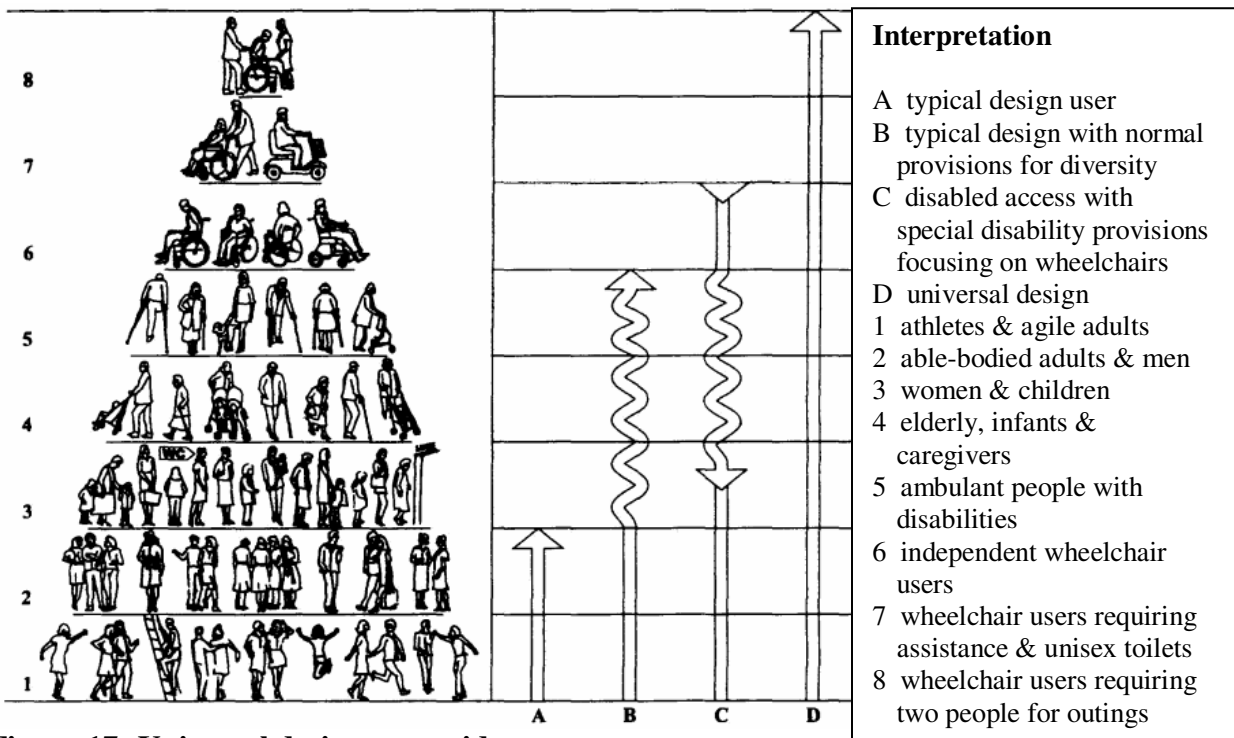
Figure 17: Universal design pyramid
(Source: Goldsmith 2000:3)

According to the *U.N. Convention on the Rights of Persons with Disabilities*, universal design encourages environments and services that are accessible to all people without the need for specialized design—although this does not preclude the possibility of assistive devices for particular groups (UN General Assembly 2006). Universal accessibility therefore involves integrated design for people with diverse abilities including those with temporary conditions and a range of people who do not have disabilities. For example, public buses with low floors and ramps do not only facilitate access by people who use wheelchairs; they also benefit people with ambulatory injuries (like a sprained ankle), pregnant women, people with strollers, those carrying luggage, the elderly, children, and those with short or obese body types. In contrast, specialized paratransit services with wheelchair lifts benefit only those with long-term disabilities who entitled to use such services.

According to specialists, universal design encompasses a number of key principles outlined below:

- "Equitable design—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 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." (North Carolina State University 2006)

When applied to pedestrian facilities, these principles reflect a concern for *anthropometrics* and *equality*—with diversity, social inclusion and equality being central to multiple definitions of universal design and accessibility. Universally accessible pedestrian facilities and external areas are characterized by *continuity*, *connectivity*, *safety* and *sustainability*—characteristics that also correspond to the transportation-related definition of accessibility (Hong Kong Architectural Services Department 2007).

Accessibility Policy and the Market Rationality in Jakartan Planning

As discussed above, accessibility (*aksesibilitas*) in Jakarta is officially defined in terms of context-insensitive translations of disability-related access standards from Western countries. This definition therefore focuses on physical design elements that permit wheelchair users and other people with disabilities to move along the sidewalks of a "regular" range of street typologies and building routes, but it omits many narrow or informal street typologies that are prevalent within the local context. It also overlooks transportation-related definitions of accessibility that address the more basic issues of pedestrian network coverage, and universal-accessibility that begins to combine both disability- and transportation-related approaches to the issue.

From streetscape observations and interviews that I undertook with policy-makers, Indonesia's accessibility standards are rarely implemented in Jakarta, even in their limited disability-related form. The standards are not at all evident in informal areas of the city and, even in formal real estate areas, implementation is almost non-existent. In the very limited sites (such as Jalan Sudirman) where the accessibility standards have been implemented, the environment is compromised by inadequate maintenance, inappropriate operating conditions, and a lack of connection to any other accessible sites. It is also compromised by incomplete inventories of pedestrian networks and conditions, as well as complex and power-laden relations between different users of public space.

The ineffectiveness of Jakarta's accessibility measures can be explained by considering pedestrian public space and the associated discourse as both a *boundedly rational planning process*, and as *products in the market for urban policy choices and power*.

At an international level, accessibility is frequently discussed in terms of bureaucratic design standards needed to achieve social inclusion or accessibility in a comprehensive, binary fashion. Like human rights, accessibility and accessible design involves minimum or absolute standards to be provided by multiple producers of urban space within a framework of state regulations and infrastructure.

In the context of Jakarta, however, the scarcity of public space and glut of potential users better situates accessibility as a *market good* than a *human right*, thereby complicating the problem definition relating to accessibility. Within the context of a market, different modes or users of public space compete for a limited supply of urban spatial goods by encouraging investment in one mode at the expense of another. The ability of different groups of users to compete in this market is largely determined by their relative power in terms of political power, monetary resources and differential abilities to accessing what Guillory refers to as cultural capital or the symbolic goods associated with planning discourse (Guillory 1993).

The failure of most pedestrian interests to compete within the boundedly rational process of planning has transformed so-called universal access rights into a privilege of the elite, where only those pedestrians who are represented within the official discourse are provided with international minimum standards of accessibility. Public spaces that are used by other "less fortunate" pedestrians are provided and maintained at a standard that can only be considered as inaccessible and perilous to even the most agile pedestrians. The result of bounded rationality in pedestrian planning is therefore the inaccessibility of both physical spaces and discourse on the production of urban space is itself.

Using the market rationality for unconventional products
In his book on *Language and Symbolic Power*, Pierre Bourdieu uses the notion of market rationality to explain the value and functions of symbolic goods associated with language and literature. According to Bourdieu, the meaning and value of the linguistic products of discourse are determined through power-laden relationships within a social space (Bourdieu 1991:38,170). Language is therefore not simply a means of communication, but also signifies the knowledge, wealth and authority of the speaker. Bourdieu describes the latter non-monetary assets as cultural capital that can be used to gain upward mobility or a more powerful position within a social space.

In the context of Jakarta, the production of pedestrian urban space can be seen as involving three different types of markets:

- Firstly, pedestrian interests operate within the market for urban public space where pedestrian facilities compete with motorized transportation facilities for a limited supply of public space.
- Secondly, pedestrian planning projects exist within the market for impressions where alternative policies represent marketing opportunities for the producers of public space.

- Finally, the discourse of pedestrian planning occurs within the market for cultural capital, where one's ability to participate in the discourse signifies one's potential for upward mobility.

Within each of these markets, ordinary pedestrians and pedestrian spaces are uncompetitive and therefore marginalized in the contradictory market for human rights, as associated with universal access. The "market" supplier in this case includes the city's planning bureaucracy, private sector entities that produce real estate development, and community-based entities that shape public space in formal and informal neighborhoods.

Pedestrians as consumers in the market for urban public space
Like other products, public space is described by Jakarta's policy-makers as a commodity for which pedestrians and other users must compete. High density conditions, slow transportation links and a limited stock of public space drive up the value of proximity, access and public space. Street rights-of-way, which embody all three of these goods and constitute the lion's share of urban public space, are then allocated to the most competitive bidder. The competition is not based on the relative efficiency or cost of each mode, but on the willingness and ability of groups of mode users to pay for their spatial claim in a currency that has meaning within the production of urban space. In Jakarta, much of what is valued in urban planning is encapsulated in the term *Pembangunan*, or a type of development associated with modernity, economic progress and upward mobility within the global geo-political sphere.

Pedestrian travel represents approximately 40 percent of trips in Jakarta and a part of all trips by other modes of transportation (Pacific Consultants International and ALMEC Corporation, 2004) and yet pedestrian space has been all but abandoned in the planning of public infrastructure and public space throughout much of Jakarta (see Chapter 2 on the production of everyday physical spaces of walking). Instead, street rights-of-way are prioritized for motorized transportation modes such as cars, trucks and bus rapid transit. Within the market for public space, motorized modes out-compete pedestrians in obtaining a share of available resources. One policy-maker with responsibility for planning Jakarta's pedestrian network explained the situation as follows:

> *Selama ini trotoar atau pedestrian way itu hanya terbatas sekali, sisa dari kebutuhan media transportasi jalan. Jadi teman teman PDI kalau membikin jalan, yang diutamakan, primary adalah untuk traffic vehicle, traffic kendaraan ya. Terus sisanya orang yang jalan. Mungkin penda kalau lihat di Jakarta apalagi di lingkungan hampir tidak ada orang suka jalan kaki.*

> [Up until now sidewalks or pedestrian ways are only very limited, they just get the leftovers from what's needed for road transportation. So our friends at PDI, if they're making a road, they prioritize traffic vehicles, vehicular traffic, right? Then what's left over is for people who walk. Probably if you look in all of Jakarta or even the surrounding region, there's almost no one who likes to walk.]

According to this official advocate of pedestrian planning, pedestrian urban space could only be produced using the leftovers of urban public space allocated to transportation. Despite the claims of pedestrians themselves—who almost uniformly stated that they liked to walk—this

pedestrian planner believed that pedestrian planning did not represent the kind of development or activity that was appreciated by those who matter in Jakarta.

Another senior policy-maker reiterated this understanding that pedestrians unsuccessfully compete with motorized modes in the market for public funds and public space:

> *Nah, begitu ada pedestrian, untuk rumah-rumah yang kurang beruntung <u>ia lebih mengutamakan perlebaran untuk mobil</u>, ya kan? Karena biasanya kan si real estate yang tidak terlalu besar itu mengupayakan ROW yang terbatas. Kemudian ada kebutuhan, pengingkatan kebutuhan terus dia langsung aja… pelebaran. Mmm, tidak ada hak untuk orang… Jadi kebijakan itu pasti DKI punya ini ada pedestrian. Cuma ternyata yang penerapan di lapangan ada yang harus berantem ya berantemnya masih: Mana yang duluan? Mobil yang macet atau orang yang selamat, itu kan? <u>Dan karena kita juga, transportasi umum kita belum bagus; ahkirnya jadi mobil yang diutamakan</u>… Mmm-mm dalam pelaksanaan.*

> [Now, in terms of pedestrian facilities in residential areas for those who are less fortunate, <u>they prioritize road widening for motor vehicles</u>, right? Because normally, the (owners or developers of the) small amount of real estate which exists work on (expanding) limited street right-of-way. So when there is demand, increasing demand, the first thing they do is… (road) widening. Yeah, people don't have any rights… So of course the provincial government has a policy that that we have to have pedestrian facilities. But when we're on the ground it just happens that we still have to ask the question: What should be put first? Vehicles which are stuck in traffic or saving people's lives, right? <u>And because we also don't yet have good public transport; in the end vehicles are prioritized</u>… Uh-huh, (that's) the policy.]

This policy-maker explained that the decision to prioritize motor vehicles ahead of pedestrians hinges on the availability of alternative transportation in the form of public transit, and that this competition could be seen most clearly in places euphemisticly referred to as "less fortunate". Less fortunate pedestrians are made less fortunate still by their inability to make compelling demands for either safe pedestrian facilities or effective public transportation services. In a situation where there is only "a small amount" of real estate landuse, transportation planning policies are clearly inequitable—allocating public space to motorized transportation for the wealthy minority of trip-makers at the expense of pedestrian conditions for the less fortunate majority.

The above policy-maker continued to explain that pedestrian accessibility would only be addressed after motor vehicle traffic or public transport improved to the point that there was an excess of "space to play with". For anyone who has visited or lived in Jakarta, the idea of having excess space or street right-of-way to play with is an absurd fantasy.

> *Jadi misalnya kalau jalan-jalan di Janga ataupun yang Semijang itu kan, sudah sampai di wilayah. Nah pada saat di wilayah, mereka tahu wah ada kebutuhan pelebaran jalan. Tetapi tidak mungkin kan dalam situasi sekarang pagarnya dimundurin, harus ada bebasan lahan. Itu agak sulit karena berarti cost. Belum tentu orang juga mau gitu.*

Jadi mesti bekerja extra gitu untuk bisa mendapatkan satu sejengkal sana buat bikin jalan. Itu kendala. Tapi harapannya si, kalau misalnya public transport sudah baik berarti ada pilihan. Jadi mobil tidak terlalu banyak. Nah itu juga ruang yang ada kita mainkan itu pedestrian.

[So for example if the streets of Janga or Semijang become part of the region, then once they are incorporated into the region people realize, wow, there's a need to widen the roads. But there's no chance of doing so nowadays, so we have to push fencelines back, we have to release land (via eminent domain). That's rather difficult because it means extra expense and it's not certain that people will go along with that either. So we have a lot more work to figure out how to provide roads there. That's the constraint. But the hope is that, for example once public transport is good people will have a choice so there won't be as many vehicles. In that case, if there is space to play with, we will provide pedestrian facilities.]

The rationale behind this blatantly inequitable policy choice was implied from the dismissive terms that policy-makers used to describe pedestrians—terms such as "*kurang beruntung* [less fortunate]" and "*nenek-nenek opa-opa* [grandmas and grandpas (trying to walk across the road)]". In the market for public space, pedestrians are viewed as those without influence, without a voice and without an ability to pay.

Pedestrians living in informal squatter areas with insecure land tenure were especially disenfranchised because, as one policy-maker explained, the only planning that could be done in these areas was to provide access to bath water and sanitation. Apart from that, the policy-maker explained, the government was not able to plan for anything except evicting residents.

In the market or boundedly rational planning of urban public space, Jakarta's ordinary pedestrians are unable to pay the currency of modernity, economic progress and apparent social mobility that is used to determine the arrangement of urban public space. As a result, scarce street right-of-way is prioritized for motorized transportation, leaving only inaccessible leftovers to Jakarta's most populous mode of transportation.

Accessibility as marketing or a commodity in the market for urban impressions
While accessible pedestrian facilities are absent throughout much of Jakarta, there has been movement to implement accessibility standards in selected locations within the city. In these locations, accessibility can be seen as a marketing opportunity or a commodity in the market for urban impressions.

With the exception of one interview in which a top policy-maker expressed a desire to implement a comprehensive network of pedestrian facilities in all parts of the city, pedestrian planners in Jakarta cited only a handful of locations as examples or planned sites for functional pedestrian planning or accessibility in the city. These locations included:

- *Jalan Thamrin-Sudirman*—the city's central boulevard or protocol road for the president and convoys of foreign dignitaries;

- *Jalan Veteran*—another protocol road located behind the presidential palace in Jakarta; and
- *Jalan Teuku Umar*—a high-end residential street housing a former Indonesian president, the U.S. ambassador, and several Generals.

As explained in the following interview excerpt, the rationale for this limited choice of locations was that a comprehensive approach was unattainable and therefore the above key sites were chosen based on the impact value or "wow" factor associated with pedestrian planning projects:

> - *Dan bagaimana pilih korridornya untuk koneksi ini?*
> - *Rencananya begitu…* We have traffic plan, all connected pedestrian, all connect. *Tetapi sebagai contoh, untuk memberikan contoh, dan supaya impaknya yang besar kita ambil daerah yang strategi: Mana?* Number one *merupakan Thamrin, Thamrin-Sudirman…*
> - *Dan kenapa pilih yang itu?*
> - <u>*Beri impak; beri impak; beri impact*</u>. *Artinya kalau kita memilih di dalam kecil semua orang tidak akan bertanya dan tidak akan ketahui. Tapi ketika membuat di Thamrin <u>semua orang tahu dari petinggi sampai rakyat sama bisa tahu arti dan tahu "Wah! Jakarta sudah mulai mengenal pedestrian.</u>*

> - [And how do you select corridors to become these connections?
> - The plan is like this… We have a traffic plan for connected pedestrian facilities. But it's like a showcase, and in order to have great impact we choose a location strategically. So where do we choose? The number one location is Thamrin, the Thamrin-Sudirman (corridor)…
> - And how did you choose that (location)?
> - <u>To make an impact, make an impact, make an impact</u>. This means that if we choose a place in a little (poor and insignificant) area, people will not ask and will not know about it. But if we do something on the main road <u>everyone from high to low will know what the meaning and will know that "Wow! Jakarta has already started to know about pedestrian facilities."</u>]

In contrast to international accessibility standards that are based on the notion of inclusion and accommodation of a range of *users*, Jakarta's pedestrian planning efforts were directed toward a range of *viewers*. As a result, Jakarta's accessible pedestrian facilities therefore resemble a series of billboards, rather than a network of everyday urban infrastructure. Billboard-like "pilot projects" are located in prominent locations to showcase the city's competence in the developing facilities that meet "international minimum standards of accessibility". One policy-maker discussed the performative quality of pedestrian planning as follows:

> *Nah <u>ada sebaliknya, bukti</u> bahwa kita memang berpihak, memang DKI juga ingin membuat pedestrian yang baik… <u>Ya itu bukti kita lihat di belakangnya istana, Jalan Veteran</u>, terus juga ada beberapa tempat lagi; dan <u>sebentar lagi kita juga akan, model itu kita buat di Teuku Umar di Menteng</u> ya…*

[Now, <u>there is, on the other hand, evidence</u> that we side with, that DKI also wants to provide, good pedestrian facilities… <u>Yes we can see this evidence behind the palace, on Jalan Veteran</u>, as well as a number of other locations; and <u>shortly we will use that model in Teuku Umar in Menteng</u>…]

To this policy-maker, pedestrian projects were "evidence" of the city's success in planning for pedestrians. Unlike urban infrastructure, which provides access to services and but is often buried below the surface of the ground, "evidence" is something that requires visibility and is therefore presented in locations where it will be seen by a perceived audience. In this case, the target audience includes those who travel along key protocol roads and those granted access by local *satpam* (guards) to the exclusive suburb of Menteng. In these high-visibility sites, pedestrian planning was undertaken in order to save face or avoid embarrassment. The policy-maker continued:

> *Apalagi di era terakhir, berberapa tahun terakhir ini, <u>kita juga agak malu</u> lah kalau melihat bahwa orang berjalan bersandung-sandung seperti itukan, jadi mengupayakan ada proyek pedestrian.*

> [What's more, in recent era, in the last few years, <u>we're also are rather embarrassed (ashamed)</u> to see people stumbling as they walk (along the street) like that, so we make an effort to have pedestrian projects.]

In the market for good impressions, pedestrian planning not just focused on public comfort or safety. It is also a means of avoiding embarrassment and increasing the brand value of the city. Given the connotation of the term "era" as in "era of globalization", the suggested audience in this marketing effort is the global viewer traveling on protocol roads and high-end neighborhood streets. If pedestrians are well-provided along these routes, there is the sense that pedestrian planning has been successful even though the needs of the majority have been overlooked. Traveling along little streets and neighborhoods hidden behind main roads, the majority of pedestrians are not part of the implied performative space of Jakarta's pedestrian planning.

The top policy-maker who contemplated the idea of a more comprehensive network of sidewalks did not reject this idea of pedestrian planning as a performative activity, but used this idea to suggest a more comprehensive approach to pedestrian planning. He acknowledged the haphazard nature of current planning in Jakarta, and suggested that the newly democratic political process could promote comprehensive planning by reframing the target audience of planning practice. By considering the political constituency (rather than foreign and domestic dignitaries) as the new viewer, this bureaucrat recommended that Jakarta's first democratically elected Governor should tackle pedestrian planning in spaces previously considered politically inconsequential and synoptically invisible.

> I'm sorry to tell you, Ria, but the planning process is somewhat desultory… Before I came into this office, I told the Governor that improving the pedestrian facilities is something that would improve the lives of a large number of the population [and build his political constituency. Since I started working here, though] I've started thinking: what would be the cost?

While this policy-maker ruminates on the possibility of more comprehensive planning, "desultory" planning based on bounded rationality and a market mentality continues to be the standard practice within Jakarta. Under the desultory planning process, universal access standards are implemented in a handful of pilot project locations that are not attached to a wider network or plan. In describing this process, one policy-maker sketched the plan for accessibility in Jakarta in terms of sidewalks along *Jalan Thamrin* that end abruptly a few meters away from the protocol road (see Figure 18):

> *Misalnya* we have plan here… *nah… ah (bergambar peta)…* <u>Because it's not design priority… *nah sini jalan… nah …* we stop here</u>. Because Thamrin is only pilot project, *ya*?

> [For example, we have a plan here… and then here… and here (drawing a map)… <u>Because it's not a design priority… so here's the road… we stop here</u>… because Thamrin is only a pilot project, right?]
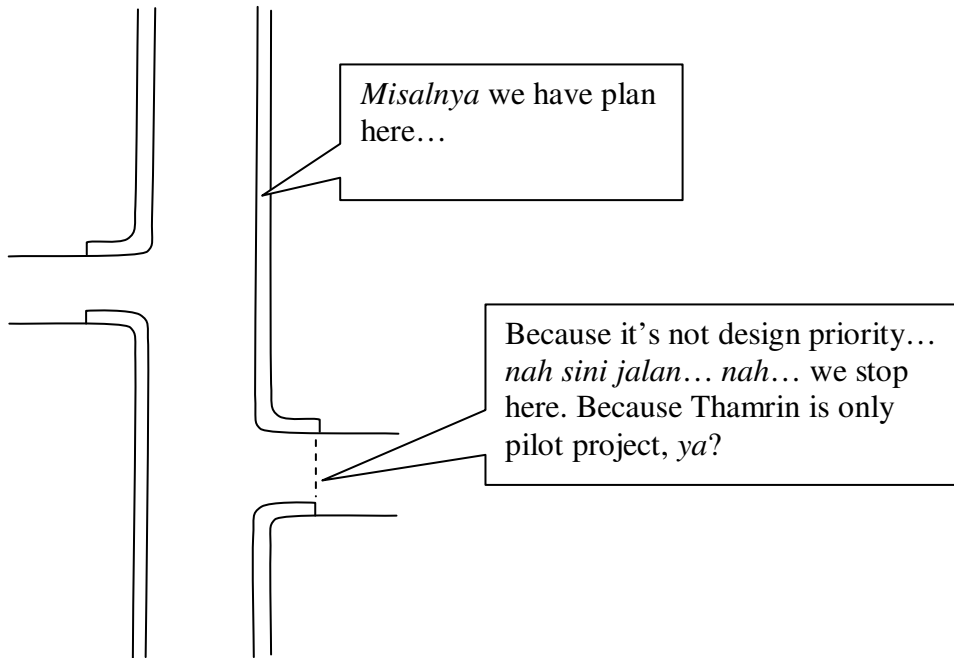
Figure 18: Redrawn cognitive map and commentary of pedestrian planning in Jakarta

With a planning process that is focused on the view from behind tinted windows of chauffeur driven convoys of high dignitaries, universal access has been treated as a privilege of the elite in Jakarta. Desultory planning has facilitated accessibility planning in a handful of exclusive locations, with no wider pedestrian network, no pedestrian plan, and no true pilot projects in ordinary locations that might be representative of pedestrian infrastructure needs. Minimum international standards for accessible pedestrian networks have therefore become maximum local standards for piecemeal planning that is designed to advertise modernity and competent governance to key consumers of the urban regime. Public spaces that are not visible to these consumers are provided and maintained at an inaccessible and even perilous state.

Universal accessibility and discursive accessibility
Within international discourse on universal access, accessibility encompasses not only the quality of the physical or services, but also the way that public space, facilities and processes are communicated to the entire community. In Jakarta, discourse on pedestrian planning and universal access is made less accessible by the fact that the discourse serves more than one purpose. As discussed by Bourdieu (1991), discourse does not only aim to communicate and generate information, but also serves to express wealth and power in the market for cultural capital.

Cultural capital can be understood as non-financial assets—such as intellectual ability, social connections and knowledge—that improve one's social standing or mobility. Like other forms of capital, the value of cultural capital increases when demand or appreciation for a good is high, and supply or access is low. For example, a PhD from UC Berkeley gives greater social mobility if a large proportion of people consider Berkeley to be a prestigious university and if few people hold such degrees. (Berkeley, incidentally, grants more PhDs than any other university in the United States.) By the same token, traditional bureaucratic discourse carries greater authority if a large proportion of people recognize its powerful role and if few people are able to participate because of the prevalence of acronyms, specialized jargon, and unintuitive legal processes. In the bureaucratic exercise of facilitating universal access, cultural capital may explain why the policy discourse is less than accessible to most of the ordinary people or pedestrians that such policies ostensibly serve.

Indonesian policy development on accessibility is marked by plethora of terms that are borrowed from English and, to a lesser extent, Dutch. This tendency to use foreign terminology is partly derived from the linguistic familiarity that students gain during university programs in technical fields such as science and engineering. English terminology is also encouraged by a creolized planning process that conducts local policy development by drawing from a canon of foreign documents and a community of foreign experts (see Chapter 3). For example, one policy-maker explained that the U.S.-based "AASHTO Green Book" is frequently used as a template for Indonesian geometric standards on roads, flyovers, underpasses and pavement design. As an international specialist on transportation issues, I have also participated in the process of policy advice to Indonesian agencies using the medium of English.

Once English is associated with technical disciplines, bureaucratic power and the intelligentsia, English terms acquire an air of authority for those who utter them. This mystique is suggested in the following quotations from a Jakartan policy-maker with my translations in which foreign terms are blanked out.

> *Ya memang focus lebih pada jalan protocol karena ada beautifikasi, tetapi disekitarnya jalan protocolnya itu menghubungkan mana itu lupa ya kan tapi tidak ada untuk seluruh kawasan…*
> *Nah dengan demikian, kalau di kawasan yang pemukinan itu, memang kita harus jamin untuk itu bersedia pedestrian. Karena walaupun itu diorganik ataupun direncanakan… sangat terjantung pada provider si real estate-nya*

[Yes certainly there is more ____ on ____ roads because of the ____ process, but around the ____ roads the connections to elsewhere are forgotten, but not in all areas…
So with that, if we're in residential areas, of course we have to require them to provide ____ [facilities]. Because whether it's ____ or planned it really depends upon the ____ of ____.]

The above policy-maker may have used more English than usual in order to accommodate a native-English-speaking guest. On the other hand, however, one can see that English is used for almost all of the discipline-specific *key words* within these sentences. Bahasa Indonesia merely provides the sentence structure and fill-in words. If a regular pedestrian wished to understand pedestrian planning discourse, they would therefore require someone from the class of people with English-language education or experience to translate all of the key words for public consumption. This characteristic makes planning information both imperfect and *inaccessible* to the bulk of constituents who are served by such plans.

The prevalence of English key words within Indonesian discourse on accessibility is encouraged by written codes such as Indonesia's *Technical Guidelines for Facilities and the Accessibility of Buildings and Environments (Peraturan Menteri Pekerjaan Umum No.30/PRT/M/2006)*. The images and wording within this document make it obvious that the document was largely imported from an overseas standard, and English terms are often used where more regular and comprehensible words already exist within bahasa Indonesia. For example, the first and second chapters describe the "essence" and "standard" application "details" for "facilities" and "accessibility". The document goes on to describe "typical" and "recommended design" dimensions of "ramps", "toilets", "markers", "pedestrian paths", "parking lot" and stairs, with specific details on items such as "handrails", "anti-slip nosing", "control panels" and "speakers".[11] For every one of there is a regular Indonesian term that could have been used to make the concepts more clear, straight-forward and accessible.

While the public servants who enact and implement the above technical guidelines may come to understand these terms, I argue that guidelines are more vulnerable to misinterpretation and misapplication when the terminology is less than accessible to the regular population. The use of inaccessible, foreign jargon also reduces the potential talent pool from which agencies may recruit, and ironically, it reduces the likely effectiveness of public information and awareness campaigns on the issue of universal access. Additionally, prevalent use of English-language terminology precludes the possibility of real public participation or informed choices in developing more useful and context-sensitive design standards… but perhaps it is naïve to assume that accessible design standards exist for the purpose of designing accessible urban public space.

Limits to discursive accessibility as cultural capital
According to Goody, written codes may exist for multiple purposes including goals related to the content of the written text and other more paradigmatic purposes. In discussing religious texts, for instance, Goody argues that religious texts were not simply used to spread a particular

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[11] For the sake of accessibility, Indonesianized versions of English or Dutch terms have been converted back to regular English spellings. For example, the Indonesianized Dutch term, *aksesibilitas*, has been written here as "accessibility". The more regular and understandable Indonesian term would be "kemudahan dicapai".

religion, but also spread literacy and the idea of religion itself (Goody 1986: 4). Similarly, written codes on accessibility and pedestrian planning may not merely be used for establishing standards of urban design and planning, but may play a role in staking a claim over urban space and communicating the idea of rational planning and bureaucratic hierarchy. These ideas can be seen in the following excerpts from an interview with a senior policy-maker in Jakarta:

> There are two basic information *ya untuk* to set up the pedestrian crossing: What is the traffic volume and the pedestrian volume? We have formula P.V-squared… *jadi dari itu kita bisa pilih nanti, apa dia tetapnya zebra cross, ada tetapnya pedestrian bridge atau apa…* But we usually very seldom use that formula… because from visual observation and engineering image, *ya*, we can know that, oh, we need the bridge or tunnel or crossing. Also we use the physical characteristics of the road. [*Misalnya kalau*] the road *sempit, kita* [*bikin* crossing *aja*] *walaupun secara formula masuk dia sebuah bridge disitu ngak laku. Juga, mereka lebih senang [menyeberang jalan] ada standar tidak cukup lebar gitu. Jalan Sudirman sangat lebar gitu, sehingga dari sana, kita udah lihat walaupun pedestrian tidak banyak gitu, menurut kita memang kita perlu pedestrian gitu…* <u>*Ada standar [tapi kita] tidak terlalu menggunakan formula… itu lebih banyak feeling*</u>*… Karena kita sering merencanakan situ, ada dampaknya sering* <u>*hasilnya itu dengan formula and feelings is similar*</u>.

> [There are two basic pieces of information that we use for setting up pedestrian crossings, right: What is the traffic volume and the pedestrian volume? We have a formula P.V-squared so from that (formula) we then know what to choose: do we need a zebra crossing, is there a need for a pedestrian bridge, or (do we need) something else? But we very seldom use that formula because from visual observation and engineering imagery, we can know that, oh, we need a bridge or tunnel or crossing. Also we use the physical characteristics of the road. (For example, if) the road is narrow we (just install a crossing) even though the formula would suggest that we need to put in a bridge there, (but we know that if we did) it wouldn't be used. People prefer to (cross at grade) if the road is not that wide. Sudirman Road is very wide, right, so from that we can already see that, even though there aren't many pedestrians, we will certainly need pedestrian (bridge) facilities… There's a standard but we don't use the formula too much… More usually, it's about feelings… Because we have often planned that sort of thing, the final result is often similar whether we use formulae or feelings.]

From this quotation, the policy-maker explained that a written code existed for planning pedestrian facilities based on a mathematical equation or formula. After citing these standards, however, he conceded that the formulae was seldom used in the process of pedestrian planning because the engineers got similar or better results from using their feelings.

The disregard for standard formulae accessibility planning may highlight the value of professional planning judgment. On the other hand, the significant investment of resources in developing and enacting such codes suggests that codes are considered to have value even though they are not used. Do they function only to standardize elements of urban public space, or do they represent a claim in the market for cultural capital as markers of the scientific process, rational planning, modernity, order, and power over the production of urban space?

In the market for what Guillory calls cultural capital (Guillory 1993), planning that has value is not necessarily that which is accessible to the public or even useful in the practical process of planning public spaces. Instead, the accessibility of discourse is compromised by the need for documents and processes to succeed in their claim for legitimacy and authority. In Jakarta, this discursive requirement means that discourse on universal access has been rendered inaccessible by the prevalence of bureaucratic processes, scientific formulae and foreign terminology that is incomprehensible to most pedestrians.

Accessibility and the Market for Public Urban Space

In a rapidly growing, developing-world megacity, the notion of universal access may be bounded by the realities of public policy-making with limited physical resources. In this context, attempts to implement universal access based on international standards developed in the West may inadvertently hinder accessibility for those facing barriers to full and effective participation in society. In the case of Jakarta, a lack of resources and the need to compete with other users of public space (such as motorized transportation users) means that boundedly rational planners can only afford to provide "universal" access as a privilege of the elite. In the same way that a democratic process which extends voting privileges to only the elite is not democratic, accessibility that extends universal design to only elite locations is not accessible. Without connections to a wide-ranging network of other accessible sites, those with impairments will still be unable to participate in society regardless of how well these fragmentary sites are implemented and maintained.

In this context, integrated accessibility may be a more desirable approach to the planning of public space. Under the notion of integrated accessibility, universal access standards would be used in the design of narrow streets (which are currently missing from Jakarta's efforts toward accessibility), and boundedly rational approaches sould be used to prioritize pedestrian network completion over strict adherence with international standards. This implies a minimum street width of 1.6 meters or 5 feet and special focus on walkability in informal land development areas and walking streets. An integrated accessibility strategy would therefore adopt a *satisficing* approach to increasing connectivity and providing the most basic facilities throughout all areas and all street types within Jakarta—prioritizing fine-grained, connected and continuous networks of low-end pedestrian facilities over piecemeal fragments of sidewalk that comply with international standards (Lindblom 1959).

At a regional scale, this approach suggests that strict international design standards may be relaxed in order to increase regional coverage in the context of limited resources. International standards may also be relaxed in order to better address local context-specific conditions that prevent "accessible" sidewalks or crossing from working. For example, many of Jakarta's sidewalks are less than accessible to pedestrians because motorcyclists use driveways and curb ramps to gain access along sidewalks when the traffic lanes are congested. An integrated accessibility strategy would therefore prioritize traffic enforcement and education strategies that target this behavior, before completing design elements such as curb ramps that might ironically undermine pedestrian safety and accessibility.

In addition to this integrated approach to non-motorized network coverage, street design, education and enforcement, integrated accessibility would also account for the market-like nature of boundedly rational planning by making pedestrians more "competitive" in the planning process. This strategy would focus on reframing pedestrians them as legitimate customers of the urban regime and key political constituents within Jakarta's newly-democratic policy making process. In this framework, pedestrian planning would be promoted as a means of improving the daily lives of Jakarta's population and winning votes in democratic elections.

Different aspects of bounded accessibility are presented in Table 11 below.

Table 11: Integrated accessibility

Accessibility paradigm	Disabled access	Universal accessibility	Integrated accessibility
Agents of interest	Persons with severe, long-term physical disability	Persons with diverse abilities in relation to attitudes & environments	Pedestrians with diverse incomes & abilities in relation to attitudes, environments, competing road users & planners
Setting	Low–high density, formal development (no provision for informality)	Low–high density, formal development (no provisions for informality)	Low–high density, mixed land uses, formal & informal development
Perceived problem	Human rights of those with disabilities	Inequality & human rights of people with diverse abilities	Inequality, human rights of people with diverse incomes & abilities, viability of markets for urban space & symbolic goods
Information	Perfect & accessible	Perfect & accessible	Imperfect Inaccessibility addressed in relation to culture
Assumed resources	Vast and redundant, except in the case of unjustifiable hardship	Vast and redundant, except in the case of unjustifiable hardship	Very limited stock of funds, land, street right-of-way and governance capacity
Strategy	Regulate minimum design standards, adjustments & specialized services	Regulate minimum design standards & recommend integrated design for people with diverse abilities	Relax standards to improve coverage & context-sensitivity Reframe pedestrians as constituents to expand the range of visible spaces
Examples	Paratransit services with wheelchair lifts	Curb ramps & low-floor buses	Connectivity & continuity of local paths

Unlike universal access, which assumes substantial resources for implementing design features in all public spaces and facilities, integrated accessibility acknowledges that cities like Jakarta have very scarce stocks of money, street right-of-way and public planning capacity.

Furthermore, planners in these contexts attempt to satisfy multiple contradictory objectives including enhancing their own cultural capital, addressing social inequality, showcasing urban economic success, and allowing the market in public space to function efficiently and effectively.

In the case of Jakarta, these contradictory goals are currently satisfied by implementing universal access only in very limited locations that contribute to the symbolic products of modernity, development and the marketing of legitimate urban governance. Sites that meet these criteria include protocol or presidential roads such as the Thamrin-Sudirman corridor, *Jalan Veteran*, and *Jalan Teuku Umar*, where already generous sidewalks are made more impressive in order to conspicuously showcase successful pedestrian planning according to international standards of accessibility. In other locations, policy choices are made to invest in meeting the needs of motorized transportation users at the expense of more populous but less competitive pedestrian concerns.

While Jakarta's pedestrian planning is limited in reach and desultory in process, most planners express an uncritical sense that pedestrian planning is underway in the city. The result of this planning, however, is that most areas of the city remain inaccessible to those with diverse physical abilities. Furthermore, planning discourse in itself inaccessible to those it ostensibly serves since it is dominated by English language terminology and information generated under less than comparable international conditions.

By aspiring to integrated accessibility, Jakarta's policy-makers may not produce any sites that are monumental, spectacular or perfectly accessible to people with all possible impairments. On the other hand, bounded accessibility may provide a more realistic model for policy-making under conditions of context-sensitive rationality and market-like competition for public space, cultural capital and urban impressions. Under these conditions, integrated accessibility has greater probability of being implemented in a widespread manner than universal access and therefore holds greater promise for achieving the original goals of accessible and inclusive cities.

Checklist for policy-makers:

- Are universal access standards used to define street design standards for narrow shared streets and pedestrian ways?
- Is a plan in place to ensure regional coverage of pedestrian pahts and sidewalks?
- Are traffic enforcement and motorist education a serious and ongoing part of the accessibility strategy?
- Are planning documents written in plain language and accessible to ordinary people?
- Are ordinary pedestrians framed as legimate customers and political constituents within the planning process?

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Chapter 5: Legibility: Anti-Planning and the Synoptic Perspective of the City

You can tell a lot about a city by looking.

(Allan B. Jacobs, *Looking at Cities*, 1985: 28)

… state simplifications, the basic givens of modern statecraft, were, I began to realize,
rather like abridged maps. They did not successfully represent the
actual activity of the society they depicted, nor were they intended to;
they represented only that slice of it that interested the official observer.
They were, moreover, not just maps.
Rather they were maps that, when allied with state power,
would enable much of the reality they depicted to be remade.
Thus a state cadastral map created to designate taxable property-holders
does not merely describe a system of land tenure; it creates such a system
through its ability to give its categories the force of law.

(James Scott, *Seeing like a State*, 1985: 3)

Urban Landscapes, Transparency and Legibility

Urban landscapes and the discourses that surround them provide information about past and present inhabitants and influences in an area. Transportation researchers examine patterns of land use, travel demand and traveler response to policy choices in order to better understand urban processes and better plan for future needs. Each of these tasks depends upon the acquisition and manipulation of data that is collected in categories or bundles representing the spectrum of transportation participants, modes and movements. These categories have been developed over time through generations of transportation and related research conducted, primarily, in the West. Where research emerges from outside of the Western world, it is therefore undertaken using categories and techniques that were developed, by and large, in Western contexts. In examining transportation within the context of majority world cities, many parameters that could be relevant are not readily visible having been swept away and rendered invisible by the limited view of researchers and practitioners who collect data in standard ways.

This chapter examines issues of spatial transparency and legibility that emerged from pedestrian transportation research in Jakarta. These issues include the difference between transparency, or the view of pedestrians as they walk along the street, and synoptic legibility, or the bird's eye view of planners. In cities with a high degree of urban informality and long-term squatting, these two factors produce two completely different pictures of pedestrian space. While this may be a problem in all cities, it is especially problematic in non-Western settings where the application of standard, synoptic research techniques renders many pedestrian spaces invisible. Under these circumstances, spatial planning can result in the exclusion and even erasure of many low-income spaces from planning processes.

Spatial Literacy and Transparency of Urban Pedestrian Space

According to Groth (1997), ordinary, everyday urban spaces are filled with clues to past and present social relations and cultural meanings that may be read by going out and observing the city. Allan Jacobs (1985) outlines specific tools that help us observe urban spaces with a view to gleaning information on the age of buildings, the socioeconomic characteristics of people, and the historic shifts within the neighborhood. The ability of people, planners and policy-makers to read or discern these clues is called *visual literacy*.

For those who have highly developed visual literacy, there is something interesting to be learnt from all urban landscapes or settlements, no matter how monotonous, ordinary, grand or overpowering they initially appear. Sometimes, however, the processes of spatial production may be read more easily due to the *immediacy* or *transparency* of the place itself. For example, a waterfront street in a fishing village, where fishermen can been seen mending nets and people can be seen selling food in shopfronts, is more transparent than an office park, where the nature of people's work and even the presence of people themselves may be essentially invisible from the street. Urban designers such as Lynch and Jane Jacobs consider transparency to be a key attribute of good cities and pedestrian spaces.

According to contemporary urban design theory, transparency also contributes to the Lynchian notion of *sense* (or *sense of place* as it is more generally known), which has been identified as a key concept for transit-oriented development, complete streets and walkability (Calthorpe 1993). Transparency is part of sense of place in that it affects how well people perceive and identify the various technical functions, activities, and social and natural processes within an urban landscape or settlement (Lynch 1984: 131, 138). Responding to the common complaint that modern cities are "opaque, impersonal, lacking in immediacy", Lynch and other Western urban design practitioners and theorists claim that places with greater *sense* are more transparent to both strangers and residents alike (Lynch 1984: 139). My research in Jakarta sought to extend this theory by considering its application in a non-Western context.

Visual literacy and transparency in Jakarta
This research considered whether preferences for transparency and abilities in urban visual literacy vary by cultural context and by class.

The exercise in visual literacy began with a two weeks journey around Jakarta on the back of a motorbike. The journey traversed most neighborhoods within Jakarta—from expansive island mansions in the north of Jakarta (where I was kicked out by private security) to bumpy dirt tracks past self-built housing held down by used car tires underneath freeway overpasses. From this exercise, pedestrian typologies were developed and sites selected for more detailed streetscape observations and surveying. The structured streetscape observations considered each of the selected street segments and associated properties in terms of the transparency of street frontages and two dozen other variables (see Appendix B). The observations therefore provided measurable understanding of the level of transparency that was associated with various types of streets within Central Jakarta.

Transparency preferences among policy-makers
Having carried out site-specific surveys and observations, several policy-makers were interviewed regarding the process of pedestrian planning within Jakarta as well as specific sites where pedestrian planning projects had been implemented. In these conversations, almost all sites identified by policy makers as exemplary pedestrian spaces were in fact opaque, superblock style spaces for office, commercial and recreational activity (represented by the top left quadrant of Figure 19). Transparency, as defined by Lynch, was not a feature of any of the sites. Many of these spaces were memorable on the level of political symbolism, but they lacked both fine-grained immediacy as well as local influence on the design of the space.

Upon further consideration, it appeared that each of the sites identified by policy-makers was in fact *legible*, even though they were not transparent. They were legible primarily from the *synoptic perspective* of satellite imagery or state political criteria, and therefore the character of the spaces was defined and designed synoptically with little attention or appeal in terms of human scale or local users of the space.

Examples: Irvine office park, Brasilia government housing	*Example: Paris café street*
Critiques: opaque, modern, impersonal, elitist, sterile	*Critiques: narrow, congested, crowded*
Example: Kabul hillside neighborhood (with no commercial activity)	*Example: Jakarta kampung area*
Critiques: narrow, opaque, overly private	*Critiques: narrow, irregular, poor, lacking privacy, unsanitary*

Increasing synoptic legibility of space (vertical axis)

Increasing transparency of space (horizontal axis)

Figure 19: Relationships between synoptic legibility and transparency of urban spaces

Transparency preferences among pedestrians

By contrast to policy makers, pedestrians who were interviewed at each of the study sites identified more transparent places as their favorite routes to walk (the right half of Figure 19), though they did not identify transparency as the key reason for preferring these places. Instead, they mentioned the following more pragmatic considerations (in order of occurrence):

- connectivity and directness of the route to where they were going;
- familiarity with the route or area;
- opportunities to gather, shop, eat and exercise;
- proximity to home and services;
- low traffic volume;
- quality of the sidewalk and street pavement;
- cleanliness of the air and street; and
- coolness or presence of shade.

The relative consistency of open-ended responses among 120 interview respondents suggests a degree of visual literacy and appreciation among pedestrians of every day spaces that were dismissed out of hand by most (but not all) of the key policy-makers in the field. In particular, the first four factors weave together notions of use, experience and memory of places that match urban design theory on sense of place, and that may help to refine transportation criteria for walkability. Differences in the preferences of local pedestrians, local pedestrian planners and Western urban design theorists are shown in Figure 20.
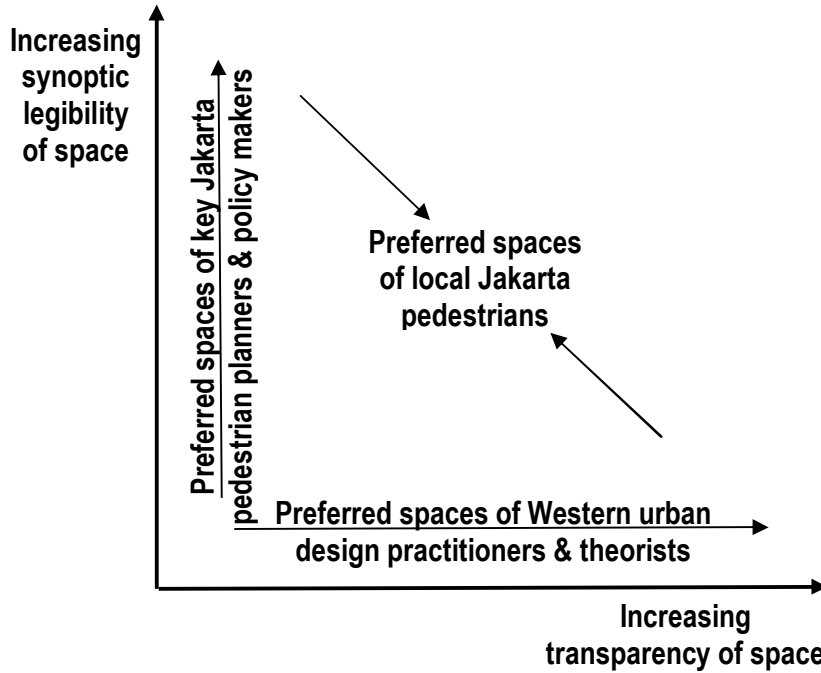
Figure 20: Preferences for pedestrian spaces with respect to transparency and legibility

Transparency preferences among urban design theorists
While the interviewed pedestrians clearly had a greater appreciation for transparent spaces than most policy makers interviewed for this research, they did not in fact select the *most* transparent spaces as their favorite places to walk. Many of the *most* transparent streets within the study area were low-income areas with a level of transparency that is unmatched in Western cities and possibly beyond the frame of reference of many urban design scholars. Within one such area, there were people pumping water, washing clothes, buying food, preparing food, welding metal, and even children going to the toilet in the public space between houses.

In this context, it appears that there are upper limits to the benefits of transparency but, at this extreme level, it is difficult to disentangle transparency from issues of social class, state control, and public sanitary services. In any case, the gritty reality of extreme transparency is unacknowledged in Western texts, which tend to view transparency with a nostalgic sense of loss relative to the sterility of modernist urban landscapes. This sense of loss results in transparency being viewed through the distorted lens of linear and unlimited benefits. In the Jakarta context, transparency is still a valid concern to pedestrians, yet their preferences suggest that this concern is bounded at both the upper and lower levels. At the upper extreme, there appears to be a trade-off or optimization between transparency and other concerns. A proposed amendment of current urban design theory is therefore suggested in Figure 21.
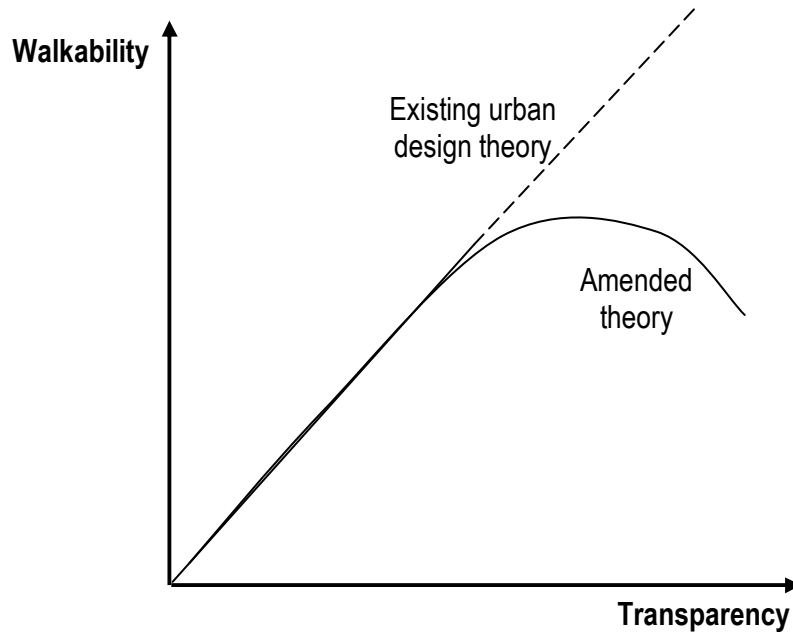
Figure 21: Proposed amendment of relationship between walkability and transparency

Synoptic Legibility and the Mapping of Informal Pedestrian Spaces

While street level transparency is considered important by pedestrians, many of the planners interviewed for this research saw Jakarta's streets from a more remote perspective – what Scott refers to as synoptic legibility (Scott 1998). At this level, many neighborhood-level pedestrian spaces are rendered completely illegible or invisible.

Synoptic network mapping
This issue emerged early in the research when I realized that some of the pedestrian routes in the neighborhoods where I was interviewing pedestrians were not marked on standard road maps of the city. In these neighborhoods many narrow streets or paths are omitted from local street classification systems, pedestrian plans and urban design guidelines particularly if they are in informal areas. When I asked about mapping and planning for these streets, local government policy makers expressed little desire to map or plan for these areas due to limited resources, concerns about uncertain land tenure and priorities in addressing motorized traffic.

As a planner who was examining these areas, however, I needed some kind of working map of the area and so I created my own maps of the local pedestrian spaces. From these hand-drawn maps it became clear that the cognitive space experienced by many pedestrians, particularly those in informal or low-income areas within neighborhoods, was radically different from the synoptically mapped space of streets, as seen by drivers and policy makers. For the Setia Budi neighborhood (shown in Figures 22 and 23), local maps show the area as a string of superblocks along two main roads, with smaller orthogonal blocks between these corridors. By following pedestrians through the neighborhood, however, a whole additional set of 8- to 15-foot-wide streets and public paths became visible.

Figure 22: Regular street map used for planning Jakarta's Setia Budi neighborhood

Figure 23: Pedestrian map of Jakarta's Setia Budi neighborhood with a shadow network of additional pedestrian spaces

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Shadow network of pedestrian paths

This latter shadow network of paths is permeable to pedestrians, carts, bicycles and motorbikes, and is a key part of the cognitive space of local pedestrians. Pedestrians complained about these narrow and windy streets, yet chose to use them because they were convenient routes for part of people's daily journeys. On the other hand, the shadow pedestrian spaces were not permeable to cars and often could not even be identified on aerial photographs due to the prevalence of overhanging rooflines and irregular or organic angles. The full pedestrian network could therefore only be mapped by walking or riding a bike along each and every path within the neighborhood—the antithesis of synoptic planning.

The illegibility of Jakarta's shadow pedestrian spaces is exacerbated when one considers the strong influence of Western research and planning practices in Jakarta. As discussed in Chapter 2, heavy Western involvement in Indonesia's development has resulted in a transportation planning discourse that is dominated by consultants, policy advisors, textbooks, technical manuals and policies from the West. By definition, the authors of imported texts and policies do not develop their treatises with developing world streets in mind, and they probably have little concept of the diversity of small, informal pedestrian streets to which their ideas are transplanted. Even when consultants and advisors travel to Indonesia to assess transportation conditions, they often remain unaware of the plethora of informal pedestrian spaces because hotels, offices and malls are located along main roads and foreigners usually travel by a narrow range of motorized modes (taxis, chauffeured cars and the Busway). To add to the challenge of visibility, navigating the back streets of Jakarta requires some command of bahasa Indonesia and may seem confusing, unpleasant or dangerous to those unfamiliar with the conditions. The result of these forces is a tendency to focus exclusively on motorized traffic routes when conducting transportation data collection and planning efforts—even when these efforts are explicitly aimed at addressing non-motorized transportation within Jakarta.

Policy implications of synoptic mapping

Since illegible and informal spaces are also low-income areas, the exclusion of these spaces from transportation data, maps and plans has negative equity implications in terms of both informational inputs and access outcomes. Low-income residents and non-motorized modes are rendered invisible, and therefore tend to be under-provided or even erased as the synoptic planning process reproduces physical space in its own representational image.

In the case of Jakarta, erasure sometimes comes in the form of mass evictions of low-income neighborhoods predicated on representations or maps from pre-1945 Dutch land titles. Despite the fact that colonial rule ended over six decades ago, land title documents from the Dutch era become tools that are use within the contemporary political economy in order to make claims to land that has often been openly and continuously used as an urban neighborhood for several generations. Given the rapid urbanization of Jakarta, colonial land title documents often show the land as vacant spaces or agricultural fields beyond the urban fringe. Enforcement of the land title documents therefore creates a chilling reproduction of such maps through forced eviction and demolition of the area.

Figure 24: Remains of a neighborhood eviction in Central Jakarta

Within the constellation of Jakarta's city planners, some expressed frustration over the city's lack of authority to provide street design, planning and all but the most basic urban services along streets in as-yet-untitled areas. With no provision for adverse possession (squatter's rights) or other non-market means of ensuring tenure security, planning for untitled neighborhoods carries the constant uncertainty of erasure should the legal titleholder emerge. Informal neighborhoods therefore remain unmapped, illegible and under-provided from a transportation perspective.

A disconnect between synoptic legibility and ground-level transparency, as reflected in formal and informal land title, produces a chasm between planned space and lived space within the city of Jakarta. This disconnect results in a type of *anti-planning* of many everyday, pedestrian spaces that are not legible to those who plan the city's public spaces. These interconnected issues of spatial illegibility and social exclusion are not unique to Jakarta but resonate throughout many parts of the developing world.

Addressing the Legibility Gap in Jakarta's Pedestrian Spaces

The anti-planning of illegible spaces in Jakarta is not be merely the result of top-down state simplifications and limited synoptic perspective of policy-makers as described in Scott's work on *Seeing like a State* (Scott 1998: 3). Rather, Scott's more recent work on *The Art of Not Being Governed* argues that those who are being governed may also consent or contribute to their own illegibility in order to avoid various state intrusions such as taxation and conviction for lack of city documentation (Scott 2008). For this reason, efforts to reduce the legibility gap can not merely involve top-down changes, but should be implemented in conjunction with grassroots

work to address both spatial legibility and other issues of concern to those rendered illegible. In particular, it should address root causes of inequality and community mistrust of government such as employment opportunity, security of tenure and corruption. Without such efforts, strategies to improve legibility may be both unsuccessful and harmful to the lives of those rendered visible.

With this important caveat in mind, there is probably still value to reducing the legibility gap in order to ensure that planning efforts reflect and address the needs of the entire citizenry of Jakarta and not just the elite. Increased legibility is also necessary if planners are to build upon existing networks in their current or future efforts to encourage more efficient urban transportation systems and more sustainable urbanism in Jakarta and other majority world cities.

To make pedestrians more visible within the planning process, pedestrian planning takes budget, priority and staff to not only plan monumental spaces but a comprehensive network of walkable routes and spaces throughout the city. Specifically, walkability planning encompasses grassroots mapping of informal spaces and fine-grained urban networks, appreciating urban design values such as street-level transparency, and understanding the upper limits of these values in a very low-income setting.

To carry out the tasks of mapping and planning, policy-makers cannot rely on existing synoptic representations of space, but need to get out and become pedestrians in vernacular places throughout the city. Planners also need to invite community participation in spatial mapping and urban planning in order to understand and address the concerns of ordinary pedestrians— women, men and children from neighborhoods being planned and not just specialists from within the field. These strategies are outlined in Chapter 8 in relation to the petition box, the WikiPlaces project and vernacular placemaking. In the context of Indonesian democratization, pedestrian planning therefore provides an opportunity to connect with constituents and make a substantial difference in the daily lives of ordinary people.

Checklist for policy-makers:

- Does pedestrian planning have budget, priority and staff?
- Are staff adequately compensated and appropriately qualified?
- Is there a pedestrian plan that has been updated within the last 5 years?
- Does the pedestrian plan encompass a comprehensive network of facilities throughout all neighborhoods?
- Does the network include informal areas, streets and alleyways that are too narrow for cars?
- Does the plan address the pedestrian concerns of children and other vulnerable users?
- Have the pedestrian planners walked the local streets to verify conditions?
- Have ordinary pedestrians reviewed the maps and provided input on their concerns?

Chapter 6: Informality and Integrated Activity: Social Exclusion and Transportation Research

> … informality is the state of exception determined by the sovereign power of the planning apparatus… To deal with informality therefore partly means confronting how the apparatus of planning produces the unplanned and the unplannable.
>
> (Ananya Roy 2005: 153,156)

Informality and Transportation Data Collection

While differences between transparency and synoptic legibility highlight the different cognitive spaces of planners and pedestrians, there are a number of operational characteristics that also exacerbate anti-planning of low-income and informal spaces within Jakarta. These operational characteristics relate to informality and integrated activity.

This chapter examines informality and integrated activity as they relate to walkability planning in Jakarta. Four elements of informality and integrated activity emerged from this research:

- informal residential status;
- informal work;
- integrated activity; and
- informality within language.

These informal and integrated characteristics are not uniquely Jakartan but resonate throughout many parts of the majority world. The existence of these conditions highlights the fundamental flaws of trip-based analysis where the assumption of peak-hour commuting by motorized modes is historically embedded within standard transportation categories. More controversially, the research highlights the flaws of more recent transportation research techniques (such as activity surveys) that seek to improve upon trip-based analysis and respond to complex trip making patterns. By addressing both of these issues, transportation researchers and pedestrian planners can gain a more accurate understanding of urban travel practices and respond more effectively to the range of different road users that exist in cities of the world.

Informal Residential Status

One of the assumptions embedded within standard transportation research methods is that transportation users have a fixed home location that functions as their trip origin for various home-based trips including the all-important commute journey. This assumption proved to be faulty in the Jakartan context where many residents have informal or undocumented living arrangements.

Cultural notions of home and home-based trips
During interviews with pedestrians in Central Jakarta, I noticed that a number of interviewees provided information on their home-to-work journey that did not match their stated trip origin or travel patterns. From analyzing transcripts of recorded interviews it seemed that the term "home", which is used ubiquitously when collecting data and describing travel patterns, is a more complex idea in Indonesia—particularly among those with informal living arrangements.

The term *rumah* or "home" is normally used in Indonesian travel surveys and was recommended by local transportation specialists as part of interview questions on commute patterns. For those in the formal sector who live with their families, *rumah* is indeed the correct origin of their home-based trips. For others, however, it was not the origin of their home-based trips since

rumah implies family and roots, and this association led to misunderstandings among some survey respondents. For example, several young professionals who apparently lived in nearby rental accommodation (*kos*), provided journey-to-work information for a trip whose origin did not correspond to the neighborhood they stated as the place where they lived. Likewise, a construction worker who had indicated that he slept at the construction site explained that in order to get from "home" to work he took a commuter train from the edge of the metropolitan region into the central area of the city—clearly a different trip from his usual commute to the construction site.

In a place where many people live in non-family households or are engaged in the informal sector, the use of standard transportation terminology for describing trip origins can result in inaccuracy in the categorization and quantification of travel demand. In particular, loose use of the term "home" can lead to underestimation of short trips (such as walking commute trips) and overestimation of cross-town transportation needs. Interviewees who are more familiar with the process of surveying may be able to interpret what is being asked, but it preferable that transportation data collection does not depend upon interpretation, particularly in a developing world setting. More nuanced descriptors are therefore needed for trip origins within this context.

Informal residential status and fixed origin assumptions
To improve the accuracy of data collection in Jakarta, a better term for the origin of "home-based trips" may have been *tempat tinggal* or the place where one lives. However, this term also has problems due to sensitivities over people's rights to live within the city.

The provincial government of Jakarta has historically adopted a "closed city" policy, which means that people are not allowed to migrate to the city without a job, funds, paperwork and a legal identification card that states their residential address. In order to enforce this regulation, people who stay overnight for more than 24 hours within the city are supposed to be reported by their hosts to the local neighborhood chief. The purpose of this regulation is to reduce the rate of urbanization and control the flow of low-income rural migrants to the city. However, the policy has been largely unsuccessful and the city continues to grow rapidly through informal or undocumented migration. The actual population is likely to be at least 15 percent (or about 2 million people) higher than that reflected by the number of identity cards issued and the official Census estimates for the city. What this means is that a large component of Jakarta's nighttime population comprises of unregistered people who have no fixed address, are staying temporarily with friends or relatives, or are moving from one place to another. This lifestyle was described by one low-income street vendor who discussed her move to Jakarta in the following way:

> *Wang saya disini tadinya kontrak pindah-pindah.*
> [Don't you know, at first when I arrived here I didn't have a permanent place to stay and was moving from one place to another.]

Where there is a large population of informal or transitory residents, the assumption of a fixed home location as a regular trip origin is faulty, and transportation data collection that relies upon this assumption will be inaccurate and incomplete. For undocumented residents like the woman quoted above, a more accurate description of their commute trip origin might therefore be *tempat menginap* or the place where someone stays overnight.

Even where the correctly nuanced term is used in survey instruments, however, the sensitive nature of legal residency in Jakarta is likely to produce some proportion of evasive or biased survey responses to questions about where people live, how long they've lived there and where they are coming from. This might be akin to asking immigrants about their visa status in the United States.

Although I was aware of Jakarta's residency policy, I had not considered its potential effects on data collection until I reviewed a number of interviews that seemed to have peculiar responses to questions that involved home location and tenure. One respondent claimed that she did not remember where she lived and others gave contradictory responses on their travel patterns, occupation, home location and tenure. This seemed to be more prevalent for informal and low-income interviewees but also arose in an interview with a young professional who gave contradictory responses on how she spent her time and her occupational status.

Given the policy context of Jakarta, it is unlikely that this source of bias can be completely eliminated. The usual data collection method of in-house interviews organized through the local area chief is also likely to exacerbate this source of bias by discouraging responses from undocumented household members. One means of reducing this bias may be to use intercept surveys and ask about home location in a more general level than the specific neighborhood.

Implications of informal residential status
Wrong questions and incomplete descriptors produce wrong data on people's travel patterns and inappropriate policy choices for the city more widely. In this research, incorrect descriptions of primary trip origins raised concerns regarding the validity of survey results on trip characteristics for the journey-to-work and other home-based trips to the point that I am not comfortable presenting the more quantitative results from pedestrian interview survey data. More concerning, however, is the fact that this survey was not unique. Its wording followed the standard format of previous transportation surveys conducted by NGOs, city agencies and development organizations. These previous transportation surveys gathered data according to the standard categories and study results had been used to inform various policy decisions.

Incorrect coding of trip origins and a lack of ethnographic analysis within these surveys is likely to have resulted in overestimates of motorized trips from distant locations, and underestimates of short trips from informal places of abode. When used for policy analysis, this bias would encourage policy choices that favor investment in long distance transportation systems (like the present emphasis on commuter trains and freeways), over the provision and maintenance of sidewalks that many residents use to work and to get to work.

Informal Work

In addition to the dilemma of collecting accurate data on trip origins for people with no fixed or legal residence, the prevalence of informal economic activity in Jakarta also affects the accuracy of data collection on trip destinations within the city. Informal street vending is one form of informal work that interacts heavily with walkability planning in Jakarta. Informal street

vendors use walking as a commute mode, a marketing strategy and a workplace for carrying out their business. They may also enhance or interfere with the walking experience of other pedestrians.

Recent research by Yatmo (2008) and Rukmana (2011) categorizes Indonesian street vendors as belonging to one of the following groups:

- *warung* (permanent kiosks), which are constructed over sidewalks, setback zones or as street front additions to neighborhood houses;
- *tenda* (tents), which often replace sidewalks or street verges with informal cafés, restaurants and shops;
- *gelaran* (mats), which are often laid out in high foot-traffic locations such as footbridges leading to busway stations;
- *gerobak* (cartpushers) or *pedagang kaki lima* (*PKL*) (five-legged vendors), who often follow a circuit through neighborhood streets like a traveling salesperson before settling down for several hours at a regular location along the sidewalk, interchange or side of the street;
- *pikulan* (yoke wearers), who often operate in a similar manner to PKL;
- *bakul* (basketcarrier) such as traditional herbalists (*tukang jamu*), who carry their products through the neighborhood like a traveling salesperson; and
- other street vendors who use motorbikes, bicycles and pedaled-vehicles to move around.

In addition to the above street vendors, there a continuum of informal and quasi-formal workers who may also share some of the peculiar commute and walking trip characteristics of street vendors. These other workers include traveling salespeople, freelance workers and home-workers doing piece-work for formal sector industries.

Informal work and mobile trip destinations
While conducting pedestrian intercept surveys in Jakarta, it became apparent that a large proportion of interviewees were either engaged in informal employment (such as cart-pushing or mobile vending), or freelance employment (such as door-to-door sales) within the modern sector. For both of these categories of work, the assumption of a regular, daily commute journey did not apply due to irregular work hours, shifting work locations, and integration of the journey-to-work with other activities.

In the case of mobile food vendors, their daily journeys were predictable even though they did not fit the trip purposes of a standard transportation survey. Based on my observations, many vendors had a regular route so that they become like transient destinations, with regular customers who knew when to expect particular vendors at particular locations. Despite this regularity, the vendors found it difficult to inform surveyors of their usual travel patterns because they could not talk in terms of the standard trip categories laid out in the pedestrian survey: They had no single, fixed work location and their journey-to-work was essentially indistinguishable from other trip purposes such as "business", "shopping" and "visiting friends". Their travel patterns could not be described as "trip chaining" because the activities themselves served multiple purposes and their chain links were continually "interrupted" for socializing and carrying out informal business along the way. One vendor explained how she started her daily

rounds with a trip to the market where she bought supplies and socialized with friends. Another explained how she sold cut fruit along the way to her usual location, which she chose because she had friends who also sold goods there.

Informal work and occupational identity
Part of the difficulty the "other" informal workers had in describing their daily walking trips may have been that they did not identify themselves as "workers" so the notion of going to work or having business-related travel was altogether foreign. At the end of the survey sheet there was an apparently comprehensive and mutually exclusive list of occupational categories including worker, student, housewife/homemaker, retiree and unemployed. From the survey responses, however, 16 percent of respondents did not identify themselves as any of the categories but chose "other" as their occupational status and explained in the open-ended comment that they were informal workers (*pedagang*, *tukang* and other descriptors). Freelance workers within the *modern* sector identified themselves as workers even though they could be considered informal sector workers on the basis of their lack of regular working conditions or benefits—from the surveys freelance workers actually worked fewer days than "other" informal workers and had only slightly higher incomes. In any case, the ambiguous and informal nature of work came through on several survey transcripts such as the following man who paused to situate freelance work within the appropriate occupational category:

> - *Apa [pekerjaan] pak?* [What (are you employed) as, sir?]
> - *Freelance saya sih. Tidak tetap gitu freelance. Ya, pekerja lah gitu.* [I do freelance. It's not a permanent (fixed) job. Yes, but I'm still a worker.]

Implications of informal work
In settings where a high proportion of people work in the informal sector and freelance market, individual travel patterns may not fit well into the regular patterns or neat trip purpose categories of standard travel surveys. This issue results in inaccurate transportation data, with the inaccuracies concentrated among women, the poor, and those with more complex or less regular patterns of travel. The bias is particularly problematic in developing world cities where a sizeable portion of the population is engaged in the informal sector. However, it is also relevant in the West where increasing informality, changing work patterns and higher female participation in the workforce have produced more varied travel patterns and mixed purposes activities. The resulting inaccuracies are most likely to affect pedestrians because informal sector workers are more likely to walk and to walk for longer portions of the day (see Figure 25).
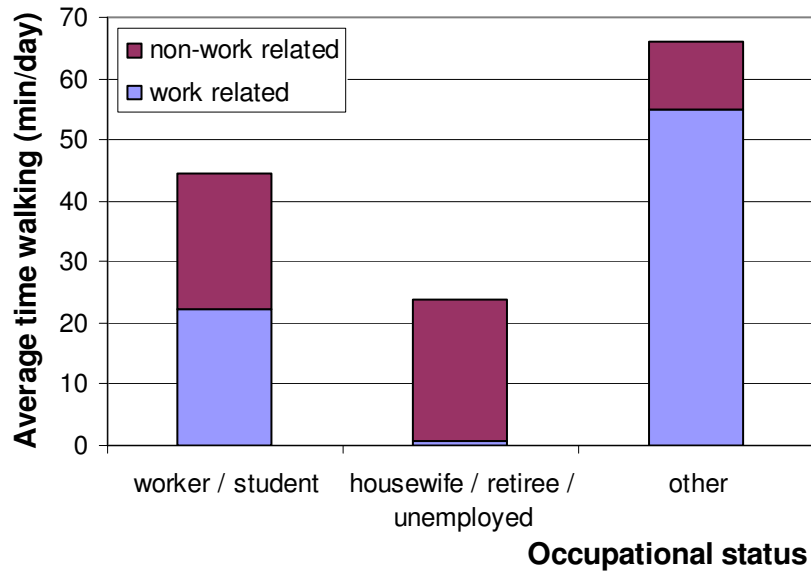
Figure 25: Average time spent walking by occupational status, Central Jakarta, 2008

At a fundamental level, the difficulty that informal and freelance workers had in responding to survey questions exposed inadequacies in transportation data collection that focuses on transportation itself. Transportation is a derived demand; it is a means to accessing opportunities for exchange (Engwicht 1992). Some commentators have therefore argued that data collection should instead focus on activities and exchange rather than mobility and motion. This would mean the use of activity-based surveys in preference to the standard trip-based surveys.

From this research, activity-based surveys would indeed be an improvement upon trip-based surveys, but activity-based surveys still fail to capture the pedestrian movements of many people engaged in the informal sector. As suggested in this research, street vendors and informal sector workers have travel patterns that are more complex than that reflected in activity-based surveys because the activities themselves are integrated. In this case, it is therefore difficult for survey respondents to even separate "trips" from "activities" since their trips are taken on foot and are continually interrupted to serve customers and interact with other pedestrians. Integrated activity patterns create a more complex challenge for transportation and urban researchers, but one that is worth addressing in order to better understand and reflect travel patterns in majority world cities.

Strategies for improved data collection on integrated activity are discussed further in Chapter 8.

Informality and transportation hierarchy in language

In addition to the issues of a synoptic perspective and urban informality, the problem of limited visibility and understanding of pedestrians within the planning process is exacerbated by informality in language. This linguistic informality and hierarchy tends to omit pedestrians from the vocabulary of transportation when data is collected at the street level.

The Indonesian language (bahasa Indonesia) is a modern language that was derived from the trade language of bahasa Malay and was selected by early nationalists as a more egalitarian lingua franca than other options such as Javanese with its embedded, social hierarchy (Hefner 1992, p109). Despite these egalitarian intentions, the rapid development of bahasa Indonesia has produced a formal-informal duality within the language: Informal bahasa Indonesia, which is spoken on the street, has a loose grammatical structure, many slang terms, and many words from local languages like Betawi or Javanese as well as Arabic. Formal bahasa Indonesia, on the other hand, has strict grammatical rules and numerous terms introduced from Dutch and English. One such word is *transportasi*—the Dutch-derived term for "transportation".

Transportasi and pedestrian research
Among policy-makers in the transportation field, *transportasi* is well understood to include all modes of transportation including non-motorized vehicles and walking. Among the local pedestrians surveyed in Central Jakarta, however, it became apparent that walking was not necessarily part of what people understood as *transportasi*. When asked about which mode of transportation people took to get to certain places, respondents frequently selected "none" rather than "walking only". Also, when asked to compare walking with other modes of transportation, respondents separated walking and transportation as illustrated in the following interview excerpt:

> - *Terus kalau ibu bandingin dengan transporasi lain bagaimana dengan pejalan kaki itu?* [Ok, how do pedestrians compare to other modes of transportation, madam?]
> - *Kalau transportasi dia kan lebih cepat aja ya.* [If you take transportation it's just faster, isn't it?]

In the above example, the respondent provides a clue to her framework of thinking when she contrasts walking to "transportation" and not to "*other modes* of transportation". Apparently, walking was not part of what she considered to be transportation.

The lack of correspondence between the meaning of *transportasi* in formal and informal language may be result of the modern connotations that are carried with many Indonesian words derived from Dutch: Most words for technological matters are derived from Dutch. On the other hand, it may also be a wider critique of planning jargon, where the meaning of terms within planning discourse do not match that of the surrounding language. Within bahasa Indonesia, a number of alternative terms might be used instead of *transportasi*, however, these terms are fraught with similar problems: *angkutan* suggests the conveyance of someone or something and therefore also excludes walking; and *perhubungan* refers to connections (i.e. transportation and communications) but is somewhat formal, abstract and overly general.

Linguistic informality and inclusion
While these words may be peculiar to bahasa Indonesia, they highlight the wider difficulty of inclusiveness embedded within language and its effects on transportation research. Where conceptual differences are unacknowledged, transportation data collection is likely to undercount walking and non-motorized trips since these are often excluded from the mental concept of transportation as a technological endeavor. Policy decisions that then emerge from such research

are likely to de-emphasize non-motorized modes in favor of what is considered to be real transportation.

Democracy, ethnography and pedestrian transportation research

Research on pedestrian preferences in Central Jakarta illustrates how standardized planning processes can inadvertently exclude vulnerable members of society when they are implemented in a majority world context. In the case of Jakarta, transportation data collection that uses trip categories derived in the West may render many pedestrians—particularly low-income pedestrians—invisible within the planning process. They are also likely to produce transportation profiles that fail to reflect prevalent patterns of informal housing, informal work and integrated activity within the city. This omission produces biased transportation data and policy decisions that are optimized in favor of motorized modes and long-distance transportation options.

Pedestrian planning is not a purely technical exercise but requires policy-makers to address wider issues affecting the city's political economy—issues of why certain members of society remain disenfranchised, and how the informality of certain spaces and activities is produced (Roy 2005). Walkability planning in Jakarta would greatly benefit from efforts to address security of urban citizenship and security of land tenure in a nuanced and sensitive manner. Resolution of these issues may be part of Indonesian efforts toward democratization, as well as providing side-benefits for the measurement, understanding and planning of urban public spaces.

With increasing transportation investment in the majority world and increasing informality even in Western cities like New York (Devlin 2011), transportation planners and researchers need to consider the assumptions that underpin their research and address the biases that undermine the quality of pedestrian space. These biases may be addressed by incorporating ethnographic techniques into transportation and urban data collection to ensure that concepts are appropriately translated and framed within the local cultural context. In addition, a transition away from trip-based surveys and toward time-use or activity surveys may also alleviate biases that result from assumptions of regular travel patterns, and fixed home and work locations. Finally, new integrated activity studies are needed in order to provide a more accurate and appropriate measure of walking patterns and the use of public in a majority world context.

Checklist for policy-makers:
• Is security of land tenure being considered and resolved in conjunction with the community?
• Are surveys ethnographically informed and appropriate for those without fixed home or work locations?
• Do data collection efforts account for informal and integrated activity patterns?

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Chapter 7: Shared Streets: Planning for Prevailing Practices

The best streets should help to make *community*, to bring people together,
to do in concert what they could not do alone. This means *accessibility* to all,
as well as accessibility to property, to help people get where they want and need to go.
The best streets are *desirable places to be*, to spend time, to walk with leisure.
Good streets are *safe*: safe from physical danger, where one is not likely to get hit
by a car or a truck. *Physical comfort* is a quality of the best streets.
The best streets are *public*, they are for everyone, they exclude no one.
They are *diverse* and they *encourage participation* on them…

The best streets seem to share a number of physical, desirable characteristics.
There is no mystery to them and I suspect that they characterize
streets in Asia as well as in the West, but I can not be sure of this assertion.

(Allan Jacobs from *On Asian Streets and Public Space*, 2010: 161,163)

Institutional Divisions in the Planning of Streets

In this chapter, I argue that Jakarta's streets are used as shared spaces and should therefore be planned and designed in such a way as to reflect this practice. The daily spatial practice of using streets as shared spaces is prevalent across a variety of street typologies and social classes within Jakarta. It can also be seen in many other cities of Asia and the majority world. Arguments for shared street design in Jakarta therefore have implications for the design and operation of great streets in many cities within Asia and across the world.

In contrast to the shared use of streets, institutional and disciplinary arrangements for Jakarta's street design and planning are characterized by deep schisms and assumption of spatial practice that are segregated by agency. As discussed in Chapter 2, pedestrian planning is characterized by disjointed institutional arrangements where the Department of Landscaping oversees street beautification, the Department of Transportation oversees traffic lanes, but there is no comprehensive oversight of the entire urban network of sidewalks, routes of travel or pedestrian public space (see Figure 3). This situation is further complicated as designated pedestrian public space is appropriated for road widening and median development (see Figure 4). Given that non-motorized transportation comprises the bulk of Jakarta's transportation task, this trend compromises not only design values but multimodal transportation performance itself.

Walking as a Shared Spatial Practice

While the planning and design of Jakarta's streets is characterized by disjointed institutional boundaries, the use of these streets is much more fluid and intertwined. From field observations of pedestrian activity, Jakarta's streets are almost always used as shared spaces, where pedestrians regularly share traffic lanes with motorized vehicles; and motorbikes and parked vehicles share sidewalks with pedestrians (or displace them from the sidewalks).

The everyday practice of shared streets
In the Central Jakarta streets where the pedestrian activity mapping was undertaken,[12] the practice of pedestrians sharing traffic lanes with motorvehicles was much more often the case than not. As shown in Table 12, only 2.3 percent of observed pedestrians displayed the "normally" assumed behavior of staying on the sidewalk or verge for their entire journey along the street segment (discounting portions of the journey where they needed to cross the street). The overwhelming majority (98 percent) of pedestrians opted instead to use the traffic lanes for at least a portion of their walking trip along the street segment. Furthermore, more than 80 percent of pedestrians used the traffic lanes for their entire journey along the street segment— meaning that pedestrians were four times more likely to treat the street as shared space than segregated space for their entire journey along the street segment.[13]

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[12] For a description of pedestrian activity mapping, please refer to the Research Methods section of Chapter 1.
[13] In order to make the information more easily interpretable, Table 12 includes those who walk entirely along traffic lanes under both "entirely along traffic lanes" and "at least partly along traffic lanes". Likewise, those walking entirely along sidewalks are counted under both "entirely along sidewalk" and "at least partly along sidewalk". For this reason, columns should not simply be added.

Table 12: Observed pedestrian routes between street corners in Central Jakarta, 2008

Pedestrian walking route \ Site	All fifteen street segments within the study		Jalan Mas Mansyur segment with high quality sidewalks	
	Number	Percentage	Number	Percentage
Entirely along sidewalk (i.e. "normal" assumed behavior)	215	2.3%	144	14%
At least partly along sidewalk	1,749	18%	299	29%
At least partly along traffic lanes	9,280	98%	871	86%
Entirely along traffic lanes	7,746	82%	716	71%
Total pedestrians past cordon	9,495	100%	1,015	100%

Possible reasons behind shared street practices

Interviews with pedestrians revealed that some of this practice could be attributed to poor quality sidewalk and the presence of undesirable conditions such as mud, holes, broken pavement, and rocks along the sidewalk or verge. The most common nuisance factors identified by pedestrian interviewees as they reflected upon their least favorite street segments included the following:

- excessive traffic (15 percent);
- poor surface conditions, including holes, broken pavement or rocks (15 percent);
- poor drainage and muddy conditions (11 percent);
- dirty or polluted conditions (9 percent);
- circuitous routing or a lack of proximity to key destinations (8 percent);
- narrow or windy streets and alleys (9 percent);
- the presence of vendors on the sidewalk (3 percent); and
- slopes and topographic factors (3 percent).

Given the parallel concerns of heavy traffic and poor surface conditions, however, poor quality sidewalk conditions do not provide a complete explanation for the prevalence of pedestrians walking along the traffic lanes. Field observations from Jalan Mas Mansyur reinforced this argument. Despite the road's heavy traffic (10,000 through-traffic vehicles/hour[14]) and high quality sidewalk for the segment under consideration, one might expect most pedestrians to use the sidewalk. Instead, 86 percent of pedestrians opted to travel within the traffic lanes for a portion of their journey along the street segment, and 70 percent walked entirely along the traffic lanes.

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[14] There are four lanes marked on the street pavement, but vehicles operate (in the through traffic section), as if it were a six lane facility with two lanes of traffic traveling along the wide outside lane. During congested periods, streams of motorbikes pass between rows of vehicles further increasing road capcity.

Two explanations for this observation exist. Firstly, a lack of system-wide continuity tends to negate the comfort and safety benefits of those sections of the network that *are* furnished with high-quality sidewalks. This network discontinuity also makes pedestrian journeys more circuitous or inconvenient for those who choose to weave in and out of sidewalks—using sidewalks when they are provided and the traffic lanes when they are not. In the case of Jalan Mas Mansyur, the sidewalk was effectively a detour for those walking further than one block, because it ended at the corner after which point pedestrians had to dismount and come out onto the street in order to reach their destination.

A second, and related, explanation for the prevalent practice of shared street use is the possibility that shared street usage is a cultural norm and not just a physical necessity. In fact, shared street usage may be a cultural norm reinforced by regular physical necessity (with that necessity being the need to walk along the traffic lanes due to inadequate sidewalk conditions). As a combined cultural and physical practice, shared street usage might then be expected to vary with different social and physical characteristics—a hypothesis that was borne out by activity mapping in Central Jakarta.

Pedestrian Activity Types

Pedestrian activity mapping results suggest that different types of pedestrians had different spatial practices and, by inference, different needs and preferences. Four types of pedestrians emerged from observations of pedestrian behavior in Central Jakarta:

- surface-sensitive pedestrians;
- risk-averse pedestrians;
- distance-minimizing pedestrians; and
- stationary pedestrians.

The general operational zones or path of travel for each of these types of pedestrians are indicated in the diagram provided in Figure 26 as well as the sample activity mapping diagram that follows in Figure 27:
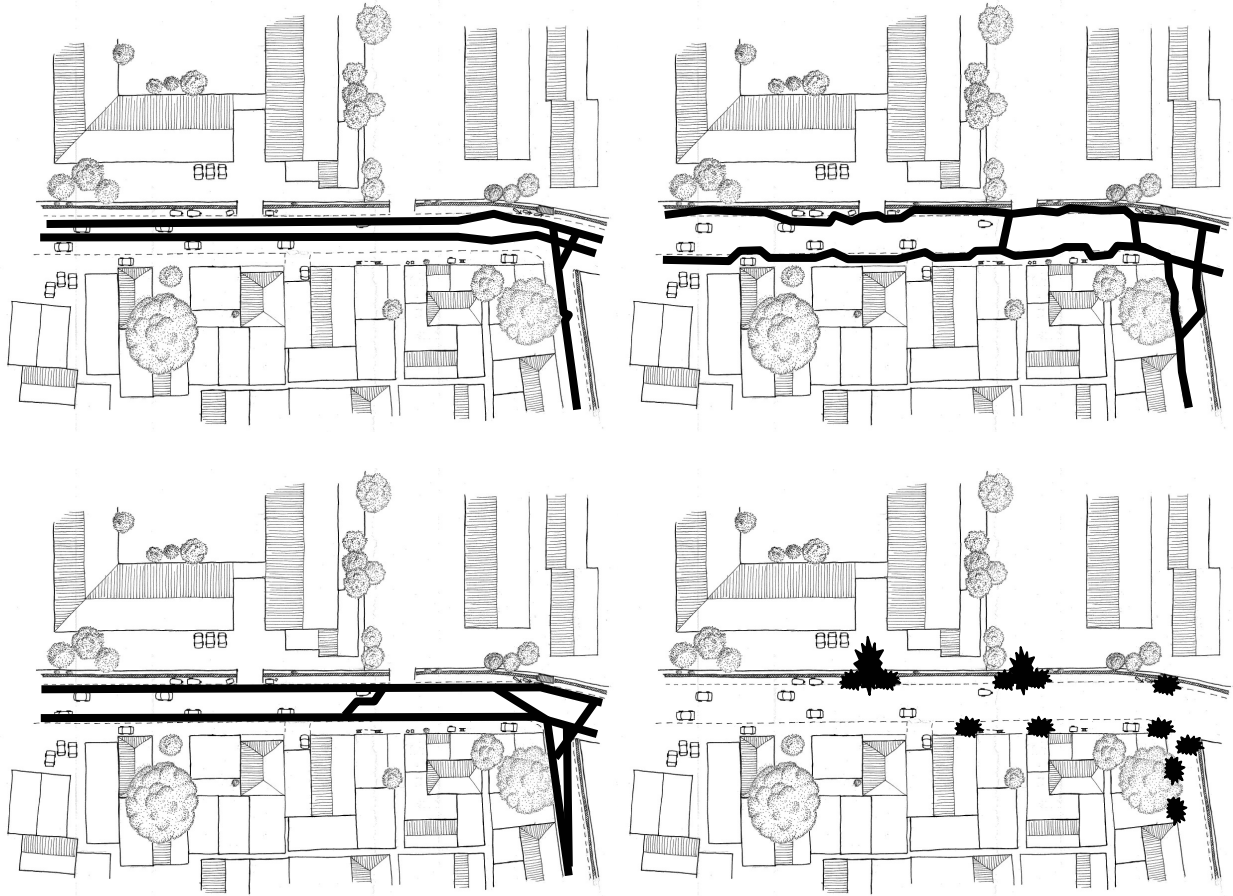
Figure 26: Activity zones for surface-sensitive, risk averse, stationary and distance-minimizing pedestrians (clockwise from top left)
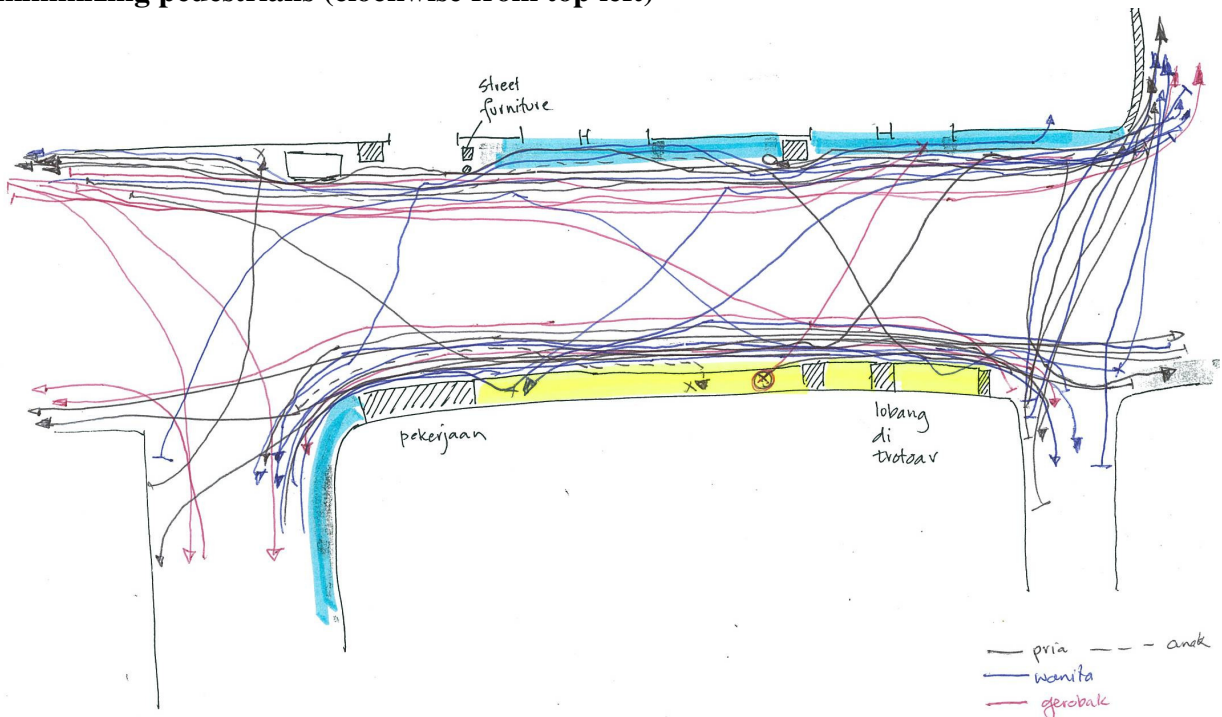

Figure 27: Activity mapping, Jalan Setia Budi 2 (11-11:30am 31/7/2008)

Surface-sensitive pedestrians

Perhaps the most obvious distinction among pedestrians observed within this study was the tendency of some pedestrians—particularly those pushing carts—to travel squarely within the traffic lanes, rather than on the sidewalk, verge or even road edge (see Figure 28 or the top left quadrant of Figure 26). By traveling within the traffic lanes, cart-pushers achieved a considerable energy advantage associated with avoiding grade changes at unramped corners, and bumpy conditions along the edges of the street. Interview data reinforced this advantage and highlighted the sensitivity of cart-pushers to traveling uphill or over uneven surfaces such as speed bumps, broken pavements and unramped curbs. The obvious trade-off for this advantage is the danger associated with a higher exposure to traffic.

While no wheelchair users were observed within the study, the inability or unwillingness of cart-pushers to travel along sidewalks or verges provides an indicator of the present lack of accessibility of Jakarta's sidewalks and verges for those with various ambulatory disabilities. The position of cart-pushers within the street may therefore assist in understanding current pedestrian amenity from the perspective of other surface-sensitive pedestrians who are not currently participating in the use of urban street life and urban public space.

To address this situation, there is therefore a need to either make streets function well as shared space for all non-motorized users; or to provide continuous, ample and accessible ramps, sidewalks and crossings for designated pedestrian routes of travel. Both of the above improvement would require the establishment or designation of a governing agency that advocates for pedestrians as a viable mode of transportation.

Figure 28: Surface-sensitive pedestrians avoid uneven road edge or sidewalk zones

At the other extreme, a second group of pedestrians tended to have circuitous routes of travel as the wound in and out between the sidewalk and the edge of traffic lanes (top right quadrant of Figure 26). Along segments of the street where the sidewalks were broken or obstructed, risk-averse pedestrians opted to use the street. At other times, however, they gravitated toward the sidewalk and away from the flow of traffic. Even while traveling within the traffic lanes, risk-averse pedestrians tended to maintain a position that was closer to the edge of the road than other pedestrians.

In some cases, pedestrians who displayed risk-averse behavior for one portion of the street did not display the same behavior for the entire street segment. Instead, they reverted to walking along the edge of a traffic lane where a high quality sidewalk was available. This inconsistency suggested a level of mental exertion in order for risk-averse pedestrians to engage in a dynamic decision making process—where they need to continually consider the trade-off between perceived safety and the perceived effort associated with altering their path of travel.

In the context of the fifteen study sites that were examined as part of this study, women generally displayed more often risk-averse behavior than men, children or cart-pushers. This pattern can be seen in Figure 29 and previously in Figure 27, where women's walking paths (the blue lines) are more often close to the edge of the street or are circuitous paths that wind between traffic lanes and the sidewalk.

Figure 29: Risk-averse pedestrians make constant trade-offs between traffic exposure and the energy required to skirt around broken pavement or obstacles in the sidewalk

Distance-minimizing pedestrians

The bulk of pedestrians were neither extremely risk-averse nor obviously surface-sensitive. Instead, they displayed walking routes that were primarily distance-minimizing—using streets as shared spaces, where they walked either along the sidewalk or traffic lanes (usually the latter) so long as they maintained a relatively straight course along the street (bottom left quadrant of Figure 26).

This tendency toward shared street usage was not uniform across all street segments under analysis. Instead, this study found that there was a reasonably strong relationship ($R^2 = 0.86$) between the percent of pedestrians who opted to walk entirely with the traffic lanes and a range of physical design and operational traffic variables. In particular, sidewalk maintenance problems (0.150) and sidewalk environmental problems (0.105) were correlated with higher rates of pedestrians walking entirely within the traffic lanes. Likewise, streets with less effective sidewalk with respect to sidewalk width (-0.107), sidewalk length (-0.0971) and raised curbs (coef = -0.115) had less pedestrians walking entirely along the traffic lanes.

These results suggest that shared street usage is not entirely a matter of pedestrian preference, but is strongly influenced by the degree to which street lacks separated sidewalk facilities and apparent maintenance within the sidewalk zone. For those pedestrians who seek to minimize their distance traveled, a lack of safe, effective and well-maintained sidewalk network facilities is a strong incentive for walking entirely along the lanes of vehicular traffic flow.

A more confusing result that emerged from the regression analysis was the finding that more mixed land use environments tended to have lower rates of pedestrians walking exclusively within traffic lanes (-0.534), while streets with more transparent street frontages had higher rates of pedestrians walking entirely within traffic lanes (0.0930). These results are displayed in Table 13.

Table 13: Regression results for percent of pedestrians walking entirely on-street

Source	SS	df	MS			
Model	11.0097332	14	.786409517	Number of obs	=	204
Residual	1.72320347	189	.009117479	F(14, 189)	=	86.25
				Prob > F	=	0.0000
Total	12.7329367	203	.062723826	R-squared	=	0.8647
				Adj R-squared	=	0.8546
				Root MSE	=	.09549

% walking entirely along traffic lanes	Coef.	Std. err.	t	P>|t|	[95% conf	interval]
Raised curb	-.1147795	.0514471	-2.23	0.027	-.2162639	-.0132951
Sidewalk env problems	.1050019	.0171412	6.13	0.000	.0711892	.1388147
Average bldg height	.0260268	.0026753	9.73	0.000	.0207496	.031304
Sdwalk maint problems	-.1501921	.0178404	-8.42	0.000	-.185384	-.1150003

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% walking entirely along traffic lanes	Coef.	Std. err.	t	P>|t|	[95% conf	interval]
Average lot width	.001797	.0011754	1.53	0.128	-.0005216	.0041156
Effective sdwalk width	-.107261	.0143107	-7.50	0.000	-.1354902	-.0790317
Average transparency	.0930434	.0159782	5.82	0.000	.0615249	.1245619
Land use diversity	-.5339165	.1116374	-4.78	0.000	-.7541318	-.3137011
Motor vehicles	-.000535	.0000993	-5.39	0.000	-.0007308	-.0003391
Motorbikes	.0007619	.0001526	4.99	0.000	.0004609	.0010629
Pedcarts	.0051888	.0019036	2.73	0.007	.0014338	.0089438
Ratio shared or sdwalk to segment length	-.0971475	.0296398	-3.28	0.001	-.1556148	-.0386802
Total peds past cordon	.0003875	.0001907	2.03	0.044	.0000114	.0007637
Proportion vacant	.0166425	.0104108	1.60	0.112	-.0038938	.0371789
_cons	.6829863	.0411676	16.59	0.000	.6017794	.7641933

Among the pedestrians who were observed as part of this study, men and children were the most likely to be distance-minimizing pedestrians who used streets as shared spaces. Given the vulnerability of children within a motorized traffic environment, traffic calming and pedestrian improvements are particularly important for school streets and pathways that are used as routes to school. Potential design improvements to reduce traffic speeds and protect children within school zones are therefore provided in the next section.

Figure 30: In this study, men and children were more often observed as distance-minimizing, especially on streets with less sidewalk and less comfortable sidewalks

Stationary pedestrians
A final group of pedestrians who were observed within this study was stationary pedestrians. This diverse group included the following types of people:

- shopkeepers, street vendors and salespeople;
- patrons, customers and people eating or drinking;
- street performers, people soliciting donations and beggars;
- people socializing, playing, talking on phones or texting;
- guards (*satpam*), security personnel and traffic police;
- pedestrians stopping to rest, look or smoke;
- *ojek*, *bajaj* and other drivers out of vehicles resting, socializing or awaiting passengers;
- waiting passengers, pedestrians waiting to cross the street, parking monitors, traffic entrepreneurs and *joki*; and
- event participants and people doing unpaid work (such as cleaning, washing, pumping water, picking fruit, preparing food and cooking).

As discussed in Chapter 6, street vendors are an important user of pedestrian space and include food tents (*tenda*), stalls or kiosks (*warung*), mats on the ground (*gelaran*), pushcarts (*gerobak*), yokes across the shoulders (*pikulan*), and baskets strapped onto one's back (*bakul*) (Yatmo 2008). These different street vendors and different types of stationary pedestrians displayed different preferences for their stationary street location.

In general, however, high foot traffic and gateway positions were popular among many stationary pedestrians (bottom right quadrant of Figure 26). For example, neighborhood guards and resting pedestrians typically chose security posts at the entrance to residential complexes, streets or houses. Waiting passengers often emerged from neighborhood streets to wait for taxi or paratransit services at these school gates or corner locations within the neighborhood; and *ojek* drivers sat together under makeshift shelters at street corners near schools and main roads. Shaded locations were especially popular among drivers, smokers and other resting pedestrians.

While mobile street vendors (with carts, yokes and baskets) stopped wherever customers appeared, semi-permanent vendors or stall operators tended to locate near neighborhood street corners unless they were attached to a particular property. In more busy locations where neighborhood streets or alleys connected to a main road, cart-pushers and street vendors with stalls typically stopped and set up their enterprise at gateway street corners. At these locations, customers and other pedestrians gathered near food carts to socialize, eat, drink or rest on impromptu benches placed next to the kiosks. Street vendors also socialized with each other as they went about their business.

In the most crowded locations—near transit interchanges, transit stations, universities, schools and commercial zones—a large number of bajaj drivers, paratransit operators, and street vendors crowded around gateway or corner positions, or set up their tents and stands along adjacent portions of the sidewalk or the road. In these locations, street vendors and stationary pedestrians frequently blocked sidewalks with their bodies, their stalls, and their seating, thereby forcing other pedestrians to squeeze by along the edge of traffic lanes or the remaining portions of the

sidewalk. Footbridges and other sites insulated from vehicle traffic were especially popular for vendors using mats, seated beggars and people soliciting donations.

Figure 31: Pedestrians and street vendors congregate along a divided sidewalk and street edge near a transit interchange at the entrance to Jakarta's Tarumanagara University

Implications of Pedestrian Practices for Designing Great Streets

On the whole, the existence of stationary pedestrians and the practice of shared street usage is not reflected or accommodated in the design or provision of Jakartan streets and public spaces. Instead, street design standards adopt Western assumptions that streets are used as segregated spaces with no informal vendors and with all pedestrians walking along sidewalks. The result of these unrealistic design assumptions—as well as poor construction and maintenance standards— is that many Jakartan sidewalks are unused, overcrowded or impassable for moving pedestrians. Instead, the bulk of Jakarta's pedestrians walk along traffic lanes designed for the exclusive use of motorized vehicles.

In order to address this dissonance between the design and use of urban pedestrian space, there is a need for more innovative and context-sensitive street design in Jakarta. This street design should address the everyday urban practices and needs within Jakarta, and should strive to create great streets. According to Allan Jacobs, Great Asian Streets are streets that:

> … help to make *community*, to bring people together, to do in concert what they could not do alone. This means *accessibility* to all, as well as accessibility to property, to help people get where they want and need to go. [Great] streets are *desirable places to be*, to

spend time, to walk with leisure. Good streets are *safe*: safe from physical danger, where one is not likely to get hit by a car or a truck. *Physical comfort* is a quality of [great] streets. The best streets are *public*, they are for everyone, they exclude no one. They are *diverse* and they *encourage participation* on them (Allan Jacobs 2010:161).

The following sections therefore provide examples of design opportunities and initiatives to move toward great street design in Jakarta.

Great transit interchanges: Drawing lessons from Rambutan
In a number of occasions, Jakartan street design has been adapted to accommodate the reality of informal vendors and other stationary pedestrians. For example, the transit interchange at the Raya Bogor Flyover in the Rambutan area features concrete stalls designed to accommodate informal vendors while providing sidewalk space for moving pedestrians (see Figure 32).

In this location permanent vending stalls are protected by a metal awning as well as concrete borders that prevent water from moving through the stalls. The metal awnings extend shade to sidewalks, which are paved and grade-separated from bus and vehicular traffic. There are also *no* fences between the sidewalk and the road, which reduces the common practice of pedestrians walking along the traffic-side of barriers.

In terms of street furniture, the sidewalks are decorated with planter pots that provide streetside vegetation, but compromise sidewalk width to the point that it cannot be considered accessible. Behind the stalls, the interface with properties is rather messy, with loose concrete, stones and wooden pallets providing a walking surface over drainage ditches in front of the property line. A number of unused vending carts are also located on top of this surface (see Figure 33).
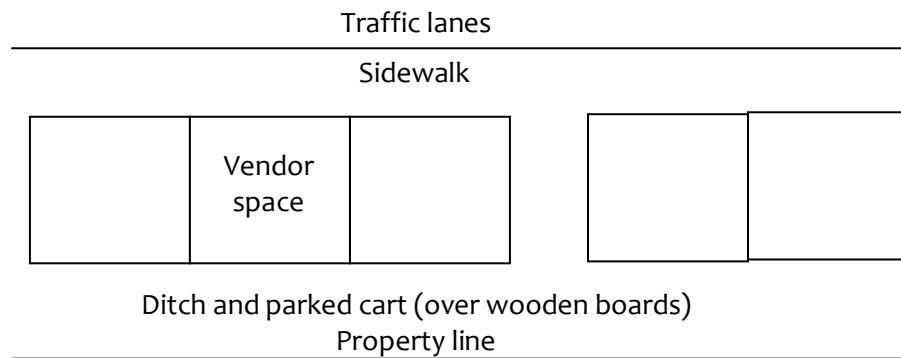

Figure 32: Innovative sidewalk layout at the Rambutan transit interchange

Figure 33: Innovative street design accommodates both pedestrians and vendors at the Rambutan transit interchange

While the accessibility, aesthetics and property interface of the Rambutan sidewalk design could definitely to be improved, this innovative spatial arrangement has allowed for informal vendors to coexist with pedestrians in a zone that is grade-separated from buses and traffic. It therefore provides a starting point for local design efforts focused on improving the balance between pedestrian and vehicular traffic at busy transit interchanges. In particular, the design reflects a number of elements of Great Asian Streets as suggested by Allan Jacobs: it acknowledges and brings together diverse segments of the community, it provides a degree of safety and physical comfort, and it excludes no one (Jacobs 2010:161).

Great shared streets: Emulating Jalan Lima

Jalan Karet Pasar Baru Barat 5 (Jalan Lima) provides a model neighborhood street which is heavily used by pedestrians—particularly schoolchildren who use the street in preference to the parallel service along Jalan Karet Pasar Baru Barat 3 (Jalan Tiga). The street represents an exemplary shared space where vehicles and pedestrians safely share the street, and no one is excluded. Physical design features of Jalan Lima are listed below:

- The street is narrow, with just 5.3 meters (16 feet) between property lines and no kerbing or grade-separated sidewalks. This narrowness ensures that the street is used as a shared space by pedestrians, cart pushers, cyclists, motorcyclists and the occasional car traveling at slow speed.
- Parcel sizes are small, with an average lot width of 5.3 meters (16 feet) and varied rooflines. This fine-grained diversity provides a visually interesting streetscape.
- Building heights vary from 2.5 meters (7 feet) to 6.5 meters (20 feet), with an average of 6 meters (17 feet). This creates a 1:1 width-to-height ratio along the street, which provides a sense of enclosure and allows for street shading.
- The street has gateway treatments in the form of a decorative posts and a guard's gate (common in many neighborhoods) at the eastern entrance to the street, and a small arched bridge over the creek at the west end of the street. These gateway treatments enhance the sense of enclosure along the street.
- Buildings are oriented to the street and there is close interaction between the public and private sphere as a result of shallow setbacks (0–2 meters), transparent building frontages (a B average on a scale from A to F), and numerous intermediaries such as patio chairs, plant pots, hand washing basins and clothes racks. These features enhance the sense of community and ensure that there are many eyes on the street at all hours.
- There is a mix of land uses (entropy index 0.5), with housing interspersed with small-scale retail, *warung,* community service offices, and narrow pathways to rear housing. This density and diversity produces a large number of local walking trips and walkable destinations.
- There are no dead spaces, no vacant buildings and no driveways. A potential dead space in the form of a concave corner at the end of the street has been activated through the creation of a small community garden.
- There is a high degree of community stability, with many long-time residents living alongside newcomers to the area. The social stability is apparent in the local street life as well as spatial investments such as the numerous, well-maintained plant pots that are painted in matching colors along the street.
- Slow traffic speeds and shared street conditions are self-enforcing as a result of physical design elements such as the narrow street width. There are therefore no superfluous traffic signs to indicate that this is a shared street or pedestrian zone.

narrow street width & gateway

plants, small setback & narrow parcels

mixed land uses & eyes on street

transparent frontages & seating

negative grade change & drainage

street life & multimodal mobility

Figure 34: Images from Jalan Lima
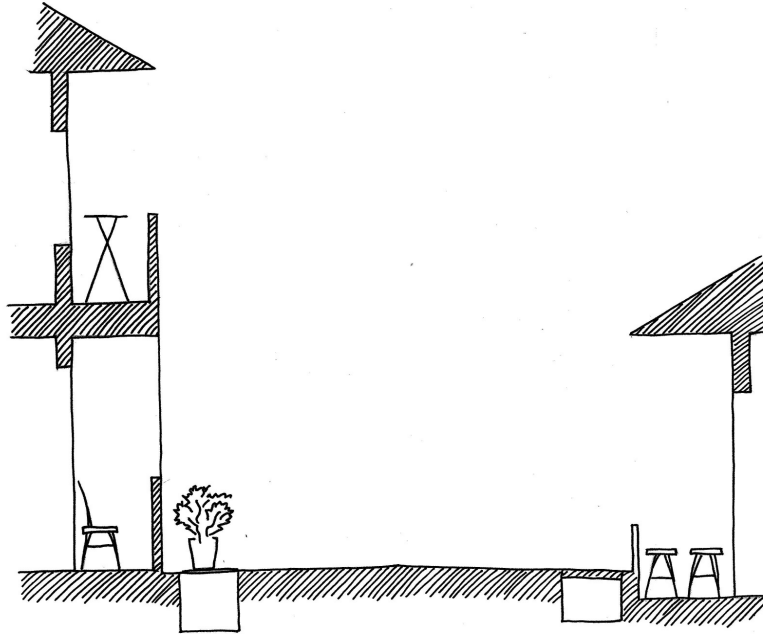
Figure 35: Jalan Lima, existing section

5–6 m
(15–18 ft)
average
building
height

high transparency,
frequent intermediaries
(plants, seating)

robust centerline drainage,
elevated properties

5–6 m (15–18 ft)
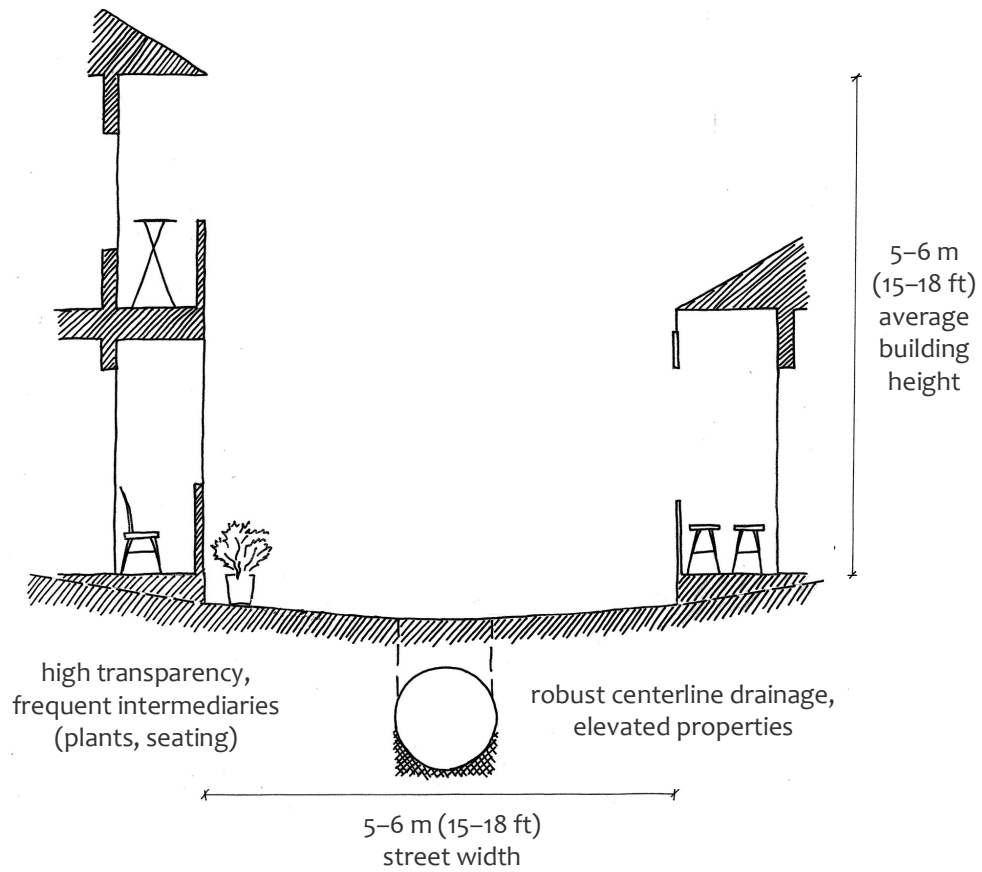street width

Figure 36: *Great Shared Street*, proposed section

While Jalan Lima provides a model shared street for walkability purposes, potential improvements could be made in terms of drainage elements within the street design. In particular, drainage channels (located underground near the property line on both sides of the street) are apparently too small and there is a reverse grade change between the street and the surrounding housing and neighborhood. This means that during flood times, water drains away from the street and into the local houses. In the neighborhood behind the street, floodwaters have been known to reach the top of the ground floor, and one resident explained that, since she was not strong enough to carry furniture upstairs, she was not able to keep furnishing her ground floor rooms. A more preferable situation would situate new housing at a higher elevation from the road and provide more structurally robust and higher capacity stormwater facilities along the centerline of the street. Under flood conditions, water would tend to drain away from houses toward stormwater drains that are designed to fail (overflow) incrementally during extreme flood events. This enhanced design is represented in Figures 36 and 37.

While not the subject of this dissertation, great street design in the Jakartan context would be greatly enhanced by flood-resistant building form and land use development. This flood-resistant design could borrow from indigenous practices (such as stilted houses) as well as international best practice in the area.
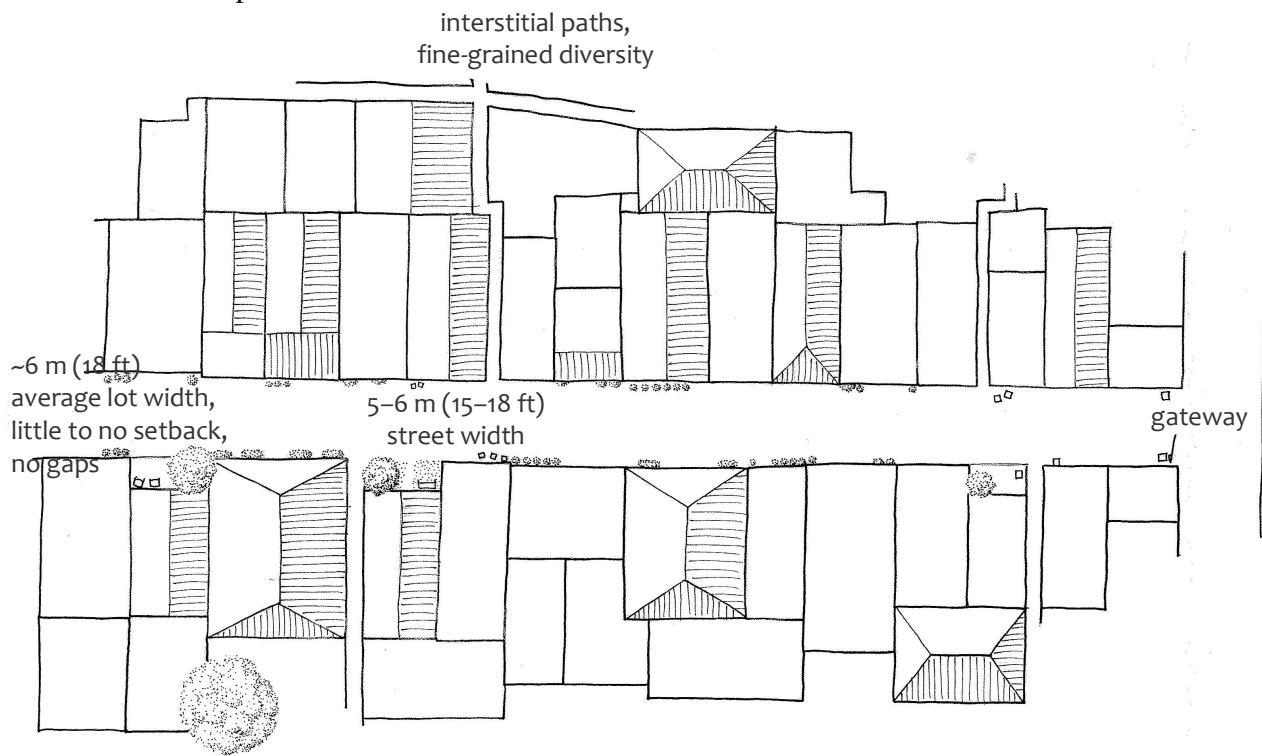

Figure 37: *Great Shared Street*, **plan view**

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Great school streets: Learning from failure at Jalan Tiga

Jalan Karet Pasar Baru Barat 3 (Jalan Tiga) is the main traffic thoroughfare through the Karet Tengsin neighborhood, connecting two main roads—Jalan Bendungan Hilir Raya to the west and Jalan Mas Mansyur to the east. Given the lack of alternative routes between these two roads, the street is heavily used by motorized traffic with one lane in each direction. During observations weekday peak of 1,255 motor vehicles per hour traversed the street (7:20–8:20 a.m.).

Locally, the street functions as a school access route, with two schools on the northern side of the street—SD Karet Tengsin and the well-reputed SMA 35. During peak times, there is heavy pedestrian flow, with 227 pedestrians passing a cordon point along the street between 9:15 a.m. and 10:15 a.m. Many cart pushers (*tukang gerobak*) also use the street as a through route or temporary work site during school change-over times such as 7 a.m., 9 a.m. and 11 a.m. Since two major destinations are located on the street, the total pedestrian activity is considerably higher than the cordon counts suggest. Between 8 a.m. and 9 a.m., for instance, 412 pedestrians were seen along the street segment but only 101 crossed the cordon. Also, since the school and neighborhood are located on opposite sides of the street, children generally cross the street on their way to school. Traffic moves slowly but does not usually stop for pedestrians, so children frequently resort to running across the street.

Along Jalan Tiga, there is little functional sidewalk (5 percent of the street length) and no marked crossings. The streetscape on the northern side of the street is dominated by high perimeter walls, which contribute to low average transparency (D on a scale from A to F)[15] along the street. Also, vehicles frequently park on the unpaved verge between the northern traffic lane and the ditch, thereby forcing pedestrians into the traffic lanes. Most pedestrians opt instead to walk along the southern side of the street, where there are a dozen small scale food outlets (*warung*), phone and internet cafés (*warnet*), and workshops (*bengkel*)—some of which are boarded up. On this side, there are a few patches of sidewalk which are badly damaged or missing culvert covers (thereby producing 2 foot holes through the sidewalk). At the west end of the street, some of the sidewalk has been replaced by adjoining property owners with paved or tiled driveways. Also, there is little shade and the street environment becomes very hot in the early afternoon. During this period of the day, there are considerably fewer pedestrians and few people in the open-air *warungs*. From time to time, *warung* operators throw buckets of water on the ground to cool down the pavement and the air around their business.

The only pedestrian treatment identified during the study was a tall, leaning sign to indicate that the area is designated as a pedestrian zone. Jalan Tiga *should* be a pedestrian friendly zone, but instead it is hostile, discouraging and dangerous for children.

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[15] For more detail on transparency, please see Figure 48 in Appendix B. Other indicators are also indicated in Appendix B.

Figure 38: Images from Jalan Tiga

In order to transform Jalan Tiga into a Great School Street, the street needs to be redesigned along the lines of "complete street" design, with adjustments to respect the spatial constraints of the street. Specific design recommendations for Jalan Tiga are illustrated in Figures 40 and 41 and listed below:

- Sidewalks should be installed on both sides of the road in order to allow children to walk safely. This recommendation necessitates that ditches and covered culverts be replaced with permanent underground stormwater pipes of sufficient capacity to handle flood flows. Given the geometric constraints in this street, the standard 1.5 meter (5-foot) minimum sidewalk width may be relaxed to 1.2 meters (4 feet) as long as a 1.5 meter (5-foot) square "box" is provided adjacent to crossing points every 60 meters (200 feet). This square passing box would allow carts and wheelchairs to pass.
- Street edges should be clearly defined with raised curbs and landscaped buffers separating the traffic lanes from the sidewalks.
- Narrow traffic lanes should be provided to permit through traffic at slow speeds. In general, a maximum street width of 6.6 meters (20 feet) is recommended for school zones. In this case, 6.0 meters (18 feet) is proposed in addition to a 15 cm (6 inches) allowance for curbs on either side of the road. This road width will allow slow traffic and sidewalk construction, while preventing the taking of any property in the community.
- Shade trees should be planted and maintained on both sides of the street in order to provide a canopy and heat sink along the street.
- Traffic-calmed crossings should be installed at multiple crossing points along the street including sections adjacent to school pedestrian entrances. Traffic calming treatments should self-enforce a speed limit of 20–25 kph (12–15 mph), while minimizing drainage concerns and discomfort to non-motorized vehicles and cart pushers (*tukang gerobak*). Specifically, speed humps with a longer profile of 3.7–4.3 meters (12–14 feet) by 8–10 centimeters (3–4 inches) high are recommended. At this length, motorists cannot fly over the device like a pothole at high speed, and carts are less likely to become stranded on the device.
- Community crossing guards should be positioned at each crossing to help children safely cross the road during change-over times. The installation of volunteer crossing guards should also be part of a citywide media campaign to promote road safety and appropriate motorist behavior around schools and pedestrian crossings.
- Separate entrances for vehicles and pedestrians should be provided at all schools. Multiple pedestrian entrances should provide more convenient access paths for students from feeder neighborhoods than the vehicular entrance. To minimize noise impacts, sound treatments (such as trees or sound barriers) may be provided at new entrances.
- Space for informal vendors should be provided near school entrances. In cases where space permits, informal vending space could be incorporated into bulbouts and road narrowings at school crossings.
- Passenger waiting zones should be provided for paratransit and demand responsive services. In this case, paratransit vehicles should load and unload passengers on either side of pedestrian crossings.
- ZEV queuing areas should also be provided for zero-emission vehicles that provide demand responsive services. These services—including pedicabs (*becak*), informal pedicabs (*ojek sepeda*), and bicycle buggies (*odong-odong*)—should be permitted to operate along school and neighborhood streets throughout Jakarta. A number of the vehicles should also be permitted to queue in a non-disruptive manner within vehicle access and parking areas of schools, if such an area exists, and to pick up students at the passenger waiting zones. High emission vehicles, such as conventional *bajaj*, should be

discouraged along school streets and should not be permitted to enter school property or idle near passenger waiting areas.
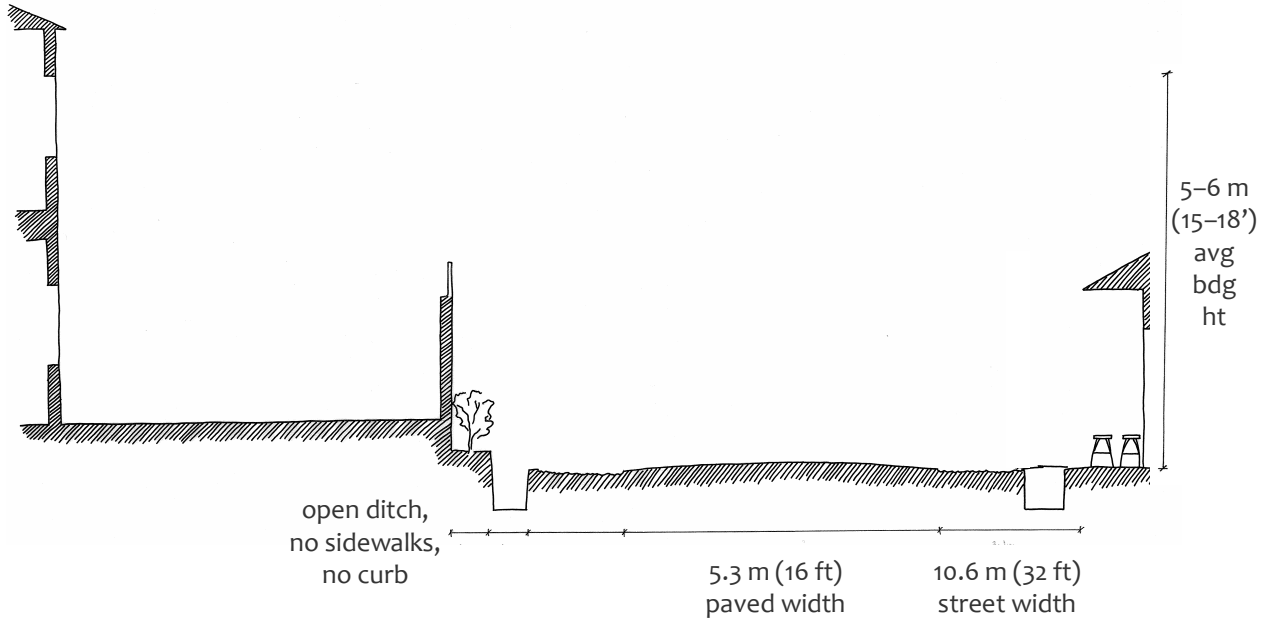

Figure 39: Jalan Tiga, existing section

Labels within the figure:

open ditch, no sidewalks, no curb

5.3 m (16 ft) paved width

10.6 m (32 ft) street width

5–6 m (15–18') avg bdg ht
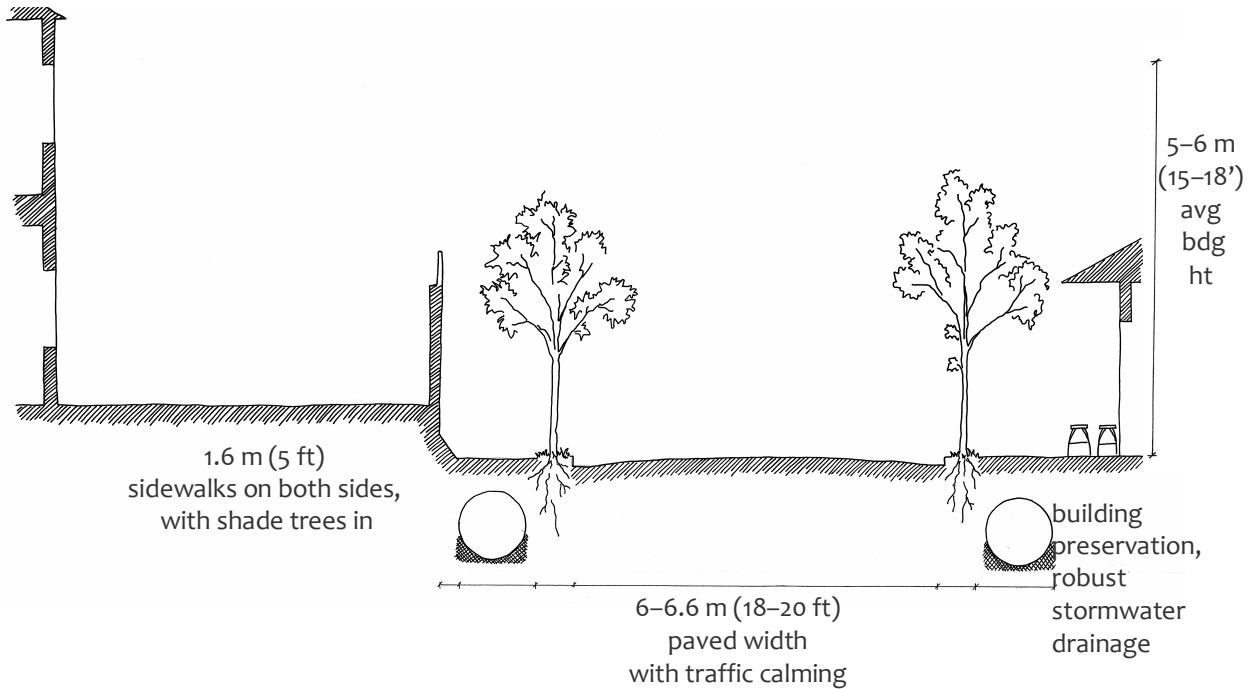
Figure 40: *Great School Street***, proposed section**

Labels within the figure:

1.6 m (5 ft) sidewalks on both sides, with shade trees in

6–6.6 m (18–20 ft) paved width with traffic calming

building preservation, robust stormwater drainage

5–6 m (15–18') avg bdg ht
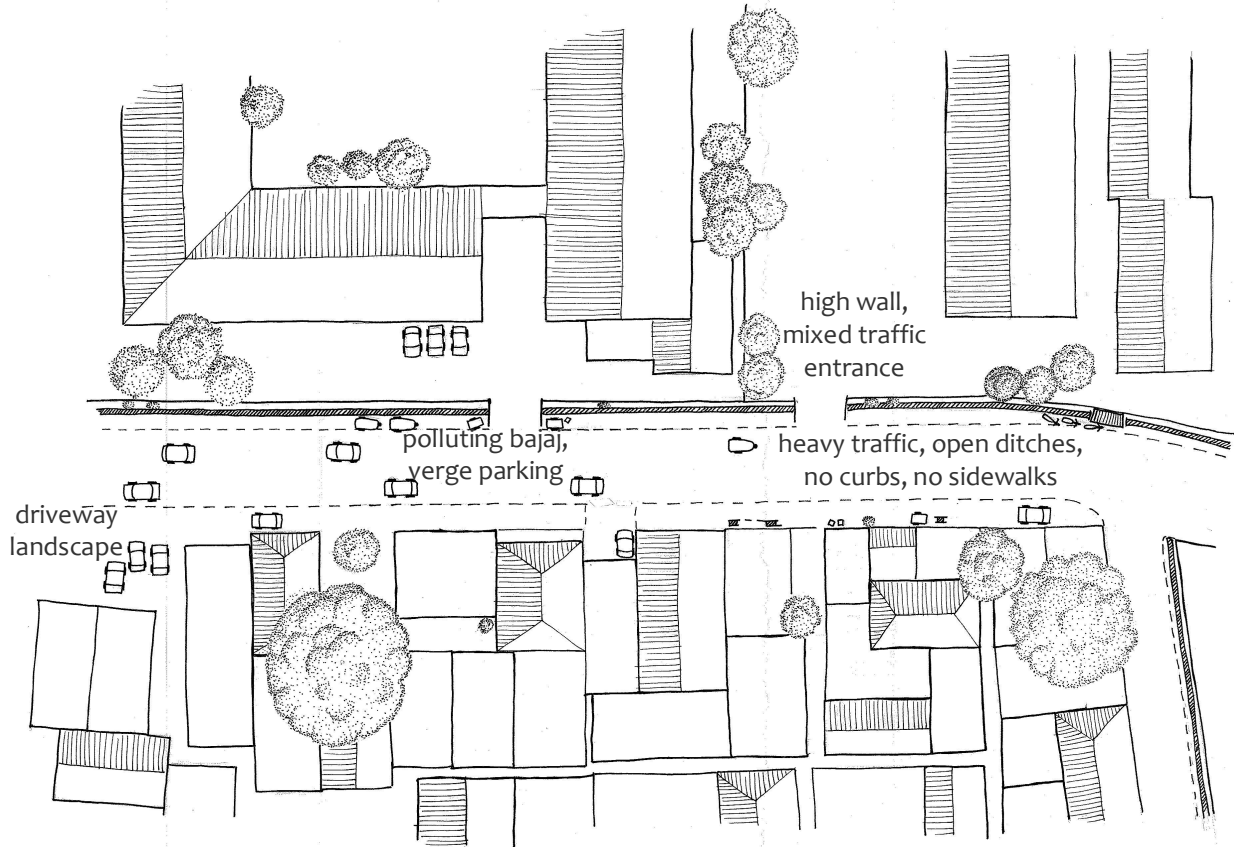
Figure 41: Jalan Tiga, existing section

high wall, mixed traffic entrance

polluting bajaj, verge parking

heavy traffic, open ditches, no curbs, no sidewalks

driveway landscape
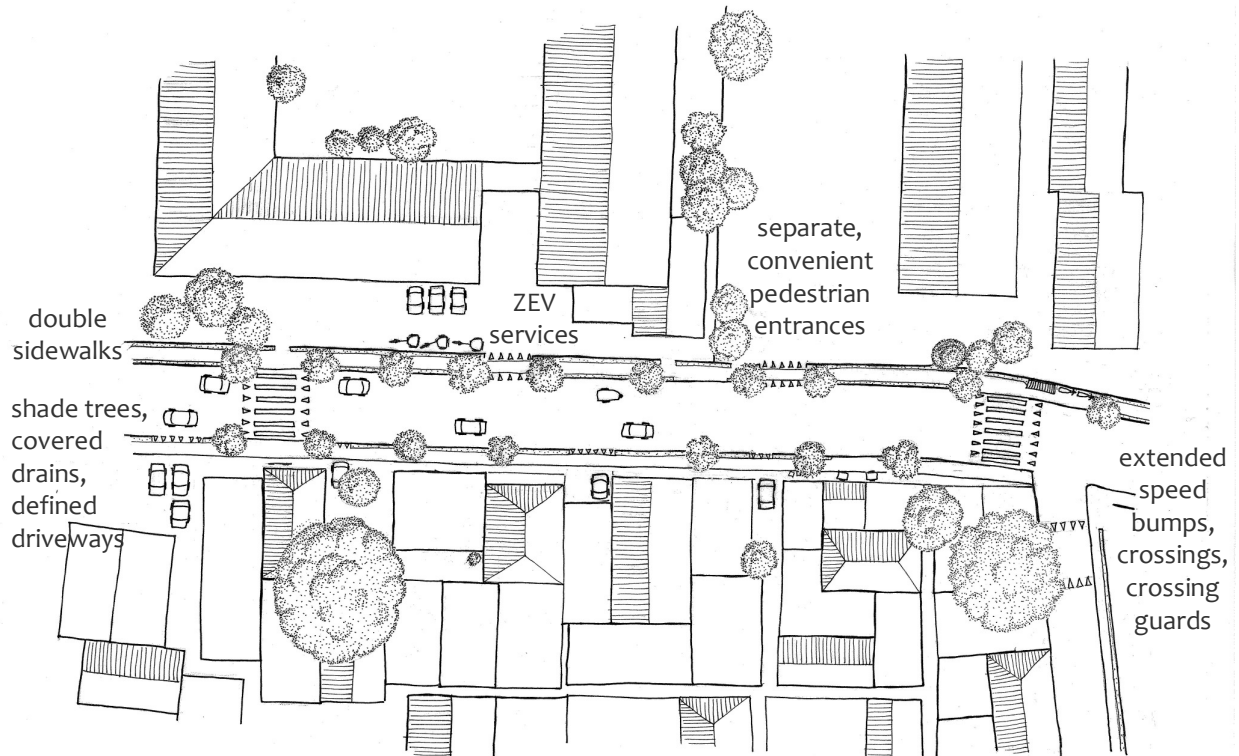
Figure 42: *Great School Street*, **plan view**

double sidewalks

shade trees, covered drains, defined driveways

ZEV services

separate, convenient pedestrian entrances

extended speed bumps, crossings, crossing guards

Designing Great Streets in Jakarta

The practice of walking along sidewalks is not "natural", but is historically produced, environmentally influenced and socially learnt. In the Jakartan context, the historic, social, regulatory and physical condition of streets discredits the assumption that pedestrians will walk along sidewalks. In this research, over 90 percent of pedestrians were observed to be walking along traffic lanes even for street segments with high quality pedestrian facilities. By contrast, the planning of streets and sidewalks is spatially segregated with deep institutional divides between the planning of traffic lanes for the exclusive use of motorized vehicles, and the planning of sidewalks and street landscaping for urban beautification.

In order to better match street design with spatial practice there is a need for inter-agency coordination on the planning and design of streets and urban public space. This is discussed in more depth in Chapter 2 and involves more comprehensive planning of urban public space and pedestrian networks, and better coordination between agencies responsible for different components of the street. In addition to interagency coordination, there is also a need for urban planning which acknowledges and integrates informal activity and informal land uses into the design of urban space, as outlined in Chapter 5.

In addition to these policy changes, more flexible and innovative approaches are proposed for designing "Great Streets" in the local context. These design strategies might include transit interchanges that accommodate pedestrians, vendors and transit vehicles; street designs that allow for the safe sharing of street rights-of-way by multiple modes; complete street planning in school zones; and integration of drainage improvements with walkability planning.

Checklist for policy-makers:

- Do street designations exist for a range of shared streets, alleys and pedestrian ways?
- Do design standards encourage the development and operation of shared streets?
- Have current and potential shared streets, school streets and transit interchanges been identified?
- Do shared street design elements reflect those listed in relation to Jalan Lima (p. 106)?
- Are school zone streets designed in line with the lessons from Jalan Tiga (p. 112)?
- Does street design around transit interchanges adequately accommodate pedestrians, vendors and transit services?

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Chapter 8: Policy, Planning and Design Strategies for Jakarta and Beyond

The problems that scientists and engineers have usually focused upon are mostly "tame" or "benign" ones. As an example, consider a problem of mathematics, such as solving an equation; or the task of an organic chemist in analyzing the structure of some unknown compound; or that of the chessplayer attempting to accomplish checkmate in five moves. For each the mission is clear. It is clear, in turn, whether or not the problems have been solved.

Wicked problems, in contrast, have neither of these clarifying traits; and they include nearly all public policy issues…

(Rittell and Webber 1973:160)

Problem-Solving in the Face of Complexity

This dissertation identified six key issues that affect walkability planning in Jakarta. These issues include the need for multidisciplinarity, ethnography, accessibility, legibility, integrated activity and shared spaces in walkability planning. These issues are complicated by the social, political and discursive environments in which planning and design are situated. For example, the need for legibility to improve the health and security of vernacular spaces is complicated by the fact that local residents may actually contribute to their illegibility in order to avoid the intrusion of government in their lives. While this complexity creates a "wicked" problem (Rittel and Webber 1973), the normative, problem-solving nature of planning compels us to devising ameliorative strategies while acknowledging their short-comings and inadequacies. In this way planning research continues to be rooted in real processes, conditions and places.

In this chapter, I propose a number of cross-cutting strategies as important elements in efforts to improve walkability. Some strategies specifically address walkability in Jakarta. For example, I propose that the City of Jakarta develops a regional walkability plan, inclusive road designations and a bounded accessibility approach that uses new data collection and analysis such as WikiPlaces network mapping, an integrated activity study, and pedestrian network cost-benefit analysis. In conjunction with these infrastructure and information-related strategies, I argue that soft infrastructure approaches are also required. These approaches include institutional and governance reform, participatory planning mechanisms, ethics education, environmental policy, and a constituency building approach to Jakarta's walkability planning.

While these strategies are detailed in reference to Jakarta, I believe that they have the potential to provide a more appropriate model for other majority world cities than Western models of walkability planning. The reason for this broader applicability is the way in which the strategies address conditions of informality, complex trip-making, integrated activity and governance capacity, which are prevalent in much of the majority world and even in parts of the West. The degree of applicability of specific strategies to specific cities should be investigated on a case-by-case basis.

In addition to Jakarta-specific strategies, I propose a number of strategies for advancing knowledge and contributing to discourse on walkability. These strategies include studies on integrated activity, informal economic activity, vernacular placemaking and Asian shared street design. Each of these strategies has the potential to contribute to more decentered and context-sensitive planning of pedestrian urban space in Jakarta and throughout the world.

Both general and specific strategies for walkability planning cover the three basic areas of policy, planning and design. They are listed in Table 14 in relation to the six issues that intersect with walkability planning in Jakarta.

Table 14: Summary of policy, planning and design strategies for walkability planning

Issue / Strategy	Policy	Planning	Design
Multidisciplinarity	Energy and environmental policy	Regional walkability plan & institutional reform	Participation, ethics education & the petition box
Ethnography	Decentered & context sensitive cross-disciplinary research		
Integrated accessibility	Integrated accessibility strategy and design		
Legibility	Pedestrian planning as constituency building	Pedestrian network cost-benefit analysis	WikiPlaces pedestrian network mapping
Integrated activity	Analysis and provisions for informal economic activity	Integrated activity study	Vernacular placemaking and Asian shared street design
Shared spaces		Inclusive road designation	

Strategy 1:   Pedestrian planning as constituency building

As argued in Chapter 2, Jakarta's functional urban pedestrian space is discouraging and dangerous for those who walk. These conditions are not a coincidence or a natural byproduct of a fiscally constrained planning environment. Rather, poor conditions are *produced* through the processes of planning Jakarta's urban public space in a way that prioritizes motorized transportation modes above more populous pedestrian needs.

Since 1998, the Indonesian political climate has changed dramatically and yet the apparatus or process for pedestrian planning has not fundamentally changed to reflect the new political environment. Key political changes that are occurring in the post-Suharto era include democratization and decentralization of development planning from a Jakarta-centric model (where "Jakarta" is seen as a representation of the national government) to one where each province has authority and resources to undertake their own planning. While the special area of Jakarta continues to function as the seat of national government, decentralization within Jakarta itself is seen in a shift from provincial development planning as an appendage of national development planning to more autonomous provincial planning. The current Governor, Fauzi Bowo, is a trained engineer, career bureaucrat, and the first provincial Governor to be elected democratically by the people of Jakarta. Previous Governors (or mayors) were generally military leaders who were appointed to the gubernatorial post by the President of Indonesia.

In this context, the key constituency to whom the governor must respond has fundamentally shifted from that of the President of Indonesia to the people of Jakarta. Yet the local approach to pedestrian planning does not yet reflect this sea change.

As discussed in Chapter 4, three key pedestrian planning sites that were identified by Jakarta's policy-makers all point to the President as the primary constituent: *Jalan Thamrin-Sudirman* is the city's main protocol road along which the president travels with or without foreign

dignitaries; *Jalan Veteran* is another protocol road which is situated directly behind the president's palace; and *Jalan Teuku Umar* is a high-end residential street along which a former president lives. In contrast, the local alleys (*gang-gang*) along which a majority of Jakartans reside are illegible in both the planning processes and related representations and maps (as discussed in Chapters 2 and 5). Even formal streets located behind Jakarta's corridors of ribbon development patterns are absent from pedestrian planning maps and activities at the provincial level.

This disequilibrium between new political allegiances and old policy structures presents an enormous opportunity for winning political constituents by paying attention to pedestrian planning and the physical wellbeing of people—particularly those in the illegible areas of the city. This strategy could be viewed as an explicit movement further toward bio-power—the authority derived from planning to nurture life and the physical health of a population; as opposed to sovereign power—the authority derived from military strength and the threat of taking away life (Foucault 1976; Calogero 2010).

In addition to capitalizing on political opportunities in the specific case of Jakarta, the strategies outlined in the following sections show promise in achieving the wider goals of walkability planning in the majority world. These goals include improving urban quality of life, increasing efficiency and decreasing costs of urban transportation, enhancing environmental sustainability, and reducing mortality from traffic crashes.

Security of tenure
One issue that relates directly to constituency building, and that is a prerequisite for many other planning actions, is the need to address security of tenure. The current ambiguity of land tenure in many *kampung* or informal areas of Jakarta impedes efforts to plan and provide urban services or walkability to many areas of the city. It also leaves many urban constituents vulnerable to potential land claims by those who gain access to historic land titles and who use these titles to evict and demolish multi-generational neighborhoods of low-income residents.

To address this issue, there is a need for both academic and participatory processes to consider available options and associated implications of improving tenure security. In the West, tenure security has often been addressed through "squatters' rights", a private-goods model that transfers use, exchange and exclusion rights to residents if no timely claim is made by titleholders. Given the porosity of land use in Jakarta's informal areas and potential predatory ramifications of bestowing exchange rights (Calogero forthcoming), tenure security discussions should also consider a range of possible public-goods models to address this issue.

Strategy 2   Regional Walkability Plan and Institutional Reform

While the provincial government has conscientiously undertaken five-year development plans, walkability planning has not historically been part of the process. The most recent regional spatial plan introduced a number of pedestrian-related goals for the first time. These goals include the following:

- To develop adequate pedestrian facilities to create a culture of walking for short trips;
- To account for the needs of people with disabilities in pedestrian facilities; and
- To develop pedestrian crossing facilities (DKI 1999, my translation).

Implementation of these goals, however, is hindered by a lack of specificity of goals and the lack of resources that many policy-makers identified as a reason for the very limited scope of current pedestrian plans. From casual observations of numerous disengaged public employees reading newspapers, watching television, chatting idly or spacing out at work, a lack of professional integrity and efficiency would also seem to be a contributing factor in the difficult progress toward various policy goals. (The author notes that there are many hard-working, committed and trustworthy public employees, but the prevalence of disengagement across agencies is unmistakable.)

Regional walkability plan
Alongside the pedestrian transportation goals listed above, more ambitious, specific and measurable goals are proposed for comprehensive walkability planning at the regional, subregional and subdistrict level. The three main walkability goals include increasing the share of walking throughout the region, decreasing the rate of pedestrian fatalities resulting from traffic crashes, and improving pedestrian amenity and safety for children. In reaching these outcomes, a number of output goals are proposed including increasing budget, staffing and productivity to establish a walkability database, develop a comprehensive walkability plan, and implementing plan elements in a collaborative manner.

Table 15: Proposed walkability goals

Outcome related goals	Incremental measures
To increase the mode share of walking in all subdistricts relative to existing mode share	- Share of all trips undertaken by walking
To decrease the number and rate of pedestrian fatalities in all subdistricts	- Number of pedestrians fatalities from traffic crashes (including fatalities that occur later in hospital or at home) - Rate of pedestrian fatalities as a function of pedestrian flow density
To enhance walkability and pedestrian safety for children	- Number of child pedestrian fatalities - Rate of child pedestrian fatalities as a function of flow density - Number of schools participating in for safe routes to school community program
Output related goals	**Incremental measures**
To increase the budget, staffing and productivity in the area of walkability planning	- Number of well-qualified staff - Size of budget for walkability planning - Staff productivity (incremental measures as a function of budget)

Output related goals	Incremental measures
To establish and maintain a comprehensive, regional database and map of pedestrian network facilities and conditions	- Length of facilities (km) and number of crossing locations covered by database and regional network map - Length and number updated by surveys or resident data within the last 5 years
To develop comprehensive walkability plan with broad collaboration and public participation	- Residential population living immediately adjacent to facilities covered by plan - Number of public participants and entropy index of income diversity
To construct and maintain network facilities such as sidewalks, crossings and shared streets (engineering)	- Length of network and number of crossing locations constructed or maintained within the last 5 years
To increase public interest in and support for walking and increase motorist consideration of pedestrians (education)	- Level of interest in and support for walking - Driver and motorcyclist consideration of pedestrians
To improve the behavior of drivers and motorcyclists with respect to pedestrians (enforcement)	- Level of compliance with traffic laws (e.g. slowing or stopping at zebra crossings, not riding motorbikes on sidewalks)
To collaborate effectively with other agencies involved in walkability planning	- Opportunity savings attributable to collaboration (e.g. drainage, utilities and sidewalk maintenance)

Having agreed upon walkability goals, the walkability plan should include a number of elements which were outlined by the author in an international review of the 2010 *Draft Indonesian National Technical Guidelines for Pedestrian Facilities*. These plan elements include:

- Staffing, accountability and performance;
- Program budget and management;
- Collaboration and coordination arrangements;
- Public participation and problem reporting;
- Vision and objectives;
- Data collection, surveys and comprehensive database development;
- Comprehensive mapping, identification of needs and phasing;
- Technical design of network and facilities;
- Education and marketing of walkability;
- Enforcement of motorized traffic violations;
- Engineering construction and maintenance; and
- Evaluation and monitoring.

Staffing and institutional reform
Part of the process of walkability planning is streamlining and improving organizational aspects of pedestrian planning in Jakarta. As discussed in Chapter 2, no single agency presently has

ownership of walkability issues within Jakarta, and numerous observers point to ongoing problems in terms of inefficiency, incompetency and corruption within local government processes. In order to address this issue and improve policy outcomes without further straining the public purse, there is a need to downsize public agencies to only those individuals who are qualified and performing well. Simultaneously, there is a need to improve organizational morale and engagement, reward high-performing workers for good work, encourage innovation and collaboration, and reduce temptations for graft and corruption.

An important source for these ideas was the successful institutional reform model implemented within Indonesia's National Land Agency (NLA) under the leadership of Joyo Winoto (Winoto 2010). Basic elements of institutional development and reform for walkability planning are outlined below:

- Designating a lead agency responsible for overseeing walkability planning and identifying other agencies which need to collaborate on walkability related matters;
- Designating a walkability planning manager within the lead agency to oversee the walkability plan and coordinating with relevant bodies and timelines;
- Securing agreement from related agencies to cooperate and collaborate on walkability related matters (such as data collection, public works and traffic enforcement);
- Allocating sufficient resources for the walkability planning program;
- Defining and expressing expectations and consequences in relation to staff performance including integrity, competency, productivity, innovation and collaboration;
- Implementing a system of promotion, reward, discipline and termination based strictly on demonstrated performance within the lead agency and other coordinating agencies; and
- Ensuring that all staff retained under this system receives adequate income relative to the cost of living and their level of performance.

In addition to these strategies, there is a clear need for more general efforts to boost employee morale, engagement and initiative. This process would address present disengagement and unproductivity, and ameliorate negative effects on employee morale that result from organizational downsizing. The specific process for enhancing organizational success should be developed in consultation with staff.   It should include training modules and ongoing strategies to address the following needs:

- Improving coaching skills of all people in supervisory roles including active listening, expressing visions and expectations, providing positive and constructive feedback, and building a culture of collaboration and innovation (Seijts and Crim 2006);
- Increasing employee skills and willingness to think critically, identify potential problems, suggest new ideas, develop solutions, request clarification, voice concerns, and evaluate outcomes;
- Translating institutional walkability and management training goals into individual goals, and helping all staff to develop, evaluate and discuss their own bi-annual professional development plans in terms of strengths, weaknesses, accomplishments, and opportunities for the coming period; and

- Identifying and implementing structural changes and programs (such as rotation and exchange programs) that might enhance opportunities for professional engagement, growth, collaboration and advancement.

Strategy 3   Participation, Ethics Education and the Petition Box

In addition to the issue of governance capacity, there are a number of likely reasons for the historic lack of walkability and walkability planning in Jakarta. One reason is highlighted by Appleyard in a forthcoming post-humus publication, who argues that Third World pedestrian urban space is deliberately anti-planned because those who participate in the planning process in do not walk. Policy-makers and planners are wealthier than the average resident of the world's cities, and they take for granted levels of stability and mobility that are inaccessible to many of those who use the spaces they plan. Stability includes access to and tenure of housing and work. Mobility includes access to and use of private motor vehicles. As non-users of pedestrian facilities, policy-makers and planners are unaware of the problems, needs and importance of these facilities and therefore underprovide for them in their planning actions.

Public participation
In order to address this problem, planning must become a participatory process. Many of Jakarta's policy-makers and key planning documents make claims regarding public participation, however, the substance of this participation is outreach to other bureaucratic agencies, planning specialists (such as academics and industry experts), and community leaders. This outreach is a good start, but it is not "public" participation.

True public participation should reflect the desires and aspirations of ordinary people. Public input should be sought through a variety of fora such as personal conversations, intercept surveys, charettes and petition boxes. Conversations, surveys and charettes need to become a standard component of planning and design processes—from regional master plans to individual street improvement projects.

Ethics education
According to one policy advisor, public participation and data collection efforts are greatly hindered by the prevalence of corruption that is still embedded within Jakarta's bureaucratic processes. For consulting projects, this policy advisor indicated that consulting firms regularly set aside 40 percent of the bid price in order to pay off bureaucrats who impose bribes or arbitrary fees at each stage of the project. The result of this enormous waste of public monies is that part of the winning proposal must be cut in order to fit within 60 percent of the final bid price. The portion of work that is usually cut is data collection and public participation. A second consequence of this practice is that public agencies, planning firms and the entire local economy becomes unattractive and hostile to intelligent and ethically-minded individuals who are uncomfortable with bribing people or dealing in corruption.

A number of strategies aimed at preventing corruption are presented in the previous section on *Staffing, Management and Planning for Pedestrians*. Additionally, public education should be part of the solution. This strategy should include media campaigns and the teaching of social

ethics in primary and secondary schools. The author defers to education specialists regarding pedagogical principles and marketing techniques, but both media campaigns and school programs should emphasize the relationship between individual actions and societal consequences. In English, the slogan of "think globally, act locally" encapsulates this notion that individual actions make a difference. (I am NOT advocating the adoption of an English language slogan.) This principle might be illustrated with negative examples such as the cumulative effects of small bribes on regional service provision, the contribution of throwing rubbish in ditches on urban floods, or the contribution of individual decisions to drive on regional traffic congestion. On the flipside, the program should also emphasize the positive cumulative effects of honesty, integrity, environmental consciousness, and abiding by the law.

The petition box
A third component of the participatory planning process is the petition box. This mechanism has been found to be highly successful for situations where there is wide inequality or power differentials and an earnest commitment to the program by upper leadership. Such a program was exemplified by the prison reform efforts of Kiran Bedi in South Asia (Bedi 1999).

In the case of Jakarta, mobile petition boxes could be circulated on foot in individual neighborhoods and placed outside local government (*kelurahan*) offices. The petition system should be accompanied by public education campaigns explaining the purpose of the system. In terms of pedestrian planning, individual petitions might report problems with sidewalks, crossing conditions and pedestrian facilities, or express anonymous grievances related to the implementation of plans. The petition box may therefore function as a low-technology version of pedestrian reporting systems, providing grassroots input on sidewalk survey data as well as wider governance issues.

Importantly, the petitions should be collected and reviewed by someone with a direct advisory relationship to the mayor (there are five in Jakarta) or Governor and with no managerial responsibilities over police, planning or budgetary affairs. At the regional level, the Vice Governor might be an ideal recipient of petitions. Pedestrian petitions that address facility problems should then be recorded in a database that builds or maintains a record of the entire network and facility conditions. The petition box is an important mechanism for providing direct public input on pedestrian related matters to regional leadership within being filtered by the interests of local leaders or intermediate agencies. It also allows pedestrian planning to occur within the public eye.

Strategy 4   Integrated accessibility design

In the context of Jakarta, the notion of implementing universal design for external areas and pedestrian facilities is compromised by the Western-centric bias of the international standards as well as the tendency of the limited implementation under conditions of constrained resources. Limited implementation of international accessibility standards in Jakarta has produced isolated islands of high-end pedestrian facilities that are in fact inaccessible because they are not connected to a wider network of accessible pedestrian routes of travel throughout the city. To redress this problem, a broader framing of accessibility is required—where the transportation-

based notion of accessibility is combined with the disability-related definition of accessibility to produce more flexible standards at a more comprehensive scale. This integrated accessibility would produce the following changes:

- Implementation of accessibility standards should be broadened from sidewalks along major protocol roads to complete street design of all main roads, local streets, alleyways and paths (walking streets). This network should be based upon a complete inventory of all pedestrian facilities and routes of travel within the region.
- International accessibility standards should be used to guide the development of convenient, safe and resilient sidewalks, pedestrian crossings and drainage facilities along all main roads—and not just protocol roads.
- The process of street design should focus on the needs of the most vulnerable road users including those with disabilities, elderly pedestrians, children, cart-pushers and cyclists.
- Design principles for walkability, shared streets and complete streets should then be used to inform the development, maintenance and retrofit of all streets from main roads through to walking streets. These principles include clear accommodation of non-motorized users; self-enforcement of slow traffic speeds (e.g. using narrow street widths); safe at-grade crossings (rather than bridges or underpasses); and integration of transportation and ecological goals (e.g. shade and percolation).
- Accessibility standards (such as ADAAG) should be adopted as street design standards for very narrow streets, alleyways and pathways (walking streets) thereby suggesting a minimum street width of 1.5 meters (5 feet).
- Accessibility strategies should always include substantial ongoing programs for education/marketing, enforcement, collaborative maintenance, and evaluation.

Strategy 5   WikiPlaces pedestrian network mapping

As described in Chapter 5, a critical data gap in Jakarta's pedestrian planning process is the mapping of everyday pedestrian networks, particularly in low-income neighborhoods of the city. Given resource constraints and the difficulty of identifying this network from aerial photography or satellite imagery, the author recommends that network data collection occur through a process that simultaneously engages the community in democratized urban planning while also providing a supplementary data source upon which to base pedestrian planning activities. This process is referred to here as the WikiPlaces project.

The WikiPlaces project is proposed as a means of undertaking distributed data input of geo-referenced data points within a comprehensive network of everyday pedestrian spaces. This data entry might be undertaken by local urban activists as well as enthusiasts engaged in an electronic project styled after a videogame or social networking app. The project would therefore provide open source geo-referenced data to be verified by project staff who check the resulting network on foot, bicycle or motorbike.

In order to further develop the WikiPlaces project, a non-profit or startup model could be used with the goal of developing pedestrian maps for places like Jakarta where sidewalks and pedestrian paths do not necessarily correspond to street networks (or google maps). In order to

attract grants and funding, the project may consider a range of reasons other than transportation planning that would justify the complete mapping of sidewalks and pedestrian paths. For example, garmin currently sells pedestrian maps for a number of cities across the world, and a technology startup (m cubed) seeks to develop a cellphone-based gyroscope for indoor pedestrian activity which would allow for targeted marketing. Given the importance of walking within the Jakarta trip, the development of a complete pedestrian map has a range of potential benefits to both individuals and firms.

Strategy 6   Pedestrian network cost-benefit analysis

Having developed a complete pedestrian map, the provincial government of Jakarta may use this data analyze pedestrian planning options, needs, costs and benefits. One city policy-maker specifically expressed a desire to obtain data on the costs and benefits to assist decision making in relation to urban pedestrian planning. Impacts, costs and benefits to be included in such an assessment might include the following:

- Planning and design related costs;
- Costs associated with drainage and below-ground utility box improvements;
- Construction costs for complete sidewalks, pedestrian facilities and shared streets throughout Jakarta;
- Ongoing maintenance costs for the complete pedestrian network in collaboration with drainage and utilities maintenance;
- Benefits of effecting mode shifts to walking, preventing mode shifts to motorized modes, and savings in motorized transportation network construction and operating costs;
- Benefits associated with utilities improvements;
- Economic benefits associated with formal and informal economic activity;
- Pedestrian safety improvements in terms of disability adjusted life years; and
- Environmental benefits associated with air quality improvement and other impacts.

The resulting data may be used to make an argument to the Governor for comprehensive pedestrian planning as part of constituency building in the newly democratic political process. Additionally, it may be used at the regional and sub-regional level to prioritize pedestrian improvements on the basis of actual costs and benefits for the greatest number of people.

Strategy 7   Integrated activity study

Most research on transportation demand employ travel, activity or time-use surveys that are conducted at the household level. These surveys draw upon the respondent's memory to recall travel patterns and provide information on trip characteristics and objectives. They also prompt respondents with a range of trip or activity categories to minimize the risk of forgetting or omitting a portion of travel demand. Trip based surveys have been criticized in Western research as less than effective in accounting for complex trip-making practices such as trip chaining and interrupted trips. As a result many scholars now favor activity-based surveys over trip-based analysis.

As discussed in Chapter 6, however, neither trip-based analyses nor activity-based surveys adequately account for transportation practices of low-income residents in non-Western cities such as Jakarta who are engaged in informal and integrated activities. In theses case, the author recommends integrated activity surveys. Integrated activities studies allow researchers to examine travel demand—particularly pedestrian demand—in a way that does not impose inappropriate assumptions regarding categories of trips, activities or even the distinction between trips and activities. The integrated activity study would involve the following steps:

- Site selection and sampling procedure
- Pedestrian interception and request to participate
- Demographic survey questions
- SMS pedestrian study

After selecting sites and the sampling procedure, study participants would be identified through intercept surveys. The intercept survey would communicate the goals and requirements of the study and ask respondents if they are willing to participate.

Demographic survey questions
For those willing to participate, an introductory survey would cover demographic characteristics. On the basis of ethnographic findings of the present study, a number of draft survey questions are suggested for the demographic survey of study participants. These questions take a context-sensitive approach to understanding characteristics related to vehicle access, regular mode choice, trip anchors (such as "home"), household structure and household income. Draft demographic survey questions are as follows:

- How many vehicles do you own?
    - Number of bicycles   [*sepeda*]
    - Number of motorbikes [*sepeda motor*]
    - Number of cars   [*mobil*]
    - Number of SUVs   [*jeep / kijang*]
    - Other vehicles   [*lain*]
- Do you sometimes borrow a vehicle? Please explain.
- How do you normally travel to places?
    - Bicycle   [*sepeda*]
    - Motorbike   [*sepeda motor*]
    - Car   [*mobil*]
    - SUV   [*jeep / kijang*]
    - Train   [*kereta api / KRL*]
    - Bus rapid transit   [*busway*]
    - Other full-sized bus [*bis umum / patas / patas ac*]
    - Midibus service   [*kopaja / metromini*]
    - Minibus service   [*bemo / angkot / mikrolet*]
    - Taxi   [*taksi*]
    - Three-wheeled taxi   [*bajaj*]
    - Motorbike taxi   [*ojek*]

- o Pedi-cab [*becak*]
- o Private shuttle [*omprengan*]
- o Company bus [*bis perusahaan*]
- o Other [*lain*]
- Where do you normally live or stay?
  - o How long have you been there?
- What do you normally do on a daily basis?
  - o Work: What do you work as? Where?
  - o Study: Where do you study?
  - o All: Do you also operate a stall or other income-generating activity? Where? Describe the activity.
- What is your individual income group? (flashcard)
- Please describe your household.
  - o How many people live there? How are they related?
  - o What is your role or relationship to others in the dwelling?
  - o How many people are in your family unit (within the dwelling)?
  - o What is the "household" income for your family unit? (flashcard)
  - o How many people share this income?
  - o Is any of this income regularly used for remittances? Do you regularly receive remittances in addition to your income? How much and how often?
- What is your age group? (flashcard)
- Do you find it easy to get around? Why or why not?
- Gender

SMS pedestrian survey

After gathering this initial demographic data, an SMS (text messaging) pedestrian survey would be conducted using GPS-enabled cellphones which allow researchers to understand actual activity, rather than relying on the memory of respondents. This is particularly important for walking trips which tend to be taken less consciously than vehicle trips and which may be taken while carrying on various activities.

In exchange for participating in the study, respondents would receive a GPS-enabled cellphone with pre-paid text messaging service and a limited number of calling minutes for the duration of the survey. A private GPS tracking service would allow study organizers to obtain high resolution data (to within 10 meters) on the location of the device.[16]

Before participating in the study, study organizers would work with participants to practice sending text messages and agreeing upon standard abbreviations. During the study, respondents would be regularly prompted to send a text message with their response to the following three questions:

- Are you using a vehicle? And if so, what type of vehicle?
- What are you doing? (in a word or two)

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[16] At the time of writing, this level of resolution was not available among cell-phone tracking services within Indonesia.

- If you are walking, how much do you like the area for walking?

The first question regarding whether the respondent is using a vehicle is important in this study because, under highly congested conditions, speed may not always be a good indicator of whether a respondent is walking. Prompts would be sent to request this information every two hours or whenever the participant changes locations (whichever is less frequent). Study participants would also be asked to send a text message when they get in or out of vehicles, and prompts may also be sent if an ambiguous activity or unusual pedestrian location is detected.

Integrated activity analysis
Using data from this study, walking paths could be traced and frequent daily walking routes and daily stopping places identified. Additionally, text message data could be used to identify locations that are most liked and disliked.

For each site and path, a streetscape analysis could then be undertaken using the streetscape observation techniques outlined in Chapter 1. The technique could be further amended to allow various features to be measured at the property rather than segment level. Additional property-specific features might include:

- Setback;
- Width of functional sidewalk;
- Apparent sidewalk maintenance;
- Side uses;
- Obstacles to walking;
- Informal activities; and
- Full width of property.

This data should be analyzed using multivariate statistical analysis in order to better understand what factors contribute to walking and walkability.

Strategy 8   Analysis and provisions for informal economic activity

Urban informality is a prevailing issue that intersects with the spatial practice of walking and the ability to plan for walkability in Jakarta. Jakartan pedestrians identified informal economic activities or vendors as making both positive and negative contributions to walkability. On the one hand, pedestrians appreciated the way in which informal vendors enhanced street life by making available food or convenient places to sit, shop, and eat. The presence of vendors also allowed for community-based surveillance (eyes on the street) and prevented the street from being quiet, which some pedestrians identified as undesirable. On the other hand, some pedestrians viewed informal vendors as undesirable, particularly when they took up the entire sidewalk and made it difficult to walk along the street.

Based on their contributions to economic productivity, social equity and poverty alleviation, Indonesia's Spatial Planning Law (26/2007) now requires that informal economic activities such as street vendors be accommodated in urban space (Rukmana 2011: 138). In order to fulfill this

requirement in a way that enhances walkability and economic productivity, there is a need to better understand the nature of informal economic activity, and to address many negative impressions of informality in Jakarta.

Analysis of informal economic activity
In 2008, Indonesia's Central Agency for Statistics (BPS) assessed informal sector employment at a national scale and concluded that 69 percent of Indonesia's workers operated within the informal sector (Rukmana 2011; BPS, 2009). In this assessment, however, the agency erroneously defined the informal sector on the basis of employment sector, rather than employment conditions, taxation status and the like. As a result, all self-employed sales workers were assumed to be informal sector workers, while all people with paid employees were classified as formal sector workers. In order to rectify and localize this data, there is a need for analysis of informal economic activity within Jakarta.

The analysis of informal economic activity should provide information on the types of economic activities and their respective urban spatial practices. Information that is relevant to walkability planning includes the density, type and spatial practices of street vendors on sidewalks, transportation facilities and street frontages in different parts of the city. In undertaking the survey, Yatmo's typologies of Jakartan street vendors may be useful (Yatmo 2008).

In addition to providing a profile of activity types and locations, a more ethnographic study of informal economic activity might consider the reasons why vendors choose to operate in particular areas or particular ways and the ways in which informal actors contribute to public safety and street life. Ethnographic analysis should also consider the boundaries between the "formal" and "informal" sectors. For example, freelance workers doing door-to-door sales within the modern sector could be included in the analysis, though they are frequently excluded from discussions about informal sector work or street vendors.

A third element of the informal economic activity study is assessment of informal sector contribution to economic productivity. This study would collect data on revenues, working hours, expenditures and household budgets of informal sector workers, including informal fees paid to the local mafia in exchange for some degree of protection. The study would also consider how informal actors contribute to service provision and economic supply chains in the formal sector.

Making accommodations for informal and vernacular activity
Alongside efforts to understand and measure, informal and vernacular economic activity, Jakarta's policy-makers should accelerate their efforts to make accommodations for these activities within public streets or rights-of-way. Key locations for accommodating informal activities include:

- Commercial shopping zones;
- Transit stations and interchanges;
- School zones; and
- Gateway intersections between neighborhoods and main roads.

Vernacular design strategies are outlined under Strategy 9. These designs integrate space for informal economic activity, with traffic calming, landscaping and local stormwater drainage. In addition to physical design of streets, legal and economic accommodations should be considered based on the following principles:

- Accommodations for vendors should be developed in collaboration with vendors themselves.
- Urban space should accommodate street vendors without requiring their relocation to sites that are unlikely to be economically feasible.
- Accommodations should improve physical and economic security of vendors, without imposing financial burdens or greater indebtedness.
- Efforts to improve health and safety aspects of informal street vendors should allow for incremental compliance.
- Programs to legalize or formalize street vending should be accompanied by continued efforts to improve the integrity and legitimacy of law enforcement.

It should be noted that accommodation of informal activities does not necessarily equate to formalization or legalization and many authors have expressed concerns that regularization of informal landuses can actually produce more insecure conditions than those they are seeking to remedy. In New York, for example, Devlin described efforts to legalize street vending that increased indebtedness by forcing vendors to purchase trucks (Devlin 2011). Likewise, Roy explained how land legalization in Calcutta deepened intrahousehold inequality by granting titles to male heads of household (Roy 20005:152). In transnational upland Southeast Asia (also known as "Zomia"), Scott argued that entire communities deliberately took up informal lifestyles to avoid slavery, conscription, taxation, and other state intrusions (Scott 2009). Each of these cases highlights how structural inequalities within societies and households undermine the success of strategies to formalize or legalize the informal. For this reason, accommodation of informal economic activities should remain firmly focused on reducing inequality, while allowing flexibility and ambiguity on the issue of legalization.

Culture change surrounding informal economic activity
Improving accommodations for informal sector employment does not only hinge on the adequacy of information and space. It also requires a cultural change with respect to the prevailing negative views of street vendors as "out-of-place" elements of the urban environment (Yatmo 2008). As described by Yatmo (2008: 397), Jakarta's street vendors are often perceived as "dirty" or "undesirable" and therefore in need of cleansing or removal. While Yatmo does not delve into the causes of this perception, one likely cause is class bias—where it is not the activity per se that is undesirable but the poor people who carry it out.

The issue of class bias could be compared to the common Western disdain for skateboarding, which is banned in public spaces of many cities ostensibly because it is considered dangerous and destructive (Yatmo 2008: 398). In the United States, where upwards of 30,000 people die from traffic collisions each year, skateboarding is certainly no more dangerous or destructive than car-driving, and yet the latter is permitted in public spaces of all cities throughout the United States. A better explanation for the undesirability of skateboarding might therefore be found when one considers those who skateboard: strong, edgy or unruly, young men who are not

at work, not at school, and not paying (much) to do what they enjoy. Unlike golfers who need to work and pay to engage in their hobby, skateboarders are frequently viewed as out-of-place because of their threatening disinterest in capitalist society—being simultaneously unproductive and unconsumptive. Ironically, this outsider status also makes them immensely marketable as a source of fashion-related production and consumption.

In an analogous manner, informal street vendors are generally considered outsiders in the economy and public space of Jakarta. Given the contributions of informal sector workers to service provision and regional economic output, they are generally tolerated but not accommodated or engaged in the planning of urban public space. At times they have also been forcibly removed in efforts to make commercial and residential areas more attractive to middle class constituents or development proponents. Like skateboarders, informal sector workers are considered undesirable less because of *what* they do, and more because of the threatening nature of *who* they are: the poor majority. An additional element of the disdain for informal street vending may be a form of *cultural cringe*, which internalizes colonial perspectives of inferiority and backwardness.

Like skateboarders, however, street vendors and indigenous forms of informal sector work are sometimes embraced as a style of "authentic" cultural practice, and cultural cringe is replaced with cultural appropriation of spatial practices in new, commercialized spaces of consumption. For example, many of Jakarta's high-end shopping malls feature so-called *warung*-style restaurants in expensive, air-conditioned complexes where they are set alongside Western-style food courts and pharmacies that sell mass manufactured *jamu* (Javanese herbal medicine traditionally by women who carry baskets of ingredients through local neighborhoods). While this stylistic imitation may provide some degree of cultural validation, it does not address the role of street vendors in vitalizing urban public space, delivering walkable services, and providing economic opportunity for the poorest in society. Instead, it turns the fluid spatial practices of street vending into theme parks of commerce and social interaction from which informal sector workers are excluded. Around these car-oriented complexes, parking, road widening and heavy traffic make the surrounding streets more hostile to pedestrians.

In order to improve social aspects of street vending in Jakarta, Jakarta's planners and policy-makers should acknowledge the role of informal sector activity within the city, and consider mechanisms to accept and embrace these activities as part of the inevitable "branding" of Jakarta as a global metropolitan region. These mechanisms should include spatial accommodation, management, and protection of the rights of street vendors, as well as wider practices to make Jakarta's streets more walkable and less hostile to pedestrians.

Strategy 9   Inclusive road designation

Metropolitan branding, however, does not mean that planning should only focus on formal real estate and areas of the city that are visible to rich outsiders—as exemplified by the present focus on protocol roads. Instead, urban branding and walkability planning address both an internal and external audience and require that all areas of the city be covered by planning efforts.

At present, national street design standards and disabled access standards cover all types of roads down to local streets but not including the various types of alleys (or *gang*) that are prevalent in low-income and informal neighborhoods. This oversight likely reflects the fact that Indonesian design standards are derived from foreign sources, for which such street types do not exist. In order to make street standards relevant to Jakarta, various types of narrow alleys (or *gang*) should be addressed within the street classification system. Potential new street typologies are listed below, with approximate widths indicating the total right-of-way between property lines (not just the traffic lanes):

- Walking streets less than 3.6 meters (11 feet) wide;
- Shared streets 3.6 to 6.0 meters (11 to 18 feet) wide;
- Traffic calmed shared streets 6.0 to 10.0 meters (18 to 30 feet) wide; and
- School streets.

These street types should then be included in the pedestrian and street networks for implementation as part of regional walkability and transportation plans.

Strategy 10   Vernacular placemaking and Asian shared street design

In addition to new street designations, street design standards should be updated to provide a more realistic and inclusive street rights-of-way. At present, design standards focus on traffic flow capacity and grade-separated sidewalks, but implementation of the standards is less than ideal. In addition to improving implementation, more context-sensitive design standards should include shared streets, as well as spatial accommodations for children, cart-pushers, pedaled vehicles, informal (or semi-formal) economic activity and living space for residents.

Beyond Jakarta, these street design standards might be used as a basis for discourse on Asian street design more broadly.

Great shared streets
As outlined in Chapter 7, new design standards are recommended to encourage the production of great shared streets within neighborhoods. Based on many of the dimensions of existing neighborhood streets that are great by definition, key design features of "shared streets" should include the following:

- Narrow street widths of less than 6 meters (18 feet) between property lines;
- No grade-separated sidewalks;
- Gateway treatments at either end of the street;
- Structurally robust centerline drainage that is designed to fail incrementally;
- Building forms that overlook the street and that provide continuous street enclosure;
- Varied building form featuring shallow setbacks (0–2 meters), transparent frontages (A to C on a scale from A to F), and numerous intermediaries (seats, plant pots etc.);
- Average building heights that create a 1:1 street width-to-height enclosure ratio;
- Small average lot widths of around 6 meters (18 feet);
- Horizontally and vertically mixed landuses (entropy index of 0.5 of greater); and

- Slow traffic speeds that are self-enforced by narrow street widths and the presence of people, without the need for superfluous traffic signs.

This proposed street design is displayed in Figures 36 and 37 (Chapter 7).

Great school streets

The increase in traffic-related pedestrian fatalities in Jakarta and other majority world cities highlights the need for pedestrian safety and walkability strategies that address the needs of child pedestrians. Given the importance of "safety in numbers", these strategies should encourage more walking among all members of the community, rather than simply barricading off traffic rights-of-way and thereby making streets impermeable to pedestrians. To facilitate more walking and safer walking for children, there is a need to focus on strategies that reduce traffic speeds, and increase street connectivity, sidewalk continuity, crossing safety and the quality of pedestrian facilities.

One aspect of improved accommodations for child pedestrians is the adoption of design standards for great school streets. These design standards should include the following requirements of streets within school zones:

- Well-maintained and flood-resilient sidewalks on both sides of the street;
- Minimum sidewalk widths of 1.5 meters (5 feet) or—in the case of geometrically constrained streets—1.2 meters (4 feet) with a 1.5 meter (5-foot) square "box" provided every 60 meters (200 feet).
- Clearly defined street edges with raised curbs and landscaped buffers between traffic and sidewalks;
- Narrow traffic rights-of-way of 6.6 meters (20 feet) or less;
- Shade trees on both sides of the street;
- Well-maintained zebra crossings at multiple crossing points including adjacent to school pedestrian entrances.
- Traffic calming treatments such as 4-meter (13-foot) long and 10 centimeters (4 inch) high speed humps that enforce a speed limit of 20–25 kph (12–15 mph).
- Community crossing guards and related media campaigns to encourage appropriate motorist behavior and help children safely cross the road during change-over times.
- Separate school entrances for vehicles and pedestrians, with pedestrian entrances located in the most convenient locations for students walking from feeder neighborhoods.
- Space for informal vendors near school entrances.
- Passenger waiting zones for paratransit and demand responsive services.
- Regulatory systems that allow zero-emissions vehicles such as pedicabs (*becak*) and bicycle buggies (*odong-odong*) to queue and operate in neighborhoods and school zones.

This proposed street design is displayed in Figures 40 and 41 (Chapter 7).

Great transit interchanges

New design approaches are also proposed for transit interchange locations where a great number of people, vendors and vehicles frequently interact. Key features of great transit interchange design in Jakarta include adequate and sheltered sidewalk accommodation for both pedestrians

and street vendors, as well as barrier-free transitions between sidewalks and transit waiting zones.

Strategy 11   Energy & Environmental Policy

One reason for the anti-planning of Jakarta's urban pedestrian space is the low priority given to environmental sustainability, and a failure to acknowledge the contribution of walkability to efficiency, productivity and sustainability goals.

A strength of Indonesian planning is the consistent development of five-year plans including the annunciation of national and provincial development goals. In Jakarta, the regional strategic master plan (*Rencana Strategis Daerah* or *Renstrada*) expresses several goals, which are abbreviated below (Pemerintah DKI Jakarta 2002, my translation):

- Adequate, efficient and effective infrastructure;
- Social justice and equity, environmental sustainability, and community participation;
- Supremacy of law, order, peace and security;
- Safety, harmony, livability, and quality of life; and
- Good governance, consistency, transparency and accountability as supported by professional, hardworking staff and reliable information.

While environmental sustainability is included as a regional development goal in Jakarta, there is a need for a more explicit environment policy at both the national and regional level—particularly as it relates to mode split and energy consumption.

Replacing the fuel subsidy with a fuel tax
A key energy and environmental issue to address is the perverse effects of the fuel subsidy, which has been in place since 1967. As described by scholars, the fuel subsidy encourages over-consumption of energy-inefficient transportation modes and underwrites the bias toward motorized transportation in Jakarta (Setyaka 2007). At a national level, the fuel subsidy consumes resources that could have been spent on other things such as schools, policing and welfare programs. In addition to the direct cost of subsidizing people's inefficient use of fuel, the fuel subsidy results in massive expenditure of public monies for development infrastructure, such as freeways and road widenings, which aim to alleviate the very congestion that the fuel subsidy helps to produce (Setyaka 2007). By consuming scarce public funds and encouraging inefficient choices, the fuel subsidy is therefore an impediment to sustainable transportation and walkability planning in Jakarta.

As discussed previously, walking constitutes 40 percent of Jakarta's trips and a large portion of the population cannot afford to own or operate a private car. The poorest residents of the city cannot even afford public transportation or motorbike usage, and therefore use non-motorized transportation almost exclusively. In this context, the fuel subsidy is socially regressive, in that it delivers greatest benefits to the rich, at the expense of the urban poor who help to generate tax revenue. Ironically, however, efforts to dismantle the fuel subsidy have met complaints regarding the equity effects of increased cooking fuel prices on the urban poor. If the goal of the

fuel subsidy is indeed social equity, the subsidy would be better spent providing direct welfare payments or cooking fuel coupons to the poor. By contrast, those who are very poor gain no benefit from this supposed poverty alleviation strategy and the key recipients are people who are wealthy enough to own and operate cars or SUVs. In the case of Jakarta, a more progressive policy would be to replace the fuel subsidy with a fuel tax, and to allocating fuel tax revenues to programs that directly improve the welfare of the poor. Such program might include community development and walkability planning in low-income neighborhoods of the city.

Strategy 12   Decentered, cross-disciplinary and context-sensitive research

As discussed in Chapter 3, discursive biases within transportation, urban design and planning are exacerbated by a concentration of data collection, research and policy development in the West. When this research and policy is translated to other contexts, such as that of Jakarta, it can result in inappropriate assumptions and unintended outcomes. In order to counter this effect there is a need for calibration, critical analysis and original research within the Indonesian context.

Decentered and cross-disciplinary research
For a start, local researchers should undertake analyses to critically analyze the limitations and potential applicability of influential source material that is applied in Indonesian policy development. Key documents that should be critically analyzed in this way include the AASHTO Green Book, ITE Transportation Planning Handbook, and the ADA Guidelines. Where possible, source data that contributed to these documents should also be analyzed in relation to contextual relevance. An example might include the location, demographic context and transportation profile of studies undertaken to provide data points in the ITE Trip Generation manual.

Decentered and critical urban analysis would be greatly enhanced by incorporating cross-disciplinary approaches and findings. This cross-disciplinary approach may encourage transportation and urban design concepts to be scrutinized in new ways and different angles— thereby exposing possible differences in assumptions and origins. For example, recent Western studies of transit-oriented development and station access could be repeated in Jakarta and analyzed through the sociological lens of equity impacts.

Researchers who undertake original urban research within Indonesia or other majority world settings should be encouraged to submit their research findings to international journals, fora and conferences in order to create a more comparative and polyphonic discourse on urban issues.

Context sensitive research and ethnographically informed surveys
In terms of specific survey instruments, there is a need for more ethnographic understanding in the development of surveys and interpretation of results. For example, local institutions and international aid agencies have sponsored household travel surveys as part of efforts to address pressing transportation needs in Jakarta and other Indonesian cities. When undertaking such surveys, researchers should routinely record a sample of interviews and analyze these surveys using in-depth ethnographic techniques. This approach may help research better understand how survey questions are being interpreted and what changes need to occur within the research.

This step is particularly important in a somewhat bilingual policy context—with foreign documents used as source material for local policy development and foreign consultants engaged in research, development and policy advising. In these contexts, there is particular need for explicit translation of different linguistic understandings and spatial practices.

As discussed in Chapter 6, ethnographic analysis within this research revealed that standard transportation survey categories do not account well for the travel choices of those who have informal living or working arrangements and those who have integrated trips and activities. For this reason, the author recommends replacing standard travel surveys with integrated activity survey.

Final Comments

Before his untimely death in 1982, the prominent Berkeley professor, Donald Appleyard, was working on a paper that he had tentatively titled: "'Streets Can Kill Cities: Third World Beware' or 'Guidelines for Street Design in Third World Cities'". In this paper, Appleyard argued the following:

> "I suggest that the streets of the western world, particularly those of California, are not models for the future streets of the Third World, and yet the possibility that they will be seen as such is very high. Our streets from a social viewpoint are dead places, killed by the automobile for which they were built." (Appleyard forthcoming)

In this dissertation, I examined the issue of walkability and walkability planning in Jakarta. The research sought to extend earlier research by undertaking pedestrian preference surveys, traffic counts, structured streetscape observations, pedestrian activity mapping and policy interviews on walkability planning in Jakarta. This research therefore draws upon a diffuse and multidisciplinary body of previous scholarship and writing in the area. Many of these earlier efforts, however, were aligned with a limited disciplinary perspective or were derived from Western settings where walking constitutes only a small fraction of urban trips and where urban conditions vary substantially from that of Asian and majority world cities.

As a city of the "developing" country and the world's fourth most populous nation, Jakarta has conditions that may be more representative of growing cities throughout the world than the Western settings from which most planning research is derived. Jakarta is also an important case study in that improved walkability in this location poses synergistic benefits because of the very high land use densities, mixed land use conditions, low median incomes, limited financial resources and rapid urbanization. Similar conditions exist in many cities of the world from Nairobi to Mumbai and São Paulo. In these contexts of high density, low median income and rapid motorization, walkability improvements may contribute to efforts to manage congestion, improve multimodal efficiency, contain traffic-related injury, and enhance urban vitality.

This research has found that, although walking is Jakarta's most populous mode, pedestrians are largely neglected in the planning and design of everyday urban public space. This disconnection results from biases within the international discourse on transportation planning as well as

domestic political discourse that downplays multidisciplinary, non-motorized and low-income elements, in favor of activities seen as "developed", modern or middle-class. In order to plan for walkability in Jakarta, there is a therefore a need to address both physical design elements and the assumptions underlying urban research, policy and development.

One way of exposing, communicating and addressing bias and assumptions is meaningful interagency coordination that allows for more multidisciplinary input and systems approaches to the planning of urban public space—including pedestrian facilities and traffic rights-of-way. Interagency and multidisciplinary approaches to pedestrian planning should also aim to produce entire pedestrian networks and paths of travel rather than piecemeal facilities and symbolic monuments.

This spatial approach requires a new perspective of planning space that acknowledges and examines the reality of informal land development and integrated activity patterns that are currently rendered invisible within the planning and research process. The approach also requires a more context-sensitive approach to urban planning, where ethnographic methods are used to inform all research and policy development, and to make the planning process accessible to the entire community—and not just those with a technical background or an understanding of foreign terminology.

In terms of physical design for walkability, two key issues emerged from the research. The first issue is the mismatch between the prevalent use of streets as shared spaces and the standard design of streets as segregated spaces, with pedestrians traveling strictly along sidewalks. To address this mismatch, I propose a number of new street designs including great shared streets, great school streets and great transit interchanges. More generally, I propose that placemaking and street design practices be investigated and developed to acknowledge and embrace vernacular, informal and shared spatial practices. This approach is certainly applicable to many Asian and majority world contexts beyond that of Jakarta. In Jakarta and other comparable cities I propose an integrated accessibility approach that prioritizes the completion and effectiveness of pedestrian networks over strict compliance with international standards in only limited showcase locations.

As the main mode of transportation in cities throughout the world, walking deserves attention, research focus and policy commitment. This dissertation has extended the conversation on walkability planning and has identified research categories, street designs and planning mechanisms to produce equitable, vibrant, sustainable and walkable pedestrian space in Jakarta and, hopefully, many other cities throughout the world.

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Appendix A: Sample Pedestrian Activity Maps
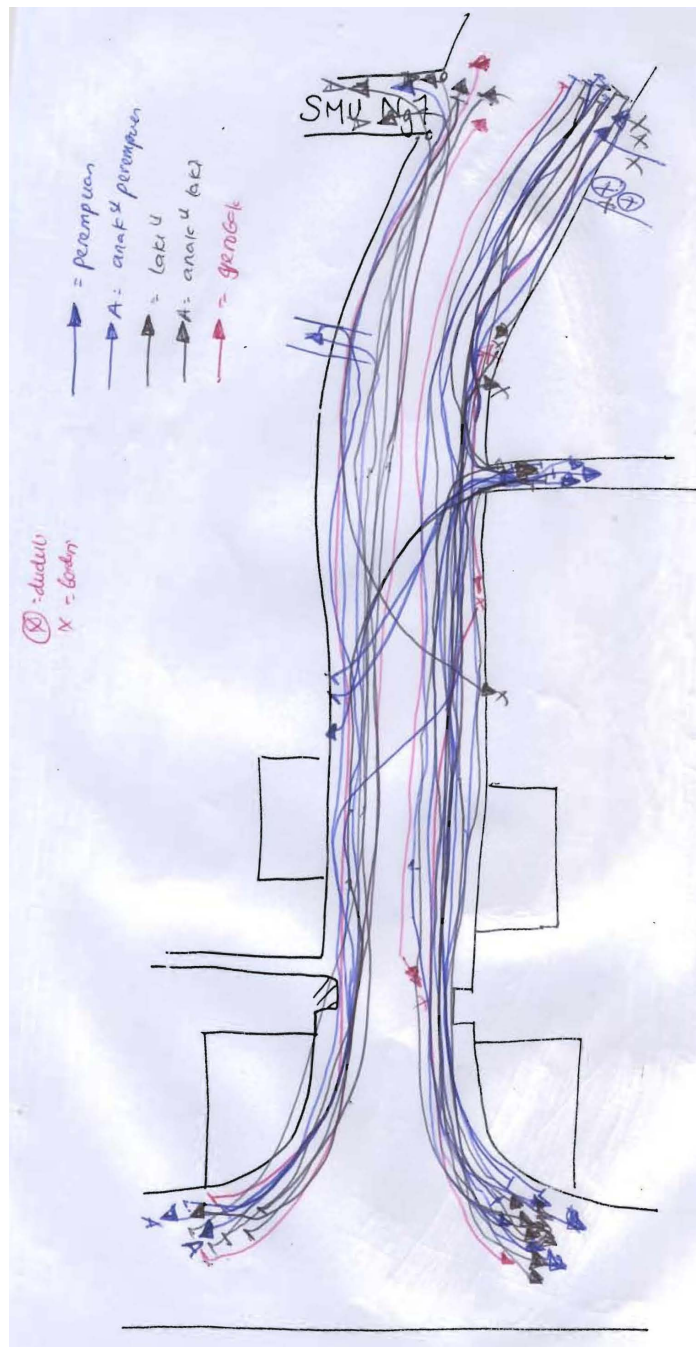
Figure 43: Pedestrian activity mapping along Jalan Lima, 8:00–8:30 a.m. 6 August 2008
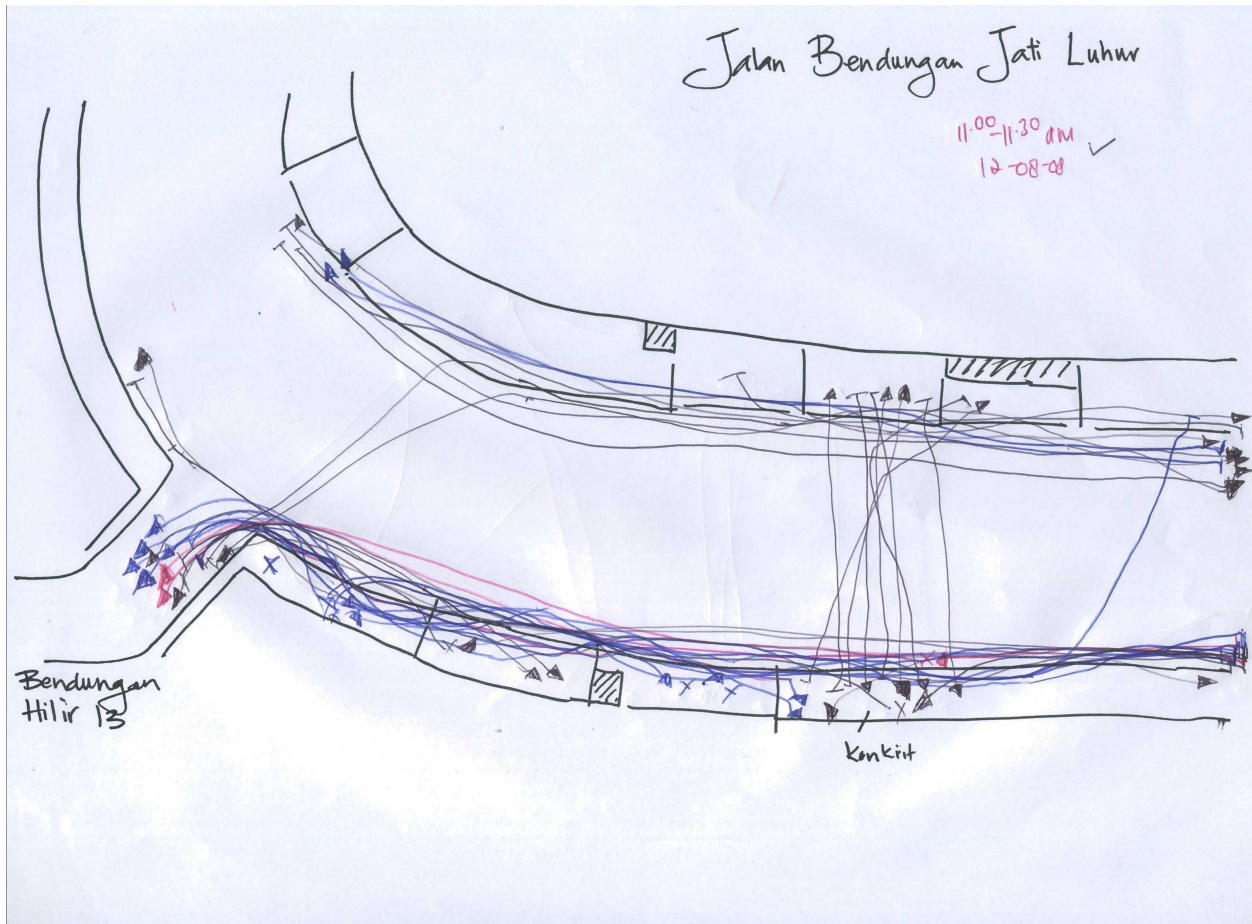
Figure 44: Pedestrian activity mapping along Jalan Bendungan Jati Luhur, 11:00–11:30 a.m. August 2008

Appendix B: Walkability Measurement Instruments

Streetscape observations were based on the following walkability measurement instruments, which have been translated from bahasa Indonesia. These street segment and property measurement instruments were derived from the work of Sungjin Park and adjusted for the Jakartan context.

Figure 45: Property frontage walkability measurement instrument
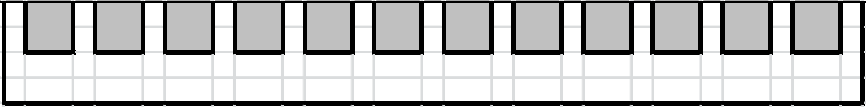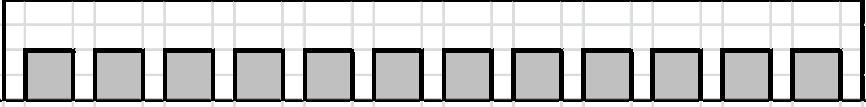
	FORM 2	
	Area:	Date:	Weather:
	Surveyor:	Time:
1	Street name	
2	Property ID	
3	Building height (flr @ 10'/flr)	
4	Ground floor uses	[a]
5	Upper floor uses	[a]
6	No. street-facing doors	
7	No. street-facing windows on ground floor	
8	No. street-facing windows on upper levels (#/flr)	
9	Building width (')	
10	Transparency at the pedestrian level	[b]
11	No. driveway curb cuts (sidewalk breaks)	
12	No. intermediaries (e.g. chairs, tables on verandah)	
13	Fence type and height (')	[c]
14	Fence length	
15	Setback use	
16	Retail uses and other specifics	
17	Interstitial pathway access	
18	Type of security feature	
1	Cross streets:	Street ... Street
2	Property ID	
3	Building height (flr @ 10'/flr)	
4	Ground floor uses	[a]
5	Upper floor uses	[a]
6	No. street-facing doors	
7	No. street-facing windows on ground floor	
8	No. street-facing windows on upper levels (#/flr)	
9	Building width (')	
10	Transparency at the pedestrian level	[b]
11	No. driveway curb cuts (sidewalk breaks)	
12	No. intermediaries (e.g. chairs, tables on verandah)	
13	Fence type and height (')	[c]
14	Fence length	
15	Setback use	
16	Retail uses and other specifics	
17	Interstitial pathway access	
18	Type of security feature	
[a]	B: green open space, R: residential, T: retail/commercial, K:
[b]	See diagram
[c]	e.g. chain link, iron bars, wood board, picket

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Figure 46: Street segment walkability measurement instrument

	FORM 1
	Area:
	Surveyor:
	All measurements in feet (') and inches (")
	Write to the right of the number. If the element doesn't exist, cross it out

Date: / Weather: / Time:

No.	Item	
1	Street name	
2	Upper crossing street name	
3	No. approaches	
4	Upper left crossing distance (')	
5	Upper left crossing type	[a]
6	Upper crossing type	[a]
7	Upper right crossing type	[a]
8	Upper left setback (')	
9	Left stormwater drainage type	[b]
10	Left road edge indicator	[i]
11	Left side width (')	
12	Left side uses and widths (')	[c]
13	Left midblock setback (')	
14	Lower left setback (')	
15	Left-side on-street parking type	[d]
16	Left-side on-street parking lane width (')	
17	Length of street between ped edges (')	
18	Length of functional left sidewalk (')	
19	Length of street with functional left kerb (')	
20	Maintenance issues for left sidewalk	[e]
21	Environmental conditions on left side	[f]
22	Number of upward traffic lanes	
23	Type of median	[g]
24	Width of median/right turn lanes	
25	Number of right-turn lanes	
26	Number of downward traffic lanes	
27	Midblock crossing type	
28	Width of traffic zone	
29	Length of functional right sidewalk (')	
30	Length of street with functional right kerb (')	
31	Right-side on-street parking lane width (')	
32	Right-side on-street parking type	[d]
33	Right stormwater drainage type	[b]
34	Right road edge indicator	[i]
35	Right side width (')	
36	Right side uses and widths (')	[c]
37	Lower right setback (')	
38	Right midblock setback (')	
39	Upper right setback (')	
40	Maintenance issues for right sidewalk	[e]
41	Environmental conditions on right side	[f]
42	Lower right crossing type	
43	Lower crossing type	[a]
44	Lower left crossing type	[a]
45	Lower right crossing distance (')	[a]
46	Lower crossing street name	
47	No. approaches	

No.	Item		No.	Item
48	Number of trees		54	Number of mobile vendors carrying t
49	Total canopy (')		55	Number of mobile informal vendors
50	Type of pavement		56	Number of informal eating outlets
51	Number of street furniture		57	Number of informal stalls
52	Visual obstacles		58	Number of traffic calming treatments
53	Obstacles to walking			

[a]	G: stop line, 2G: double stop lines, Z: zebra crossing, RK: yield sign, RS: stop sign, LP: pedestrian signal, LT: traffic lights with no pedestrian signal, J: footbridge, U: underpass, 2L: 2 curb ramps for wheelchair users
[b]	G: open ditch (next to property line), T: covered culvert sidewalk, S: concealed drainage
[c]	T: sidewalk, KM: cafe seating, W: informal eating place, K: stall, PKL: mobile stall, G: ditch, P: landscaping/trees, M: street furniture, Ti: poles, or specify other
[d]	P: parallel street parking, S(#°): 30, 45, 60 or 90 degree parking, H: surface parking lot, G: parking structure
[e]	R: weeds, TG: uneven sidewalk (for wheelchair users), TP: broken up sidewalk ie very uneven, TR: rubble on the sidewalk, L: holes (#, size, depth), M: missing sections of sidewalk ('), TA: unpaved sidewalk
[f]	R: weeds, B: rats/stray animals, S: rubbish, SB: rubbish incineration, AH: black water, AK: dirty water
[g]	C: painted median, T: raised median, PT: landscaping/trees, P: fence (with height)
[h]	3: triple rumble strips, B: speed bump, CH: choker, BO: bulbout, CH: chicane, TT: street closure, RC: praised crosswalk, AK: paving treatment, D: diverter, CI: crossing island, MC: minicircle, RR: roundabout
[i]	P: white line, A: absence of pavement, K: raised kerb, KT: kerb and raised sidewalk, and conditions of each

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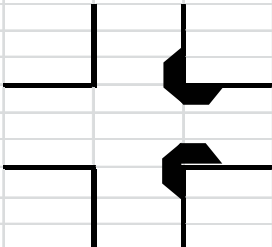**Figure 47: Traffic calming codes for street segment walkability measurement instrument**
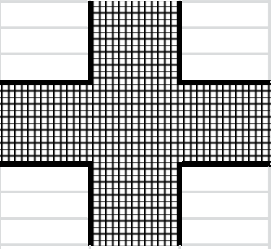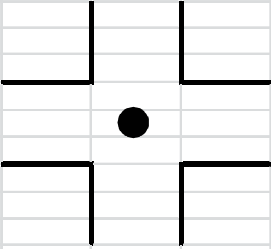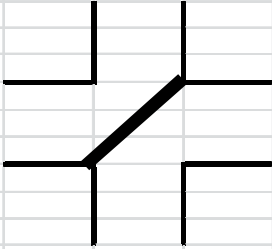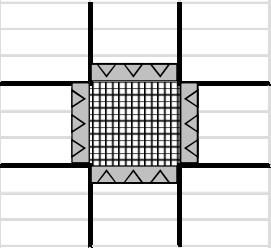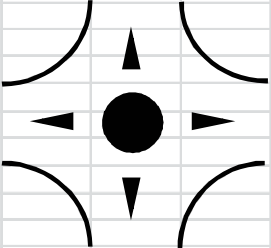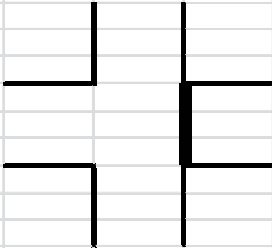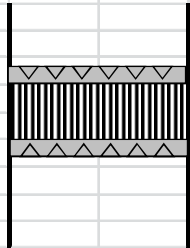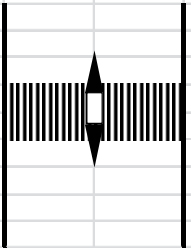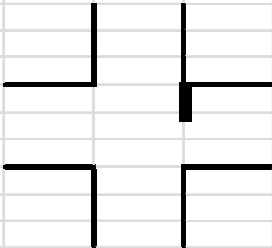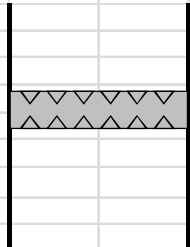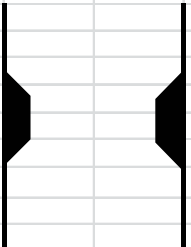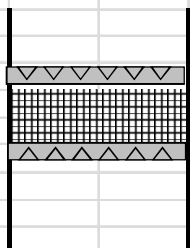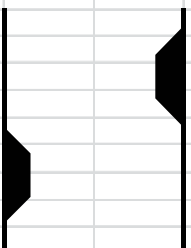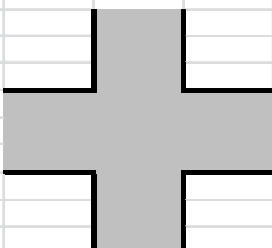
FORM 3

Vertical shift / Perubahan vertikal		**Horizontal shift / Perubahan mendatar**			
TP	textured pavement / aspal yg khusus	**MC**	minicircle / bundaran lalu lintas kecil	**DD**	diagonal diverter / pengalihan diagonal
RI	raised intersection / persimpangan terti	**RB**	roundabout / bundaran lalu lintas	**FC**	full closure / tutup jalan
RX	raised crosswalk / penyeberangan terti	**XI**	crossing island / pulau penyeberangan	**HC**	half closure / separoh tutup jalan
SB	speed bump / bongkol jalan	**CH**	choker / alat untuk membuat jalan sem	**BO**	bulbout / alat utk mbuat jln smpt di poj
ST	speed table / meja aspal	**CC**	chicane / urutan garis bengkok	**W**	colored pavement / aspal yg berwarna

Figure 48: Transparency codes for property frontage walkability measurement instrument

Appendix C: Pedestrian Interview Format

Survai Pejalan Kaki 1.4

Tempat: Bendungan Hilir: Tanggal:
Pewawancara: Pukul:
No. (dari wawancara hari itu):

- *Selamat pagi/siang/sore! Apakah anda rela menjawab beberapa pertanyaan untuk saya?*

Kalau ya:

- *Saya salah satu pewawancara untuk survai pejalan kaki di Jakarta. Survai ini dilakukan unuk proyek riset S3 oleh Ria Hutabarat di Universitas Kalifornia di Berkeley. Maksud riset adalah mencari fasili yang paling disukai orang pejalan kaki di Jakarta.*
- *Survai betul-betul sukarela, anonim dan bisa dihentikan sesuka anda. Sebaiknya survai akan makan sekitar 10 menit untuk diselesaikan. Apakah anda ingin mengikuti sekarang atau pada saat lain?*

Kalau sekarang:

- *Kalau ada pertanyaan atau persoalan yang bersangkutan dengan riset ini silakan menghubungi saya atau universitas. Disini ada kartu dengan email dan nomor teleponnya.*

Berikan kartu berisi keterangan ini.

- *Apakah saya boleh menggunakan alat perekam?*

Kalau ya, pasangkan alat rekam dan mulai survai.

Berisi ini berdasarkan penglihatan anda – ini bisa dilakukan sesudah survai telah diselesaikan.

	1	2	3	4	5+	Krg tahu
a) Jumlah orang yang berikut	☐	☐	☐	☐	☐	☐
b) Jumlah anak yang berikut	☐	☐	☐	☐	☐	☐
c) Hambatan mobilitas yang jelas kelihatan						
d) Jenis kelamin	☐ laki^2	☐ perempuan				

Tolong bertanya pertanyaan pendahuluan yang berikut:

1. Kalau anda pikir tentang orang pejalan kaki, apa kesan yang muncul dalam benak anda?   _____

2. Bagaimana anda menilai berjalan kaki dibandingkan dengan transportasi lain?   _____

1

Peta daerah

Ruta berjalan yg biasa — — —
Bagian yang paling disukai o o ⬜
Bagian yang kurang disukai **xxxxx**
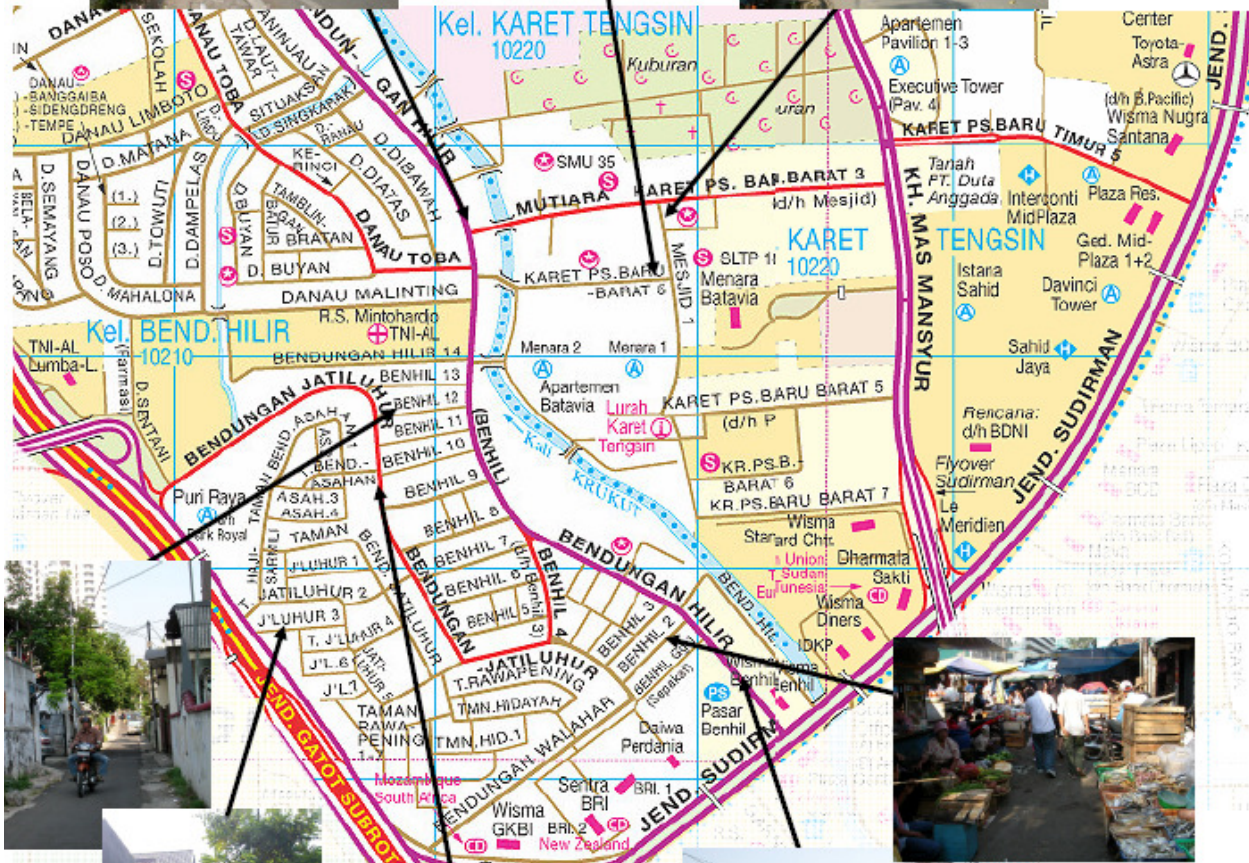
Silakan memikir tentang perjalanan jalan kaki hari ini.

3. Berapa sering anda berjalan di daerah ini?

hari	minggu	bulan	tahun	pertama
☐	☐	☐	☐	☐

_____ kali se

4. Dimana anda mulai perjalanan hari ini?

rumah	kerja / sekolah	toko²	teman / keluarga	lain
☐	☐	☐	☐	☐

Lain: _____
- o Apa alamat tempat itu? (RW/RT, jalan, tempat)

5. Dimana tempat tujuan perjalanan anda?

rumah	kerja / sekolah	toko²	teman / keluarga	lain
☐	☐	☐	☐	☐

Lain: _____

- o Apa alamat tujuan itu? (RW/RT, jalan, tempat)

6. Apa moda transportasi lain akan dipakai untuk sampai ke tempat tujuan?

Kolom: tak satu pun, sepeda, sepeda motor, mobil / jeep / kijang, kereta api / KRL, Busway, bis umum/patas/pts ac, kopaja/metromini, bemo/angkot/mikrolet, taksi, bajaj, ojek, becak, omprengan, bis perusahaan/sekolah

☐ Lain: _____   ☐☐☐☐☐☐☐☐☐☐☐☐☐☐☐

7. Silakan menceritakan / menunjukkan di peta rute-rute yang anda pakai untuk berjalan sehari-hari? (Kalau pertama kali, hari ini cukup.)

- o Bagian mana yang paling disenangi? Mengapa? _____

- o Bagian mana yang kurang disenangi? Mengapa? _____

8. Menurut anda apa yang bisa membuat perjalanan lebih baik untuk pejalan kaki? _____

Silakan memikir tentang semua macam perjalanan jalan kaki sehari-hari.

9. Pada umumnya, apakah anda senang berjalan kaki?

sangat tidak senang	tidak senang	neutral	senang	sangat senang
☐	☐	☐	☐	☐

10. Apa yang mempengaruhi kenyamanan anda berjalan kaki? _____

11. Pada umumnya, jalan seperti apa kurang disukai untuk berjalan kaki? _____

12. Apakah anda secara rutin berjalan kaki dengan kondisi tidak nyaman (secara terpaksa)?
- o Apa yang membuat tidak nyaman?
- o Dimana? _____

3

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13. Pada hari-hari kerja yang biasa anda berjalan kaki untuk tujuan apa? (Pilih semua tujuan yang betul.)

bisnis	rumah ke tempat kerja/belajar	tempat kerja/belajar ke rumah	toko2/perlayanan	memunjungi teman/keluarga	tempat ibadah	main2/olah raga	lain
☐	☐	☐	☐	☐	☐	☐	☐

- o Berapa perjalanan kaki anda perlakukan untuk setiap tujuan? ____ ____ ____ ____ ____ ____ ____ ____
- o Berapa lama anda berjalan kaki untuk setiap tujuan? (menit) ____ ____ ____ ____ ____ ____ ____ ____

14. Pada hari Jumat yang biasa anda berjalan kaki untuk tujuan apa?

☐	☐	☐	☐	☐	☐	☐	☐

- o Berapa perjalanan kaki anda perlakukan? ____ ____ ____ ____ ____ ____ ____ ____
- o Berapa lama anda berjalan kaki? (menit) ____ ____ ____ ____ ____ ____ ____ ____

15. Pada hari Sabtu/Minggu yang biasa anda berjalan kaki untuk tujuan apa?

☐	☐	☐	☐	☐	☐	☐	☐

- o Berapa perjalanan kaki anda perlakukan? ____ ____ ____ ____ ____ ____ ____ ____
- o Berapa lama anda berjalan kaki? (menit) ____ ____ ____ ____ ____ ____ ____ ____

Sekarang saya ingin tahu sedikit tentang perilaku transportasi anda.

16. Berapa kenderaan bermotor anda punyai?

	0	1	2	3+
o Sepeda motor	☐	☐	☐	☐
o Mobil	☐	☐	☐	☐
o Lain: (tambahkan)	☐	☐	☐	☐

17. Biasanya naik apa untuk pergi kemana-mana? (tanda semua yang betul)

	tak satu pun	sepeda	sepeda motor	mobil/jeep/kijang	kereta api/KRL	busway	bis umum/patas/pts ac	kopaja/metromini	bemo/angkt/mikrolt	taksi	bajaj	ojek	becak	omprengan	bis perusahaan
o ke/dari tempat kerja / belajar ☐ Lain: ___	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
o untuk maksud lain ☐ Lain: ___	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐

18. Anda tinggal di mana? (kelurahan/kode pos)

- o Sudah berapa tahun tinggal disana?

19. Apa status pekerjaan anda?

pekerja	pelajar	ibu rumah tangga	pensi unan	tuna karya	Lain
☐	☐	☐	☐	☐	☐

20. Anda bekerja / belajar dimana? (kelurahan)
- o Bekerja sebagai apa?
21. Anda bekerja dimana? (kelurahan)
- o Sebagai apa?
22. Dari kartu ini, berapa golongan pendapatan rumah tangga per bulan? ____ (A – I)
23. Berapa jumlah orang di rumah tangga? ____
24. Dari kartu ini, berapa golongan umur anda? ____ (A – N)
25. Apakah ada komentar lain?

Terima kasih banyak atas bantuan anda. Ada kenang-kenangan dari California.

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Appendix D: Policy Interview Questions

- What institutions are involved in planning pedestrian space within the Jakarta region?
    - e.g. planning, design, construction, maintenance, enforcement
- What maps do you have on pedestrian matters? What other maps exist?
    - e.g. networks, districts, facilities, crosswalks
- What data do you have in regard to pedestrians? What other data exists?
    - e.g. counts, accidents, facilities, maintenance
- What plans do you have that relate to pedestrian space? What other plans exist?
    - e.g. pedestrian master plan, specific plans for pedestrian districts, details from Jakarta 2010
- What programs do you have to address pedestrian issues? What other programs exist?
    - e.g. safety, planning, provision, access to transit, kampung improvement
- How much funding is allocated to pedestrian planning and development?
- How many people are involved in pedestrian planning?
    - Who?
- How do you decide how to build/plan/operate pedestrian facilities?
    - What is the process by which pedestrian space is planned?
    - Do design standards exist? On what are they based?
- Are you familiar with pedestrian research that has been done?
    - e.g. local research, wider body of research on pedestrian metrics
- What are your key goals in relation to pedestrian planning?
- What trends do you see happening in relation to pedestrian transportation and planning in Jakarta in the future?