05

LIVABLE CITIES

#Street #Parking #Urban #Building #Planning
#Canal #Water #Land #Space

Streets, public spaces, and city blocks are a physical manifestation of urban planning and policy.

1. HOW PHNOM PENH CAN RECAPTURE ITS MID-CENTURY GLORY

By Oung Ty Keithya

The Cambodian capital of Phnom Penh was once considered the Jewel of Asia. “I hope, one day, my city will look like this,” Lee Kuan Yew, Singapore’s first prime minister, reportedly told his host, Prince Norodom Sihanouk, as he cruised along the capital’s elegant boulevards in a Mercedes convertible during his visit to Cambodia in April 1967.

Phnom Penh was founded as the capital of the Cambodian kingdom in 1434 but was abandoned several times before being reestablished again as the capital and center of royal power in 1865. Under the French protectorate (1863-1953), Phnom Penh was used as an experimental blueprint for French architects and engineers. The French planners carefully crafted a modernization plan for Phnom Penh by laying out roads, designing public buildings, and locating urban spaces via a thorough analysis of the city’s physical characteristics

Colonial buildings dot the old district of Phnom Penh marking urban areas which were planned in the French way.

Interestingly the combination of immaculate buildings and wide boulevards—when closed off to vehicles—creates a pleasant public realm.

Gazing at a map of Phnom Penh from the 1960s, one cannot ignore the order and the alignment that characterizes the street networks in the central part of the city. A series of almost-identical city blocks are hugged by networks of small streets that run parallel between the boulevards and the main streets, creating an order and a strong connectivity of roads, and a good flow of traffic. The city's highly organized numbered street system and defined hierarchy of urban spaces were designed to integrate the rural areas with the urban as the boulevards and the main roads stretched toward the outskirts.

The design not only focused on highly-planned street networks but also took careful consideration of other vital urban amenities, including public parks, greenery, and supporting infrastructure. The streets were equipped with broad sidewalks, and lined with trees and candelabra streetlights. Networks of roads featured full-fledged systems of water supply, drainage, infrastructure, and electricity network.

Despite constant investment, Phnom Penh new district lacks the same level of livability.

The era of urban sprawl

Modern-day Phnom Penh is playing witness to a rate of urbanization that can be best described as relentless. Urban sprawl and haphazard development along the city's edges stretch out in all directions. Uncountable numbers of condos, villas and housing projects are expanding the suburbs and exurbs to accommodate more and more people migrating to the city in search of better opportunities.

Rural farmlands are being transformed into commercial and housing projects. Lakes and wetlands with ecological and hydrological importance are being filled to meet the growing demand for land.

But, while these other topics have been well-explored, an element of this sprawl that is particularly troubling, and largely ignored, is the planning—or lack thereof—of the new city streets.

Taking a bird's-eye view of the modern map of Phnom Penh, focusing in particular on the outer districts west of the center, we see that the network of streets is fragmented and patchy.

These outer sections are completely devoid of boulevards and main streets, and the smaller streets lack connectivity with one another, resulting in weak road connectivity between the outskirts and the downtown.

The likely cause is that these streets were built as an afterthought. Real estate developers who buy land in these areas have a myopic focus on building housing and commercial spaces, and only consider the logic of the road placement after. The result is that road systems in these areas exist purely to serve the accessibility of these individual real

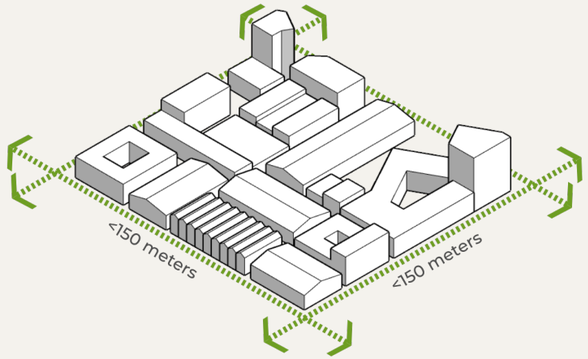
estate projects, for obvious profit-based reasons. This piecemeal mode of urban development results in a lack of broader public-facing road connectivity and coordination throughout the edges of the city.

However, Phnom Penh can change course and regain its order with proper urban planning and implementation. One of the first and most important steps to take is better street network planning.

Increasing reliance on private vehicles is straining Phnom Penh street network which were not designed for current levels of motorization.

CITY BLOCKS

OPTIMAL SIZE & WELL CONNECTED STREET LAYOUT



OVERSIZED BLOCK

City Block dimensions which are longer than 150 meters makes it difficult for active commuters to navigate and redcuces alternate paths.

CITY BLOCKS

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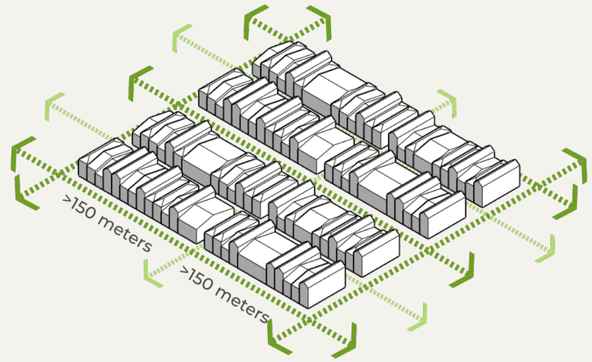


OPTIMIZED BLOCK

City Block dimenstions are shorter than 150 meters, facilitates walking and cycling by allowing short cuts and alternative routes

Dimension of city blocks determines connectedness and walkability of a neighborhood.

The importance of street network planning

Street network design could influence the development of Phnom Penh in a number of crucial ways. First, street network design determines the level of traffic safety, mobility, and transport efficiency within the city. One study analyzing the street networks of ASEAN cities has shown that street networks with longer street lengths and many intersections tend to promote a better flow of traffic due to the formation of a square-like structure with a high degree of street connectivity. This allows commuters to travel faster, more safely, and more efficiently to their destinations. Applying these findings to Phnom Penh, we can understand why these peripheral parts of the city lacking street density are more prone to traffic disruption and congestion.

Second, street network design determines commuters' behavior and the choices they make around modes of transportation. A well-connected system of street networks makes streets more accessible for walking and biking. A study on Phnom Penh's street networks, drivability, walkability, and bikeability shows that the street networks in the central districts are more accessible to walking and biking than the peripheral ones. More walking and biking ability would lead to less vehicle dependency, resulting in less congestion and less consumption of fossil fuels. Evidently, many Cambodian people decide to own private vehicles at least partly because of the city's disconnected streets, long distances, and unreliable public transport services.

Third, street network planning is also strongly linked to the economic activities of urban spaces. The study on ASEAN cities indicated that a high degree of street accessibility provides a boost to urban business activities. For instance, businesses that are located on more interconnected street networks attract more sales opportunities as these streets attract more visits and through-traffic. Shops located in disconnected areas with streets that are harder to navigate force people to visit those shops only with purpose, instead of via natural encounters.

Given the importance of a well-executed street network, it's important to ask how Phnom Penh can get this critical component of urban planning back on track.

Urban policy should encourage optimal city blocks sizes, well-laid street networks, and walkability, all of which are critical factors of a city's urban mobility.

The challenge of enforcement

It would be incorrect to say that Phnom Penh currently has no master plan for the city. At the end of 2015, in collaboration with development partners, City Hall issued Phnom Penh Land Use Master Plan 2035, providing broad strategic directions for the capital.

How much the plan is actually being implemented is another question.

There is some ambiguity regarding whether private developers consult the master plan before planning to build a project. The overall lack of enforcement and unclear construction and real estate development policies lead the city's urban development into a devastating combination of illegal construction sites and implementation loopholes as the capital continues to progress into an urban mess. The lack of enforcement and coordination in urban planning have clearly taken a huge toll on the city's street networks, the planning of which falls among the city's least-prioritized tasks.

This clearly shows how badly Phnom Penh needs an improved and updated master plan. Such a plan must include thoroughly-studied land use and zoning policies with built-in practical enforceability and well-designed street networks, and must consider the infrastructural and architectural identities of the city.

Perhaps most importantly, any land or construction permit granted to developers must be in strict compliance with the city's land use master plan. Street networks cannot be an afterthought that follow profit-driven decisions by real estate developers. City authorities must act to collaborate with, and monitor these projects on the outskirts to be sure that they adhere to the larger vision for our urban space.

If the status quo continues unchecked, we will be left with a tangled mess of disconnected streets, wondering how our city lost its character and order. A more coherent street network design alone is not likely to fix all of Phnom Penh's mounting problems. It is, however, a critical starting point. Only by focusing on this issue, by prioritizing long-term planning over the single-minded profit needs of real estate developers, can we establish a stronger foundation for the urban development projects to follow.

Originally published 12th of August , 2022
by The Diplomat

Availability of ample parking spaces significantly contributes to a commuter's decision to drive rather taking an alternative commute mode.

2. LESS PARKING SPACE IS ACTUALLY GOOD FOR A CITY

By Ses Aronsakda

The end of 2020 saw more private vehicles in Phnom Penh than people: a total of 2.53 million private passenger cars and motorcycles compared to its 2.18 million population. With about one car and four motorcycles for every household, this is a clear indicator that Phnom Penh is heavily dependent on private vehicles.

As Future Forum's urban policy researcher, I spent the past year examining Phnom Penh's urban mobility. A part of that study involved digging into Cambodia's current parking policy and the impact it has on the city.

Every square of meter vehicle parking imposes a direct cost to residents and businesses, as well as externalized cost.

According to my estimation, the parking area required for all private vehicles in Phnom Penh is 22.8 square kilometers, which is roughly the size of Russey Keo district. But currently the city has only 0.98 square kilometers of registered parking space, which is severely inadequate.

Building a parking lot the size of Russey Keo district is obviously not possible. But even putting aside the logistical and financial constraints, adding more parking to a city isn't a cure-all. In fact, too much parking can lead to just as many problems.

A minimum parking requirement is not the solution

Although an overlooked topic, parking policy significantly impacts urban mobility, affordability, growth and the environment of a city. Despite being such a multifaceted topic, current efforts of the Cambodian government focus solely on gaining more parking space for cars.

In 2015, the Ministry of Land Management, Urban Planning and Construction devised and adopted a minimum parking mandate. In this scheme, for example, restaurants and cafes are required to have one car parking spot for every 20 square meters of retail space.

This seems like a reasonable solution. But in practice, it subjugates the city to the needs of cars rather than the needs of people, and there are hidden costs to this decision as well.

The economic cost of a minimum parking requirement is severe, making construction and operation of property more expensive. The average cost of building a single ground-level parking spot is $500 as the cheapest option without even counting the cost of land, which would be exorbitant in Phnom Penh's core.

For large retailers, spending millions of dollars to provide enough parking is not overly detrimental. But for small and medium-sized businesses, even a modest size parking lot may prove untenable, thus serving only to stifle growth.

More nefariously, minimum parking requirements also harm home buyers, as money spent on building the appropriate parking will be pushed back on to buyers as a hidden cost within the property price.

Lastly, there are also environmental costs to parking lots. They are impermeable surfaces and their concrete or asphalt construction—which in itself is an environmental concern—contributes to heat gain in urban areas, prevents the infiltration of groundwater and makes flooding run-off worse.

As a result, with a portion of any investment absorbed by parking, the city cannot build more affordable housing nor boost small shops and business, and is racked by the environmental impacts of parking structures.

Yet this is not all. As a whole, traffic in Phnom Penh will become worse if parking becomes more widespread.

On public streets, vehicles parked along the sidewalks and on-street take up valuable public spaces, block sidewalks, and contribute to unsafe traffic by blindsiding commuters.

An oversupply of parking will hurt urban mobility

Not only does an oversupply of parking occupy valuable urban space, it also causes further vehicle dependency, which ironically makes traffic worse. This is because with an abundance of parking, commuters gain a perception that it is always easier to drive.

Phnom Penh's Sen Sok district perfectly encapsulates this phenomenon, where the construction of large big-box commercial centers like, Makro, Aeon 2, Global House, Design Village and such all contain large swaths of parking space. Traffic congestion is a common occurrence in this area despite larger roads criss-crossing the district.

Additionally, parking lots lining the streets dissuade active commuters. The absence of buildings closely flanking streets, providing shade and a sense of enclosure creates desolate and uncomfortable thoroughfares for pedestrians and cyclists to navigate. With active commuting no longer an option, public transit also fails, which leaves only one choice—even more drivers on congested roads.

An oversupply of parking encourages vehicle usage, displaces other commuters and induces traffic congestion, which—taken as a whole—ultimately degrades urban mobility.

Solution lies in responsiveness and adaptability

In light of this realization, instead of mandating minimum parking, city planners globally are moving toward systems which regulate the maximum amount of parking a property can have.

For example, in Portland, Oregon a parking maximum ordinance was enacted. Each category of building is given a formula to determine the parking minimum as well as the parking maximum. In some cases, the minimum and maximum lot requirements are reduced if a development is located close to a public transit system.

Vancouver chose to implement parking maximums as well, but went a step further in recognizing the reduced needs of parking in dense urban areas. Thus the city mandated a total parking cap in the downtown areas to prevent parking induced traffic congestion.

The city of Mainz, Germany gives a significant parking requirement reduction to properties that are in walking proximity to a bus station or tram station, the city even takes into account how well-serviced by trams and buses those stations are. This is to incentivize public transit usage and discourage vehicle usage in areas already well served by public transit.

Meanwhile in Singapore, the Range-Based Parking Provision Standards are based on urban density and proximity to public transportation. For example, Zone 1 (City Center and Marina Bay area) offers developers the freedom to reduce parking to only 50 percent of the minimum standard and capping maximum parking to 20 percent above the minimum standard, while other areas have their maximum parking capped at the previous minimum standard.

And these efforts can make a difference. A study on how the availability of parking impacts driving behavior illustrates a significant association between free and generous parking and the choice of driving a car to work—with the odds of driving quadrupling in this case. It also showed that no parking availability at work reduces the odds of driving most effectively.

Because it is considered a public space, street space should be allocated fairly to all users.

Cambodia's case

In this regard, Cambodia is a step behind. As mentioned above, the country clings to a conventionally fixed parking requirement ratio. More importantly, it does not distinguish between property in dense urban zones and property located in the suburbs.

The way forward for parking policy is a more responsive and adaptable system. In this regard Phnom Penh can be bold and innovative by not just replacing parking minimums with maximums, but by formulating a context-based, multi-tiered parking requirement system.

This tiered system should be designed to take into account a number of characteristics like mobility access (is the location best served by public transit, active commuting or motorcycles?), utilization of space (does the space need frequent freight vehicle access?), centrality of location, urban density, existing street network capacity and related concepts.

It will then be possible to tailor parking requirements according to the local context. The densest parts of Phnom Penh with well-connected street networks should require the least amount of parking, which will make the areas less vehicle-dependent and encourage active commuting.

Dense areas with heavy commercial activities, like Phnom Penh's traditional markets O'Russei and Toul Tompong, should introduce total parking caps to dissuade visitors from relying on private vehicles, while still preserving enough spaces for freight vehicles.

When streets are devoid of private vehicles, it is obvious that only a minuscule amount of space is located for active commuters.

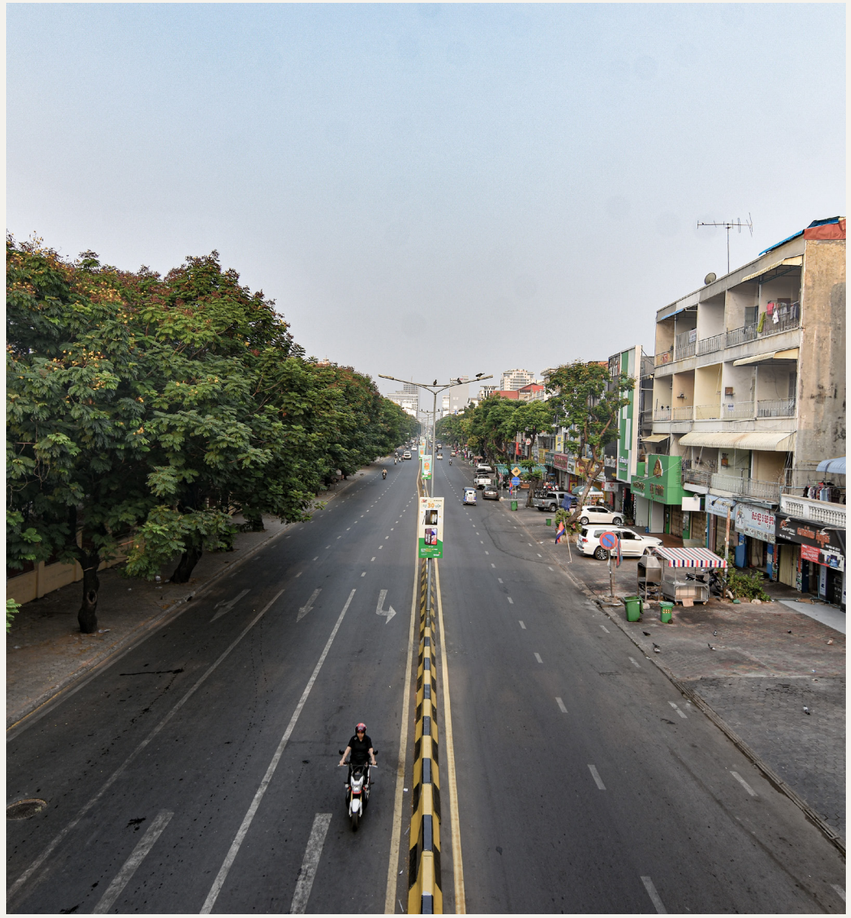
Reducing traffic congestion through curtailing parking space will also boost public transit speed and efficiency, making it a more viable alternative to driving. Thus, locations close to public transit should require even less parking to encourage public transit usage, particularly if this is combined with additional improvements to Phnom Penh's public transit system.

For example, Phsar Thmey is the nexus of several bus lines, spanning all the way to its outskirts. But on-street parking around the market slows traffic and encourages visitors to drive there, thus negatively impacting the effectiveness of the buses.

Given its context, Phsar Thmey will benefit from eliminating on-street parking and using the space gained for bus shelters and pedestrian paths, boosting public transit effectiveness, gaining more space for visitors, and reducing congestion in its vicinity.

Meanwhile, Phnom Penh's residential suburbs should retain minimum parking requirements to ensure enough parking for neighborhoods that are not covered by public transit. This is crucial for less fortunate residents who have no commuting alternative. It is, however, still possible to simultaneously impose maximums to curb overabundance of parking which is common in more affluent neighborhoods.

Likewise, suburban commercial streets should enact parking caps, and fee schemes for on-street parking to reduce reliance on private vehicles and to encourage the city's development in a more sustainable direction.



Furthermore, to avoid creating a desolate streetscape for pedestrians and cyclists, parking lots above a certain size should not be placed between the street and a building. Instead the building should be brought forward as close as possible to the street—while still respecting site setbacks—and the parking lots be placed behind the building.

A human-centric city

Parking policy is often overshadowed by public transit, urban parks or affordable housing discussions, but it is just as crucial in progressing toward a sustainable and livable city. Only through thinking beyond conventional rationale can Cambodian cities avoid the calamitous cost of outdated parking concepts.

More importantly, this is a chance for Phnom Penh and other Cambodian cities to be bold and innovative, replacing their vehicle-centric approaches with a human-centric ones.

Originally published 9th of March, 2022
by VOD English

Car-centric development has sprawled into Phnom Penh's last few water bodies.

3. ACTION NEEDED NOW TO REDUCE PHNOM PENH'S FLOODS

By Chanvoitey Horn

Don't let the humorous memes featuring soggy commuters trudging through water-laden Phnom Penh streets fool you; urban flooding is a serious problem, and one that receives regular discussion but sparks little concrete action.

Typically, if flooding in Cambodia is discussed at all, it's brought up in relation to its rural impacts. Rural flooding affects large swaths of agricultural land and homes and threatens the incomes of these communities. Urban flooding, by comparison, gets relatively little coverage despite the large number of people affected and the damage to property it causes.

Flooding is an omnipresent issue for Phnom Penh's residents impacting their livelihood and health.

One aspect that makes urban flooding so problematic is how unpredictable it can be, with sudden heavy downpours swamping many communities in Phnom Penh, and rendering roads impassable. Heavy deluges, for instance, have caused flooding in Por Senchey district's Kakap commune among many other urban neighborhoods.

There are direct and immediate economic impacts of urban flooding. Inundated roads paralyze transportation, preventing people from reaching their workplaces, disrupting local and national supply chains. These impacts are particularly harmful for small and medium-sized businesses that are already susceptible to other kinds of shocks.

Urban flooding is also a public health issue. Waterborne diseases—particularly diarrheal diseases such as viral and bacterial gastroenteritis, dysentery and cholera—appear to increase during flooding.

Looking beyond the immediate impact, Phnom Penh's floods can lead to extensive property damage, which in turn erodes savings and increases indebtedness, thus deepening cycles of poverty vulnerable urban families are already exposed to.
Flooding events are expected to get worse. The Mekong River Commission warned in May that between June and July of this year Cambodia would experience more rain and flash floods, an issue that is certainly linked to climate change.

However, urban flooding is not entirely a natural disaster. While Phnom Penh's floods are exacerbated by the increasing frequency and intensity of precipitation patterns, human decisions—rapid, unchecked land development, the reliance on aging, outdated and inadequate urban infrastructure, and failure to invest in infrastructure improvement—only serve to worsen outcomes.

Pushing Environmental and Infrastructure Boundaries

The past two decades have brought rapid economic growth and structural development to Cambodia, and it's a trend that isn't expected to slow down. Phnom Penh is continuing to expand. In February, the government announced that after the construction of bridges is completed, the Arey Ksat and Svay Chrom areas will become a satellite city. Phnom Penh's population is expected to nearly double to 2.86 million inhabitants by 2035.

Rapid urbanization requires investment in infrastructure, inadequate investment in public infrastructure makes urban flooding especially acute.

Flashy high-rises and glittering air-conditioned malls are popping up at an ever-increasing rate. The Ministry of Land Management, Urban Planning and Construction issued permits for 728 new projects in the first two months of this year alone. That's an increase of 28.1% from 568 in the same period last year. These projects cover a total of 4.2 million square meters, which is an increase of 34% year-on-year compared with the first two months of 2019.

The city's aging and inadequate drainage systems simply cannot keep up. Existing infrastructure is being stretched past its limit by an increasing population and unchecked development. Making matters worse, Phnom Penh lacks a comprehensive drainage and flood-protection system.

Only four central districts—Charmkar Mon, Doun Penh, Prampir Makkara and Toul Kork, which have benefited from donor assistance—have sufficient drainage and wastewater collection. The rest of the city relies on an outdated sewage system, and broken water supply lines. Even a small amount of rain overwhelms this infrastructure.

Lack of investment on the part of the government is part of the problem. Yong Kim Eng, the director of non-governmental organization the People's Center for Development and Peace, told The Phnom Penh Post that historically, the government has prioritized road infrastructure, rather than focusing on drainage systems.

For example, the Cambodian government devoted 13,031 million riels, just over US$3 million, to water drainage-related initiatives in Phnom Penh in 2014, which equals just 0.3% of the 2014 national budget of $3.4 billion.

Another factor of the flooding is waste management, or lack thereof. Phnom Penh Governor Khuong Sreng identified the source of the issue as the "indiscriminate disposal of rubbish, which flows into the drainage system."

Phnom Penh produces 3,000 metric tons of solid waste per day, and much of that waste winds up clogging critical water-drainage systems. The government removes as much as 10,000 tons of waste from the city's sewage canal every year, a fraction of the waste that likely remains in these waterways.

A third factor keeping Phnom Penh flood-prone are the land-reclamation projects that have filled in the capital's lakes. A study on the spatial growth of Phnom Penh from 1973 to 2015 revealed that after 2006 the number of natural lakes and wetlands that had been converted to urban land areas increased by 34%.

Water Resources and Meteorology Minister Lim Kean Hor has expressed concerns about the country's diminishing ability to "overcome floods caused by opportunists who fill in lakes, rivers, canals and ponds." At the same time, the ministry asked "the capital and provincial authorities to prevent the encroachment of construction on riverbanks, ditches, creeks, canals, water reservoirs and lakes to avoid the effects of water-drainage and flood disasters."

Speedy and lucrative development has clearly taken precedence over good management of the city's waterways. As of 2019, 16 lakes have been filled in, 10 lakes have been partially filled and no lakes remain untouched in Phnom Penh, leaving water that would otherwise empty into these lakes to remain trapped in the city streets.

Adding to this is the matter of concrete being laid over land previously used to store the water. The result is that natural drainage and wastewater treatment systems have been obliterated.

Water no longer flows the way it should, which increases surface runoffs, and aggravates flood risks.

This is not to say that the government of Cambodia cannot or should not prioritize development projects. Rather, the country needs consistency in implementing long-term plans for development while simultaneously implementing flood-management policies. Efforts to prevent urban flooding do not automatically have to mean jeopardizing economic growth.

Instead of degrading existing water bodies, they should be rehabilitated and incorporated into flood resilient infrastructure.

Balancing environmental preservation and urbanization

Take Singapore for example. It's the most competitive economy in the world, but it proves that urban development and economic growth can go hand in hand with sensible, flood-sensitive urban planning. As it has developed, Singapore has focused on converting canals and reservoirs into streams and lakes, as well as constructing artificial wetlands to increase the city's rainwater absorption capacity. Between 2010 and 2018, Singapore completed as many as 75 projects to mimic such natural flood defenses.

China has also made urban flood management a priority. The country launched an engineering solution called "sponge cities" in 2015 in 16 cities to hold, clean and drain rainwater in natural ways across targeted areas. The approach is meant to reduce flooding but also to enhance water-supply security. The goal of the project was to be able to reuse at least 70% of the rainwater that falls on these target cities.

It should be acknowledged that the Cambodian government has taken some steps to deal with urban flooding. For example, regarding the problem of waste management, the government has ended its contract with garbage contractor Cintri and adopted a new system. The government is reviewing the companies that have submitted bids for the rubbish-collection contract. Phnom Penh will be divided into three zones for at least three companies to collect waste.

There have also been some efforts to enhance flood protection and drainage systems in Phnom Penh, such as the $27 million construction of a wastewater-treatment station in Choeung Ek, which was funded by the Japanese government. The project to build the station was set to begin by the end of 2020.

The Ministry of Economy and Finance is drafting an "Urban Solid Waste Management 2019-2028" policy, and recently Phnom Penh City Hall, in cooperation with the Embassy of Japan in Cambodia and the Japan International Cooperation Agency (JICA), unveiled a mechanical screen to clear drainage pipes as part of the Project for Flood Protection and Drainage Improvement.

As well, in an attempt to build a resilient city, the government has laid out several thematic master plans, including the Urban Transport Master Plan 2035, Drainage and Sewerage Master Plan 2035, and Green City Strategic Plan 2016-2025.

But according to the World Bank, these plans fall short. "The city's ambitious Master Plan 2035 lays out a strategic vision for growth, but lacks a corresponding detailed land use plan and accompanying regulatory framework to support implementation," one World Bank report states.

Managing flood risk and building a more resilient city will take more than just good planning. Tackling the problem will require commitment from all stakeholders, including land developers, politicians and communities.

The calculus is clear. The government can invest now to mitigate future floods and minimize further damage, or pay later to repair the properties and restore the environment. The longer the government waits, the harder it will be to prevent future urban flooding.

Originally published 17th of June, 2020 by Asia Times

Without integrating various aspects of urban planning we risk stumbling our way into an unlivable built environment.

4. CITY PLANNING REQUIRES AN INTEGRATED APPROACH

By Ses Aronsakda

Along Veng Sreng Boulevard, factories and warehouses sit meters away from houses and schools. Freight is carried on the same road as commuters, and workshops handling hazardous materials sit next to cramped markets, where stalls sell their wares right up to driving lanes.

Trucks, cars and motorcycles weave through traffic as droves of workers make their way to a nearby garment factory.

This busy thoroughfare in Phnom Penh's southwestern quarter is just one example of a confused and often dangerous urban layout. This type of unregulated land use doesn't just lack optimization, it also gravely impacts urban mobility and results in danger for users.

In spaces without restrictive zoning residents are free to set up small shops, seating areas, and make the space comfortable.

Locals and observers have long lamented the risks this type of land use creates and often attribute the shortcomings to Phnom Penh's lack of a definitive land-use master plan. But, while Phnom Penh would certainly benefit from a more comprehensive land-use plan than the one it has, adopting a strict land-use plan would have far-reaching consequences. Land-use zoning, especially when understood as an end goal rather than as a tool, would lead to more issues than it would resolve.

Zoning alone does not equate to planning

The perils of exclusive land use are not entirely obvious. It might be tempting to designate whole blocks or neighborhoods for a single type of land use (for example as residential only).

But this type of exclusive zoning has the effect of segregating homes from daily necessities like schools, workplaces, grocery stores, pharmacists and public facilities, placing them much farther away. This is physically reflected in large city/suburban blocks and low population density, which makes it difficult for active commuters and public transit to operate.

In Phnom Penh's specific context, where the street network is circuitous, lacks permeability and is littered with dead ends and cul-de-sacs, this issue would be further compounded. Hence, making it impossible to commute with anything but private vehicles which only leads to gridlock.

Another overlooked disadvantage of strict zoning is that single-use zones become quiet and empty over certain periods. For example, a zone entirely designated for offices will become poorly utilized and even feel unsafe when office hours are over.

While exclusive zoning presents many unforeseen consequences, completely ignoring planning is also undesirable, as shown by the chaotic Veng Sreng Boulevard. A compromise between the two is necessary. Fortunately, many excellent examples of a balanced approach exist for Cambodian planners to examine.

A balanced planning policy

Paris is known for its well-preserved architecture, generous public spaces and well-defined street networks. Yet it might be a surprise for some to learn that the French capital, especially its historic center, is zoned as a mixed-use area. Where residences, shops, schools, museums, restaurants and hotels are often next to each other.

A vibrant city space is dependent on a fine balance between order and flexibility, planning and spontaneity.

The city utilizes a planning strategy that closely regulates the building's physical form rather than the function of each building.

By not utilizing exclusive land-use zones, Paris avoids the issues pointed out earlier. More importantly, residents benefit from having a diverse mixture of building types and functions in close proximity. These key points are crucial in creating vibrant neighborhoods where daily necessities are within walking distance of homes and workplaces.

Parisian authorities balance this freedom by limiting certain building types from its mixed-use areas that do not complement the space or may cause hazards to others. For example, industrial buildings, vehicle garages, freight facilities and gas stations are not permitted in these mixed-use areas. This is in contrast to Phnom Penh which often sees at least two gas stations occupying corners of an intersection.

To maintain the uniform look of its built environment, Paris also heavily regulates a building's form (height, frontage, facade, build to line, etc.) which helps preserve coherence between buildings and preserves the city's architectural heritage. Moreover, by actively regulating a building's appearance authorities can guarantee the quality of the public realm—ensuring, for instance, that streets and walkways are wide enough, and that squares are well-shaded, have ample space, and are accessible.

In summary, Parisian planners shape how buildings look but give a degree of freedom to what buildings will be used for, while actively discouraging functions that are inappropriate for a given area. Meanwhile, strict building regulations have ensured that public realms are preserved and maintained high quality.

Ironically, by not strictly managing land use in a black-and-white way Parisians enjoy better access to daily necessities, often just a few steps from their homes.

Planning with flexibility

The advantages of a diverse and compact cityscape are essential for increasing livability and mobility in Phnom Penh. A revised master plan must strive to create an environment where urbanites have access to daily necessities within walking distance.

Given the capital's existing condition, a balanced approach is best. A solution must leverage the current mixed-use scenarios while minimizing restriction to only unsuitable and hazardous land uses.

In this regard, authorities should designate the city's core districts—Khan Toul Kork, Prampir Makara, Chamkar Mon, Boeung Keng Kang, and Doun Penh—as mixed-use zones.

Within this zone, a single land-use type should not exceed 10% of the neighborhood's total area. This will keep the existing diversity of businesses and services intact, encouraging new mixed-use developments.

Additionally, planners should provide clarification to exclude certain types of buildings that are not appropriate for the area, for example, vehicle

garages, industrial facilities, freight facilities or hazardous material storage, instead, only allowing their presence in the outskirts, where they can be placed further from houses and shops.

Building regulations should aim for a density of at least 15,000 people per square kilometer, which is close to Boeng Keng Kang district's current population density. Although this may sound uncomfortably high, according to my own research, this level of population density only requires a combination of 3700 shophouses and 360 single-family homes for every square kilometer. With residences only occupying a third of the total area, the rest should be left for public spaces, infrastructure, and commercial activities.

Additionally, the implementation of existing building regulations should be strengthened, especially regulations that ensure that build-to lines and open spaces are preserved as mandated. Building laws could be improved with incentives for developers to include more open spaces and for new designs to facilitate active commuting, thus ensuring the quality of street-scape and helping to improve the public realm.

Delivering well built, livable urban environments requires transportation planning and land-use planning to reflect each other.

Adaptable land-use

Phnom Penh can further innovate on land-use planning by categorizing land-use based on mobility profile, meaning that a building's placement would take into account how users commute to and from it, and the intensity of traffic generated by users of that space. A mobility profile, for example, would take into account the fact that people are more likely to drive cars or trucks to a furniture store compared to a dental clinic, while a school will generate more traffic than a clothing store.

A mobility profile, in essence, allows planners to tailor a city's built environment to work with the local street network.

Sites that generate heavy traffic should not be located at intersections or street corners where they would dramatically affect traffic flow. In contrast, sites, where visitors can mostly arrive by public transit, can be encouraged to be located near major bus lines. Similarly, facilities that require frequent freight truck access would only be permitted adjacent to major roadways, and avoid placement near living, leisure and business areas.

This type of planning allows authorities to replace the outdated method of deciding the placement of buildings based on land use. Instead making that decision based on their impact on urban mobility which is far more relevant and crucial.

With these benefits in mind, it is vital that local planners introduce a mixed land-use approach, strict building regulations, and a mobility profile, into Phnom Penh's urban planning policy.

Originally published 2nd November, 2022 by Cambodianess

Urban canals are unpleasant environments, yet they serve as critical waterways and often represent the few public spaces left in a city.

5. HEALTHIER CANALS MEAN HEALTHIER NEIGHBORHOODS

By Keth Piseth

When the Boeung Trabek sewage canal was first designed, it was known as the “canal of a thousand fragrances”. The French designed the 20th-century infrastructure as a vast water system to allow the marshy floodplain on which Phnom Penh sits to drain into the surrounding lakes.

The current version of the sewage canal is much less illustrious and known by the more prosaic nickname “loo teuk sa-ouy,” “smelly water canal”, or even “shit canal.”

As vibrant city life has sprung around the canal, the stench still remains and flooding caused by overflow is a constant worry for residents.

The Boeung Trabek waterway flows slowly south, sometimes covered in concrete and open to the air as a dark brown sludge. In the rainy season, the toxic cargo of the canal is known to overflow the embankments and flood the surrounding streets. Residents have raised the alarm over the health issues this waterway, and others, pose.

Nevertheless, innovative, low-cost, decentralized approaches to wastewater treatment have the potential to make a big difference for this sewage canal and the surrounding neighborhoods.

Millions of dollars in foreign aid have flowed in at various points to maintain or update the canal and other parts of the city's sewage system. At the same time, local spending on wastewater management remains low. As little as "10% of the income received by the Phnom Penh Water Supply Authority (PPWSA) from water bills is allocated to the sewerage system and wastewater treatment." Furthermore, the city lacks a sewerage master plan and comprehensive wastewater strategy.

Initiatives that can potentially rehabilitate this canal are not just a matter of mitigating the health and flooding problems these waterways pose. Projects focusing on Phnom Penh's canals could also serve as opportunities to turn polluted parts of the city into vibrant public spaces that local communities badly need.

Boeung Trabek needs a decentralised water treatment plan

Alongside the Boeung Trabek sewage canal, inhabitants and properties have drastically increased, and the surrounding neighborhoods have become increasingly densely populated. The water infrastructure in the Boeung Trabek neighborhood cannot keep up with this level of population density. To improve the current condition of the canal and revitalize the surrounding area, the city of Phnom Penh must install filtration tanks. This is the best way to ensure that local households' black and gray water is treated before flowing into the canal.

Filtration tanks will reduce the level of water pollution that travels straight from households to the canal, which will, in turn, create direct benefits for the general health of the neighborhood and leverage increased economic opportunities for those who own the shophouse alongside the waterway.

While many different types of water filtration infrastructure exist, one strategy fits the Boeung Trabek sewage canal's needs exceptionally well. This system, called DEWATS, is a low-cost, bio-based, decentralized wastewater treatment

approach that is particularly well-suited to use in densely populated urban communities in developing countries. The passive design of this system uses physical and biological treatment mechanisms such as sedimentation, floatation, and aerobic and anaerobic treatment to treat both household and industrial wastewater sources. Crucially, DEWATS is designed to be low-maintenance, to use local materials, and to meet environmental laws and regulations.

In a DEWATS system, water flows through a series of tanks that work in combination. For example, when water flows through a DEWATS Settler tank, scum floats to the surface, and waste is sedimented at the bottom. With the proper infrastructure in place, the DEWATS system could generate usable renewable energy in biogas, which residents can use for cooking and lighting.

It should be noted that as many as 62 DEWATS systems are already in use in other contexts in Cambodia. DEWATS have been installed in Cambodia to provide water filtration primarily to school sanitary facilities and hospitals.

Aside from water filtration, if Boeung Trabek aims to transform its waterways, authorities must invest more in upgrading critical pump stations. These pump stations manage the rainwater circulation in that area to keep canal water from flooding the roadside during the rainy season. While some restoration efforts are planned, greater attention must be paid to these stations to maintain the water flow.

Likewise, any project to rehabilitate the sewage canals would only be helpful with a concerted effort to maintain and protect the remaining lakes. These lakes, or what is left of them, are necessary for resilient and sustainable Phnom Penh waterways.

Revitalizing the canal could create a sustainable public space

If we transform the canal into a green, pleasant public space, it could become a place for the residents to congregate and for children to play. The positive impact this would have on the neighborhood's livability and its residents' well-being cannot be overstated.

Siem Reap has already begun to think creatively about the ways canals of this sort could be transformed into green public spaces. The project in Siem Reap to transform a former sewer into a park is relatively small. The sewer canal is 635 meters long and between five and eight meters wide. However, it shows how even a tiny space can make a massive difference for surrounding communities and create potential economic dividends.

“This sewer canal in Siem Reap used to stink and negatively affect the environment, but now it will be converted into a new tourism spot to attract not only local visitors but also international tourists who come to the area to visit Angkor Park,” Ly Raksmey, undersecretary of state at the Ministry of Land Management, Urban Planning and Construction told Khmer Times.

What if Boeung Trabek could adopt a similar approach to rejuvenate the space? Markets, schools, and some local art spaces already surround the site. Phnom Penh could transform this canal into a vibrant open area with a rehabilitation project.

However, to revitalize local areas, it is crucial to have local communities' involvement. When households are involved in the reinvention of this place, it contributes to their sense of belonging and ownership of the space around the canal, which increases the likelihood that they will feel responsible for their efforts to care for the space.

Transforming this sewage canal would transform the lives of locals around the area. This is about more than just a waterway. It is about the health, safety, and well-being of whole neighborhoods. Implementing decentralized water treatment plants, refurbishing the canal space, upgrading the pump station, and protecting what remains of the lake will allow people to reclaim the space for all benefits.

Originally published 23rd October, 2023
by Cambodianess

Although it can sometime seem disorganized, lively streets or alleyways are more welcoming urban spaces compared to sterile and desolate ones.

6. STREETS ARE CATALYSTS FOR LIVELY AND SAFE URBAN SPACES

By Ses Aronsakda & Prak Norak

We have probably all experienced this sensation: When you're walking down a city street you can often innately sense whether the environment around you is inviting, comfortable, and safe—or not. And often it can be difficult to articulate why certain parts of a city feel this way, and others do not.

Many of these unconscious feelings are actually the result of the built environment around us. Intentional, or unintentional, decisions that designers and architects make can determine whether a space inspires feelings of warmth and safety, or whether the built environment triggers internal alarm bells for passersby.

Human-scaled spaces, active facades, and engaging signage combine to create lively and comfortable thoroughfares.

The fact that the architecture of the built environment has the potential to affect the mood or perceived comfort of the user, is not a new concept. Designers often use this information to their advantage when creating or building private spaces.

Yet when it comes to public spaces in Phnom Penh the same level of attention and intentionality is often lacking, particularly when it comes to buildings that flank our city streets. As Phnom Penh continues to change and grow, the people responsible for the look—and therefore the feel—of the city must consider the impacts their work can have.

To boost feelings of safety and comfort in our public spaces, city planning authorities should formalize a few key design strategies that can have a major impact on the way public spaces are perceived. Codifying these strategies—namely street-to-building ratio, active facades and building gap ratio—into existing building regulations can ensure that new developments and existing urban areas encourage active, positive engagement between people and the streets and buildings they interact with.

Influencing behavior through architecture

User perception of safety along public streets is strongly linked to how lively a street is. Liveliness and on-street activity creates safer streets overall. Think about how differently you might feel walking along a street that is bustling, with pedestrians, with people dining at sidewalk tables, with kids biking along the road. Now think about how you might feel if you turned a corner and discovered your route takes you down a dark, empty street, bordered by high walls and closed gates. You might think twice about continuing on.

On-street activities are critical in that they attract users who provide eyes monitoring the street, thus creating a network of natural surveillance. This network, in turn, creates a safe street boosting the well-being of the neighborhood. People play an important role in making a street safe, but the design choices we make about the built environment greatly influence this dynamic as well.

One of the ways we can influence this dynamic is by creating active facades. This is a design term that refers to openings—windows and doorways—on the street-facing sides of buildings at the ground level that generate activity and interest. The degree to which a given building is open to the street determines whether and how people on the street can engage with that building. This could mean window shopping, stopping to read interior or exterior signage like menus, conversing with locals, and more. Active facade design features also crucially determine how easily the people within a building can observe or even engage with what's happening at the street level.

This type of engagement, between streets and buildings and vice versa can make a huge difference in terms of perception of safety for residents and for visitors.

Sense of scale is another design decision that can affect how at ease a person feels while walking along a street. Sense of scale in a city is often measured using the street-to-building ratio, which refers to the width of the street in comparison to the height of the buildings that flank it. An ideal street-to-building ratio creates human-scaled spaces, provides shading, and creates a comfortable sense of enclosure and protection. When the street-to-building ratio is proportional, people feel more comfortable and secure.

But the opposite can also be true. A street that is too wide with short buildings lacks shading, induces a sense of desolateness, and creates too much distance between points of interest that makes the street more difficult to traverse.

The building gap ratio is the third design decision that can impact how a public space feels. This measurement refers to the size of gaps between buildings lining the street. The gaps guarantee adequate air circulation and natural lighting for the street. The more generous the gap percentage, the more natural air and light can get through.

Safety and comfort along public streets are mainly influenced by these three characteristics. Thus, having an active facade, comfortable street to building ratio, and facade breakage are crucial for a neighborhood to feel safe and therefore improve livability.

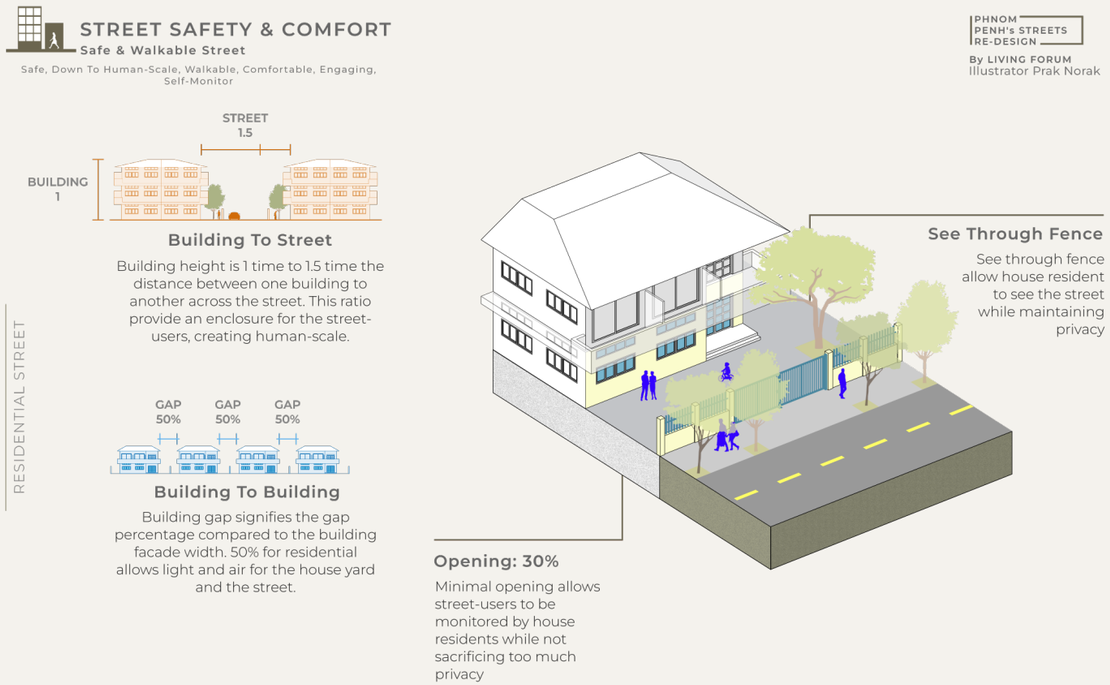
Engaging Phnom Penh streets

Phnom Penh does have a few prominent examples of streets whose design features lend themselves to an innate sense of public safety and comfort. One example of a particularly well-designed active facades in Phnom Penh can be found on street 308, also known as Bassac Lane. The liveliness and activity of this street is due in large part to the design characteristics of the local shops, bars and restaurants that line the street. These facades have been built with large windows, openings, awnings, and porches that allow, and encourage, pedestrians and building occupants to interact. The inclusion of signage, and decoration at eye level also encourages street users to engage with these spaces, helping to maintain an active connection between the street and its buildings.

Bassac Lane is also a great example of a successful street-to-building ratio. The building height along these blocks is about 2 times the width of the street. This is a proportional arrangement for a pedestrian-oriented street where it is not too wide and buildings are not too short or too tall. With this kind of ratio, buildings are able to provide shading and a comfortable sense of enclosure to users without overpowering the human-scale feeling of the street below.

Having an ideal building height to street width ratio also ensure that the street is well shaded throughout the day.

Cambodia should adopt policy to encourage human-centric urbanism across its towns and cities.



Some of these aspects are already present in many other streets in Phnom Penh. Yet the city would do well to re-examine these design concepts and to formalize them into existing building regulations, to ensure that our urban spaces can harness the safety advantages offered.

Policies to ensure safe and comfortable streets

Cambodia's existing building regulation, Sub-decree No.42, should be further elaborated upon with provisions for the design characteristics explained above.

First, an ideal active facade ratio - which denotes how much of a building's facade is made up of windows and doors—should be regulated for all buildings. Preferably this ratio should reflect the type of street the building is located on.

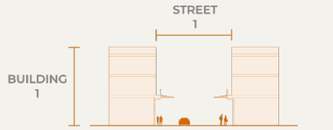
For example, streets in residential areas should strive to reach an active facade ratio of 30%, meaning that about a third of the facade should consist of openings. For existing residential property, wall openings can consist of permeable material, enough to let air and light through but still respecting privacy. Air bricks and louver design—a staple of Khmer Modernist Architecture—can make a comeback serving this requirement.

Permeable fences also allow human voices to be heard by passersby. People may feel more at ease when hearing human voices as an ambient sound whether from the street itself or from within the fences.

Larger collector streets, which tend to have numerous shops and businesses flanking them, should adjust the active facade to be made up of 50% openings, consisting of entranceways and large store windows. While on the busiest streets, like the boulevards which cut through city centers and dense neighborhoods, the ratio should be between 70% to 80% to accommodate the high concentration of shops, offices, and facilities along them.

Authorities should also consider setting a comfortable building-to-street ratio and building gap ratio. On residential streets, the building height should be 1 to 1.5 times the width of the street. Simultaneously, the gaps between houses should be maintained at 50%, meaning that for a house with a street facing side of 6 meters long, the gaps of each side should be 3 meters long.

COLLECTOR STREET

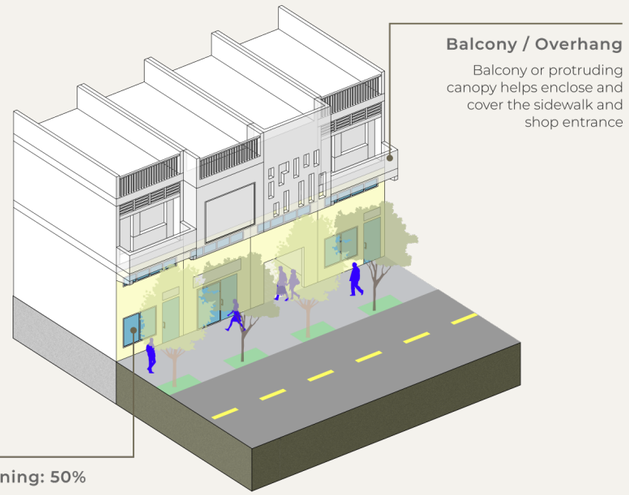


Building To Street

Building height is equal to the distance between one building wall to another across the street. This 1 to 1 ratio provide enclosure to street-user

Building To Building

Building gap counted the break between a row of shophouse with another. The gap allows air and light to penetrate the building line while



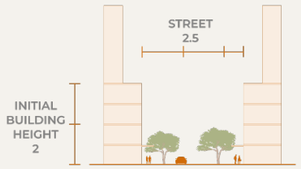
Balcony / Overhang

Balcony or protruding canopy helps enclose and cover the sidewalk and shop entrance

Opening: 50%

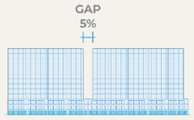
Shophouses with 50% opening actively attract passerbys and also helps with monitoring the street activities

BOULEVARD



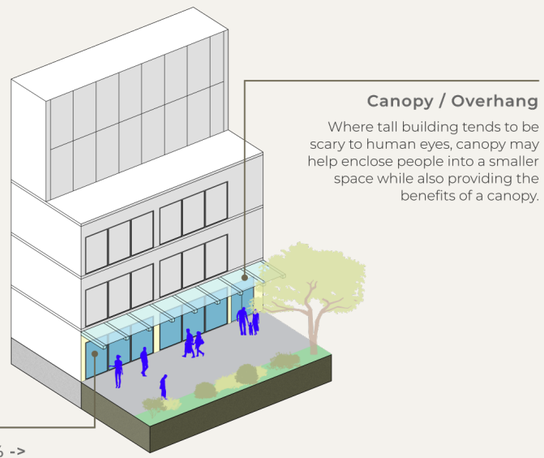
Building To Street

Building height is the intial height (from street to the top of the first projected building) of most medium or high rise building. Often along boulevard, the street are too wide so



Building To Building

Medium and High rise can afford minimal gap for air and light but may not need to sacrifice too much floor area.



Canopy / Overhang

Where tall building tends to be scary to human eyes, canopy may help enclose people into a smaller space while also providing the benefits of a canopy.

Opening: 70% ->

On large boulevard, buildings needs to be most active in connecting with street-users. These types of building tend to be less private so opening can be at a large percentage

Collector streets should limit their building heights to 1 times the width of the street. And the building gap percentage should be 35%.

As for boulevards, where the density and scale of building would be much higher, building heights should be limited to 2 to 2.5 times the width of the boulevard. And retaining a building gap percentage of 5%.

On boulevards in the outskirts of Phnom Penh, where streets are too wide and buildings tend to be low and sparse, trees can be a very useful design element to take advantage of. Adding trees can add scale to an otherwise desolate space, as tree canopies help break up the space and create smaller, human-scaled areas within a larger plane. In addition, buildings can alleviate this issue by incorporating more decoration and detailing to help build a healthier sense of scale.

Of course exceptions should be made accordingly. Especially in areas like the central business district. In those cases taller buildings can be allowed, but compensated by setting the breakage between taller buildings to be higher.

In terms of the role of the street, American urbanist Jeff Speck famously described a user-friendly street as one where four things are happening simultaneously. A street is user-friendly when there is a reason to walk on the street (shops or destinations to walk to), when the street is safe and feels safe (safe from traffic and crime), when the street is interesting, and when the street is comfortable. If Phnom Penh were to formalize design decisions that lend themselves to these outcomes, the city can ensure our streets are safe, interesting, and comfortable for the city's residents and visitors.

Originally published 18th July, 2023 by Kiripost