TRANSIT-ORIENTED DEVELOPMENT 2

A FRAMEWORK FOR ANALYSING MOBILITY HUBS FROM THE USER EXPERIENCE

Theory, Case Studies, and Strategic Approaches



NIRAS URBAN EUROPE

UNIVERSITET STOCKHOLMS

TONGJI UNIVERSITY 1907

VETENSKAP OCH KONST

NANJING UNIVERSITY 1902

“Think big
but always remember to make the places
where people are to be, small.”
(Jan Gehl)

Contents

About the TOD2 Research Project 4

Introduction 6

PART 1: Theoretical Framework & Methodology 17
Strategic Analysis: A Two-Zone Framework 21
Strategic Analysis: The Hub as Place and Transport Machine 26
Strategic Analysis: Perception of Safety 30
How to Use the Safety Analysis Tool incl. Worksheet Questions 32

PART 2: Case Studies 39
Copenhagen Central Station (Copenhagen, Denmark) 42
Lyngby Station (Kongens Lyngby, Denmark) 46
Nørreport Station (Copenhagen, Denmark) 50
West Jiading Station (Shanghai, China) 54
Songjiang Xincheng Station (Shanghai, China) 58
Dapuqiao Station (Shanghai, China) 62
Zhangfuyuan Station (Nanjing, China) 66
Wudingmen Station (Nanjing, China) 70
Fochengxilu Station (Nanjing, China) 74

PART 3: Strategic Approaches to Improve Existing Mobility Hubs 81
Urban Acupuncture 83
Short-term Interventions 84
Long-term Impact 99

Bibliography 114

About the TOD2 Research Project



Project Background

The *Transit-Oriented Development 2 (TOD2)* project aims to advance existing TOD design guidelines to address three key focus areas:

- Improvement of the human experience of public spaces for increased perception of safety, comfort, and usage
- Integration of mobility hubs with the urban environment for better connections with the mobility- and transit-oriented development
- Carbon neutrality and increasing modal shift from private cars to active and public transport

The strategic analysis that follows is part of a three-year research project including partners from Denmark (NIRAS), Sweden (KTH Royal Institute of Technology), and China (Nanjing University and Tongji University). This international collaboration has provided a unique opportunity to share knowledge on how TODs function in other contexts and communities.

With Denmark's history of approaching design from the human perspective, NIRAS' role as the Danish partner was to develop a new method for evaluating the mobility hub as a complete system from the user point-of-view - particularly regarding the perception of safety and comfort.

The resulting guide provides a practitioner-friendly approach to analysing mobility hubs and highlighting barriers to a safe and well-functioning hub. It enables decision-makers to identify where efforts should be focused - both financially and in terms of time - for the greatest possible positive impact.

The Challenge

The founding father of Transit-Oriented Development, Peter Calthorpe, coined the phrase in 1993 to describe a type of urban development that maximises the amount of residential, business and leisure space within walking distance of public transport – creating land-use patterns that support transit (Calthorpe 1993). In theory this would inherently lead to liveable, walkable spaces with minimal car use. In practice, urban development around stations often results in Transit-adjacent Development and lacks the elements needed to mitigate the attraction of driving (Currie 2025).

While Calthorpe's work was focused on North America, many European neighbourhoods are similarly designed for individual mobility, and prioritise private cars and excessive automobile travel. Transit, biking and walking facilities are ubiquitous in Denmark, however the transportation network is still auto-oriented and driving often remains the easiest and most obvious choice in many neighbourhoods, at the expense of better public space and lower carbon emissions.

The Strategic Analysis of Mobility Hubs - who is it for?

This framework is for anyone interested in enhancing the experience of mobility and public space at and near the transit station. While the primary determining factor of getting more people to choose transit resides with transit operators on frequency of service, reliability and ability to get people where they need to go quickly (particularly in comparison to driving), that is merely a starting point. To create a truly successful transport system where the journey itself also contributes positively to quality of life and well-being, it is essential to strike a good balance between the hub as a transport machine and the hub as a public space for staying.

More specifically, this analysis is for those working at municipalities, transport authorities, or private developers interested in:

- Increasing public satisfaction and perception of stations
- Providing opportunities for car-lite, car-free, traffic-lite, traffic-free urban development
- Setting the tone for their community as one that bikes, walks, and takes transit
- Encouraging behaviour change from travel by car to travel by transit and active modes
- Mobility hubs
- Mobility justice and equitable access to mobility
- Personal security and the perception of safety at stations

This study examines existing mobility hubs to understand what can be learned from them when designing new hubs or improving those that already exist.

Using This Guide

This strategic analysis simplifies the comprehensive research methods and data-based analyses from TOD2 into a practical and user-friendly guide for measuring and evaluating existing mobility hubs.

First you will be introduced to the concepts behind TOD, the theoretical framework and methodology used in developing the tools. Then you will be presented with the tools and case studies of 9 mobility hubs across Denmark's Capital Region, Shanghai and Nanjing, China. Lastly, you will be presented with examples of good practices from case studies throughout the research project on tactical improvements to security and comfort at the hub.

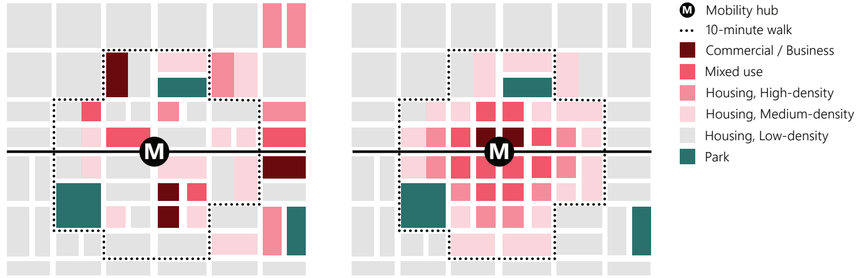
Introduction

What is TOD?

Year 2023 marked the 30th anniversary of the book "The Next American Metropolis" (Calthorpe 1993) that promoted Transit-Oriented Development (TOD) as urban design policy to prioritise public transportation. The term TOD addressed urban sprawl and sustainable development in American cities. TOD refers to the near surroundings of a transit hub, featuring high-density and mixed-used buildings, with walkable access to shopping and service functions, and public space designed to encourage walking, cycling and public transportation.

TOD takes different forms in car-oriented North American contexts than in European and Asian cities that have historically prioritised walking, cycling, and transit (Currie 2025). In the US, TOD evolved largely as a corrective approach within a predominantly automobile-based planning culture marked by dispersed growth and parking-heavy urban form.

TOD provided a means of achieving a walkable city centre, but TODs are often "patchy... creating pools of development around a major transit node." (Currie 2025). In Europe, TOD tends to strengthen established development patterns and promote infill within already dense urban environments (Currie 2025).



Organisation of land use in relation to a mobility hub. Based on Barnett (2013).

How Can TOD2 Support the Growing Complexity of Urban Mobility Planning?

The evolving discourse in mobility increasingly emphasizes broader perspectives: concepts like the 15-minute city reflect a new and more holistic approach to urban design, where accessibility, liveability, and environmental sustainability are prioritised alongside transport. In this context, updating the TOD framework is essential to better align with contemporary goals that extend beyond transportation to encompass climate, social, and quality-of-life considerations.

The increasing demand for carbon neutrality, walkable communities, and better mobility is driving the need for transit- and mobility-oriented development. Mobility-related challenges that have become more complex over the last 30 years – and that TOD can help address – include the following:

- Car-oriented urban form
- Messy trips
- Congestion and population growth
- An increase in different types of modes



Car-oriented urban forms continue as planning still responds to future traffic demand models and develops infrastructure accordingly. TOD should evaluate street design and hierarchies within the road network to better prioritise pedestrians, active transportation, shared mobility, and of course public transit.



Congestion and population growth remain a challenge. Even with the growing use of electric and hybrid vehicles, increasing urban populations still result in congestion on the roadway and auto-dominated environments. TOD should ensure active links to transit, reducing trips by car, and mitigating sprawl through densification near transit.



Messy trips are trip chains that could include, for instance, daycare drop-offs, vet visits, and other caregiving responsibilities. Travel planning often overemphasizes peak-hour commuting, rather than messy trips. TOD should instead adopt a "mobilities of care" framework that recognises the high volume of non-commuter and off-peak care-oriented trips, alongside increasingly flexible post-COVID work schedules. This requires prioritising the security, reliability, and attractiveness of transit service beyond traditional peak hours.



Modal choice is expanding and includes modes like bike share, car share, light electric vehicles, scooters and cargo bikes. With more types of transportation modes available to people, stations as mobility hubs are increasing in complexity. Additionally, service providers often see their role as a singular contributor to a hub, whereas the rider sees the hub as a system of integrated options. TOD should focus on the increasing significance of the hub as a seamless transfer hub and in making the hub as intuitive as possible to navigate.



"In the 70ies people were even more in love with their cars than they are today. The cities that are most liveable today, like Copenhagen and Amsterdam, are cities that challenged that and changed their policies and land use to limit the spread of car dependency. This shows that trends shouldn't be followed. Instead we need to shape our cities according to how we want them to be used."
(Luca Bertolini)

INFO BOX: The Danish Approach to Urban Space Planning

The Danish approach to urban space planning – and by extension, to mobility hubs – is rooted in a welfare-oriented mindset. Danish citizens pay relatively high taxes, contributing to a shared expectation that society should be designed for the common good. This includes the belief that everyone has the right to access high-quality public spaces, such as plazas, streetscapes, and transport areas, which are free of charge and free from commercial motivation.

Public amenities like benches and rest areas are considered essential and are deliberately non-commercialised, reinforcing the idea that public space should serve people first, not profit. Greenery and landscaping play a key role in softening the atmosphere of mobility hubs, helping to shift the perception from "transport machine" to "urban place." Additionally, these elements make mobility hubs feel more welcoming and human-scale, enhancing the sense of place by focusing on small, thoughtful details at eye level.

Non-commercialised design ensures that public space remains open to everyone, regardless of income. It may improve inclusiveness for all users, enhance public ownership and trust, and spaces might feel more genuinely community-oriented, encouraging public stewardship.

On the other hand, what Danish mobility hubs often struggle with is limited commercial activity which could reduce the vibrancy or convenience that some commercial offerings bring. Relying solely on public investment may affect upkeep and innovation over time. A strict anti-commercial stance might limit opportunities for flexible, multi-use programming. Processes may be less responsive to rapid changes in mobility behaviour or technology.



A Short History of Urban Morphology in Denmark

A mobility hub is not an isolated point but a node woven into the urban fabric: The perception of its character and function is colored by the surrounding streetscapes, building forms, and human-scale details.

The way we perceive urban structures, whether through the intimacy of narrow streets, the openness of wide, busy boulevards, or the rhythm and sizes of façade, shapes our experience of the city and, by extension, the mobility hubs embedded within it.

To better understand the wider urban surrounds of the mobility hubs and their character, we turned to Tom Nielsen's book "Byen Danmark" ("City of Denmark"). His book gives a rich history of Danish urban development, which informed the summary on the following pages. The short history explores how the physical qualities of urban environments affect our perception of the urban space, and reveals how different spatial patterns influence movement, interaction, and the sense of place. Understanding these morphologies informs our awareness of their potential challenges to the human experience of the city. Thus, offering additional factors to consider when looking at the mobility hub as part of a bigger urban context, and in an effort to make the last mile more attractive (Nielsen 2023).

1850

From the 19th century, the primary source of energy gradually shifted from muscle power to coal, marking the Industrial Revolution.

For settlement geography, it became crucial that production could now be located independently of the natural resources it processed. Raw materials, goods, and people could be transported long distances.

Cities gained a new role as production and labor became co-located. As a result, cities became infrastructural hubs.

1900

The Industrial Revolution happened late in Denmark compared to other parts of Europe. It gradually emerged after the end of absolute monarchy in 1848.

Liberalism played a significant role during this period, and the market economy began to grow. The rise of industrialisation also brought the development of railway towns.

1950

The first cars arrived at the turn of the century, bringing asphalt with them.

By 1936, the groundwork for an extensive motorway network (Motorway H) was laid.

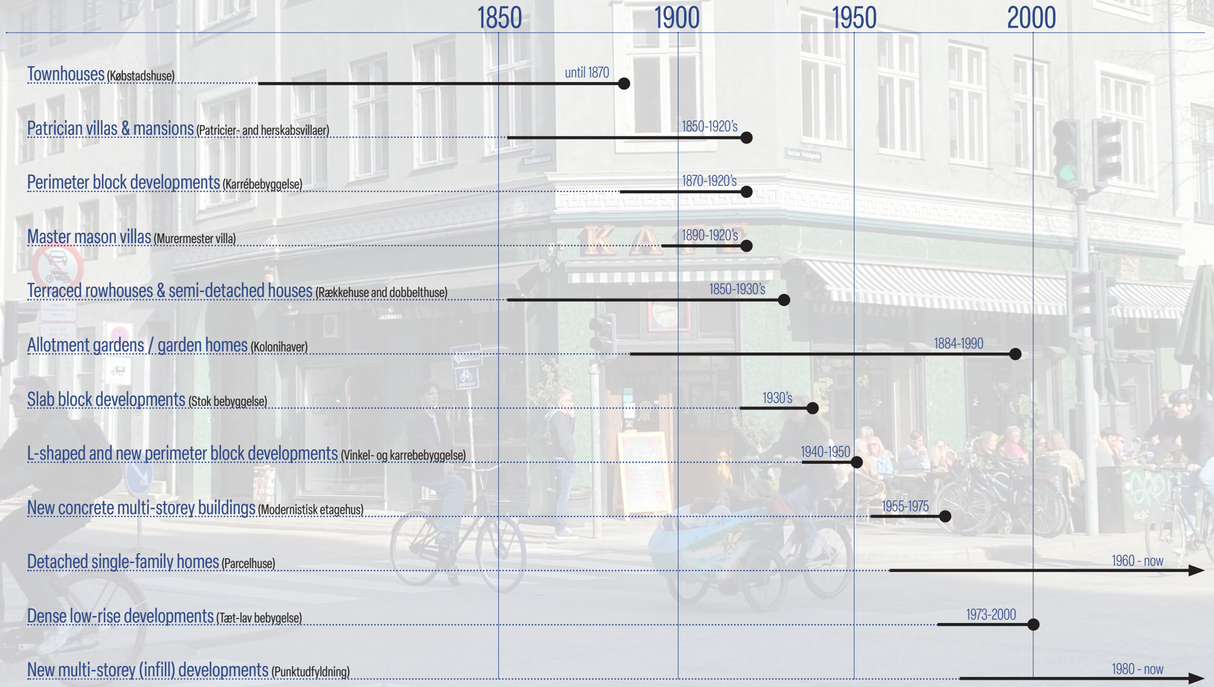
In the 1950s, cars became widespread enough to reshape geography and cities. The Motorway H network shifted urban centrality.

Cars diminished small station towns, but enabled commuter settlements, weakening market towns as hubs while enhancing access to nature. From the 1990s, car ownership, especially second cars, accelerated the changes.

2000

After 2000, trains and cars continued to reduce the impact of physical distance, while telecommunications eliminated it, enabling any location in the country to connect through IT.

Characteristic Periods of Danish Housing Typologies



Townhouses (Købstadshuse)



Townhouses, dominant in Danish merchant towns until 1870, featured half-timbering with small houses on side streets and larger merchant houses on main streets. Many of these grander homes were built with two storeys. In many cases, workshops, warehouses, or boutiques were directly connected to residences, especially in larger homes. Irregular, narrow streets and buildings at the street edge defined their layout.

The urban morphology of older Danish cities is characterised by a street layout with irregular, winding, and nonlinear streets. Additionally, houses are built directly adjacent to the streets, resulting in narrow thoroughfares. With townhouses as the predominant housing typology, the built environment forms enclosed streets with limited open space.

Patrician villas & mansions (Patricier- and herskabsvillaer)

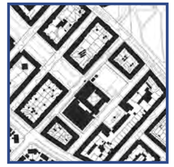


Overpopulation in Danish cities from the 1850s led wealthy residents to build large villas on expansive plots out of the cities, creating rather grand estates until the 1950's.

Patrician villas and mansions are multi-storey, most often designed with the living room, kitchen, office, maid's room and conservatory at the ground floor. The large multi-storey villas are constructed with lots of detail and are inspired by national romanticism and new classicism.

The large estates created a sprawled morphology and urban layout, but with a great attention to detail in the built environment, where the houses are visible from the road.

Perimeter block developments (Karrébebyggelse)



From the 1870s, overpopulation in major Danish cities became a pressing issue, prompting the expansion of city boundaries. New land was incorporated to accommodate the growing demand for housing. Perimeter block developments were typically 3 to 6 storeys high, often constructed using red brick. The architectural style drew inspiration from historicism and national romanticism, with many buildings featuring bay windows or other projections on their façades.

Similar to townhouses in older city centers, these new perimeter block developments were built in continuity with one another, extending all the way to the street. However, unlike the winding streets of the older city areas, the new streets were laid out in a linear, straight pattern. Several buildings were placed close together, forming a cohesive block or an enclosed courtyard. This urban layout and morphology led to a significantly higher population density than what had been seen in Denmark before.

Master mason villas (Murermester villa)



In the 1890's, the construction of detached houses became increasingly popular in urban areas surrounding the city centres, giving rise to new suburban districts. This style became the dominant housing typology in these emerging neighbourhoods, primarily occupied by the middle and upper-middle classes, until the 1920's. The term master mason villas reflects the fact that these houses were built by master masons.

The master mason villas and the spread-out arrangement of the houses largely mimicked the suburban morphology of the upper-class Patrician mansions, but on a more modest scale. Additionally, new building regulations were introduced, setting requirements for the distance between houses, neighbors, and the street, creating slightly more dense developments. These homes were well-proportioned and drew inspiration from national romanticism and neoclassicism.

Terraced rowhouses & semi-detached houses (Rækkehuse and dobbelthuse)

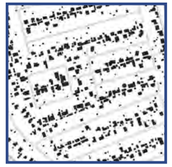


In response to the emergence of new factories in larger Danish cities during the 1800s, perimeter block developments were built as worker housing, along with terraced and semi-detached houses from 1850 to 1930's. The terraced houses were constructed in the traditional rowhouse style, typically featuring a small front yard and a slightly larger backyard.

Both housing types drew inspiration from classic Danish building traditions and neoclassicism. Most of these homes were constructed in red brick.

Areas dominated by semi-detached houses created a unique urban structure, characterised by a human-scale environment. Neighbourhoods with terraced houses had a more linear morphology, with narrower and more compact streets.

Allotment gardens / garden homes (Kolonihaver)



The first Danish allotment gardens, or garden homes, were established in 1884, offering workers a chance to escape the city and enjoy fresh air and natural light. These gardens allowed workers to grow their own vegetables in addition to their daily labor. Initially, the allotment gardens were not intended for permanent residence. However, due to a widespread housing shortage, they were officially permitted as year-round residences in the 1920s, and again during the 1940s and 1950s.

Allotment gardens are characterised by very small houses, typically between 15-30 square metres, along with small sheds. The layout created by these gardens is expansive and closes in on themselves, functioning as a gated community with a barrier to the outside city.

In addition to the allotment gardens, some alternative self-built communities emerged in a similar style, featuring small, inexpensive shed-like homes, or repurposed barracks, without gardens.

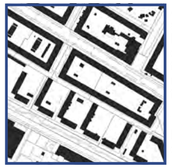
Slab block developments (Stok bebyggelse)



The 1930s were deeply shaped by a new movement that influenced not only architecture and urban planning but also society as a whole. With the rise of functionalism, and the principle of "form follows function", new concepts of light and space became crucial in the design of buildings. A fundamental idea behind the slab block development, was to ensure quality housing with affordable rent by constructing and financing homes outside the profit-driven housing market, to ensure social housing.

The movement marked a departure from the previously popular perimeter block developments, instead introducing urban layouts with more north-south orientation. This shift led to the absence of traditional urban street spaces, often defined by perimeter blocks. Instead, these new functionalist developments prioritised open green spaces, creating a more open and airy environment, as well as a streetscape with less obvious zoning.

L-shaped and new perimeter block developments (Vinkel- og karrebebyggelse)



After World War II, Denmark once again faced a severe housing shortage in many cities, along with high unemployment. To address these challenges, the state introduced favorable loan programs for new developments and eased expropriation regulations, enabling rapid construction of new housing. While the architectural style remained rooted in functionalism, the new developments were denser and less constrained by strict orientation principles, not necessarily facing north-south. Additionally, buildings were constructed taller, with more floors to accommodate the growing urban population.

The resulting urban structure from the 1940-1950's was a hybrid of traditional perimeter block developments and modern slab block housing, blending compact, enclosed courtyards with more open layouts.

New concrete multi-storey buildings (Modernistisk etagehus)



Modernism saw its true breakthrough in the 1950s, influenced by underlying movements such as brutalism and structuralism. These new developments were built on the outskirts of existing cities, strongly shaped by Le Corbusier's principles of zoning: high-rise concrete blocks, expansive green spaces, and growing car dependency. The urban structure often functions as a kind of island, with only one or a few roads connecting it to the rest of the city, detaching it from the surrounding urban structure.

These areas created a disrupted sense of human scale, resembling an extreme functionalist slab block development, often making the environment feel vast and impersonal. While façades varied across different developments, many of these areas were criticised for their lack of identity and anonymity. In later years, many of these areas became stigmatised due to high crime rates and social challenges within this urban structure, hence this housing typology has contributed to severe social segregation within Danish cities.

Detached single-family homes (Parcelhuse)



During the 1960s, a growing number of women entered the workforce, leading to dual-income households, that made owning a home both desirable and financially attainable for most of the middle class. While detached single-family homes varied in style and design, most were constructed with red or yellow brick, featured gable roofs, and included a small front yard along with a larger backyard.

In Danish, the word "parcelhus" is used to refer to divided plots of land, where larger areas were subdivided into smaller parcels. This typology creates human-scaled streetscapes, walkability and a sense of ownership.

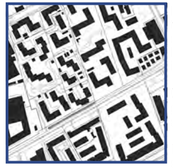
Dense low-rise developments (Tæt-lav bebygelse)



In the 1970s, a new counter-movement emerged in Denmark, challenging the dominance of functionalism and modernism. Gaining momentum, this shift was influenced by postmodernist ideals, rejecting monotonous, functionally segregated urban areas in favor of more compact, cohesive and socially integrated neighbourhoods.

From the 1970s to the 2000's, dense, low-rise developments evolved in form and character, varying between different areas. However, most followed a common pattern: Single-storey, smaller rowhouses connected in clusters. While urban structures within this typology differ, they typically feature small courtyards nestled between housing units, creating a sense of community and interaction.

New multi-storey (infill) developments (Punktudfyldning)



In modern times, from the 1980's to now, the demand for smaller apartments has risen due to a growing number of single individuals and people living alone. Many new apartment developments are built as infill projects, utilising available land within existing urban areas. In larger Danish cities, infill development is often integrated with broader urban renewal initiatives.

While architectural styles vary, most new developments feature a strong emphasis on geometric forms, predominantly squares and rectangles, combined with smooth surfaces and flat roofs. This contemporary minimalism is heavily influenced by functionalism.

The urban structure created by this typology typically includes numerous pathways, green spaces interwoven throughout the area, and a less rigid, more organic street layout.



Part 1

Theoretical Framework & Methodology

“Streets are more enduring than buildings –
the street layout often outdates the buildings
with 100s, sometimes 1000s, of years.
Plan your streets wisely!”
(Ivor Samuels)

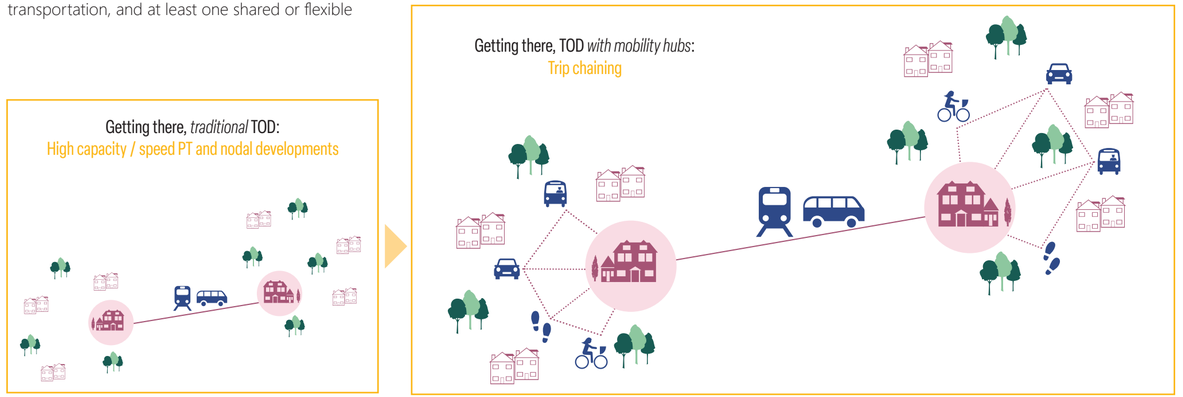
Understanding the Mobility Hub as Place and Infrastructure

This study focuses on the mobility hub at its primary exchange point, i.e. the station area. While there is no universal definition of a mobility hub, this framework understands the hub as a location with opportunities for switching easily and intuitively between modes.

Identified by at least one high-capacity public transport mode – such as train, metro, light rail, BRT, or bus – hubs should also include facilities for active transportation, and at least one shared or flexible mobility service – such as bike or scooter share, car share, or on-demand mobility services.

Beyond its role as a transit node, the mobility hub sets the tone for the greater mobility-oriented development as a place. It should function as a gateway to the community - welcoming people into a vibrant public space with opportunities to stay, shop, meet, or spend time enjoyably between transfers. The design of the space around the hub should create a safe and legible environment for people of all ages and abilities to comfortably explore their mobility options.

Clear visual and physical connections between the hub and surrounding community position walking, biking, micromobility, and shared mobility as the obvious and preferred choice.



Traditional TOD focus on transit to connect nodes. TOD with mobility hubs integrates trip chaining and enhances the connection between station and developments (Bertolini 2025).

The Hub at Eye Level and the User Perspective

Contemporary Danish urban design has been largely influenced by Jan Gehl. Since the 1970s, Gehl has developed a human-centred approach grounded in the simple principle that cities should be designed for people before cars or infrastructure. His research focuses on the quality of life in public spaces, emphasizing the importance of human scale, sensory experience, and social interaction at eye level.

Transit stations and mobility hubs are complex environments – rarely does one encounter such a diverse cross section of the population – people of all ages and abilities moving in all directions for all different purposes. Through systematic observations of how people actually use streets and squares, Gehl introduced concepts such as the "life between buildings" (Gehl 2006) the significance of active ground floors, and the importance of inviting, safe, and comfortable urban environments for people of all ages and abilities.

This perspective has become deeply embedded in Danish planning practice, influencing national policies, municipal strategies, and everyday design decisions. As a result, the Danish urban planning tradition today prioritises walkability, cycling, vibrant public spaces, and high-quality streetscapes – reflecting Gehl's belief that well-designed cities can support healthier, more sustainable, and more socially connected communities. These concepts can be applied to mobility hubs to help make sense of the complexities.

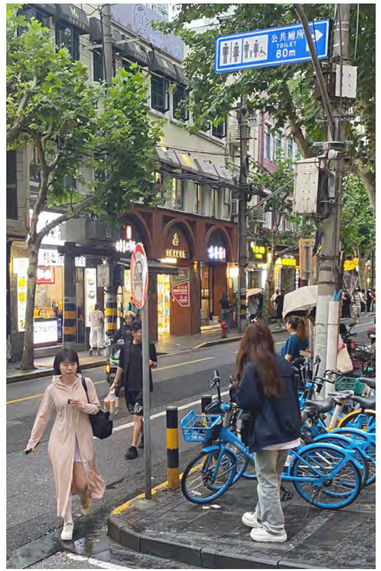
The approach in this framework focuses on understanding the mobility hub from the perspective of an infrequent user from the moment of arrival – stepping off the platform and entering the station area. It analyses how spatial design and diverse functions shape the initial experience through urban furniture, landscape elements, shops, façades, and programming in the area.

Improving Sense of Place

The aim of this framework is to improve sense of place at the mobility hub, and its connection to the surrounding environment.

In Danish urban areas, especially around stations, the built environment is often already established, leaving limited opportunities for physical changes to support TOD. The biggest opportunity thereby becomes changing the user perception of mobility hub from transportation machine to an important urban space.

The resulting guide provides a practitioner-friendly approach to evaluating mobility hubs, and highlighting barriers to a safe and well-functioning mobility hub from the user perspective. It enables decision-makers to identify where future development efforts should be focused – both financially and in terms of time – for the greatest possible positive impact.



Strategic Analysis: A Two-Zone Framework

Theoretical Background

Urban experience is shaped by viewpoints that comprise the viewshed. Gordon Cullen, a key figure in urban design theory, introduced the concept of *serial vision* to describe how cities are understood not as static compositions but as a sequence of unfolding views experienced through movement (Cullen 1961). His approach emphasizes how comprehension of urban space is built from what is seen at each step – how scenes reveal, conceal, and transform as one progresses through the space.

Calthorpe's TOD focuses on development within a ½ mile walking distance of public transport (Calthorpe 1993), where it is often interpreted as a circular walkshed around the station.

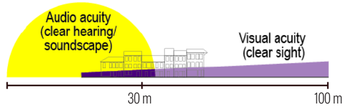
This project further defines the neighbourhood as nested environments shaped by audio-visual perception. Rather than a fixed radius around a tranit station, TOD2 considers an amoebic pattern shaped by the visual connections to commercial activity and public spaces (Stojanovski 2026).

Visual proximity is defined by viewsheds from transit stops. The viewshed is an urban space with clear visual acuity of roughly 100 m.

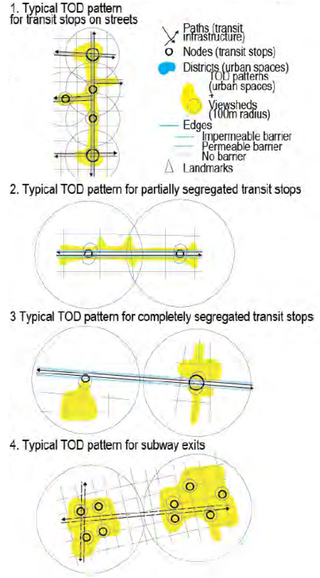
Further, pedestrian activity has the potential to trigger commercialisation within the viewsheds of transit stops and thereby help create a pattern of public spaces.

As mentioned in the introduction, urban development to support the mobility hub should consist of mixed functions. The TOD2 amoebas (functions within visual proximity) should therefore be organised around a 'Superhero Block' - a block with inviting commercial activities and storefronts, public buildings, green spaces and mobility services. It should face the station's main entrance and is designed to welcome passengers exiting the station (Stojanovski 2026).

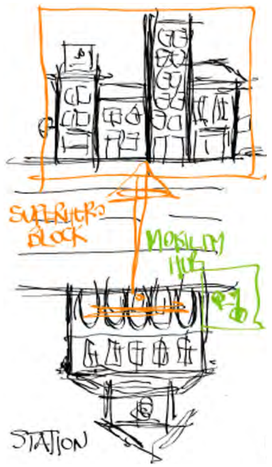
To simplify this theoretical approach, we have condensed it into a the two-zone spatial framework: Rather than attempting a direct translation of Cullen's serial vision, the framework adapts its core idea – spatial perception through unfolding views – to simplify and clarify how mobility hubs function. within the TOD2 amoeba.



Audio-visual perception and urban proxemics. Adapted from Stojanovski (2026), drawing on Gehl.



TOD patterns of public spaces around typical transit stops. Adapted from Stojanovski (2026).



"Superhero Block." Illustration: Stojanovski (2026).

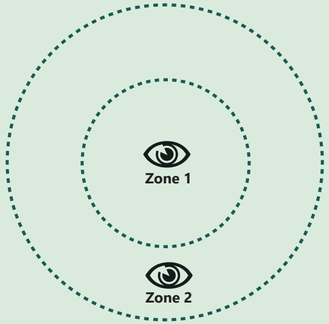
Methodology

In assessing the functionality of a mobility hub, the area is divided into two zones, each playing a different role in terms of visibility, usability, and spatial experience. By distinguishing between what is instantly perceived (Zone 1) and what is discovered through movement (Zone 2), this framework makes it easier to understand how clarity, legibility, and spatial sequencing influence user experience in complex mobility environments. Experience varies of course by user – people who are visually impaired or people with lower sightlines (children or someone who uses a wheelchair, for instance) will have different viewsheds. This should be taken into account when evaluating and designing for all ages and abilities.

Zone 1: The Arrival Area

The first zone represents the immediately visible environment: the elements, structures, and cues that shape a traveller's initial impression and orientation. This zone is typically framed by buildings, walls, corners, or other prominent structures that naturally fall within the field of vision.

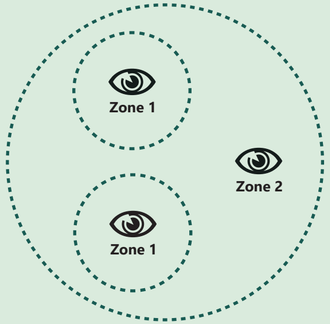
The purpose of this zone is to create a clear and welcoming first impression. Here, the focus is on how easily users can orient themselves and gain an overview of key functions, and opportunities for exchange.



Viewsheds

Zone 1 is what you immediately see - what is visible upon arrival and in the arrival area. It is what you "stumble upon" before you make your first decision about which direction to go.

Zone 2 is the area you reach afterward - in the near vicinity of arrival at the mobility hub - but which you either have to seek out, or only see once you have decided to go in that direction or around the corner.



Multiple Modes of Mass Transit

Where multiple mass transit modes share a hub, and are not visible from one another, a second, or third, Zone 1 may occur. It is worth noting that the analysis is designed for stations with one to four exits, limiting the number of possible primary and secondary zones.

While it is not impossible to apply the method to larger stations, doing so is more complicated and may not produce comprehensive results. Importantly, the limitation is not defined precisely by station size, passenger volume, or the specific number of exits, but rather the diversity of surrounding urban environments connected to each exit, or cluster of exits.

This zone often includes functions that directly support the hub such as ticket offices, kiosks, seating areas and bike racks. Elements such as signage, paving, lighting, and visible facilities play a central role in guiding movement and signalling how the space is intended to be used. It sets the first impression and plays a central role in how welcoming and navigable the space feels.

Zone 2: The Supporting Area

The second zone consists of the spaces that are not immediately visible, but are revealed only after turning a corner, crossing the first threshold, or moving beyond the initial arrival area. It encompasses the first viewshed that opens up once a user leaves Zone 1. The boundaries of Zone 2 are defined by the physical and visual limits of that newly revealed field of view – extending to the next enclosing edges, such as building façades, trees, or other features that disrupt line of sight.

This zone often includes secondary functions that enhance the hub's connection to the community, such as pathways to the city centre and more dense commercial activity.

The purpose of this zone is to provide functionality and support activities without disrupting the clarity of the arrival area. The supporting zone should be intuitively accessible through clear movement paths and visual cues, so users can find facilities intuitively.

Understanding the Boundaries between the Two Zones

The spatial arrangement of the two zones determines how intuitive and efficient the mobility hub is to navigate, while also influencing its character as an urban space.

It is important to emphasize that the two zones are not precisely measurable in quantitative terms but are defined by what the eye naturally perceives upon arrival. If the train platforms are located on a different level than the arrival area, the arrival area still constitutes Zone 1, and everything visible within that space – including escalators or connecting pathways – belongs to the zone.

The goal of this approach is not precision but to provide a qualified impression of how a new or infrequent user experiences and navigates the space.

Together, these two zones ensure that the mobility hub is both easy to navigate and functionally accessible, while also creating a sense of character and cohesion with the surrounding urban environment.

INFO BOX: Station Proximity Principle

When examining how a mobility hub relates to its surrounding context, Denmark traditionally applies two distance thresholds: a 600-metre radius and a 1,200-metre radius. The area within 600 metres of a station is defined as the primary station area, while the 1,200-metre radius is considered the secondary station area, still regarded as being within comfortable walking distance. This approach is rooted in the Danish stationsnærhedsprincip (the station proximity principle), which guides planning and development based on the assumption that areas close to stations should support mobility, density, and accessibility.

However, using these two circles relies on a top-down perspective that does not account for the qualities of the immediate urban environment. Implicitly, it assumes that moving outward from the station one encounters the same type of setting, and that similar urban typologies will offer comparable qualities and user experiences.

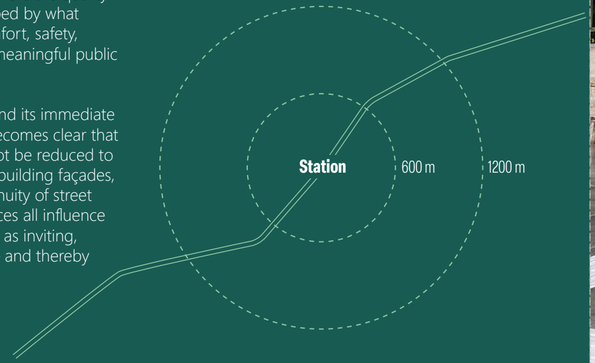
In reality, the built environment around mobility hubs can vary greatly: the height and scale of adjacent buildings, the width of infrastructure, the accessibility of the pedestrian network, and the amount and character of open space all influence how the area is perceived and used.

As a result, the very local scale is treated uniformly in this model, even though real-world experience can differ dramatically from place to place. Two areas may appear identical on a map, yet feel completely different when standing there.

Seen through the lens of Jan Gehl's human-centred urban design theory, the traditional Danish method of defining station proximity through 600- and 1,200-metre radii becomes only a partial understanding of how a mobility hub actually functions in everyday life. Gehl emphasizes the "eye-level city," where the quality of the urban environment is shaped by what people experience directly – comfort, safety, human scale, active edges, and meaningful public space.

When assessing a mobility hub and its immediate surroundings from eye level, it becomes clear that walkability and accessibility cannot be reduced to distance alone. The character of building façades, the presence of shelter, the continuity of street life, and the design of public spaces all influence whether people perceive an area as inviting, connected, and truly accessible – and thereby their perception of distance.

Linking this to Danish urban design traditions, which prioritise accessibility, vibrant streets, and high-quality public space, reveals that mobility hubs must be understood as more than nodes on a map. They are lived places where the micro-scale experience determines how well the hub supports sustainable movement and urban life.

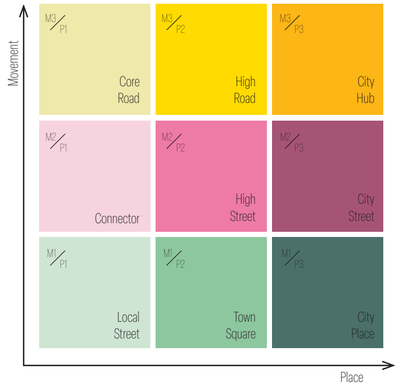




Strategic Analysis:
The Hub as Place and Transport Machine

Theoretical Background

Across urban spaces, there is a functional need to facilitate people moving through (i.e. 'flow') and a need to invite staying (i.e. 'place'). Stations and mobility hubs typically emphasize flow, but the potential of a hub as a place is often under appreciated. When a strong balance is created between place and flow, improvements in perception of safety, commerce, and connection to the community tend to follow.



Movement/Place Matrix
(Original source: Transport for London 2011)

Transit stations and mobility hubs are some of the most complex spaces in the urban environment – serving a diverse array of users, needs, and purposes. Traditionally, transportation systems are designed for peak trips – both in terms of capacity as well as considering the needs of the commuter.

Brought to the forefront by the pandemic are 'messy trips'. Messy trips are journeys that are not neatly categorised as commute trips during peak rush hour. They tend to fall outside of peak commute hours and include trip chaining – like taking kids to school on the way to work, caregiving-based trips, or even taking pets to the vet. Offering a variety of public services, markets, shops, and simply opportunities for sitting creates a more inclusive system and helps meet those diverse needs.

In the Movement and Place matrix, street segments are ordered by their classification in the network hierarchy. Places are ordered by their significance for gathering or meeting within a community. Thereby the movement and place matrix highlights the position of the mobility hub (M3/P3/City Hub) as one with maximum movement and maximum sense of place.

Improving sense of place can also encourage choice-users (not just captive users) to use public transport. In transport planning the term captive transport users are those with limited transport options, often related to economic constraints, age, or limited access to a car. To attract more people into the public transportation system, it should not only be efficient and cost effective, public transportation must also feel safe and attractive.

Building on Cullen's serial vision, when the viewpoints within the mobility hub unfold to reveal interesting places to visit, patron, or simply meet in front of, people are encouraged to walk from one spot to the next. Connecting the hub to anchor destinations means distances feel shorter and the mobility hub becomes a natural extension of the urban fabric.

Methodology: The Hub as a Transport Machine

With the increase of the types of modes available to people, stations as mobility hubs are increasing in their potential for attracting new users, as well as in complexity. Service providers often see their role as singular contributors to a hub, whereas the rider sees the hub as a system of options. A successful hub will have all options working together smoothly.

A mobility hub functions as an integrated transport system. Its effectiveness depends on both the variety of transport options it offers, and how easily users can navigate between them.

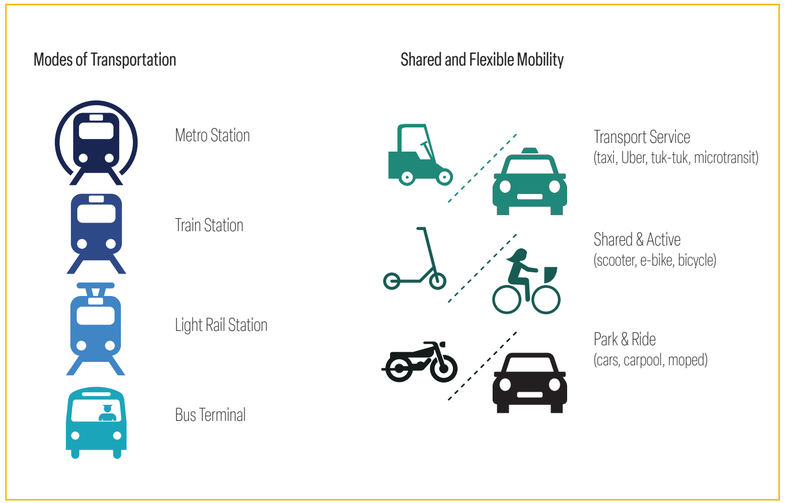
How the Study Assesses the Variety of Transport Options

The assessment first notes all modes available at a given hub. This includes mass public transport, as well as bicycle parking for regular bikes, bike share, taxis/ride share, and park and ride for personal vehicles and scooters.

To be considered a hub, the station must include at least one high-capacity mode of mass public transport (i.e. train, metro, light rail, bus and BRT) AND at least one shared or flexible mobility service (i.e. micromobility, car share, carpool parking, on-demand mobility services). The hub must be accessible by biking and walking.

How the Study Assesses Ease of Navigation

The assessment maps the modes that are visible from one another. All modes visible from the primary high-capacity mode fall within Zone 1.



Stations with multiple high capacity modes not visible from one another are mapped as a separate Zone 1.

Secondary modes (bike, taxi, etc.) not visible from the point of arrival in Zone 1 are mapped in Zone 2. Where visibility does not exist between modes, it is noted if signage or other wayfinding measures sufficiently fill that gap.

A well-functioning hub enables flexible mobility that can adapt to different travel needs and preferences, ensuring that all users can find convenient options for their journeys. This aspect highlights the hub's role in supporting diverse, efficient, and user-centred transportation.

Urban Functions

- Services (toilets, tickets, package lockers)
- Residential & lodging (homes, apartments, hotels, short-term rentals)
- Commercial & retail (shopping, restaurants, grocery stores, hair salons)
- Employment (offices, and bigger businesses)
- Institutions (schools, universities, hospitals, libraries)
- Leisure (cinema, museums, gyms)
- Greenery (plants, landscaping, parks)
- Places to sit (non commercial)

Methodology: The Hub as a Place

Reviewing each hub, the analysis considers which urban functions are integrated into the hub area. Six core urban functions are categorised: services, residential and lodging, small commercial/retail, major employers, institutions, and leisure. Green space and public seating are also included.

The categories reflect both land-use and activity type, as well as different patterns of use throughout the day. This helps capture not only the mix of functions around the hub, but also when they are likely to generate activity.

Urban furniture and landscaping, including seating, greenery and lighting, are also considered in terms of how they contribute to sense of place and human scale.

Places to sit influence how people use and interact with the space, creating opportunities to pause, wait, meet or stay rather than simply pass through.

Greenery requires particular consideration when assessing perception of safety because dense planting can limit visibility and create hidden spaces. However, other studies show that greenery can soften the urban environment and help people relax and feel at ease (Olszewska-Guizzo et al. 2022). This framework therefore suggests a middle ground: landscaping and planting contribute positively to the hub when they do not form dense walls, block sightlines or create dark, hidden pockets. Well-maintained and appropriately trimmed planting, as well as solitary trees, can add greenery and a sense of place while maintaining visibility.

Density and Diversity

The analysis considers both the diversity and density of functions. Diversity is represented by the range of functions present, while density reflects how strongly each function is represented within the hub area. The relative density of each function is qualitatively assessed in relation to the surrounding urban context and mapped using icons where: no icon indicates that the function is absent, while one, two or three icons indicate low, medium or high representation respectively.

Similar to the transport mapping, place functions visible upon arrival are positioned in Zone 1. Place functions that are revealed through further exploration are placed in Zone 2.



Strategic Analysis: Perception of Safety

Theoretical Background

Perception of safety based on what one views and perceives in the surrounding environment, as well as objective safety are predictors of public transport use (Strandbygaard 2016). When people feel that their environment is unsafe, they may adjust their travel behaviour – for example, taking different routes, avoiding certain transport modes or times of day, choosing private transport instead of public, or cancelling trips altogether when no safer option exists. The first mile and last mile are vulnerable to safety problems, especially when covered on foot and could also play a determining role on altering or cancelling the trip (Basaran 2024).

This framework focuses particularly on safety as it relates to feelings of safety and personal security.

CPTED Analysis - background for simplified safety assessment of stations

One internationally adopted approach to help pinpoint and address safety and security challenges is called Crime Prevention Through Environmental Design (CPTED). CPTED is an analytical and design-based approach that focuses on reducing crime and improving perceived safety through the planning and shaping of the physical environment. The method is based on the idea that spatial layouts, sightlines, lighting, building entrances, landscape elements, and patterns of movement influence both actual safety and people's sense of personal security.

CPTED can be used in a wide range of contexts – from public spaces and mobility hubs to residential areas, parks, and commercial districts – to identify vulnerabilities, strengthen social cohesion, and support safer, more welcoming urban environments. By integrating safety considerations early in the design process, CPTED helps create places that feel secure, foster positive activity, and support everyday use.

A CPTED analysis typically investigates six key aspects that together shape the safety and usability of an area.

1. Territoriality focuses on how spaces signal ownership and care – through design, maintenance, and clear boundaries – which helps foster responsibility and deter inappropriate behaviour.
2. Natural surveillance assesses how well people can see and be seen in the space, considering sightlines, lighting, and active frontages.
3. Maintenance and management evaluate the upkeep of buildings, landscaping, and infrastructure, as neglected environments tend to reduce perceived safety.
4. Access control examines how the physical layout guides movement, discourages unwanted entry, and supports safe, intuitive pathways.
5. Target hardening considers physical security measures, such as barriers or lighting improvements, that protect vulnerable areas without compromising openness or usability.
6. Activity support looks at how the design encourages positive everyday uses that bring people into the space, increasing natural monitoring and social presence (Crowe 2013).



Approach

Conducting a full CPTED analysis is a complex and resource-intensive process, requiring careful observation, data collection, and professional expertise across multiple disciplines. Thoroughly examining the six aspects demands detailed on-site evaluation and an understanding of how people interact with the environment over time. For municipalities or smaller planning teams, this level of detail can be overwhelming and difficult to implement within typical project timelines or budgets.

For this project, a simplified assessment tool was developed to make the method more approachable. It requires only on-site observation and a working understanding of urban design, making the process practical and actionable. This approach enables municipalities and planning teams to integrate safety and quality considerations into everyday urban planning and management more easily.

The Safety Analysis Tool

The simplified analysis focuses on six key categories to assess the safety and quality of the environment around the mobility hub:

1. Ownership
2. "Eyes" on the Street
3. Cleanliness/Maintenance
4. Quality of Surroundings
5. Protection against Violence
6. Human Scale.

During the on-site analysis, these categories guide careful observation of the physical and social environment to identify strengths, weaknesses, and opportunities for improvement.

Each category is assessed as high, medium, low, or none, based on the observer's qualified judgement. Categories that receive the lowest rating indicate the areas that should be prioritised if the goal is to improve the user experience. In this way, the analysis provides a clear overview and helps focus interventions where they are most needed.

The assessment tool is presented on the following pages.

How to Use the Safety Analysis Tool

In ownership, examine whether spaces appear cared for or neglected, and how clearly the boundaries between public, semi-public, and private areas are defined. Look for signs that someone has made the space their own or shown activity – such as planted greenery, personal items like chairs or decorations, handwritten signs, or other traces of human presence. Even if no one is there at the moment, these cues indicate that people use and interact with the area, which contributes to a sense of vitality and a lived-in environment.

In "eyes on the street," examine the level of natural surveillance – whether streets, pathways, and public areas are overlooked by buildings, shops, or people passing by. Look for indicators that the space is being observed, such as windows facing the street, active storefronts, benches near busy walkways, or frequent foot traffic. Even small details, like open cafés, visible balconies, or well-used paths, show that people are present or can easily see into the area. These cues help create a sense of safety and encourage use of the area, as spaces that are naturally watched are less likely to attract unwanted behaviour.

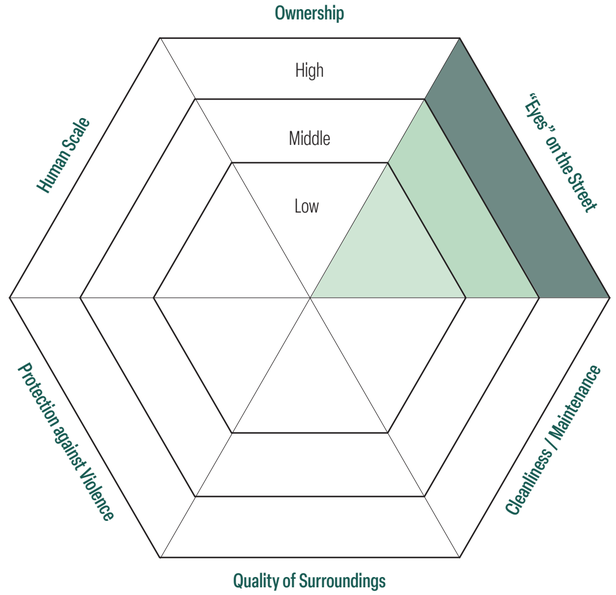
Eyes on the street is further supported by **a temporality review,** which is conducted at each site to improve understanding of how vibrancy shifts over the day. A scale is used to compare the hours that the major transit modes stop at each station, with opening hours for businesses. When analyses are limited to daytime hours, this comparison helps visualise how well 'eyes on the street' will still contribute to natural surveillance at less busy times of the day. Additionally, with fewer businesses open in the evening, station areas may experience reduced activity and a greater presence of intoxicated or disruptive individuals, increasing perceived vulnerability.

In cleanliness / maintenance, observe whether the space is well-kept or run-down, looking for signs such as litter, graffiti, cigarette butts, broken urban furniture, or damaged windows. Also consider the general cleanliness of the area and whether it appears cared for or overlooked. These indicators reveal how well the space is maintained and influence how safe and inviting it feels to users, as neglected areas often signal a lack of oversight and reduce the sense of comfort for people in the environment.

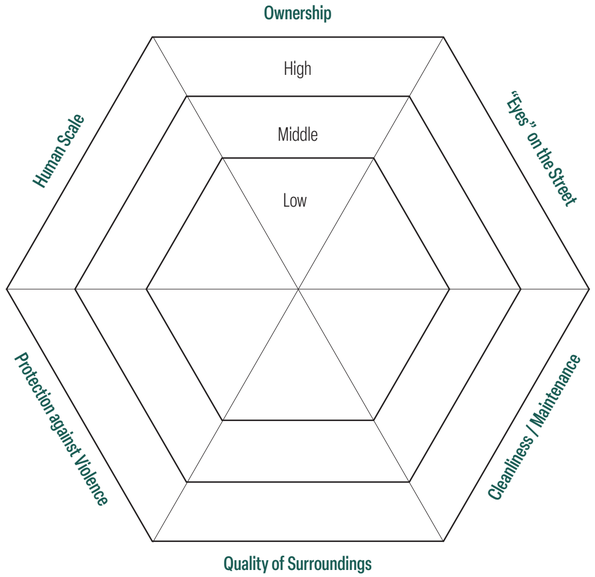
In quality of surroundings, assess the visual and functional appeal of the area, looking at elements such as landscaping, building façades, paving materials, and the presence of inviting public spaces. Examples include intentional green areas, attractive street furniture, coherent signage, or art installations. Also observe whether the environment feels welcoming and pleasant to spend time in, or whether it appears worn down, monotonous, or uncomfortable. The quality of the surroundings strongly affects how people experience the space, influencing both activity levels and perceptions of safety.

In protection against violence, look for potential risks that could make people feel unsafe or vulnerable. Examples include isolated spots, blind corners, poorly lit areas, overgrown greenery, narrow alleyways, or dark tunnels. Also consider the presence of safety measures, such as surveillance cameras or personnel with protective roles, like police officers or train guards. A combination of preventative design and active monitoring improves feelings of personal security.

In human scale, observe whether the space feels comfortable, approachable, and suited to human activity. Examples include building volumes that do not overwhelm pedestrians, street widths that feel proportionate, well-sized pathways, and elements such as benches, trees, or lighting that relate to people's presence and help bring the scale down. Also consider the un-built environment, such as large parking lots or empty areas adjacent to the mobility hub, which can make surrounding buildings feel distant and the space appear uninviting and devoid of public life. These observations help assess how well the surroundings create a positive, welcoming experience and support a sense of prioritisation for people navigating the area.



Worksheet



Ownership

- To what extent does the space appear cared for rather than worn down?
- How clear are the boundaries between public and private spaces?
- Is there visible evidence that people or businesses have personalised or claimed the space? (e.g. handwritten signs, planters, displays, seating or tables)
- Are pedestrian, bike, and service zones clearly defined and respected?
- To what extent does the area have a distinct identity or character?

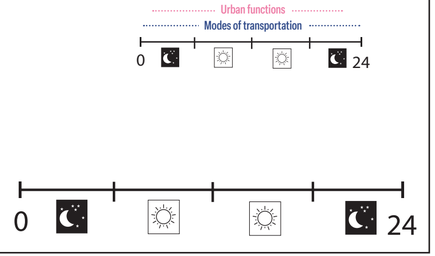
Eyes on the Street

- To what extent are public areas overlooked by buildings or active frontages?
- Do windows and buildings appear occupied?
- Are ground-floor uses active and facing the street?
- How frequent is foot traffic during the day?
- How frequently do the major modes stop?
- How frequent is foot traffic after dark?
- Overall, to what extent does this area feel active and naturally supervised? (e.g. staff, passengers, nearby buildings or passers-by)

Temporality Review:

- When do trains and buses run?
- How late/early are businesses open? (could be 24/7 businesses like 7-Eleven and McDonalds, hotels, or it could be a combination that ensures coverage - for example bars that stay open late and bakeries that open early - this is helpful in understanding the extent to which urban life and people are present at the mobility hub, and thereby how secure it feels for passengers)

Your notes:



Worksheet

Quality of Surroundings

- To what extent do buildings, surfaces, and materials appear well-built and well-maintained?
- Regardless of architectural age, which best describes the quality of the environment overall?
  - *Feels obsolete or abandoned*
  - *Feels functional but tired*
  - *Feels well-maintained and intentional*
  - *Feels distinctive/iconic and enduring*
- To what extent does the area feel permanent and intentionally designed? (coherent signage, sturdiness, consistency, few temporary solutions)
- Is there visual interest at pedestrian eye level? (art, planting, street furniture, variation)
- To what extent do public spaces invite lingering or waiting?
- How well does the lighting support visibility and orientation in this space? (e.g. evenness, coverage/ absence of dark spots, colour temperature, ability to see people and routes clearly)

Protection against Violence

- Are personnel with protective roles (e.g. police officers, staff, security) present during transit operating hours?
- Are surveillance cameras present and clearly visible?
- To what extent are there isolated areas, blind corners, or hidden spaces?
- Are there narrow passages or constrained spaces like alleys and tunnels?
- Must users pass through vulnerable areas (isolated, constrained, dark) to access transit or their destinations?
- To what extent are design features present that help mitigate risk? (lighting, mirrors, sightlines)

Your notes:

Cleanliness / Maintenance

- To what extent does the area appear to be cleaned regularly?
- How much litter, debris, or waste is present (on the ground, or overflowing from bins)?
- Are public facilities operational, accessible, and functioning properly? (e.g. toilets, elevators, doors, ticketing machines, arrival/departure screens, lighting)
- To what extent are surfaces and furniture well-maintained (e.g. graffiti washed off, no broken windows, walkways and ramps accessible)?
- To what extent does landscaping appear intentional and maintained rather than overgrown or unkempt?

Human Scale

- Overall, how comfortable and relaxed does this space feel for pedestrians?
- Which description best matches the surrounding buildings?
  - *Buildings feel overwhelming; they are tall, wide, and lack detail at street level*
  - *Buildings are somewhat large but include some human-scaled elements*
  - *Buildings feel balanced; heights and details relate well to pedestrians*
  - *Buildings strongly support human scale with frequent entrances, fine-grain detail, and comfortable proportions*
- To what extent are there elements that reduce perceived scale? (street trees, lighting height, canopies, frequent entrances)
- Are there comfortable, well-placed public seating options?
- To what extent does the space prioritise motor vehicles vs pedestrians?
- Based on the layout, traffic, and clarity of the space, what is the youngest age at which a child could reasonably navigate this area alone?

Your notes:



Part 2

Case Studies

How we move around in our childhood
affects our adult behaviour,
so we need to encourage choice users
to use public transport. And we need transport people
to recognise the neccesity of urban planning,
because the urban fabric matters
when people make their [transport] choices.
(Corinne Mulley)

Selected Mobility Hubs

The case studies cover a variety of development typologies across the TOD2 project partner cities of Copenhagen's Capital Region in Denmark, and Shanghai and Nanjing in China. The stations in each city were selected to test the analysis tool across differing urban and cultural contexts.

The Copenhagen Region stations include Copenhagen Central Station, Nørreport Station in Copenhagen, which is the busiest hub in Denmark, and Lyngby Station which is located in a Copenhagen suburb (population around 58,000).

Shanghai, one of the world's largest cities (population of approximately 25 million), provided a platform to test how well the analysis tool would work at scale, including a suburban station in a very dense urban area, a station in a less dense suburban context, and a station in the historical city centre.

Nanjing, while smaller than Shanghai, is also a major city (population of approximately 9.3 million). The analysis there also included a station in the historical city centre, a station in one of the inner city business districts and a suburban station with a densely built urban context. The stations in Shanghai and Nanjing were selected for their comparability to Danish stations – featuring a maximum of four exits, and including some above-ground platforms.

Limitations

This framework defines a mobility hub as a station that includes at least one mode of mass public transit (e.g., rail, light rail, BRT, or metro) and at least one form of shared or flexible mobility (e.g. bike share and other forms of micromobility, uber/taxi stands, or car share). To qualify for consideration, all stations must have a basic level of accessibility for people biking and walking.

The assessment method is designed for stations with one to four exits. In some contexts, such as major stations in China, facilities may have between nine and twenty-four exits. These exits often lead to very different surrounding urban environments and are connected by complex underground passage systems.

For these types of larger stations – those with approximately five or more exits, and with exits leading into significantly different urban environments that are far apart – it is recommended to analyse the station in sections based on the surrounding urban environments.

The case studies were conducted during spring 2025 and spring 2026. The results are representative "snapshots" based on the days that the analyses were conducted.

Matrix of the stations and their very near surroundings	CPH Central Station (DK)	Lyngby Station (DK)	Nørreport Station (DK)	West Jiading Station (Shanghai)	Songjiang Xincheng (Shanghai)	Dapuqiao (Shanghai)	Zhangfuyuan (Nanjing)	Wudingmen (Nanjing)	Fochengxilu (Nanjing)
Suburban Area		●		●	●				●
Urban Area	●		●			●	●	●	
Primarily Residential Buildings				●	●				
Primarily Business/Offices	●						●		
Mixed Functions		●	●			●		●	●
Station below Ground			●		●	●	●	●	●
Station above Ground	●	●		●					
Exits Next to Big Infrastructure							●		●
Exits in Urban Environment	●	●	●	●		●	●	●	
Destination Hub	●	●	●	●	●	●		●	
Transfer Hub	●		●						●

1. Copenhagen Central Station (DK)



The Mobility Hub as a Transport Machine

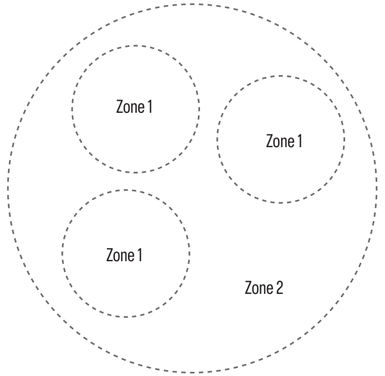
The station is centrally located in the city, directly opposite Tivoli amusement park, and surrounded by hotels and commercial uses. It functions as a major multimodal transport hub, serving both local and regional rail services.

The bus terminal is not immediately visible from within the building, as the station functions as an enclosed indoor structure. However, the bus terminal's location at the front of the station, supported by wayfinding, makes it easy to find.

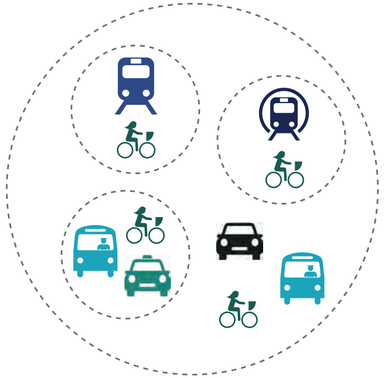
Similarly, the metro is also visually distanced from the station. Wayfinding signs guide people switching from the train platforms, but visual cues are lacking inside and around most sides of the station. Though located right next to the Central station, the metro functions somewhat separately, rather than as an integral part of the bigger mobility hub.

The main entrance faces a heavily trafficked road accommodating cars, buses, and cyclists. Due to this traffic-oriented setting, there is no significant forecourt or transition space between the station and the surrounding city. However, the station's wide sidewalks and ample space accommodates pedestrians sufficiently during peak hours.

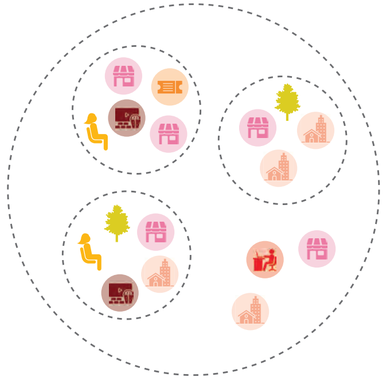
Internally, the station operates well as a transport machine. Passenger flows are continuous and well supported by clear circulation, waiting areas, seating, display screens, and access to platforms. The station is clean, well maintained, and constructed with high-quality materials. As a transport node, it functions reliably and effectively, supporting large volumes of users throughout the day.



Zoning and Viewsheds



Modes of Transportation



Urban Functions

The Mobility Hub as a Place

Despite its central location and high level of accessibility, the station does not strongly express its role as an integrated urban transport hub within the public realm.

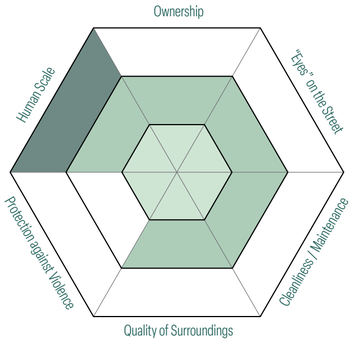
Architecturally, the station is a beautiful and well-preserved historic building. It is characterised by high-quality materials, exposed structural elements, and patterned tiling which help create a strong identity. However, the stores in their semi-permanent stalls do not appear fully integrated into the historic fabric of the building. Instead, they read as ad hoc or temporary structures that fail to fully activate the space or engage with its architectural qualities.

Although the station contains a wide range of functions – including cafés, restaurants, retail, services, exhibitions, and a police station, many areas feel fragmented.

Several internal zones function as "backsides," and certain corridors and side entrances appear underutilised or inactive, and therefore can read as a bit unsafe even in the middle of the day. This is particularly noticeable near secondary entrances and alley-like interior passages.

Externally, the station's relationship with the surrounding city is limited. While Tivoli provides a strong urban attraction directly across from the station, exiting the station leads into car-oriented infrastructure rather than an urban space prioritising pedestrians. The lack of a defined forecourt weakens the station's role as an integrated urban place.

Overall, while the interior holds strong architectural quality, the station's urban presence and spatial integration are underdeveloped.



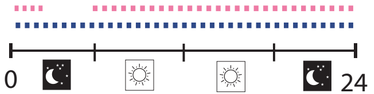
Feeling of Safety

The station benefits from a steady flow of people, including commuters, travellers, tourists, and staff, which contributes to a generally high level of natural surveillance. The presence of a police station within the building, along with visible DSB staff, reinforces the perception of safety and offers formal support when needed. As a result, fear of violence is likely relatively low, particularly in the busiest areas.

However, certain spaces – especially narrow internal corridors, side entrances, and alley-like passages – feel less inviting and somewhat unsettling. These areas lack activation and clear sightlines, reducing perceived safety despite overall high occupancy levels. Insufficient lighting in some internal corridors further contributes to discomfort.

Cleanliness and maintenance are generally good, and ownership is present through the mix of retail, services, and continuous activity. However, ownership is unevenly distributed across the station creating areas that feel overlooked. Areas with open active storefronts feel lively and safe, while zones with blank façades, backsides and inactive edges feel unsafe.

In summary, the station offers a generally safe environment supported by activity, staff presence, and maintenance. Nevertheless, improvements to lighting, activation of secondary spaces, and clearer spatial hierarchy could significantly enhance perceived safety and comfort throughout the entire station area.



Urban Functions
Modes of Transportation
Opening Hours











2. Lyngby Station (DK)

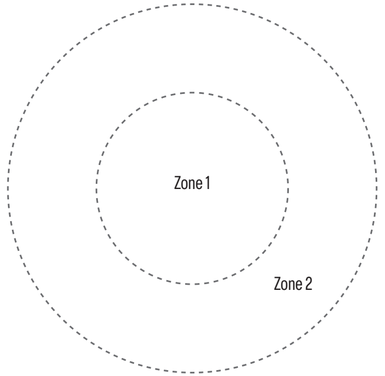


The Mobility Hub as a Transport Machine

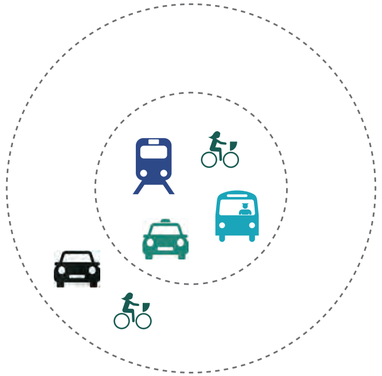
The station is an active hub in a suburb of Copenhagen, approximately 20 minutes by commuter train from Copenhagen Central Station. The connection between train and bicycle functions particularly well. Bicycle parking is located below ground to one side of the station and above ground on the other side. Both are clearly visible from the platform. The bike parking areas are well lit with both natural and artificial light, and elements such as background music and mirrors at corners improve comfort and visibility. From the main station entrance, the bus terminal and taxi stands are easy to spot.

The light rail stop, under construction at the time of the study, is planned as a separate Zone 1. The road in front of the station has a heavy vehicle function, but also accommodates pedestrians effectively. Car parking is located across the street and behind the station in Zone 2, where secured bicycle parking and bike-share facilities are also provided.

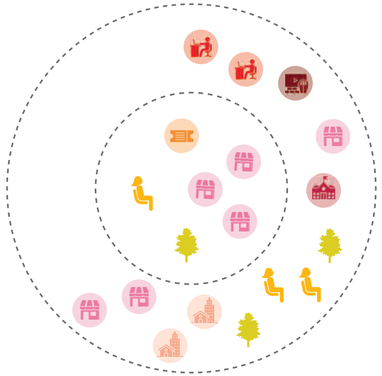
Overall, the hub feels active, with a steady flow of people throughout the day and late into the evening, with frequent shifts between transit modes. Additional opportunities for switching include secure bicycle parking, bike share parking, and car parking (that is planned for redevelopment into a city park).



Zoning and Viewsheds



Modes of Transportation



Urban Functions

The Mobility Hub as a Place

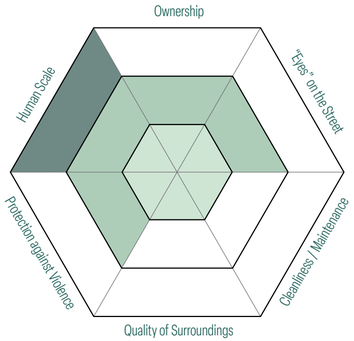
Lyngby Station is easily identified by its shopping arcade that runs underneath the 201 highway, and in parallel to the railroad tracks. Departing the platform, a flower shop with brightly displayed bouquets marks the transition from platform to sidewalk and signals the beginning of retail activity on both sides.

The arcade offers a wide range of functions, including essential goods shopping, specialty retail, services, groceries and restaurants. Plant beds between the arcade and roadway provide some separation from traffic. Aside from restaurant-owned tables and chairs, seating opportunities are limited. Combined with narrow sidewalks, the space becomes primarily oriented toward flow, rather than staying.

The roadway creates the divide between Zone 1 and Zone 2. On the opposite side of the street, there are more shops and businesses, though the footprints widen and density is lower than at the arcade. The diversity of commercial offerings continues though, ensuring a good flow of people throughout the day.

Several mini parks provide opportunities for sitting and resting, and string lights and restaurants with outdoor seating add interest and encourage exploration. A main shopping street is located one block away, though overall the connection between the station and this street could be more clear and inviting.

At the back entrance to the station (southwest), the environment is human scale with stairs, benches, and trees. However, there are few restaurants and cafes in this section, so the flow is oriented more toward flow, rather than staying in place.



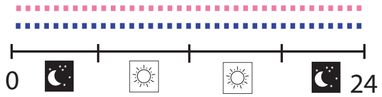
Feeling of Safety

A sense of ownership is present through shop signage, flower displays, and restaurants with outdoor tables and chairs. The arcade corridor is generally narrow which limits opportunities for expressing ownership, but the zoning of functions is clear. These boundaries help support a basic sense of comfort when moving through the space.

Activity levels vary across the station area. The front of the station is often busy, providing strong "eyes on the street," while the back side feels more distant and less active. Many shops close around 6 p.m., though grocery stores and restaurants remain open later. The flower shop opens at 6 am and the McDonalds next to it closes at 2 am. Additionally, the 24-hour 7-Eleven and events at the Templet music venue help sustain evening activity and contribute to a sense of safety outside standard business hours.

In terms of maintenance and quality, the area is generally acceptable but shows signs of age. Graffiti is regularly removed, and the space is clean, though surfaces and finishes feel somewhat dated.

The spatial scale is largely appropriate, particularly at the arcade with small shops and nice landscaping. On the southwest side of the station, wide stairs leading to bicycle parking are framed by large trees and benches, creating a calm, human-scale environment. While this area is less active, it provides informal places to sit and further brings the station to scale.



Urban Functions
Modes of Transportation
Opening Hours













3. Nørreport Station (DK)



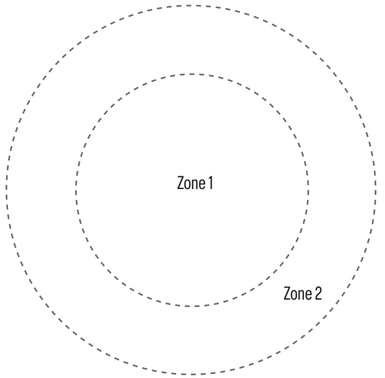
The Mobility Hub as a Transport Machine

Nørreport is Denmark's busiest station, and was redesigned in 2016 to better facilitate the hundreds of thousands of trips made there daily. It is a hub for multiple high-capacity modes including trains, buses, and the metro. Supporting modes include bicycles, taxis and – given its location at the start of one of Copenhagen's primary pedestrian streets – it is one of the more pedestrian-oriented hubs as well. Due to the heavy flow of people, structures such as bike parking facilities and pavillions, are organised around pedestrian desire lines.

Bicycles are arguably the focal point of this hub, with thoughtfully designed bike parking acting as landmarks within the public space. The bike racks are placed in 'bicycle beds' that are lowered into the ground about 0.5 m. The bicycle parking is contained to the racks and visual clutter is minimal.

Switching from one mode to the next is relatively easy. The trains and metro transfers occur underground. Upon reaching the plaza above ground, it is easy to orient yourself in the station area, with biking and walking being the most obvious options for connectivity.

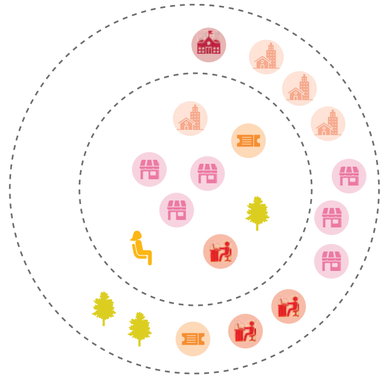
Along the plaza there is a service road for goods delivery. It is designed as a shared space with vehicles behaving as guests. Buses and taxis are at the southern-most point of the station.



Zoning and Viewsheds



Modes of Transportation



Urban Functions

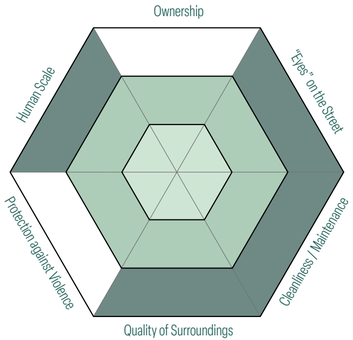
The Mobility Hub as a Place

The mobility hub integrates seamlessly with one of Copenhagen's most pedestrian-oriented areas. The forecourt is a direct continuation of one of the walking streets, and maintains the pedestrian-first character.

The sightlines of Zone 1 are notably far, and urban functions within sight include an abundance of restaurants, shops, and supermarkets. Generally, this zone is oriented toward shopping and entertainment. The plaza also features benches and planters. Planted with greenery in the winter, planters are full of colour in warmer months. Benches encircle the large ventilation columns throughout the space. Given their shape, they are best suited for individuals or small groups.

Moving into Zone 2, the pedestrian street continues with shops and cafés. In other directions, the mix of functions becomes more varied, including practical retail, businesses, professional services, schools, and parks. The area is bookended by three major green spaces: the Botanical Gardens, King's Gardens and Ørsteds Park. Torvehallerne Market (which can be reached from undersground) and Israels Plads, a large urban park and schoolyard on top of a major underground parking garage, are also nearby in Zone 2. Small streets radiate outward from the station, each with varied functions and visual cues that encourage exploration on foot and reduce the need for explicit wayfinding.

The station has a strong place function and is well integrated with the urban space. Its design character and strong connections to the surrounding areas clearly identify the station as being in the heart of Copenhagen.



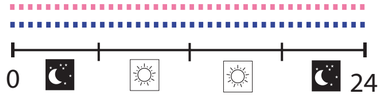
Feeling of Safety

With hundreds of thousands of transit users per day, plus numerous people passing through due to its central location, there is a consistent flow of people. Contributing to the eyes on the street, are good visual connections to shops and amenities as well as businesses with late hours, including several with 24-hour service.

While there is no formal security at the station, the good sightlines, late opening hours, and consistent presence of other people provide natural surveillance and make this station feel secure, with no dark cornors or hidden areas above ground.

Protection from the elements is provided through the large, mushroom-shaped canopies that offer effective protection from rain and shade. While impressively broad their low height, compared to the surrounding buildings, coupled with the pedestrianised plaza, ensures that the area remains human scale. Also supporting human scale, is the positioning of bicycle parking approximately 0.5 m below the plaza surface. This particularly improves sightlines for people like children and those using wheelchairs, creating a human scale for people of all ages and abilities.

The few structures on the plaza are rounded and support the pedestrian-oriented flow of the layout, as well as sense of security. The materials used are low maintenance, and primarily include white concrete, granite, glass and stainless steel. Overall, this station feels safe, well-maintained, and is a comfortable space to be in.



Urban Functions
Modes of Transportation
Opening Hours











4. West Jiading Station (Shanghai)

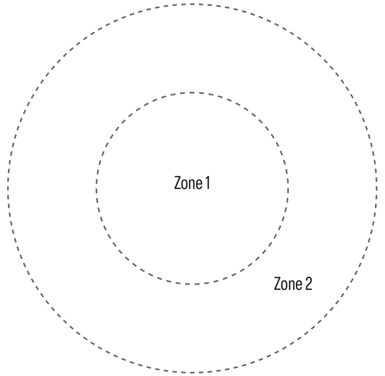


The Mobility Hub as a Transport Machine

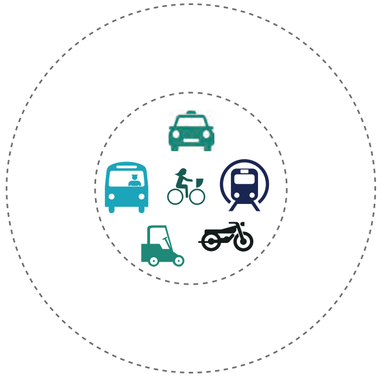
The hub is located in a suburban, primarily residential area characterised by tall perimeter housing with apartments. It functions as a classic multimodal transport node, serving last-mile connections through bicycles, mopeds, bus services, shared mobility, tuk-tuks, and taxis. The presence of extensive bicycle and scooter parking suggests that many residents commute from the neighbourhood into the city centre.

All transport modes are visually and spatially connected to the station, making transfers intuitive. The hub has two main entrances connecting a bus terminal, metro station, shared mobility services, and large bicycle parking areas on both sides. Hence, the mobility hub as a transport machine functions effectively. The wide street profiles and high-rise buildings (up to approximately 20 storeys) are balanced by ground-level activity and clear orientation, ensuring the hub operates efficiently as a transport machine.

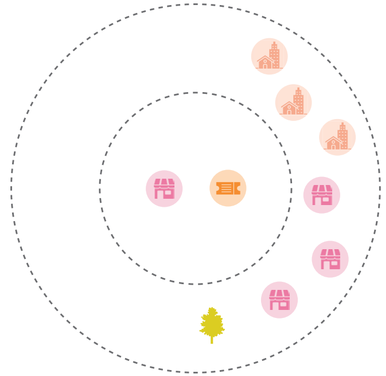
Parked bicycles and mopeds, however, create some barrier effects, limiting pedestrian accessibility and requiring careful navigation through narrow passages.



Zoning and Viewsheds



Modes of Transportation



Urban Functions

The Mobility Hub as a Place

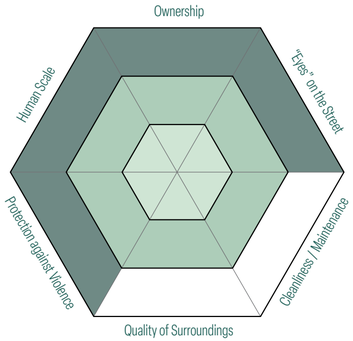
Despite the large scale of surrounding buildings and infrastructure, the station maintains a human-scale experience through active ground-floor façades, street trees, wide sidewalks, and small plazas.

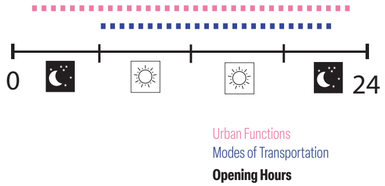
Narrow pedestrian passages, small businesses such as a shoe store and bakery, and urban greenery help reduce scale and foster a sense of place.

Ground-floor amenities like the local pharmacy, small 24-hour supermarket, and chain restaurants contribute to continuous activity throughout the day. Frontages are narrow, with the indoor space going into the building, rather than along the building, creating a highly active façade with many units.

On one side of the station however, the urban space loses its sense of scale and enclosure. The small shops and restaurants give way to an extensive moped parking area and a large building in the distance. The vastness of the space and lack of physical boundaries make it appear diffuse and less defined.

Overall though, the combination of mixed functions, human-scale streetscape elements, and continuous activity qualify the mobility hub as a vibrant urban space.





Feeling of Safety

The hub benefits from significant natural surveillance due to continuous activity generated by residents, commuters, and urban space users. The integration of a bus terminal, shared mobility services, tuk-tuks, taxi stands, and large bicycle/moped parking ensures constant pedestrian movement, which creates informal observation. Retail, dining, and service units, along with street trees and small public spaces, create active ground floors – allowing users to see and be seen, reinforcing perceived safety.

The station is accessed via two main entrances that connect to all transport modes, guiding pedestrian flows and limiting entry to defined paths. Although wide sidewalks support circulation, they are often narrowed by parked bicycles and scooters. This creates bottlenecks but also directs pedestrian movement along predictable routes.

Ongoing activity, including 24-hour supermarkets, banks and real estate agents, and shops open until 9:00 pm, ensures the space remains lively and well-used, reducing opportunities for criminal behaviour. The environment is clean and visually appealing, enhancing comfort and perceived safety. While tall surrounding buildings may reduce the perception of human scale in some areas, consistent activity at ground level mitigates this effect, supporting a secure and inviting environment.

The mobility hub is embedded in a residential district with tall perimeter buildings, which visually enclose the space and establish a defined neighbourhood context.

Hand-drawn signs and colourful chairs at restaurants create a sense of ownership, and the high density of shops contributes to a sense of social control and community care.

Overall, the hub demonstrates high levels of natural surveillance, clearly defined access points, active territorial reinforcement, and continuous activity throughout the day, all which contribute to a safe, human-scale environment. While some barriers created by parked bicycles and scooters reduce ease of access, the integration of transport, retail, and residential functions form a lively, socially monitored, and secure suburban mobility hub.











5. Songjiang Xincheng (Shanghai)

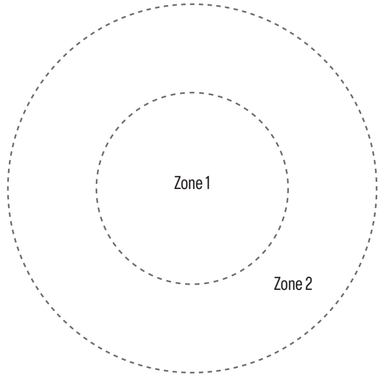


The Mobility Hub as a Transport Machine

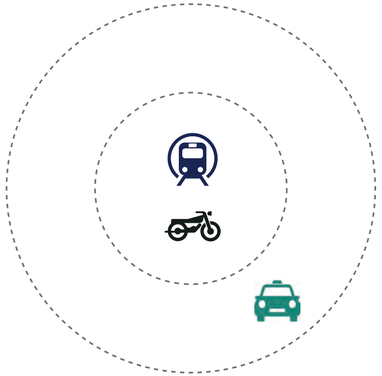
The mobility hub is a major commuter node, evidenced by the extensive station plaza dominated by parked scooters. The near absence of bicycles suggests a mobility culture oriented toward motorised two-wheelers or travel distances exceeding typical cycling range. While the scooters signal high levels of peak-hour use, their dense and linear parking configuration reduces spatial permeability and creates pedestrian barriers across the plaza.

The hub is supported by a clear transport hierarchy with scooters, taxis, and buses prioritised highest, followed by pedestrians, and then cars and delivery trucks. A low-traffic service road between the residential area and the forecourt accommodates bus stops and taxi ranks, facilitating multimodal transfers.

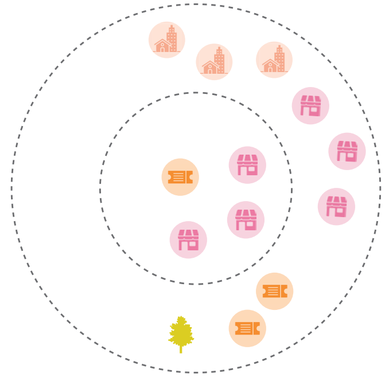
On the opposite side of the station, a wide arterial road provides drop-off and pick-up functions. Though there is easy access to the train station from the bigger road, the building is designed to open up to the square on the other side. Instead of the main entance facing the big road, the main entrance is to the side, where pedestrians and people on scooters arrive.



Zoning and Viewsheds



Modes of Transportation



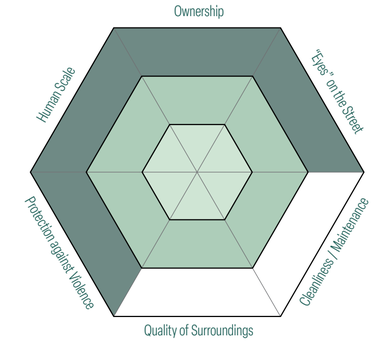
Urban Functions

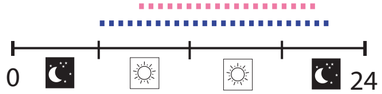
The Mobility Hub as a Place

Beyond its infrastructural role, the mobility hub operates as an urban place embedded within a suburban context of five-storey perimeter housing. The close proximity of these residential blocks establishes a defined urban edge and reinforces human-scale edges around the station and its forecourt.

The station building is conceived as a permeable structure with an internal retail spine and semi-active ground-floors facing outwards. These functions generate everyday activity beyond peak commuting hours and contribute to the hub's role as a local centre rather than as a purely transport-oriented facility.

While the station area itself lacks formal landscape design, adjacent residential courtyards with mature trees provide a green backdrop that softens the built environment. The large windows from residences facing the station square strengthen the visual and functional integration between the mobility hub and the broader urban community.





Feeling of Safety

The mobility hub benefits from a high level of eyes on the street due to continuous pedestrian activity throughout the day. Even when few train users were observed, the presence of visitors to the indoor shopping street, food delivery drivers on scooters, residents picking up mail, shop owners, and courier services creates constant informal monitoring. Large windows from the neighbouring five-storey houses overlook the station plaza, reinforcing surveillance from the surrounding perimeter housing. Active ground-floors with eateries, and the mini-mall interior ensure that key areas remain visible, contributing to a strong perception of safety. However, the upper floors of the station building seem empty and closed off, giving it a bit of an abandoned atmosphere, and therefore not living up to its full potential.

The station features clear pedestrian pathways from surrounding residential blocks into the station square and indoor shopping area. The forecourt, although densely occupied with parked scooters, channels pedestrian movement along defined corridors, limiting unpredictable or unauthorised access and guiding flows toward entrances. Taxi stands and bus stops along the service road further organise movement and prevent unsafe pedestrian-vehicle interactions. The orientation of the station away from the primary wide road reduces exposure to high-speed traffic while maintaining controlled access points for public and private transport.

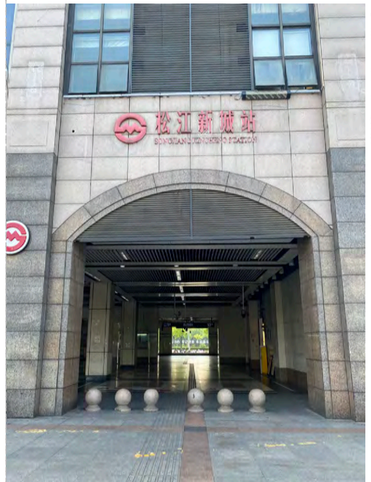
Active storefronts, large windows overlooking the plaza, and the presence of small food vendors signal community presence. The indoor shopping street functions as a semi-public urban environment, creating a sense that the station is a town centre rather than a purely transport-oriented facility. The station is clean, open, and well-maintained.

Although the station is placed in the outskirts, next to a big road, overall, the mobility hub demonstrates high natural surveillance, clearly defined access, active territorial reinforcement, and sustained activity and maintenance.

The place is not very busy during the day, but for a small, suburban town, they have succeeded in making a mobility hub that also functions as a community centre, creating more life in and around the station than there otherwise would be.







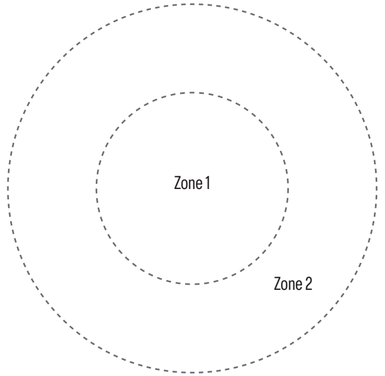




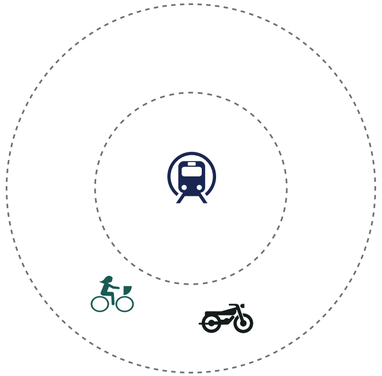


6. Dapuqiao (Shanghai)

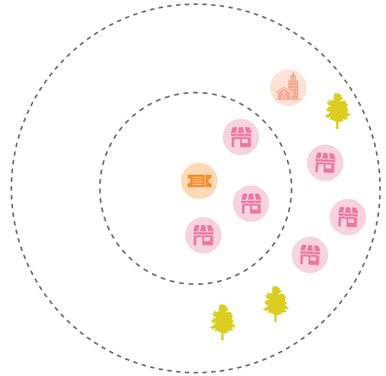




Zoning and Viewsheds



Modes of Transportation



Urban Functions

The Mobility Hub as a Transport Machine

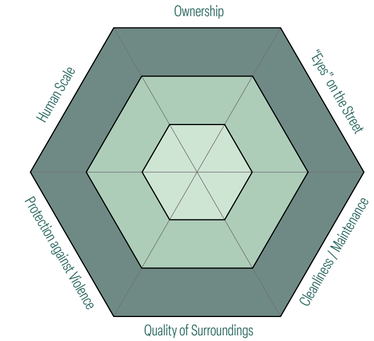
This urban metro station is integrated with a modern shopping centre, allowing for direct pedestrian access between the metro and retail areas. Shared bicycles and moped delivery services are located immediately outside the station and support first- and last-mile connectivity. Although other formal mobility options are limited, the station supports movement well for shoppers, commuters and delivery drivers. There are multiple entrances between the centre and the metro for intuitive wayfinding. The hub's primary role is facilitating pedestrian flows and localised mobility within the neighbourhood.

The Mobility Hub as a Place

The hub is deeply embedded in a historic district of dense low-rise buildings and narrow streets, giving it a strong sense of human scale and liveability.

Connections between the station, shopping centre, and surrounding streets are designed for open, fluid transitions, with stairways and pathways integrated into green public spaces. Constant pedestrian activity, along with slow-moving vehicles, cyclists, and scooters, creates a dynamic and safe urban environment. Abundant street trees, planters, and active ground-floors contribute to hub's inviting atmosphere.

By blending functional mobility with vibrant street life, the hub operates well as a transport node and as a social urban space.



Feeling of Safety

The station's integration into the shopping centre ensures a steady flow of pedestrians, shoppers, metro users, and moped couriers – creating informal observation and reducing opportunities for crime.

Inside the station, the shop walls are removed and fully open to pedestrian walkways. This openness increases visibility between transit users and patrons, and reinforces a sense of security. Façades that open toward the surrounding streets further allow residents and passersby to see and be seen.

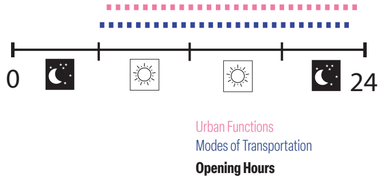
The area is lively and well-maintained, with activity lasting until 10 p.m., supported by retail, dining, and steady foot traffic. Entrances and exits are clearly defined, guiding pedestrian movement between the shopping centre, metro, and surrounding streets. The open-plan design of the internal walkways make it difficult for potential offenders to hide.

Although mobility options are limited beyond shared bicycles and moped services, the majority of users move on foot and pedestrians follow predictable paths, increasing intuitive understanding of the space.

Small stairways and pedestrian paths connect the station to the streets and green spaces – expanding the public realm.

Abundant street trees, planting, and well-kept public areas enhance the attractiveness and identity of the place, signalling that the space is cared for and monitored.

Overall, the mobility hub has high levels of eyes on the street, active public spaces, and quality surroundings. Its integration with the shopping centre and historic urban fabric ensures functional connectivity and a human-scale, safe environment, with a strong sense of comfort and security for users.



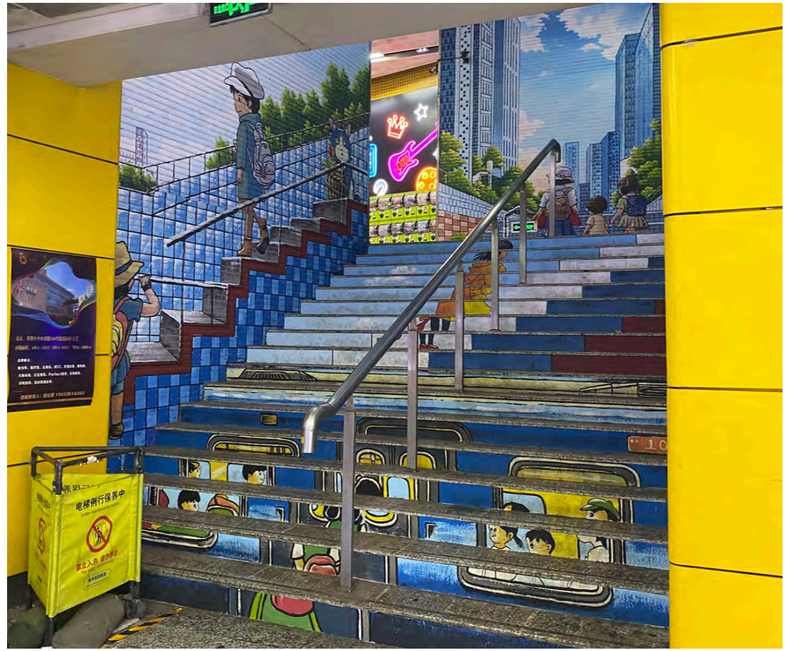








7. Zhangfuyuan (Nanjing)

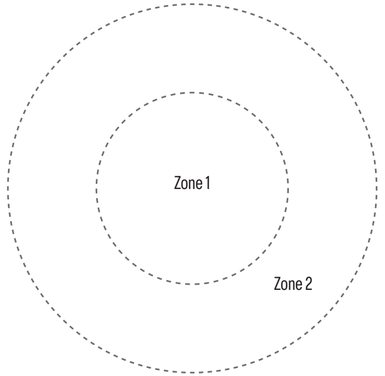


The Mobility Hub as a Transport Machine

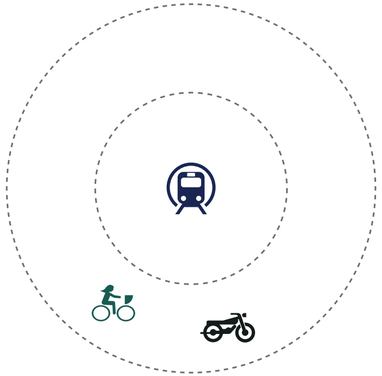
This metro station in central Nanjing is located at the corner of two major roads and directly adjacent to a large signalised intersection. From a functional perspective, this positioning ensures high accessibility and visibility within the urban network.

The station is integrated into a larger building that includes retail functions, offices, and other commercial uses. However, these functions are not meaningfully connected to the station itself. The station operates largely as a self-contained infrastructure element rather than as an integrated part of a mixed-use complex.

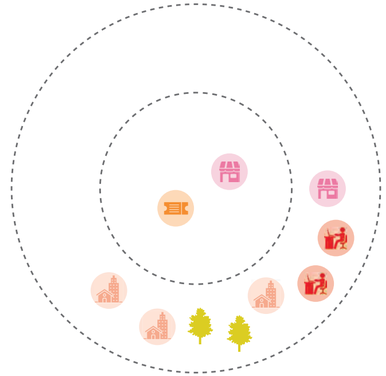
Internally, the station area is easy to navigate, but the underground corridors feel somewhat sterile. While the hub functions adequately as a piece of transport infrastructure, it does not fully embrace the logic of a highly optimised "transport machine," nor does it clearly support seamless transitions between different urban and mobility functions.



Zoning and Viewsheds



Modes of Transportation



Urban Functions

The Mobility Hub as a Place

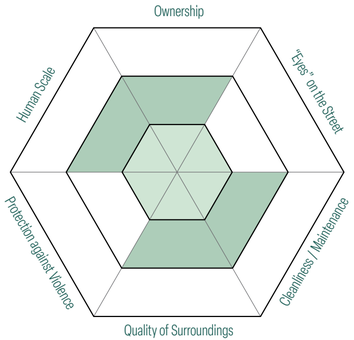
The surrounding area is characterised by a dense urban environment with a mix of residential, office, and commercial functions. However, the station exits open onto a large, empty plaza that lacks definition and enclosure. Buildings farther away, around the perimeter of the plaza, further reinforce the impression of an inactive urban space.

Despite these shortcomings at the urban scale, efforts have been made to create place-based qualities within the station itself. A large mosaic wall gives the interior a strong sense of character and acts as a site-specific marker.

Additional elements such as planters soften the underground spaces and introduce a more human and welcoming atmosphere to the otherwise hard surfaces.

On the day of observation, a temporary pop-up stall had been set up where local residents were painting bookmarks for students at the end of the semester. Although such activities may not be permanent, their presence introduced informality, social interaction, and a sense of local ownership.

Overall, the mobility hub does not fully succeed in functioning either as a strong urban destination or as an attractive public space. It lacks a coherent identity within the city. At the same time, it serves as a positive example of how site-specific interventions can help support a sense of community and place.



Feeling of Safety

Natural surveillance at the mobility hub is uneven. Despite the surrounding dense urban context, the large open plaza lacks enclosure, active edges, and clear activity zones, resulting in limited "eyes on the street." Closed façades and underused upper floors further reduce the perceived safety.

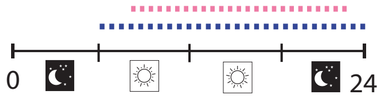
In contrast, temporary programming inside the station, such as the pop-up bookmark stall attract people and increase visibility. Elements such as the mosaic wall, help establish a more local character. Activity, and therefore eyes on the street, are limited in off peak hours.

Outside, ownership is low. The plaza lacks clear boundaries, programming, and signs of ownership, making it feel anonymous. Greenery and moped parking offer limited ownership and zoning cues.

Entrances and internal routes are legible, yet the surrounding plaza's openness offers little guidance on movement or behaviour. The absence of spatial hierarchy between transit routes, lingering areas, and undefined space creates uncertainty and reduces perceived safety.

Overall, the hub reflects inconsistent management. While the interior, in some places, shows deliberate design and identity, the inactive surrounding buildings and empty plaza suggest a lack of other people.

Without active edges, defined public space, and continuous activity, natural surveillance and territorial reinforcement remain limited, increasing the risk of the site being perceived as a "non-place."



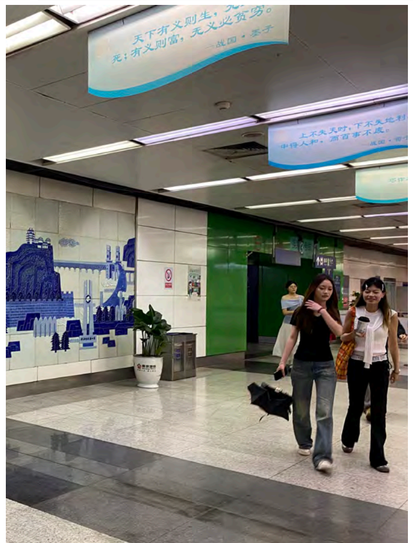
Urban Functions
Modes of Transportation
Opening Hours













8. Wudingmen (Nanjing)



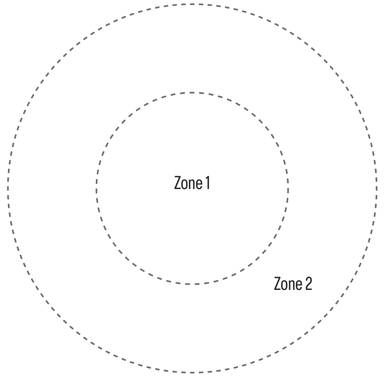
The Mobility Hub as a Transport Machine

The metro station is well integrated into the surrounding urban environment and remains functional and accessible. Bicycle racks and a bus stop outside the entrances support multimodal connections, though most users appear to arrive on foot and continue their journey on foot – highlighting the hub's role as a local node rather than a purely transport-oriented facility.

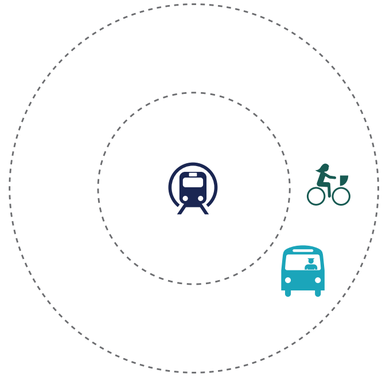
Internally, wayfinding is intuitive, ensuring smooth movement for commuters. While the station is functional as a transport facility, its design does not dominate the surrounding urban fabric; rather, it accommodates both mobility and local activity.

Placed on the edge of a historical neighbourhood, the streets are rather small, with sidewalks and bike lanes on both sides, adding to the human scale. Traffic is insistent, but does not dominate the environment.

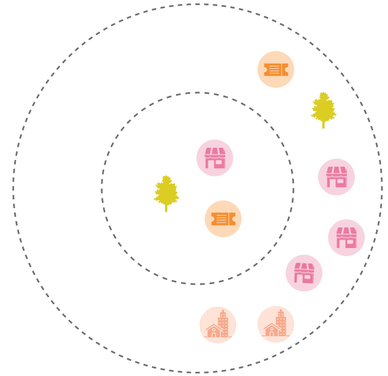
All modes of transportation have sufficient space to move and feel protected, without effecting the efficency of flow.



Zoning and Viewsheds



Modes of Transportation



Urban Functions

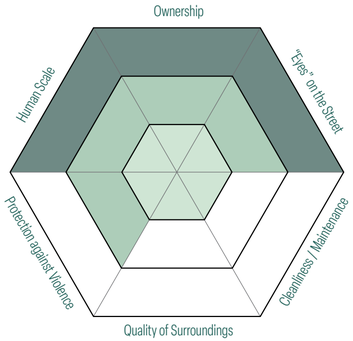
The Mobility Hub as a Place

The hub is located in a densely built urban area, adjacent to a historic district, with low-rise buildings (3–6 storeys) and narrow streets that create a human-scale environment. The surrounding streets are lively with shops, small businesses, eateries, and temporary stalls contributing to consistent street activity. Even when temporary stalls are absent, the plaza in front of the station retains a sense of openness and connection to the neighbourhood. It maintains its human-scale, rather than becoming an oversized empty space.

Inside the station, carefully placed plants soften the sterile environment, adding life and a sense of ownership. Historical murals reflecting the city's cultural heritage further enhance the station's identity and link it to the surrounding urban context.

Small-scale, temporary interventions – such as stalls, postal boxes, and pop-up markets – help create "eyes on the street" and promote social engagement, even if only temporarily.

Overall, the station demonstrates how mobility infrastructure can be thoughtfully embedded in the urban fabric, balancing flow and functional efficiency with liveability and vibrant public life.



Feeling of Safety

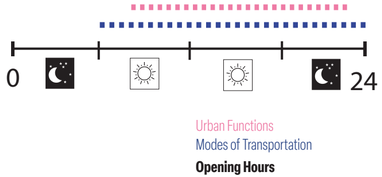
The mobility hub benefits from high natural surveillance due to its dense urban context and active streets. Low-rise buildings (3–6 storeys) and narrow streets set the tone for a human-scale environment and provide informal oversight by residents and passersby. Inside the station, strategically placed plants and good lighting contribute to visibility, while historical murals draw attention and encourage pausing. These factors increase the perception of safety, as users can see others around them, reducing feelings of vulnerability.

The station and its immediate surroundings convey a sense of ownership and care. The inside plants, murals, and design interventions signal that the space is maintained. This enhances perceived safety, as users are more likely to feel that problems such as vandalism and loitering are less likely in a cared-for environment.

Temporary stalls, postal boxes, and small markets define functional areas and suggest active use. Even when temporary elements are absent, the compact layout prevents the plaza from feeling empty. Clear territorial cues make users feel that the space "belongs" to the community, which increases confidence, and reduces discomfort associated with ambiguous areas.

Entrances and circulation paths are intuitive and well-integrated with surrounding streets. Temporary or small-scale interventions, such as stalls or seating, subtly guide movement and minimise secluded areas. The clarity of movement enhances the perception of safety by reducing uncertainty about where to walk and minimizing spots where users might feel exposed.

The strong social presence at this station reinforces the idea that the station is part of a living neighbourhood rather than a stand-alone transport facility.















9. Fochengxilu (Nanjing)

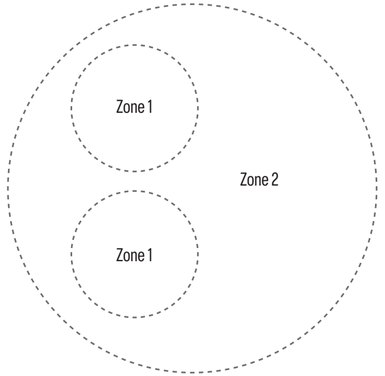


The Mobility Hub as a Transport Machine

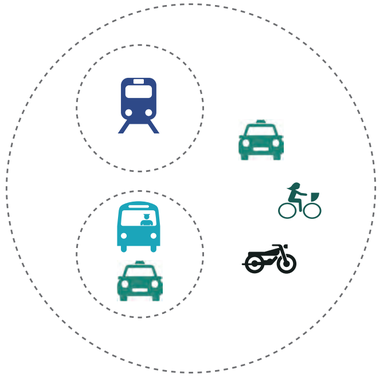
The station is located in a suburban environment and primarily functions as a transport hub. It sits adjacent to two very large roads, with high-rise buildings set slightly back, emphasizing infrastructure over human-scale development. Buses stop on the opposite side of the intersection, but they are not visible from the metro exits due to the scale of the roads.

The station is clearly designed for efficient movement rather than as a destination itself. Most users appear to arrive and depart via moped bus, taxi, or shared bike. Even with two wide roads, there is no obvious kiss-and-ride function for drop-offs or pick-ups.

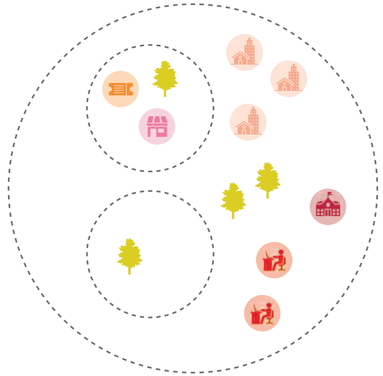
Internally, and immediately around the station, the built environment has been scaled down to improve attractiveness and comfort. Permanent umbrellas at pedestrian and bicycle crossings provide shelter while helping to humanise the space, and large street trees contribute to slowing car traffic and a cooler environment for active modes.



Zoning and Viewsheds



Modes of Transportation



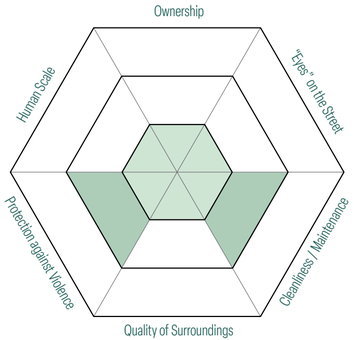
Urban Functions

The Mobility Hub as a Place

Beyond the immediate station exits, the environment is dominated by wide roads, large buildings, and empty public spaces, creating an overwhelming, impersonal scale. The surrounding residential and office buildings have few active ground-floor uses, which limits engagement with the public realm and contributes to a sense of emptiness and low social presence.

Near the busiest station exit, moped and bicycle parking areas are interspersed with tall trees and bushes. During the day, these spaces feel lively and orderly, but the densely planted bushes could feel intimidating or unsafe at night or when fewer people are present to provide informal oversight.

Overall, the hub gives a strong impression of being primarily a transport machine rather than an integrated urban place. While interventions such as umbrellas and street trees bring some human scale to the immediate vicinity, the broader surrounding environment lacks activation, street life, and social engagement, leaving the station disconnected from the urban context and experienced as a functional, rather than social, node.



Feeling of Safety

Wide roads, large buildings set back from the street, and empty urban spaces reduce informal oversight – making the area feel impersonal and potentially unsafe, particularly beyond the immediate station zone.

Near the station, large street trees and clearly visible paths with good sightlines increase the perception of safety. However, bus stops are located across the intersection and are not visible from the metro exits, creating visual gaps between modes. With few urban functions, proximity could have helped enhance the feeling of human presence and "eyes on the street".

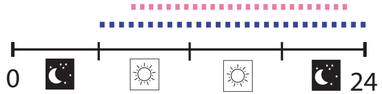
Beyond this immediate area, the lack of shops, cafes, and other active ground-floor uses limits consistent social presence, weakens informal surveillance and reduces the perception of safety during periods of low activity or at night.

Closed building façades and inactive ground floors indicate a lack of ownership or engagement with the community. Umbrellas at crossings, street trees, and covered moped and bicycle parking provide only a moderate amount of zoning and ownership.

The station has clearly defined access points and pedestrian paths within the immediate zone, supporting predictable and safe movement. However, the wide roads and distant bus stops create disconnected movement patterns, making the broader station area feel isolated and harder to navigate safely. The absence of a kiss-and-ride function further limits informal monitoring opportunities and structured access control.

The station functions efficiently as a transport hub but has limited qualities of a socially integrated urban place. While the first zone shows a conscious effort to humanise the environment, the surrounding infrastructure dominates, creating an impersonal scale and limited natural oversight.

The vast roads, large buildings, and unengaging façades convey a lack of activity and impersonal scale, reducing the overall sense of security and human comfort.



Urban Functions
Modes of Transportation
Opening Hours













Observations across the Case Studies

Across the analysed case studies, a set of recurring spatial strategies can be identified in the immediate surroundings of mass transit stations. Elements such as landscaping, active ground-floors, and clear sightlines are commonly used to contribute to human-scale, safe, and attractive station environments.

However, despite these consistent elements, the case studies also reveal three common gaps in the spatial and functional performance of station-adjacent public spaces:

- Lack of spatial definition of plazas and outdoor areas
- Limited support for activities beyond movement
- Disconnection between interior place-making strategies and the design of exterior public spaces.

Taken together, these gaps point toward a clear set of opportunities for targeted, small-scale interventions, also known as urban acupuncture. Urban acupuncture can be an effective tool in strengthening spatial definition, enabling flexible activity, and aligning interior and exterior designs.

The following chapter therefore shifts focus from observation to intervention, exploring how thoughtfully implemented urban acupuncture can enhance station areas and activate underperforming spaces.

Lack of spatial definition of plazas and outdoor areas

One of the most evident gaps concerns the spatial definition of plazas and outdoor areas, particularly between station interiors and the surrounding urban fabric. While these spaces often function as transition areas, they frequently lack clear edges, hierarchy, and identity, resulting in underutilised or purely transitory spaces. This highlights an opportunity for targeted landscape elements, micro-architectural structures, and programmatic anchors.

Limited support for activities beyond moving through

A second recurring gap relates to the limited support for activities beyond movement and short-term waiting. Although some station areas accommodate commercial functions or informal use, there is often significant opportunity to increase both permanent and recurring temporary activities, such as pop-up functions, small-scale events, or seasonal uses.

Disconnect between interior place-making strategies and the design of exterior public spaces

Finally, the case studies reveal a disconnect between interior place-making strategies and the design of exterior public spaces. While station interiors are often carefully curated in terms of materiality, lighting, wayfinding, and atmosphere, these qualities are not consistently extended into the surrounding urban realm. This misalignment weakens the experiential continuity between inside and outside and limits the potential of stations to act as cohesive urban anchors. The opposite is also true – when outside urban qualities are not reflected inside, it minimises the sense of place.



Part 3

Strategic Approaches to Improve Existing Mobility Hubs

“Benches and seating are not just objects;
they are mirrors to our social behavior.
We have seen it time and again,
that where there is seating, there is life.”
(Kathy Madden, Social Life Project)

Urban Acupuncture

Urban acupuncture is a design strategy that focuses on small-scale, targeted interventions in the urban environment to generate broader positive effects. Urban acupuncture initiatives are adaptable and often low-cost interventions, that are relatively easy to implement, as focus is on one aspect that will have a poitive effect, rather than trying to solve everything at once. Interventions in public space don’t need to be extensive to transformative. Small changes can breathe new life into areas, and can make them more liveable and enjoyable.

By implementing thoughtful, incremental interventions, urban acupuncture can improve the functionality, safety, and social quality of existing hubs – either as a precursor to larger urban transformations, or as a practical way to enhance spaces where large-scale redesigns are not feasible.

It is particularly suited for mobility hubs that are already embedded within dense built environments, where opportunities for new construction are limited. Further, short-term interventions allow for experimentation around the hub to see if they have the intended effect. Successful interventions can be made permanent, while less successful initiatives can be modified or removed.

While TOD often focuses on densification, land-use mix, and efficient transport connections, it can sometimes overlook the immediate spatial and social quality experienced by pedestrians and transit users, resulting in overwhelming infrastructure, low human scale, or underutilised spaces. Urban acupuncture can complement traditional TOD strategies by adding a critical human-scale and experiential dimension to mobility hubs.

Targeted interventions – such as mini plazas and parklets, planters, pop-up stores and programming, seating, wayfinding, and temporary markets – enhance the human experience, reduce the perceived scale of large infrastructure, and create inviting public spaces. By emphasizing micro-level improvements, urban acupuncture ensures that TOD projects are also vibrant, socially engaging urban places with strong local identity and perceived safety.

These human-centred, incremental improvements can create ripple effects that better integrate the hub with surrounding neighbourhoods, and promote continuous activity beyond peak commuting hours.



Short-term Interventions

When looking for immediate change, urban acupuncture offers quick, affordable, improvements to public space. These might include adding seating, planting greenery, activating underused areas, adding wayfinding or trimming bushes/trees. Such actions can enhance comfort, accessibility, and social interaction – often within limited budgets and fast implementation. The approach empowers local communities and creates a sense of ownership and engagement in the urban environment.

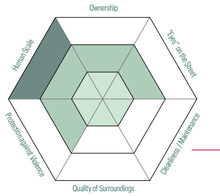
Applying the framework methodology, as described in Part 1, identifies key areas for improving the mobility hub's performance. Targeted acupuncture interventions within these areas can then enhance these aspects, making the hub more attractive to users.

Major challenges require solutions beyond urban acupuncture. However, small-scale interventions can help bridge the gap between immediate problems and long-term investments, while also contributing to a more positive user experience.

The following examples, drawn from the TOD2 studies, can be used as inspiration for short-term urban acupuncture.

After applying the framework methodology, a better understanding of the mobility hub is gained. The interventions in this section are structured by each of the safety categories in the assessment tool. The following examples can be used as inspiration for improving safety in categories where the mobility hub performs less well.

Example of Areas to Improve



Improve cleanliness and maintenance, p. 96

Enhance quality of surroundings through temporary installations, p. 90



Enhance Perceived Ownership

Ownership is perceived in spaces that appear cared for. Ways to encourage local ownership could include community planting, 'little free library' exchanges, student art exhibitions, or murals by local artists.

Even short-term and small installations increase the feeling that spaces are cared for and monitored.

Small pop-up markets in empty plazas, in front of the station or in forecourts can immediately increase activity, social oversight, and a sense of ownership. On an even smaller scale a set of chairs, personalised signs, or personalised décor, add personality and express ownership of space.



The small pop-up market at Nanjing University features stalls that all have their own look, each decorated and organised in different ways, showing personality and care.

Food and souvenirs invite people to slow down, peruse, have a chat and maybe make a purchase. The small market creates community and interest.



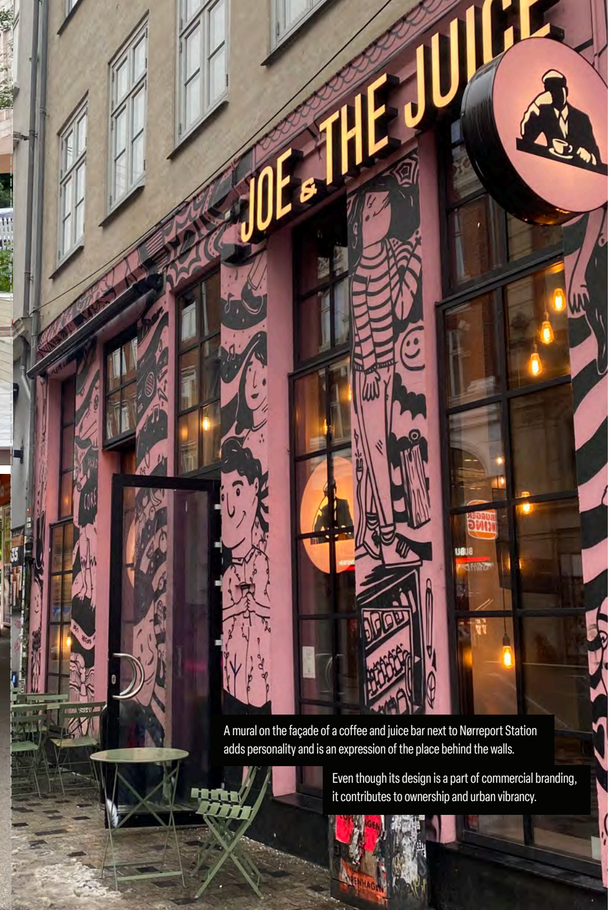
Small personal decorations outside a ticket office in China add a dash of personality,

and hint at the presence of other people and their sense of ownership over a space.



The handmade sign at a Lyngby coffee shop changes every day, with a sweet or funny message on it, putting a smile on people's faces when they walk to or from the station.

It gives the feeling of a small personalised space, that someone has taken ownership of.



A mural on the façade of a coffee and juice bar next to Nørreport Station adds personality and is an expression of the place behind the walls.

Even though its design is a part of commercial branding, it contributes to ownership and urban vibrancy.



A painted bench in Aarhus gives a sense of ownership and character to an otherwise neutral space.



A pop-up booth outside Roskilde Station invites community participation and room for generating feedback and ideas.

Support More Eyes on the Street and Increase Natural Surveillance

Improving security through increasing eyes on the street can be done by both eliminating obstacles that hinder the potential to see and be seen, implementing measures that draw more people to an area, and concentrating flows of people in less dense areas.

The amount of eyes on the street fluctuates throughout the day. If most businesses close early in the evening while transit services continue, spaces can feel empty and unsupervised. Temporary commercial uses, such as permitted food stalls or food trucks, can help extend activity into off-hours.

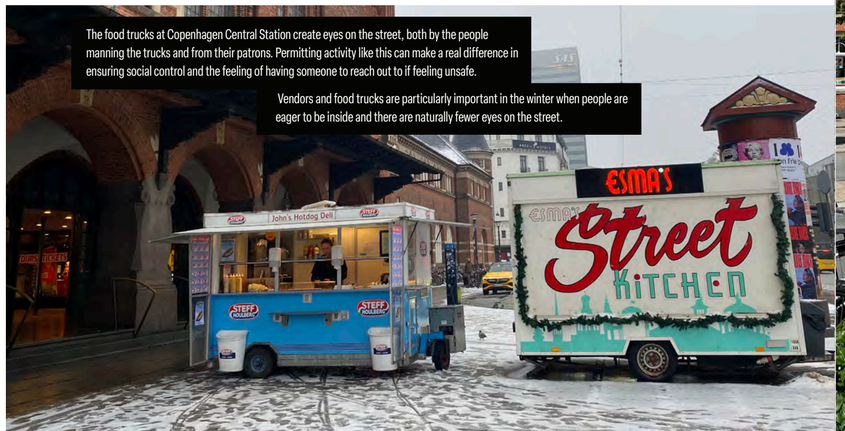
During the winter, less street life naturally occurs outside, due to cold weather conditions. Food trucks can help bring life and more natural surveillance into the nearby areas around the mobility hub.

In less-populated communities where extended business hours may be difficult to support, unstaffed services such as parcel lockers, postal boxes, storage lockers, pant return, and high-quality vending or essential goods machines disperse amenities across the hub. This helps spread movement and increase surveillance coverage.



When placed in active, visible areas, vending machines give opportunity for short pauses, in contrast to travelers hurrying through to their next destination.

Albeit brief, it contributes to lingering and a shift from the faster pace of people passing through.



The food trucks at Copenhagen Central Station create eyes on the street, both by the people manning the trucks and from their patrons. Permitting activity like this can make a real difference in ensuring social control and the feeling of having someone to reach out to if feeling unsafe.

Vendors and food trucks are particularly important in the winter when people are eager to be inside and there are naturally fewer eyes on the street.



Trimmed bushes do more than look tidy – they create clear sightlines that make a space feel open, safe, and welcoming.

When bike parking is placed in direct view of the entrance, it also benefits from this visibility. People feel confident leaving their bikes where they can be seen, and passersby naturally observe the area, adding informal social control.



Throughout the week of graduation, Zhangfuyuan Station creates a pop-up stall with hand-drawn bookmarks, gifted by the metro company, for the students.

The bookmarks are beautifully made, and a nice addition to an otherwise sterile-looking environment.

Enhance Quality of Surroundings through Temporary Installations

Adding more benches and other public seating options impacts the perception of the hub as a space, expanding corners and sidewalk space where possible. Including variations further increases that, for example playing with seating arrangements to facilitate social interactions, or permitting flexible, moveable seating to give people a sense of control over their environment.

Greenery and landscaping are often one of the most complimented aspects of public space in interviews. Interventions such as low planters and well-maintained trees can dramatically improve the appearance, and in the case of shade trees – comfort, of a station or hub.

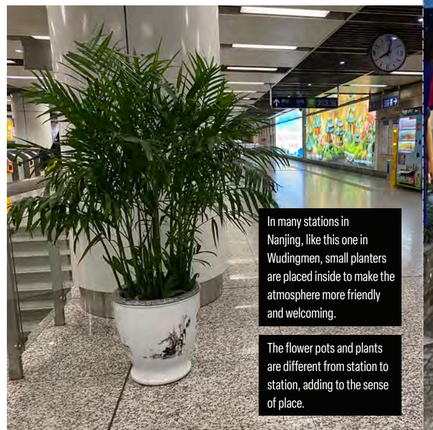
In addition to greenery, temporary art installations and community events like farmers' and artists' markets, or a pop-up stall, contribute to local identity and create a more inviting and vibrant public environment.



Heart-shaped seating on the plaza between Roskilde Station and the primary pedestrian street. It adds personality to the square and helps expand the TOD2 amoeba in the direction of the walking street.



"Show consideration" stamps on the road are a visual reminder to slow down, and can be a precursor to more permanent shared space designs or closed streets.



In many stations in Nanjing, like this one in Wudingmen, small planters are placed inside to make the atmosphere more friendly and welcoming.

The flower pots and plants are different from station to station, adding to the sense of place.



Adding plants and cosy lighting is an easy yet powerful way to enhance the visual appeal of any area.

Lush greenery, colourful flowers and lighting immediately improve the surroundings, making the space feel cared for and inviting.



Well-placed benches and trees invite people to pause and enjoy the environment - adding life, encouraging interaction, and transforming ordinary spaces into more vibrant places.

Improve Protection against Violence and Reduce Potential for Conflict

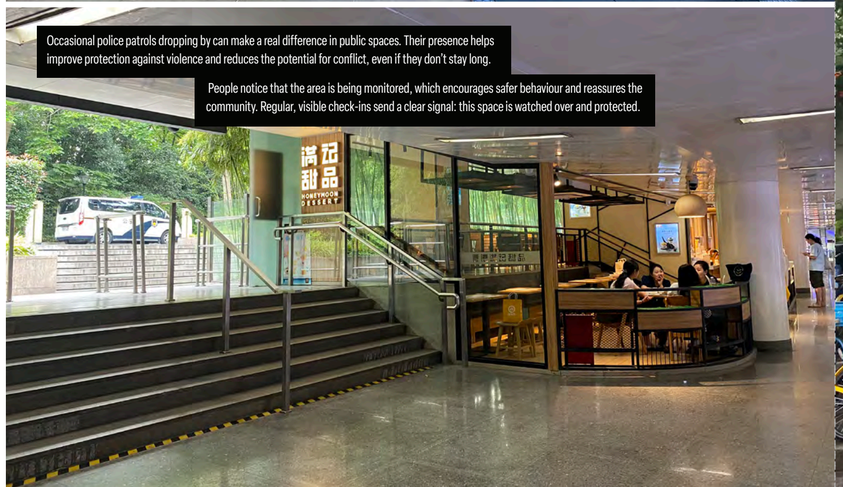
Temporary interventions can enhance safety and reduce conflict without major construction. Clearly marked pedestrian pathways and crossings around bicycle and scooter parking can reduce bottlenecks. Temporary bollards or planters can help guide flow. Modular furniture can also be used to more subtly guide pedestrians and restrict vehicles.

Where budget permits, having a guard or officer present expands the protection inherent in the built environment. This is widely used in China, where personnel and guards are found at all stations. Simply having personnel present, such as people manning a ticket office or conducting ticket control, can help enhance the feeling of safety, giving a sense of order and compliance with the rules. They serve the additional purpose of being present as an official person to turn to if conflict or criminal behaviour occurs.



Planters at Nørreport create an attractive barrier between the plaza and carriageway, protecting pedestrians from stray cars. The planters, especially in summer, attract attention and divide the space visually.

Moreover it divides the cycle path and the pedestrian area, helping to prevent pedestrians from stepping out in front of the bikes without noticing, and nudging people off their bike to walk it across the plaza.



Occasional police patrols dropping by can make a real difference in public spaces. Their presence helps improve protection against violence and reduces the potential for conflict, even if they don't stay long.

People notice that the area is being monitored, which encourages safer behaviour and reassures the community. Regular, visible check-ins send a clear signal: this space is watched over and protected.



Strategically placed bike parking can act as a protective barrier between a busy road and pedestrian areas.

By physically separating traffic from the sidewalk or public space, it reduces the risk of accidents and creates a safer environment for people walking nearby. Here, bike parking does double duty: providing convenience while enhancing safety and protection.

Create Human Scale and Enhance Comfort

Urban acupuncture can help reduce the perceived scale of plazas, forecourts or big infrastructure. Targeted implementations can make large station areas, nearby areas surrounded by huge infrastructure or high buildings, feel more approachable and comfortable.

Planters and street trees in movable pots can help define space and add visual interest, while low strung lights create a sense of being in a smaller, mor humainzed space, as well as in a welcoming and personal atmosphere.

When the mobility hub is located in an area that feels out of human scale, with vast spaces next to the entrance or without visible contact between the defferent mass modes of public transportaton, clear, legible pathways, well-lit desire lines, and painted sidewalk markings can help guide pedestrians. This is particularly helpful when modes aren't visible from one another.



Next to Fochengxilu Station are two major roads, creating substantial barriers for the urban areas the station is serving. The intersection of the two roads is very large, creating a lot of waiting for the pedestrians attempting to cross.

To protect them against the elements, big umbrellas have been installed. They also help bring down scale, making the crossing seem a bit more friendly.

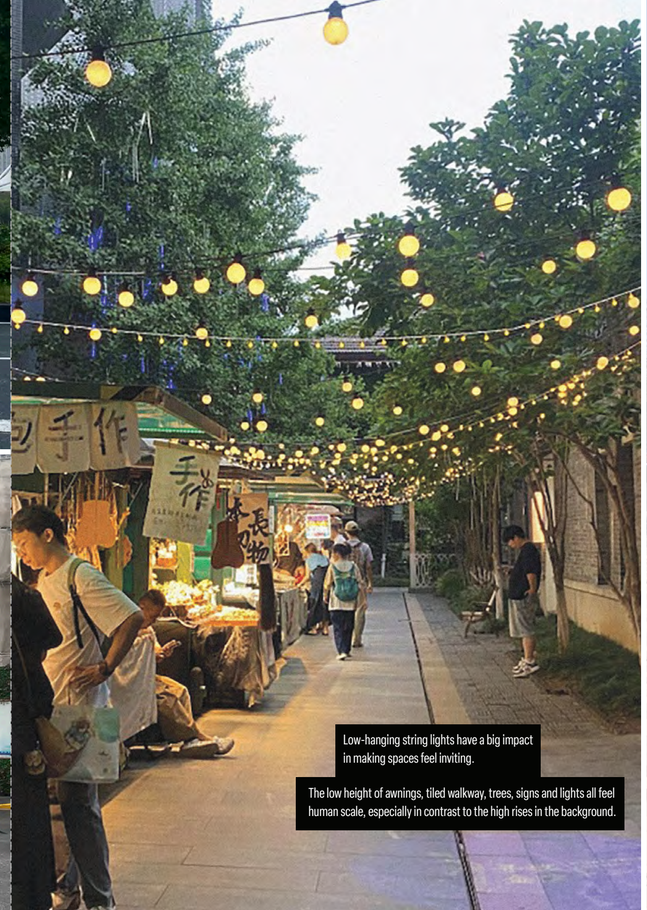


Colourful, easy to follow painted lines, like this one at Ishøj Station, increase confidence in wayfinding and modefinding.



This construction fence near Xiaonanmen mobility hub is wrapped in fake greenery, softening the hard materials of surrounding infrastructure and construction.

It brings down the scale and adds a more human touch to an otherwise unfriendly environment.



Low-hanging string lights have a big impact in making spaces feel inviting.

The low height of awnings, tiled walkway, trees, signs and lights all feel human scale, especially in contrast to the high rises in the background.



Benches create a small room within the mobility hub and a place to rest at Greve Station.

Cleanliness and Maintenance

A mobility hub shines when cleanliness and thoughtful maintenance are embedded into its design. Personnel frequently tidying and cleaning is essential to maintaining a nice environment.

Strategically placed trash and recycling bins serve as direct, visible cues for travelers, ensuring the space remains inviting. Where smoking is permitted, cigarette disposal should be included as well, to prevent cigarettes being discarded next to the trash can.

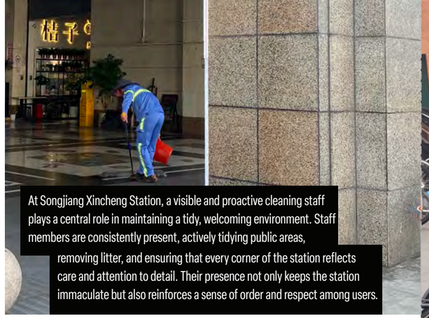
Dockless bikes and scooters often face challenges with improper parking, which can disrupt the hub's flow and bring negative attention to micromobility. For a low-cost solution, use painted outlines to designate parking zones and maintain clear pathways and overall functionality. Temporary bike racks or signs nudging the users where to park their bike are also good solutions to keep pathways free of bike clutter and maintain a sense of order around the mobility hub.

Importantly, and often undervalued with short-term installations, is an operations and maintenance plan for any new interventions. A lack of oversight here often results in installations that quickly look run down, and negative feedback from the community.



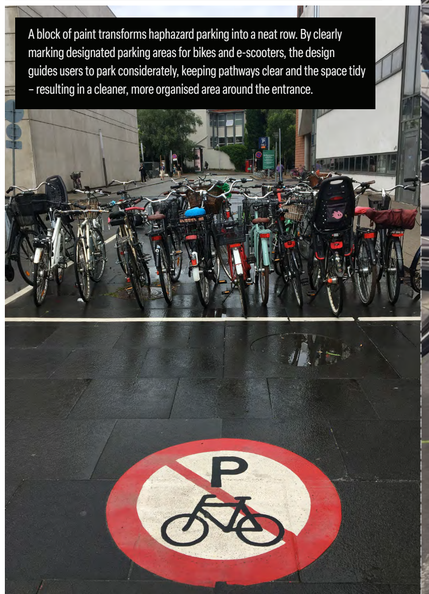
An abundance of well-placed, highly visible trash bins at Nørreport Station nudge people to keep the area clean. Bins equipped with bottle deposit holders on the exterior are a small detail,

and – aside from enabling sustainable practices – they also signal a dignified and inclusive solution for people who collect bottles.

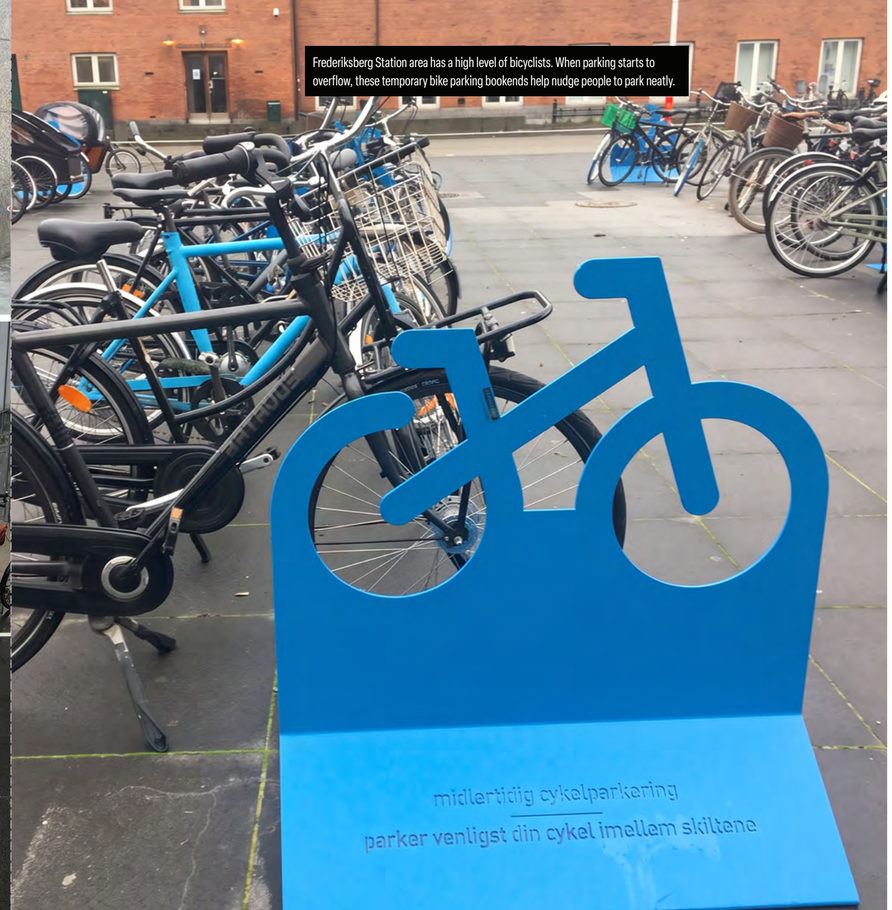


At Songjiang Xincheng Station, a visible and proactive cleaning staff plays a central role in maintaining a tidy, welcoming environment. Staff members are consistently present, actively tidying public areas,

removing litter, and ensuring that every corner of the station reflects care and attention to detail. Their presence not only keeps the station immaculate but also reinforces a sense of order and respect among users.



A block of paint transforms haphazard parking into a neat row. By clearly marking designated parking areas for bikes and e-scooters, the design guides users to park considerately, keeping pathways clear and the space tidy – resulting in a cleaner, more organised area around the entrance.



Frederiksberg Station area has a high level of bicyclists. When parking starts to overflow, these temporary bike parking bookends help nudge people to park neatly.



Dual-purpose outdoor furniture: a bench in summer, can be used as a salt container during winter if made in wood, or as terror prevention if made in a sturdier material.

“Most trips of the day are care trips, so why are mobility systems still planned around the independent elite traveler (a white male)? We need to shift the focus from ‘smart cities’ to the caring city. Mobility hubs should support this.” (Tanja Joelsson)

Long-term Impact



Long-term Impact

Over time, small interventions can catalyse larger systemic changes.

A well-placed intervention may spark renewed interest in an area, influence planning decisions, or shift perceptions of public space. Urban acupuncture can gradually improve the human experience of cities over time by embedding care, adaptability, and attention to place into everyday urban development.

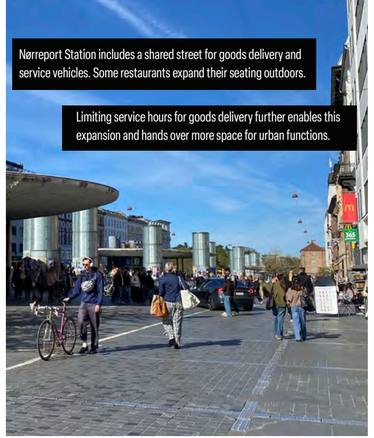
The following examples are of long-term solutions that can be achieved with a bit more time, planning and investment. The photos come from stations in the Section 2 Case Studies, as well as stations from other aspects of the TOD2 study.

Expanding Ownership

Public space with clear ownership cues also sets the tone for the character of the surrounding community. It can make destinations feel closer as the hub is already a visual expression of the identity of the surrounding community.

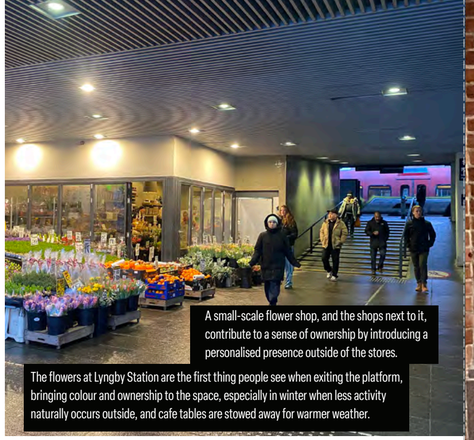
Economic incentives can also encourage small and local business owners to make long-term investments in the expansion and personalisation of their space, reinforcing identity and sense of ownership.

Building engagement around short-term interventions and previous investments provides a unique opportunity to receive community feedback on what they liked, or didn't like, and adapting long-term interventions based on that input. This approach helps residents feel ownership over their community, and the space further reflects a shared identity.



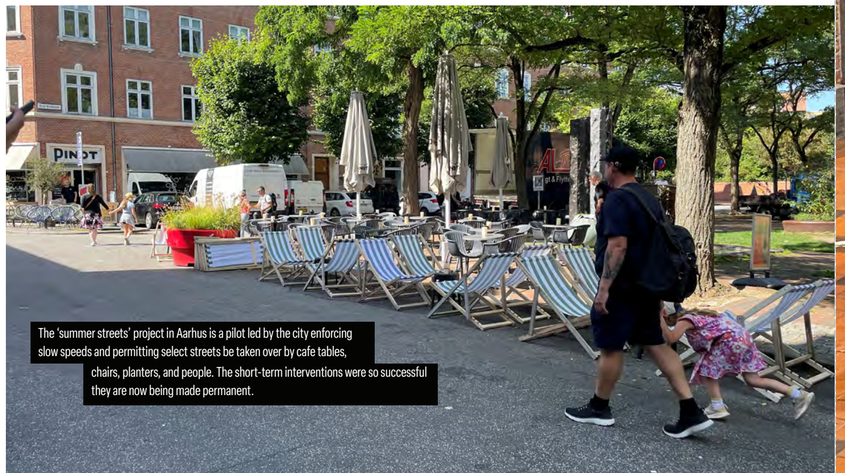
Nørreport Station includes a shared street for goods delivery and service vehicles. Some restaurants expand their seating outdoors.

Limiting service hours for goods delivery further enables this expansion and hands over more space for urban functions.



A small-scale flower shop, and the shops next to it, contribute to a sense of ownership by introducing a personalised presence outside of the stores.

The flowers at Lyngby Station are the first thing people see when exiting the platform, bringing colour and ownership to the space, especially in winter when less activity naturally occurs outside, and cafe tables are stowed away for warmer weather.



The 'summer streets' project in Aarhus is a pilot led by the city enforcing slow speeds and permitting select streets be taken over by cafe tables, chairs, planters, and people. The short-term interventions were so successful they are now being made permanent.



At Copenhagen Central Station, the model train in its glass display has been a small but cherished feature since 1967.

Visitors can light it up and set the train in motion, creating daily interaction and a shared experience. Its enduring presence and playful accessibility contribute to the station's identity.

Eyes on the Street and Social Control

To ensure more activity and people in the area, densifying urban functions and services is key.

Promoting extended service hours can create overlap between commuters and local users. For instance, supermarkets that are open late combined with bakeries that open early, attract more steady use of the mobility hub and informal surveillance beyond peak travel hours.

Similarly, economic development around stations should include a good mix of shops, cafés, services, and community spaces that supports activity, and thereby perception of safety, throughout the day and into the evening.

Strengthening clear sightlines between station exits and surrounding streets discourages criminal behaviour by increasing natural surveillance and integrates stations with the community.

Civic or institutional uses, such as police stations, libraries or municipal offices, further reinforce continuous eyes on the street and support a safer station environment.

Planning for low and mid-rise buildings (up to 5 storeys) near the exits increases visibility from surrounding windows, and thereby enhances the perception of surveillance and positive social control.



Integrating small places to eat just outside the mobility hub adds to the station's everyday activity. The ownership structure, particularly the close connection between developer and station in China, often results in more commercial uses being incorporated directly into the station, including small shops and restaurants.

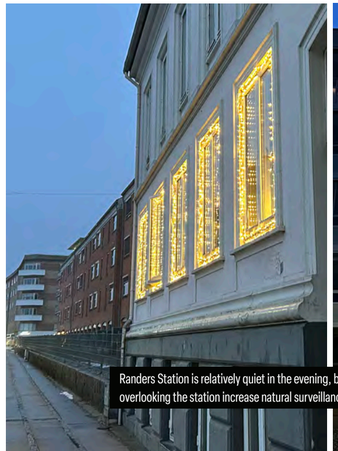


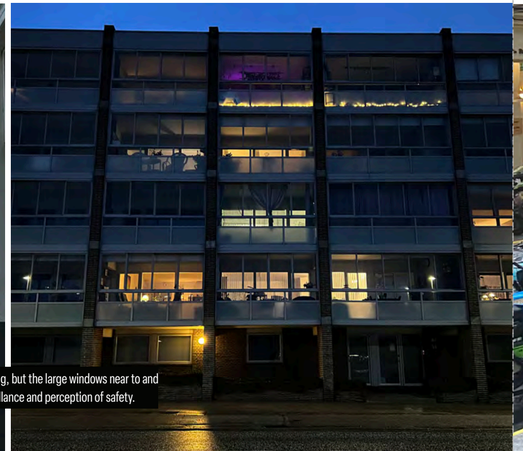
A library at Xinjiekou Station in Nanjing contributes to a diversity of functions within the area.

Cultural and governmental institutions help support a steady stream of people throughout the day.

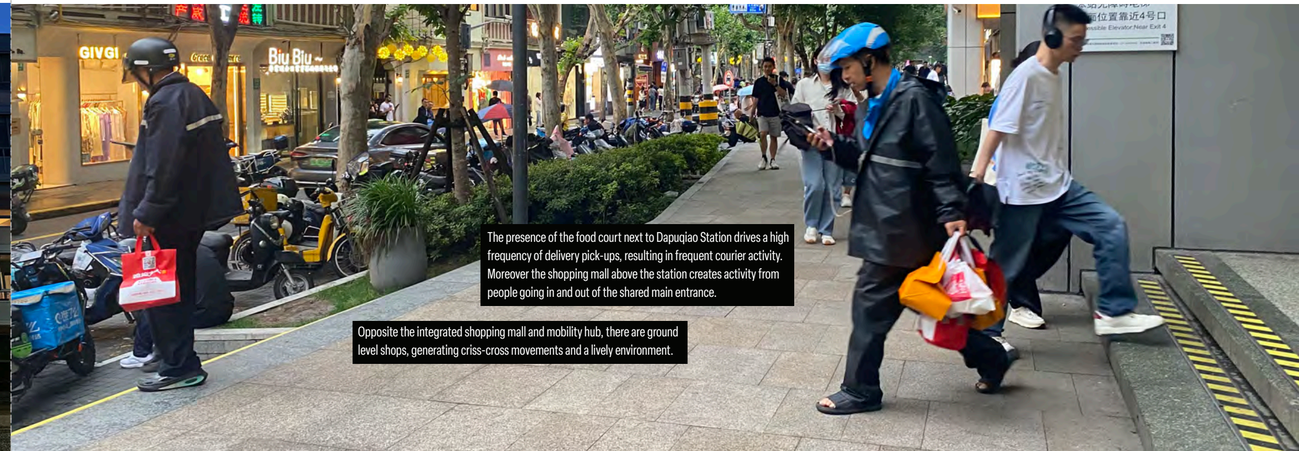


Benches and tables in front of a bakery at Copenhagen Central Station send a signal that the space is one for people to use, even when no one is sitting there.





Randers Station is relatively quiet in the evening, but the large windows near to and overlooking the station increase natural surveillance and perception of safety.



The presence of the food court next to Dapuqiao Station drives a high frequency of delivery pick-ups, resulting in frequent courier activity. Moreover the shopping mall above the station creates activity from people going in and out of the shared main entrance.

Opposite the integrated shopping mall and mobility hub, there are ground level shops, generating criss-cross movements and a lively environment.

Improving Cleanliness and Maintenance

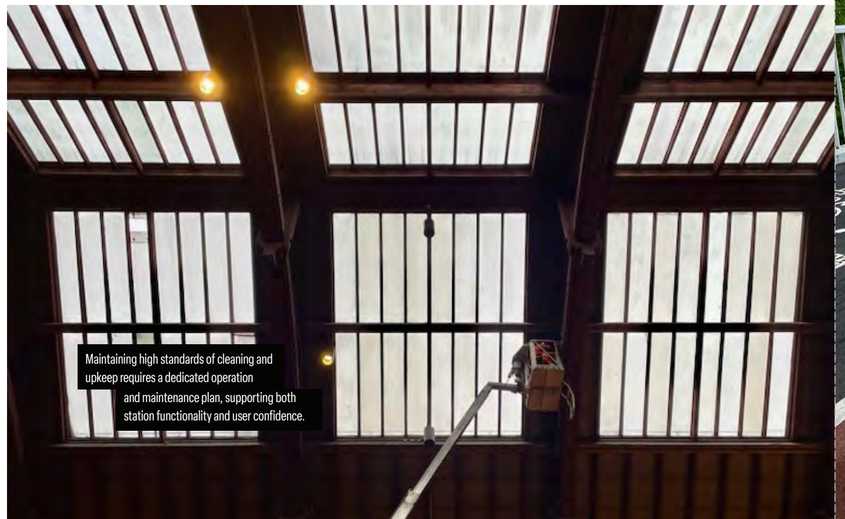
A clean, well-maintained station is the foundation of a welcoming and functional public space. By selecting durable, easy-to-clean materials for urban furniture and graffiti-resistant surfaces, the environment remains attractive with less effort. Low-maintenance landscaping further reduces upkeep while preserving the area's aesthetic appeal.

To sustain cleanliness and maintenance standards, a dedicated station coordinator, supported by a maintenance plan, can oversee daily upkeep, coordinate with cleaning teams, and engage with users to address issues before they escalate.

In collaboration with micromobility providers, organised parking zones for bikes and scooters, complete with clear signage and user-friendly infrastructure will also provide a sense of tidiness and a well-kept station. Regular maintenance agreements with these companies will ensure that vehicles are kept in good condition and parked tidily, minimising clutter and enhancing the station's overall orderliness. For private users, intuitive layouts, visual cues, and designated, high quality, racks will encourage orderly parking, reducing clutter and creating a more pleasant environment.



Dedicated cargo bike parking in front of Roskilde Station. The larger spaces leave more room between the bikes and the sidewalk - making it easier for cyclists to maneuvre their heavier bikes and keeping sidewalks cleared for pedestrians and maintenance crews.



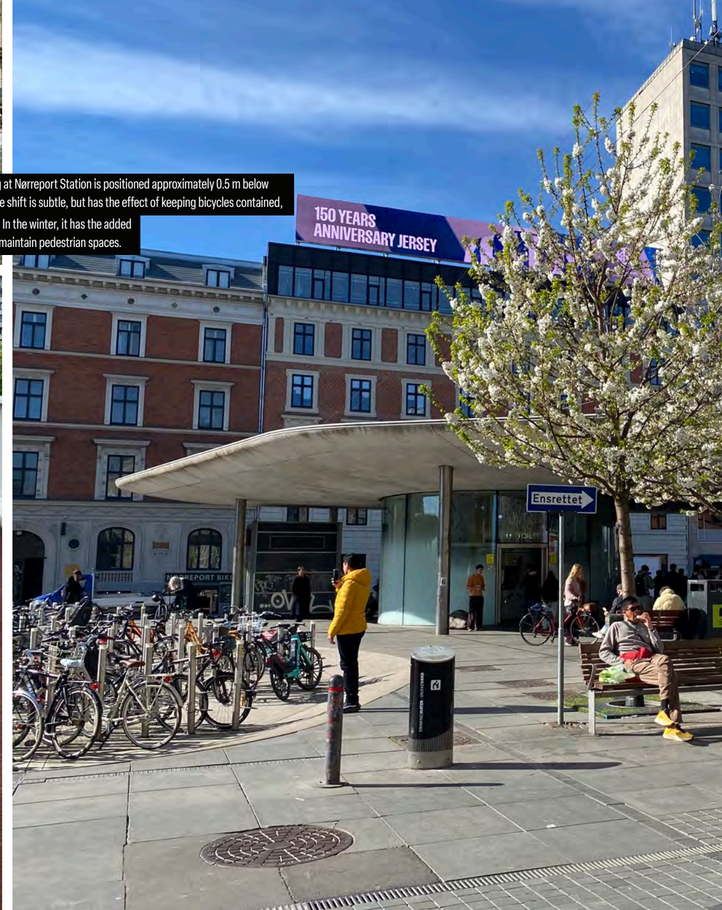
Maintaining high standards of cleaning and upkeep requires a dedicated operation and maintenance plan, supporting both station functionality and user confidence.



Bicycle parking at Nørreport Station is positioned approximately 0.5 m below street level. The shift is subtle, but has the effect of keeping bicycles contained, and the plaza clear of bikes. In the winter, it has the added value of making it easier to maintain pedestrian spaces.



Well-maintained pathways and high-quality surfaces add to the perception of being in a cared-for environment.

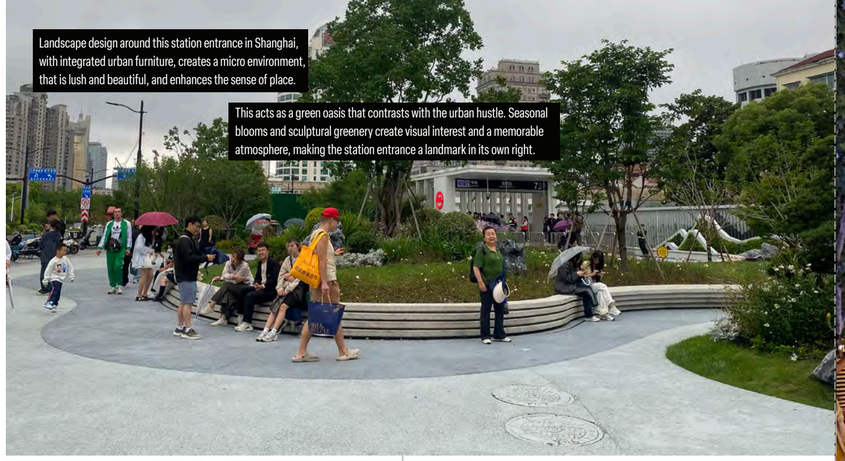


Create Strong Place Identity by Improving the Quality of the Surroundings

Permanent design interventions can be used to expand on the unique character of the community, and impress a sense of place upon arrival. Mosaics, art installations, and lighting as artwork, create visual anchors and introduce visitors to the local identity.

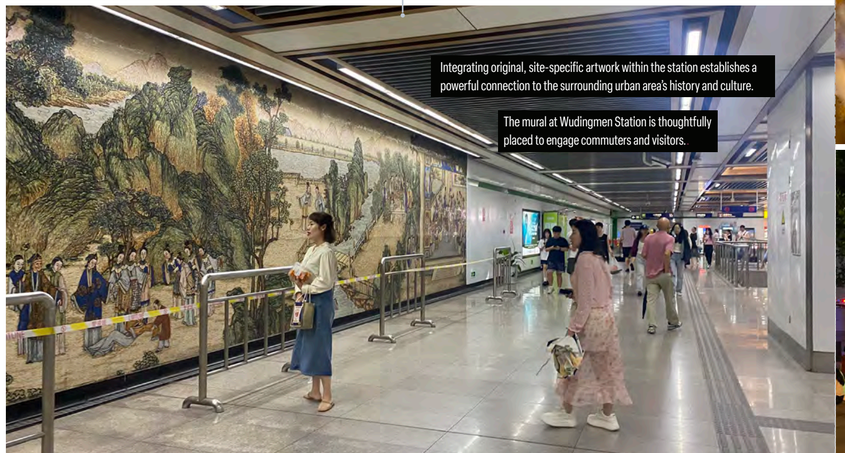
Native plants used in landscaping, and design elements that reflect local culture or history, further strengthen the connection between the hub and its community.

Re-wilding and depaving strategies that replace hard surfaces with permeable materials, rain gardens, or planted areas support the environment and soften paved spaces – shifting the emphasis from traffic and transport to public space.



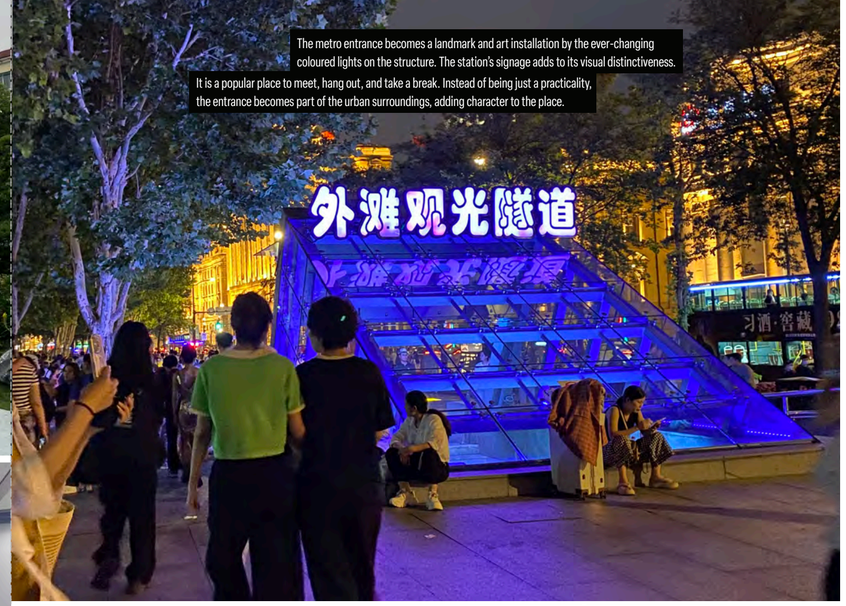
Landscape design around this station entrance in Shanghai, with integrated urban furniture, creates a micro environment, that is lush and beautiful, and enhances the sense of place.

This acts as a green oasis that contrasts with the urban hustle. Seasonal blooms and sculptural greenery create visual interest and a memorable atmosphere, making the station entrance a landmark in its own right.



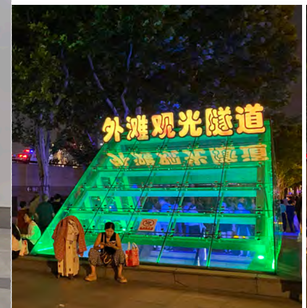
Integrating original, site-specific artwork within the station establishes a powerful connection to the surrounding urban area's history and culture.

The mural at Wudingmen Station is thoughtfully placed to engage commuters and visitors.



The metro entrance becomes a landmark and art installation by the ever-changing coloured lights on the structure. The station's signage adds to its visual distinctiveness.

It is a popular place to meet, hang out, and take a break. Instead of being just a practicality, the entrance becomes part of the urban surroundings, adding character to the place.









The red Arken Walk lamps in Ishøj create wayfinding landmarks.

These visual cues connect the station with key destinations, like the Arken Museum of Contemporary Art.

Enhance Protection against Violence

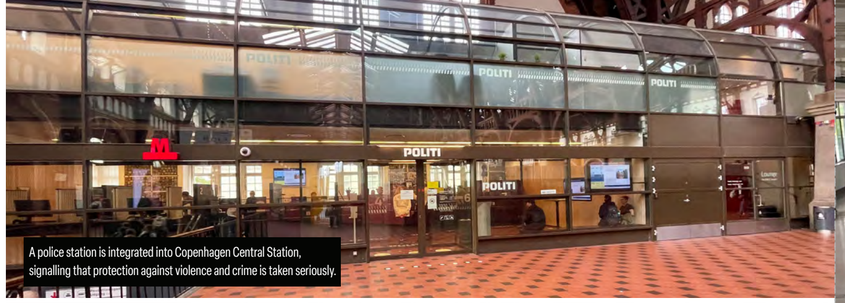
Long-term interventions to enhance protection against violence focus on designing station areas to deter criminal activity and enhance public safety. Removing visual obstructions, inside and outside, helps eliminate hiding spots and dark corners. Improving visibility makes it harder for criminals to operate undetected.

Strategic lighting placed at entrances and key routes improves nighttime visibility for pedestrians, and signage indicating camera use reinforces awareness of surveillance.

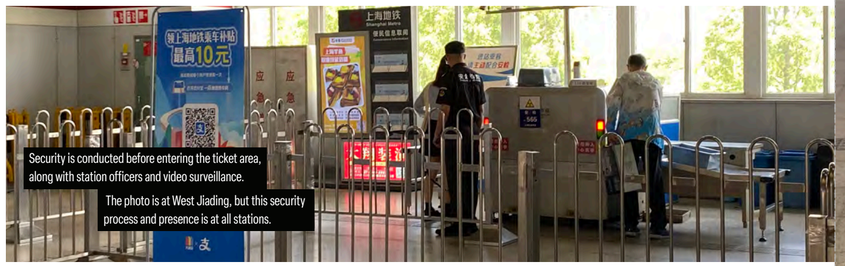
Visible video cameras can also have an effect on protection against violence and the perception of safety, if it's perceived to be used in the event of an incident (if the cultural narrative is that the footage is not actively used, it might not have the intended effect). Comprehensive systems with emergency call buttons further enhance security and enable rapid response to incidents.

Permanent security measures, such as staffed service points, on-site police or security personnel, provide a strong deterrent against crime.

Strategic placement of heavy statues, concrete furniture, poles and other physical barriers can prevent unauthorised vehicle access to pedestrian areas, reducing the risk of terror-related crimes.

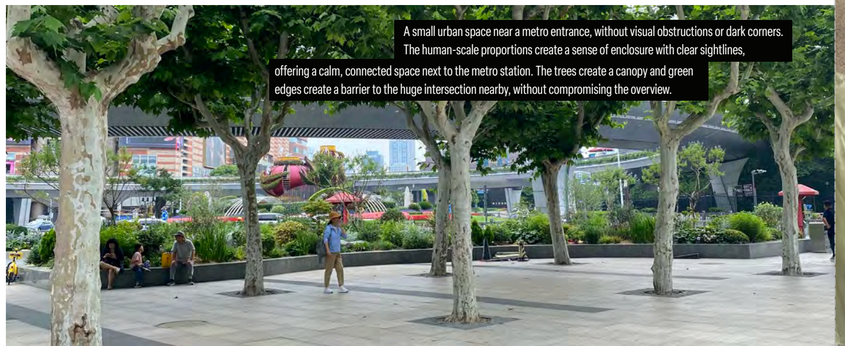


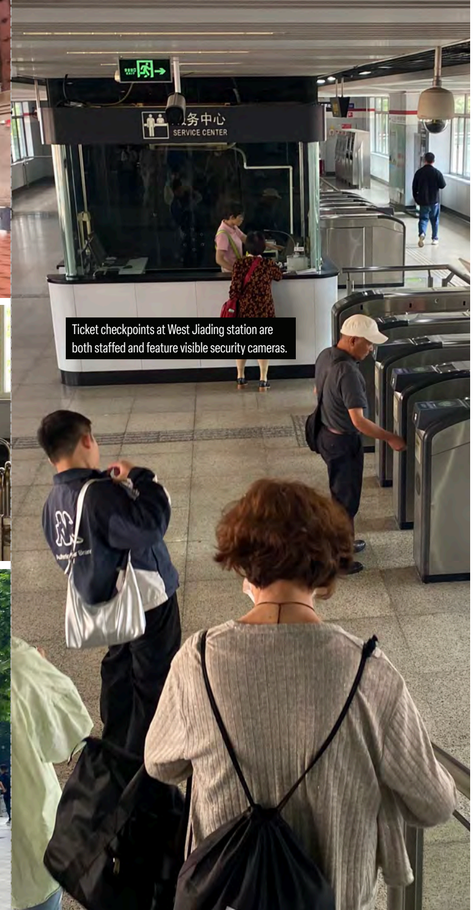
A police station is integrated into Copenhagen Central Station, signalling that protection against violence and crime is taken seriously.



Security is conducted before entering the ticket area, along with station officers and video surveillance.

The photo is at West Jiading, but this security process and presence is at all stations.


A small urban space near a metro entrance, without visual obstructions or dark corners. The human-scale proportions create a sense of enclosure with clear sightlines, offering a calm, connected space next to the metro station. The trees create a canopy and green edges create a barrier to the huge intersection nearby, without compromising the overview.



Ticket checkpoints at West Jiading station are both staffed and feature visible security cameras.



Security cameras are a common feature of Chinese stations.

In interviews at Danish stations, security cameras and personnel are noted as providing an increased feeling of safety.

Humanise the Scale around Mobility Hubs

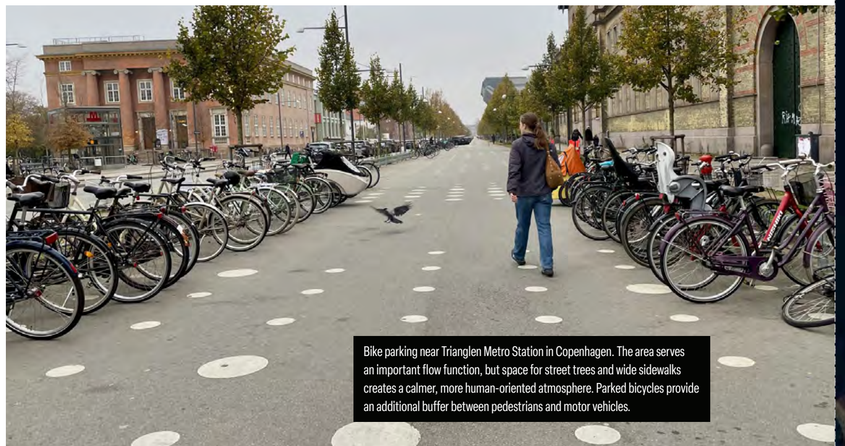
For long-term interventions street trees, street lighting, and narrowed roads turn oversized spaces around mobility hubs into approachable, human-scale zones. Integrating perimeter housing up to five storeys, creating small "rooms" within a plaza, and making regulations that activate ground floors, ensures that wide roads and large buildings don't dominate the pedestrian experience.

Big parking lots next to a station can have a profound effect on the perception of safety, as they are percieved as dead spaces with large distances to the nearby buildings. Placing parking underground can create opportunities for urban programming and densifying the nearby surroundings – adding a more welcoming environment around the mobility hub. Access management, such as filtering or closing nearby streets to through traffic, further reinforces a human-scale environment. Hub areas become an extension of the public realm, and these tactical closures strengthen the connection to the urban core.

Large, empty forecourts can be transformed through a combination of greenery, seating clusters, kiosks, and clearly defined pedestrian/bike pathways, creating layered and inviting spaces. Ultimately, the success of a mobility hub lies not in the scale of its infrastructure, but in its ability to make it feel human.



The one-way road between the residential area and the main entrance filters through traffic, hence it is possible for buses, taxis, service trucks and kiss-and-ride traffic to get close to Songjiang Xincheng Station without the infrastructure dominating the surroundings, making it easy for people to cross. Small trees break down the scale of the big plaza. The 4-5 storey buildings next to the station also enhance the feeling of human scale.



Bike parking near Trianglen Metro Station in Copenhagen. The area serves an important flow function, but space for street trees and wide sidewalks creates a calmer, more human-oriented atmosphere. Parked bicycles provide an additional buffer between pedestrians and motor vehicles.



A bicycle street has been carved out of a plaza near Copenhagen Central Station.

The pathway, benches, trees, and quiet atmosphere bring down the scale in this otherwise busy and relatively high-traffic area.



“The question is not ‘can you live without your car?’
but ‘what would a world where people did
not need to own their own cars look like?’ “
(Jillian Anable)

Bibliography

Barnett, Erica C. 2013. "*Density Opponents Pushing Back Against Pro-Transit Strategy*." Seattle Met, March 13, 2013. https://www.seattlemet.com/news-and-city-life/2013/03/one-question-for-the-head-of-the-planning-commission-march-2013

Basaran, Gulin G. 2024. *Passenger Behaviour, Terminal Design and Urban Surroundings for Attractive Public Transport.* Technical University of Denmark.

Bertolini, Luca. 2025. *Should We Rethink TOD Beyond Mobility?* Slide 8, pp. 103–104. PDF file. TOD2: The International Conference on Next-Generation Transit-Oriented Development. NIRAS. https://www.niras.com/media/qusnbm33/tod2-presentations.pdf.

Calthorpe, Peter. 1993. *The Next American Metropolis: Ecology, Community, and the American Dream*. New York: Princeton Architectural Press.

Crowe, Timothy D., and Fennelly, Lawrence J., eds. 2013. Crime Prevention Through Environmental Design, 3rd edition. Oxford: Butterworth-Heinemann. https://doi.org/10.1016/B978-0-12-411635-1.00001-2.

Cullen, Gordon. 1961. *The Concise Townscape*. London: Architectural Press.

Currie, Graham. 2025. *Transit Oriented Development, Development Oriented Transit & Movement and Place*. Slide 6, p. 6. PDF file. TOD2: The International Conference on Next-Generation Transit-Oriented Development. NIRAS. https://www.niras.com/media/qusnbm33/tod2-presentations.pdf.

Ding Wowo, Yong Chen, Ziyu Tong, Yu Ye, Lian Tang, Shanshan Shi, Youpei Hu, Yifan Li, Chenhao Duan, Guanlong Chu, Zhichao Yu, Hanting Yu, and Huali Zhang. 2026. *Technical Guidelines for Public Transport Oriented Urban Renewal.* Transit-Oriented Development 2 (TOD2). Research Findings Report.

Gehl, Jan. 2006. *Life Between Buildings - using public space*. Copenhagen: The Danish Architectural Press. 6th edition.

Nielsen, Tom. 2023. *Byen Danmark*. Copenhagen: The Danish Architectural Press.

Olszewska-Guizzo, Agnieszka, et al. 2022. *Features of urban green spaces associated with positive emotions, mindfulness and relaxation*: Scientific Reports volume 12, Article number: 20695. https://www.nature.com/articles/s41598-022-24637-0

Stojanovski, Todor. 2026. *Transit-Oriented Development 2 (TOD2) – an Urban Design (UD) handbook for Public Transport (PuT), mobility hubs and sustainable mobility.* Draft, June 2026. KTH Royal Institute of Technology. Unpublished.

Strandbygaard, Sofie Kirt. 2016. *Lokalmiljøet omkring stationen: Sammenhængen mellem oplevet tryghed og brugen af kollektiv transport*. Aalborg: Technical University of Denmark. https://backend.orbit.dtu.dk/ws/portalfiles/portal/127954025/Trafikdage_Aalborg_Udvidet_resume_Lokalmilj_et_omkring_stationen_Sammenh_ngen_mellem_oplevet_tryghed_og_brugen_af_kollektiv_transport_1.pdf.



TOD2: A Framework for Analysing Mobility Hubs from the User Experience
August 2026

Authors:
Julie Majlund Buschardt & Mary Elbech

The theory, case studies, and strategic approaches in this report were developed as part of the Transit-Oriented Development 2 (TOD2) research project

Completed by NIRAS for Innovation Fund Denmark and the NIRAS Foundation

Photos: by NIRAS, unless stated otherwise
Graphic design: by NIRAS

A special thanks to all of the project collaborators, including:

- Our project partners at KTH Royal Institute of Technology, Nanjing University, and Tongji University
- All of our colleagues at NIRAS who have supported the project
- The Danish advisory board communities of Aalborg, Frederiksberg, Ishøj, Randers, and Roskilde
- All of the international speakers and penelists who participated in the TOD2 Conference in September 2025: Jillian Anable, Luca Bertolini, Benjamin Büttner, Robert Cervero, Graham Currie, Wowo Ding, Torbjörn Einarsson, Maria Håkansson, Tanja Joelsson, Steven Jones, Corinne Mulley, Otto Anker Nielsen, and Ivor Samuels