Frederiksberg

TOD2 Perceptual Study of Mobility Hubs in Denmark

Analysing urban morphology and design elements on experiential qualities of TODs and mobility hubs in a Danish context



Frederiksberg



Randers



Ishøj

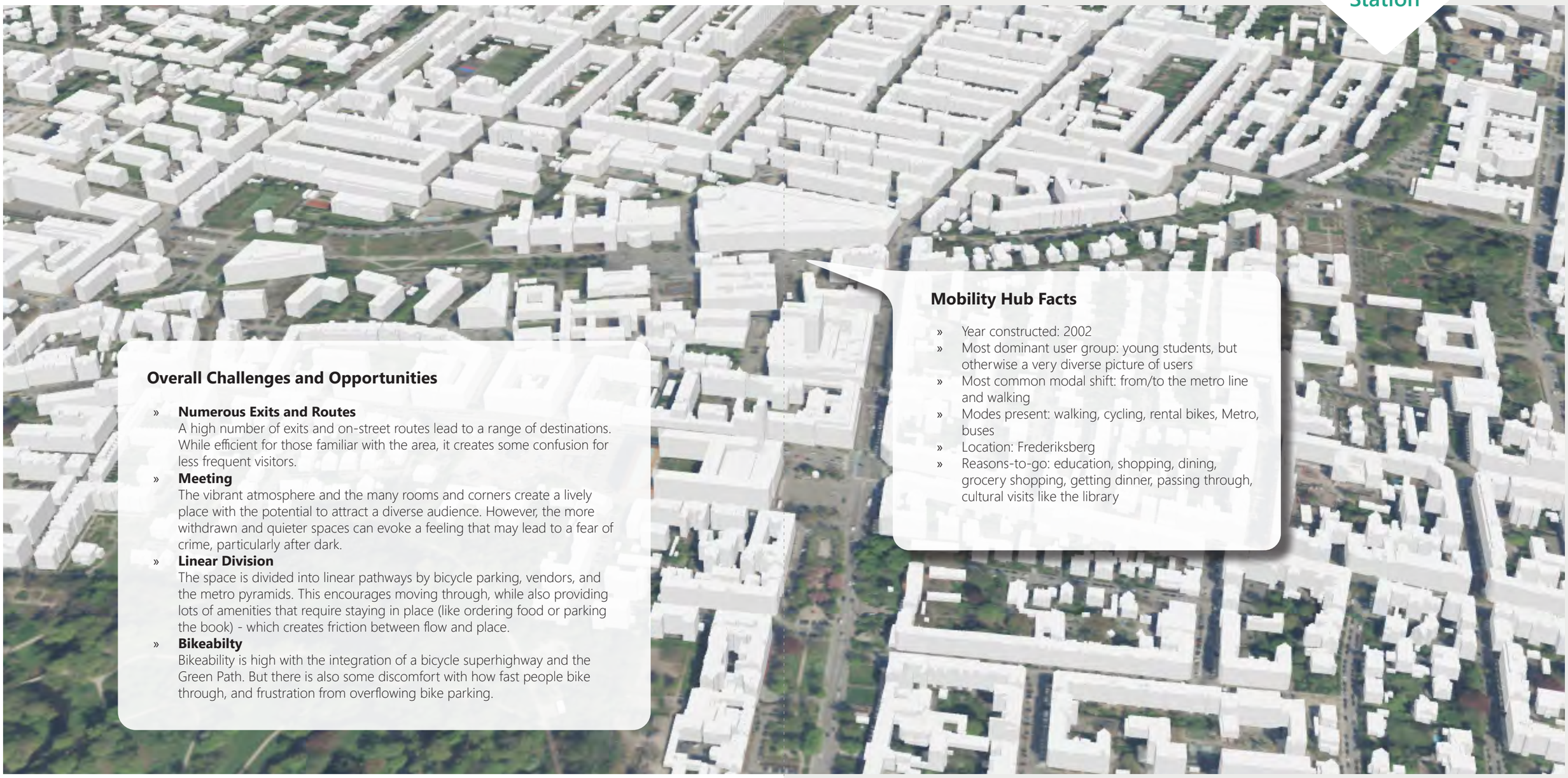


Roskilde



Aalborg

Frederiksberg Metro Station



Overall Challenges and Opportunities

» **Numerous Exits and Routes**
A high number of exits and on-street routes lead to a range of destinations. While efficient for those familiar with the area, it creates some confusion for less frequent visitors.

» **Meeting**
The vibrant atmosphere and the many rooms and corners create a lively place with the potential to attract a diverse audience. However, the more withdrawn and quieter spaces can evoke a feeling that may lead to a fear of crime, particularly after dark.

» **Linear Division**
The space is divided into linear pathways by bicycle parking, vendors, and the metro pyramids. This encourages moving through, while also providing lots of amenities that require staying in place (like ordering food or parking the book) - which creates friction between flow and place.

» **Bikeabilty**
Bikeability is high with the integration of a bicycle superhighway and the Green Path. But there is also some discomfort with how fast people bike through, and frustration from overflowing bike parking.

Mobility Hub Facts

» Year constructed: 2002
» Most dominant user group: young students, but otherwise a very diverse picture of users
» Most common modal shift: from/to the metro line and walking
» Modes present: walking, cycling, rental bikes, Metro, buses
» Location: Frederiksberg
» Reasons-to-go: education, shopping, dining, grocery shopping, getting dinner, passing through, cultural visits like the library

KEY OBSERVATIONS

A highly active mobility hub where the metro, though the transport anchor of the hub, doesn't dominate. Bicycles are the more dominate mode, and surface space prioritizes bicycle and pedestrian through movements, public life, and bike parking.

Departing the station area one encounters:
- Many parked bicycles
- Busy streets
- A somewhat cluttered environment
- Logical navigation guided by surface markings
- Public space

Different exits from the station reveal very different atmospheres. To the west, a well-established square offering various functions and amenities, removed from public transport. To the east, heavy traffic and a shift from the human-scale atmosphere. To the south, the back side of the hub.

With the three major facilities (the library, the university, and the shopping mall) surrounding the square of the mobility hub, the area attracts many people as a destination in itself, but it also serves as a throughway for pedestrians and cyclists.

The area is shaped by traditional Danish 19th-century architecture, featuring cobblestone paving, low-rise brick buildings, and slight level changes. These elements naturally slow down cyclists, making the space feel safer and more balanced for all users.

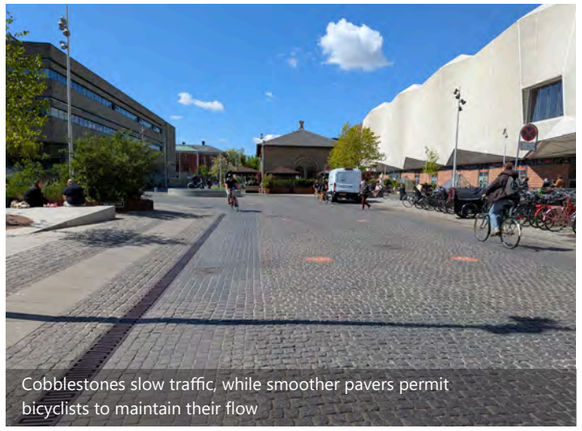
The buildings surrounding the area vary in appearance, from open facades and back sides, to larger scale structures such as the shopping mall and the office/high school in the middle of the square, which are tall and modern. In contrast, a row of low-rise restaurants add human-scale elements and hygge to the space.

URBAN AND MORPHOLOGICAL CONTEXT

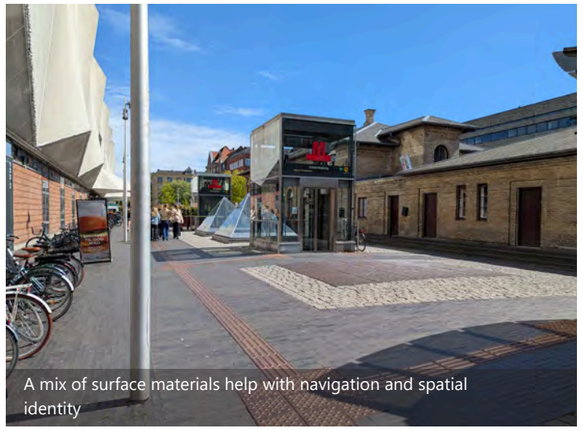


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The map highlights the area surrounding Frederiksberg Metro Station, an established mobility hub, located at the heart of a vibrant urban environment. The station sits centrally within Frederiksberg and is approximately 5 minutes by metro to Copenhagen Central Station. The area is characterized by a rich mix of cultural and leisure activities, residential neighborhoods, educational institutions, and office spaces.



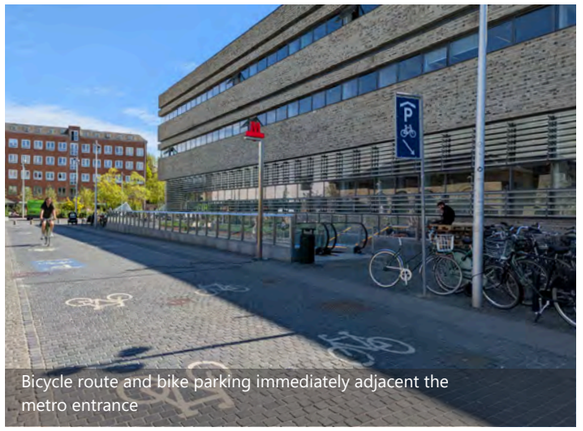
Cobblestones slow traffic, while smoother pavers permit bicyclists to maintain their flow



A mix of surface materials help with navigation and spatial identity



The glass metro pyramids filter natural light into the station underground and help peopleidentify the station from further away



Bicycle route and bike parking immediately adjacent the metro entrance

This mobility hub is located in a dense urban setting, surrounded by a wide range of facilities and services that contribute to a secondary center within the capital's urban core. The area features a diverse morphological expression, blending elements of Danish cultural heritage with postmodern and contemporary architecture.

The functions of the area are also quite diverse and include a shopping center, movie theatre, concert hall, hotel, library, schools from kindergarten through university, a fire station as well as restaurants, shops, and professional businesses. Residences range from single-family villas to 4-5 storey apartment buildings, some with ground floor retail.

Spatial context

- The spatial environment surrounding the hub is characterized by a multifunctional urban area within a highly densified context.
- The hub supports modal shifts for travelers and offers a wide range of transport options and directions - including three metro lines, bus connections, and a bicycle superhighway.
- Its close proximity to central Copenhagen strongly influences the hub, reflected in the area's urban density, cultural diversity and high housing prices.
- The urban space around the hub transitions between two contrasting environments: green space to the west and a busy road to the east.

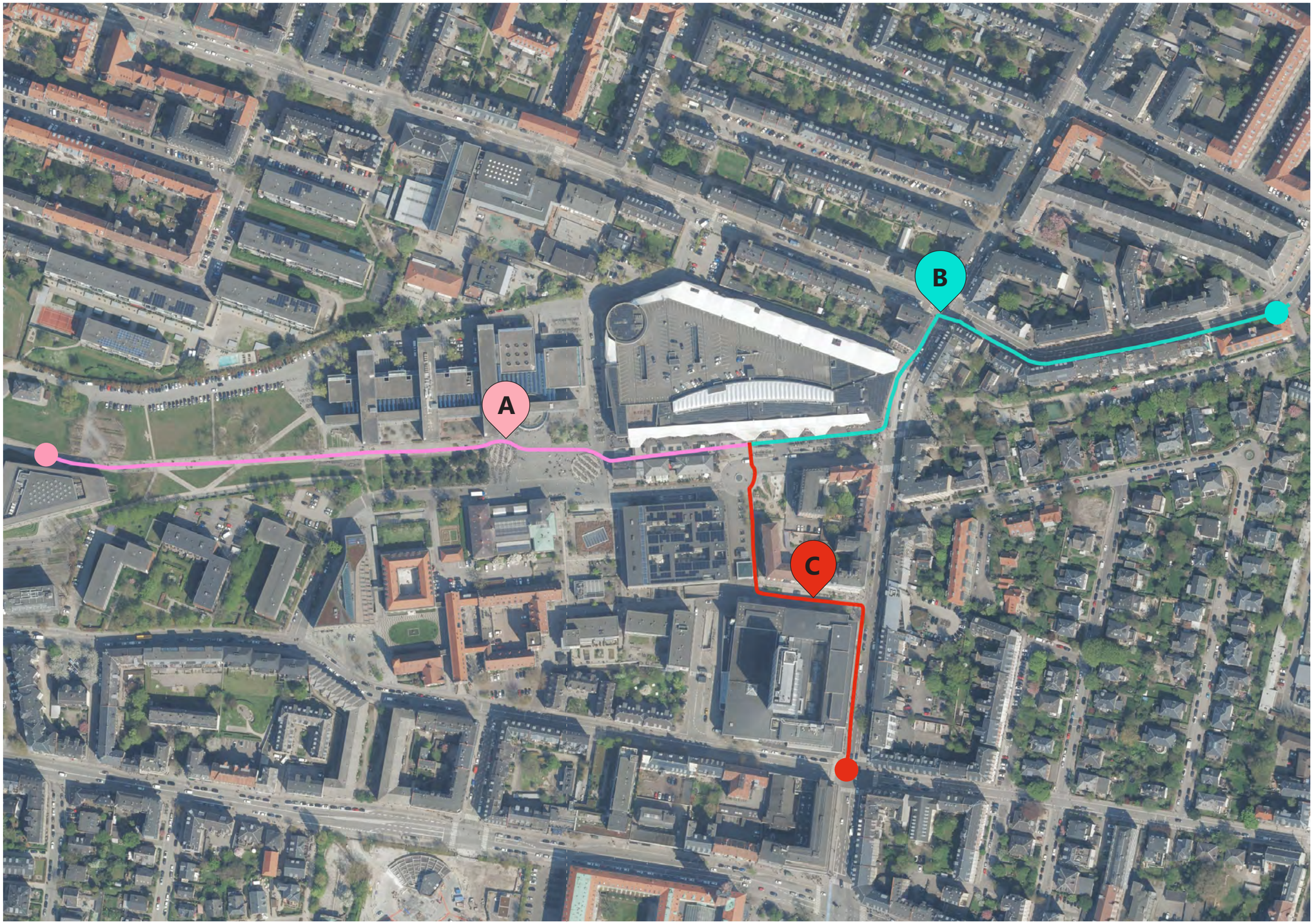
Urban typology

- Characterized by a mix of architectural styles, with many buildings in line with early 20th-century design.
- The urban typology is marked by heavy traffic, affecting both soft (pedestrian and cyclist) and hard (motorized) road users.
- A vibrant urban space with overlapping and coexisting activities.

Navigation

- Easy access between the transportation modes with the underground facilities and many bike racks.
- 'Forget the timetable' - a high frequency of public transport with the three metro lines.
- Bike parking locations distributed throughout the hub, but not enough overall spots.
- Unclear navigation for public transit modes, with a lack of signage in a messy environment.
- Pedestrian and cycling routes are integrated into the design, primarily as shared space, where boundaries between modes are often difficult to distinguish. This shared environment often works best when it's not part of a superhighway or commuter route.
- It can be difficult for newcomers to navigate between transport options due to limited visual overview, lack of clear signage, and significant differentiation in pavement design.
- The hub presents particular challenges for individuals with reduced mobility conditions, largely due to the overflowing bike parking.

POPULAR ROUTES FROM THE STATION



The map shows three common routes as people depart the station. The routes are based on on-site observations of flow, desktop analysis, and discussions with the municipality.

SERIAL VISION ROUTE A

departing the station and heading toward CBS





1. The path is clearly defined, but the overall visibility is compromised by large plants and metro pyramids. Incorrectly parked bicycles also narrow the route, making the area appear cluttered. It is difficult to exit quickly, and the limited sightlines contribute to a slight sense of insecurity. However, the presence of people from various directions and with different purposes helps support natural surveillance. The space feels highly active, with a constant flow of people moving quickly through the area.



2. The path feels safe, as it is a wide pedestrian street situated between Copenhagen Business School and the library, with the shopping mall just behind. Although there are more blind spots throughout this area, the clustered bicycle parking and surrounding functions contribute to a sense of natural surveillance. This is further influenced by the high number of people present and the diverse social groups that occupy the space.



3. Entering the space, one encounters out-of-scale buildings and a green area that leads into a park further ahead. The pavement changes, indicating that this area functions as a space primarily for pedestrians. The paving design is intended to slow down modes on wheels, fostering a calm and vibrant atmosphere, a space where one can enjoy the walk and weather on nice days.



4. Many of the same conditions continue: clustered bicycle parking, greenery and out-of-scale buildings.. However, at this point, it feels like walking along the backside of the area, which may heighten the perceived risk of crime. The visible functions ahead help guide the eye forward and make the passage feel brief and transitional. This section feels oriented toward flow more than staying.

> *Overall summary of route A*
> *Route A begins in a pedestrian-heavy space, and transitions to a pathway dominated by greenery, and a calmer atmosphere. Buildings remain in close proximity to the paths. Their large windows encourage natural surveillance and the sidewalk trees support a human-scale urban environment.*

SERIAL VISION ROUTE B

departing the station and heading east





1. This area is dense with vendors, people, picnic tables, greenery, and parked bikes. Movement is somewhat constrained. The lighting is good, and one feels safe here, albeit somewhat compressed and stressed.



2. The overview improves, but the noise intensifies. The car traffic appears and it is loud. With the entrance to FRB. C on the left, and bus stop on the right, the space is crowded and stressed. The route is clear, but there are many physical elements that require constant orientation. There is strong natural surveillance due to overlapping functions and mixed-use residential buildings. The lighting is good - contributing to a general feeling of personal safety.



3. The area has less foot traffic, but also offers less space. The sidewalk is narrower, and the bicycle path is not well protected from car traffic. The 5-6 storey unlit buildings contribute to a sense of spatial narrowness, but the ground floor with various functions provides a degree of natural surveillance and light, which helps to reduce the fear of crime.



4. The atmosphere shifts as the main street is left behind and it becomes quieter. The area is primarily residential, with 5-storey buildings and a narrow sidewalk. Sightlines are good, and the area seems well-maintained - all of which contribute positively to sense of safety.

Overall summary of route B
Route B is dominated by heavy traffic, often within constrained surroundings. The built environment feels out of scale, and it gives the impression of moving away from the more lively atmosphere of FRB.C. Where traffic dominates along Falkoner Alle, it can lead to feelings of discomfort and insecurity. There is a lack of space for ownership, which can increase fear of crime for some.

SERIAL VISION ROUTE C

departing the station and heading south along Falkoner Alle





1. Looking toward a calm and green area, there is a clear contrast to the adjacent bustling environment. The paving creates a shared space environment and one is drawn to the space on the other side. The square feels very safe regarding traffic and fear of crime. There is a good overview of the space, and a clear sense of territorial definition and ownership.



2. Walking away from Frederiksberg Centret, the atmosphere shifts. While well maintained, it feels somewhat detached, where no one has ownership or a relation to it. There is a lack of natural surveillance, and the space feels like the backside of the urban environment.



3. Turning around the corner and facing the main traffic street, a sense of urban life returns. It is quiet, but the presence of the busy road can still be felt in the atmosphere. Between the tall buildings, greenery creates a more human-scale design. Clear boundaries between public and private areas are established, and there is a reasonable degree of natural surveillance.

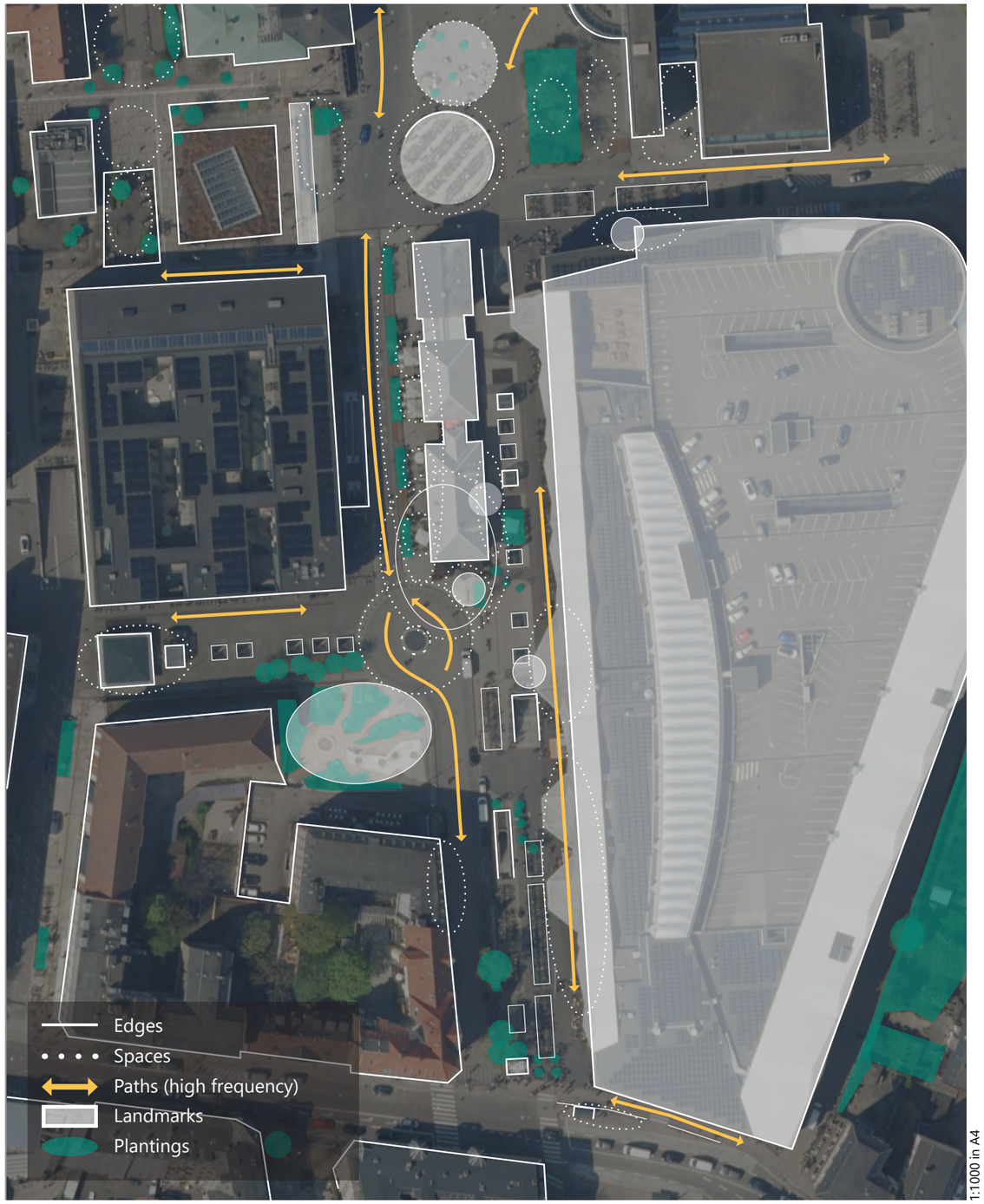


4. Upon entering Falkoner Alle, you are met with a busy atmosphere that feels somewhat stressed due to the heavy traffic and the disproportionate amount of open space relative to the area's density. There is plenty of light and a mix of functions, which supports good natural surveillance. While it is not an attractive place to walk, it performs well in terms of perceived safety and intuitive navigation.

Overall summary of route C
Route C leads through a more withdrawn area of the mobility hub. Although the entrance is frequently used, the route approaches the back side of the hub, which also faces the rear sides of other buildings. This negatively impacts natural surveillance. In addition, there are very few opportunities to stay or linger, making it an impersonal space, and one for passing through.

FUNCTIONAL ANALYSIS

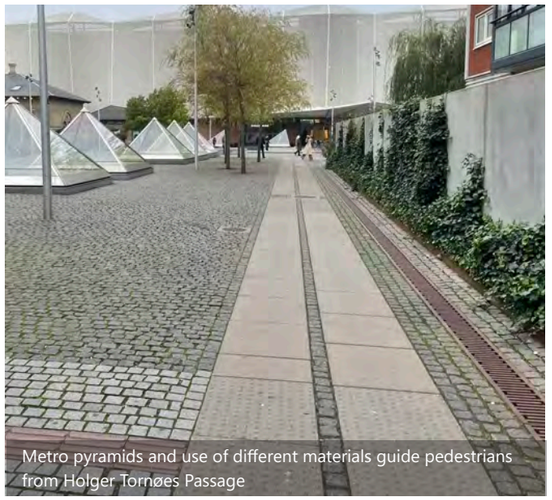
The station as a place



The map shows the organisation and overall design features of the area around Frederiksberg Center station. White solid lines mark spatial edges; white dotted lines mark smaller spaces; yellow arrows mark common paths; green areas mark plant beds; and white areas mark landmarks.



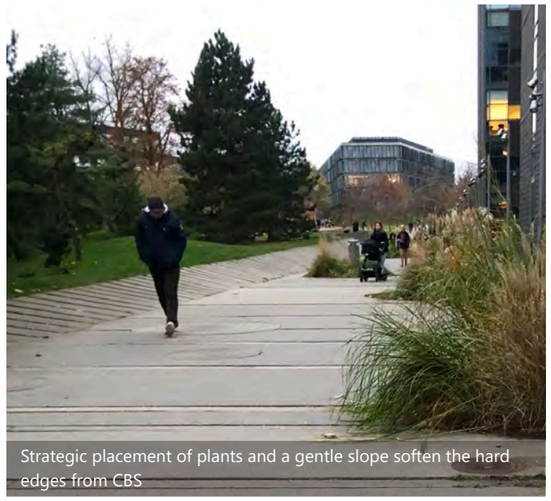
Benches and greenery create a room within the hub



Metro pyramids and use of different materials guide pedestrians from Holger Tornøes Passage



The hub opens up into a plaza, with CBS to the north



Strategic placement of plants and a gentle slope soften the hard edges from CBS

This mobility hub is set within a vibrant urban space that invites people to enjoy the outdoors, meet, and socialize. At the same time, it serves as an efficient point for switching between transport modes, while offering shelter from poor weather conditions.

Edges & Open Spaces

- The mobility hub is enclosed by hard edges from surrounding buildings, including FRB.C and CBS to the north; to the south, the edge is formed by the backs of buildings and a metro entrance; Falkoner Alle to the east; and a linear park to the west.
- Smaller structural edges form spaces for sitting and standing, creating a sense of room while also aiding in wayfinding.

Human Scale, Accessibility & Personal Safety

- Some of the buildings surrounding the hub are out of scale, but the wide spaces between them help maintain a more human scale. This is further supported by the presence of mature trees, small patches of greenery, and the integration of smaller rooms within the space.
- While elevators and pavement guides for the visually impaired are widely implemented, the variety of pavement types and the lack of clear level differences make boundaries difficult to follow naturally, which can be difficult to navigate.

Paths & Nodes

- The bicycle superhighway is the most prominent and heavily used route.
- Pedestrian traffic is dense, especially around the metro entrances. Additionally, the north-south path between the high school and the mall sees significant pedestrian traffic.
- The traffic circle, located at the center of the hub, handles a relatively high volume of traffic and distributes different modes of transport in various directions.

Landmarks

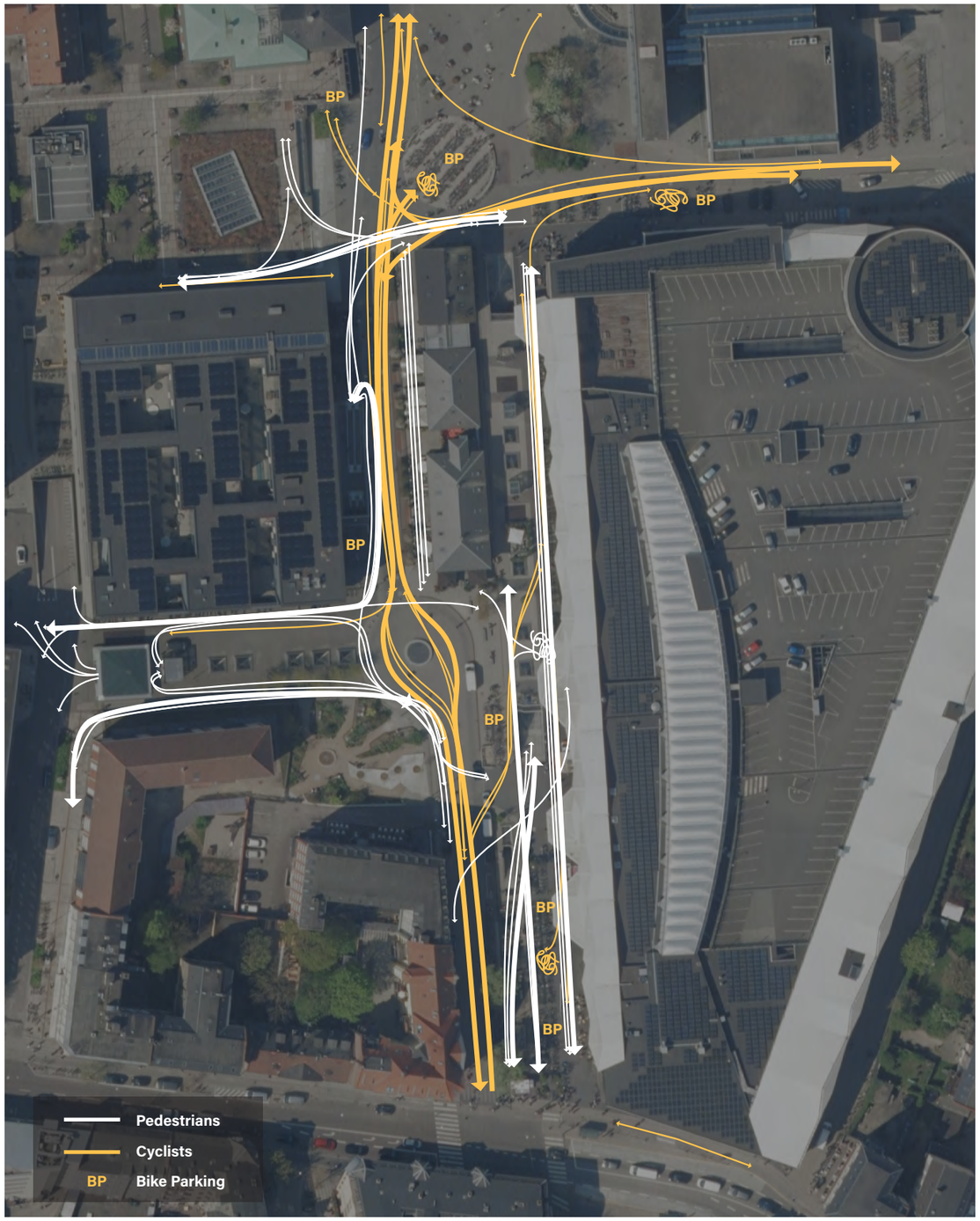
- Frederiksberg Centret
- The library
- The square in front of CBS
- The art installation
- The traffic circle
- The street food area

Materials

- The pavement throughout the area varies, mixing cobblestones, tiles, and asphalt in different patterns and elevations.
- Greenery helps soften the space and break up the hard edges.
- Pavement is used to separate spaces and guide traffic flow, as seen on the main road into the mobility hub space, which is shared by bikes and cars, where pedestrians also cross freely.

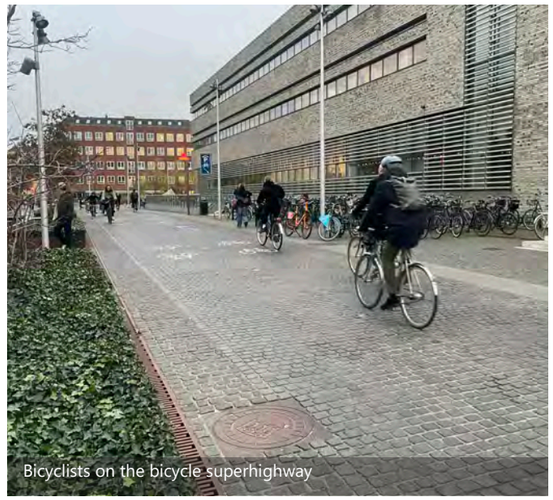
MOBILITY ANALYSIS

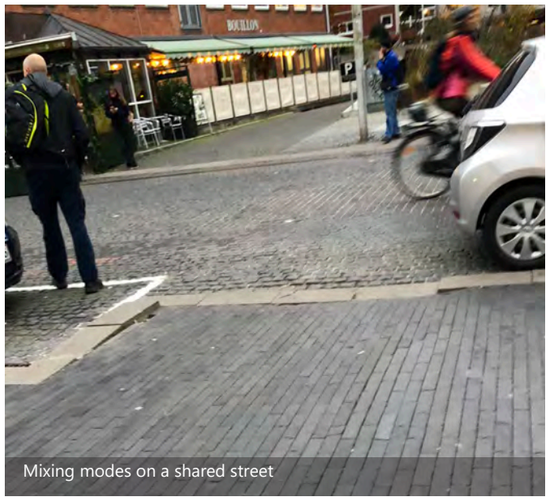
The station as a hub



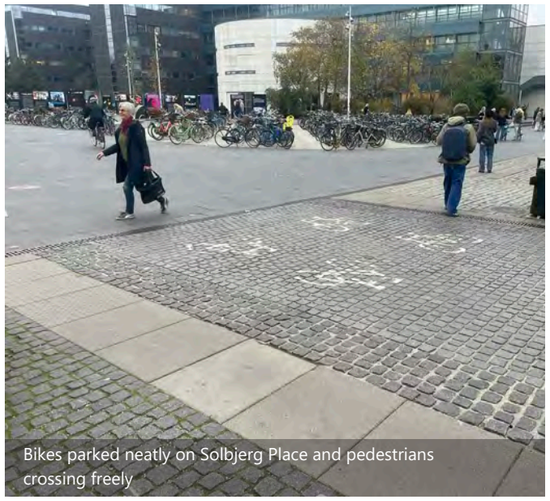
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The map shows the most common mobility patterns and routes based on observations of different modes. The tangled lines indicate where people are often stopped - waiting, parking their bikes, meandering, or meeting others. The bicycle superhighway and organisation of parking segments the space in multiple linear pathways.


Bicyclists on the bicycle superhighway


Mixing modes on a shared street


Bike parking overflow


Bikes parked neatly on Solbjerg Place and pedestrians crossing freely

The hub is planned with pedestrians and cyclists as the most prioritized modes. Movement through the area feels somewhat rushed and chaotic. Due to the minimal boundaries between modes of transport, in true shared space fashion, people often stand in each other's way, cyclists move unpredictably in various directions, and pedestrians walk on roads where cars are allowed.

Primary Modes & Modal Links

- At the mobility hub the area decidedly prioritizes soft road users and downprioritizes cars.
- There are few private cars in the area, and only one road in and out of the hub.
- Opportunities for multimodal trips include switching between the three metro lines, bus stops at Falkoner Alle and Nyelandsvej, bicycle and bike share bikes, and walking.

Behaviour & Practices

- Pedestrians cross the square freely, and the area experiences a high volume of bicycle traffic.
- There are more bicycles than the racks can accommodate, leading to a chaotic overflow of bikes onto the sidewalks.

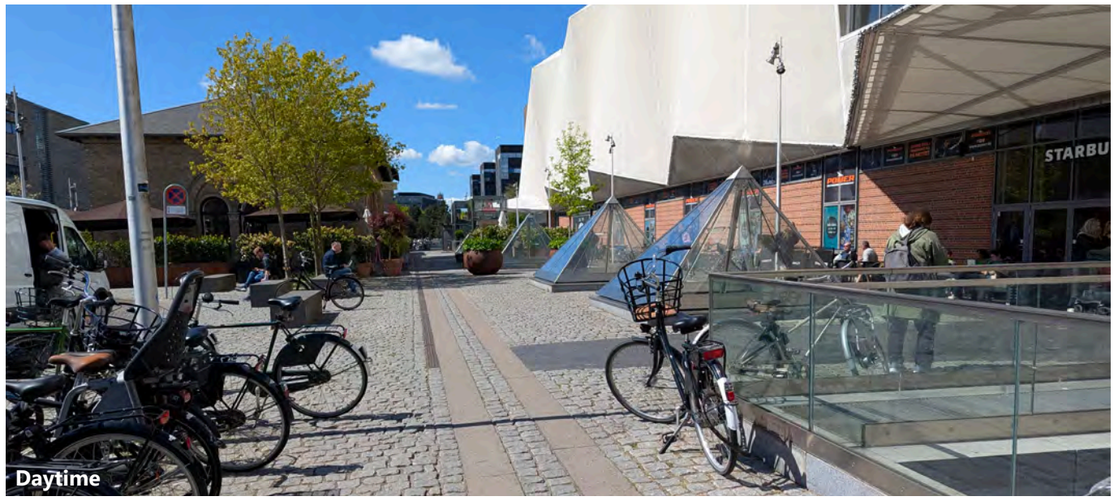
Mobility Patterns

- Pedestrians enter and exit from multiple points, making their movements unpredictable. It is unclear where they will cross the road or which stairways they will use to access the metro.
- Several hangout spots are scattered throughout the mobility hub, dispersing pedestrian movement.
- Cyclists primarily travel along the superhighway, with occasional detours past the street food vendors along the south side of the mall.
- The southern entrance to the roundabout at the hub sees little bicycle traffic.

Traffic Safety

- While uncertainty is a pillar of shared space, perceived safety is lowered due to the unclear boundaries between modes and the high density of people at the hub - making it uncomfortable for some.
- Motorists face uncertainty, encouraging slow careful driving.

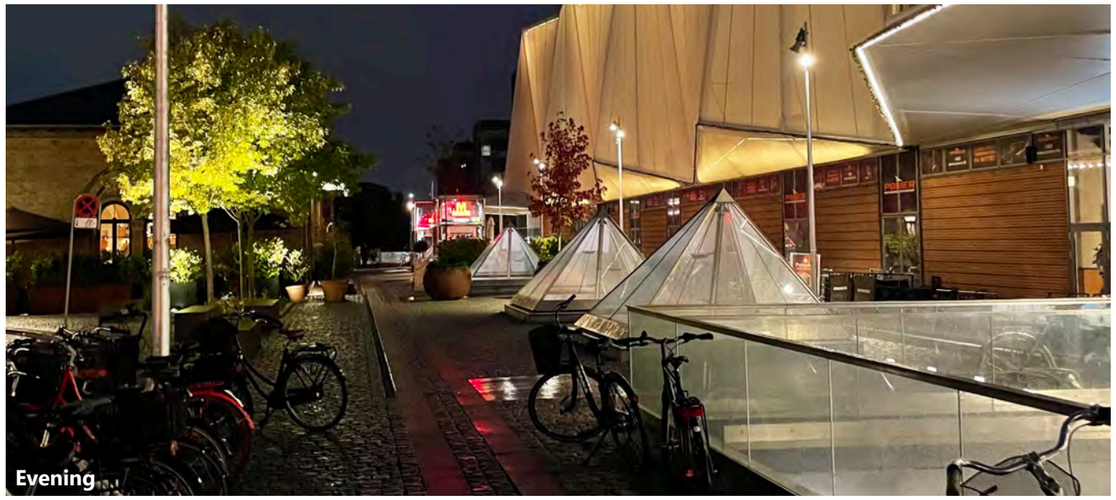
TEMPORALITY AND SECURITY



Daytime

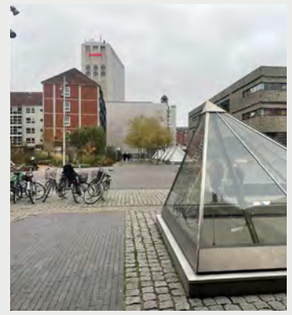


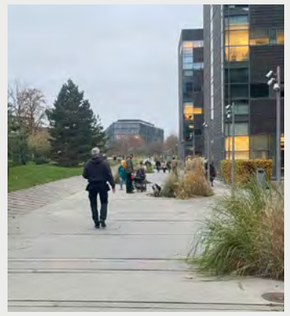
Afternoon rush hour


Evening

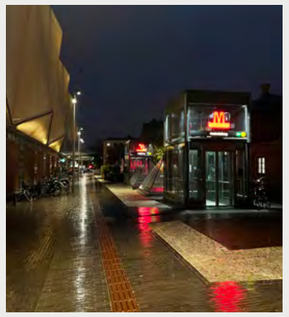


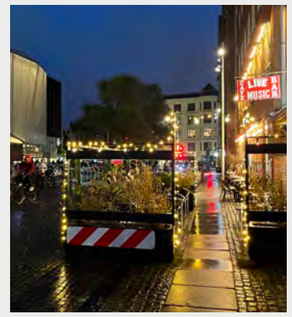








There is a steady stream of people throughout the day, which increases during rush hour, and is particularly noticeable along the bicycle superhighway/green pathway. As Frederiksberg Centret closes for the evening, there is a dip in the number of people around, however the diversity of functions in the area including restaurants open late, helps maintain security from eyes on the street. There are some unlit areas, but generally the station is well lit and feels safe. The green path, with the close trees and limited lighting may be less comfortable for some.

USER ANALYSIS

Use of the space

The Frederiksberg Metro station is situated in the heart of Frederiksberg municipality, an affluent district within Copenhagen. While all user groups are observed passing through the hub, it is clear through the generally younger demographic that the hub area includes a university and is near to many residential neighborhoods with families.

This station functions both as a transit hub and a primary destination, as it is surrounded by numerous functions and residential areas. It is also possible to access Frederiksberg Centret from inside the metro station. Many use the hub for a combination of transport and staying - connecting directly to their destination.

Users were observed in the green areas sitting both on their own and with others. Both seniors and university-aged students use the space for meeting up. The bicycle superhighway and Green Pathis popular for people of all ages.

Departing the metro exit next to the bicycle superhighway, it is not initially clear where cyclists should be and where pedestrians should be. Common complaints include people who are confused or frustrated with the food carts, or the bikes that are parked incorrectly.

User groups say...

People noted that they come for the metro connections, as well as for the many functions and facilities in the Frederiksberg Centret.

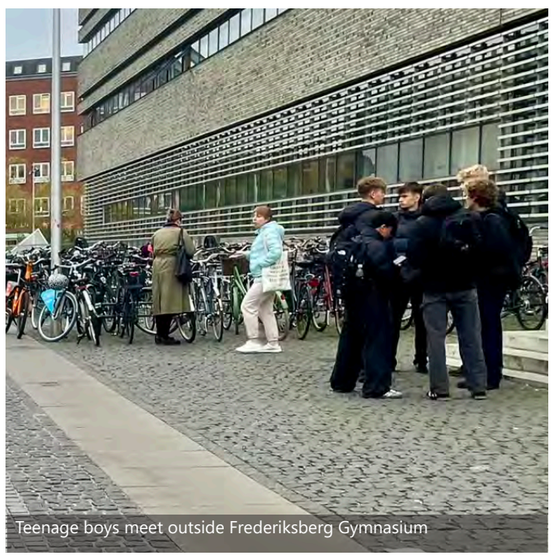
Everyone interviewed from young to old, from first-time to frequent visitors noted that the station area feels very safe. They all also noted that it was easy to get around. However, a first time visitor noted they had trouble navigating the switch between Metro lines and wished for better wayfinding.

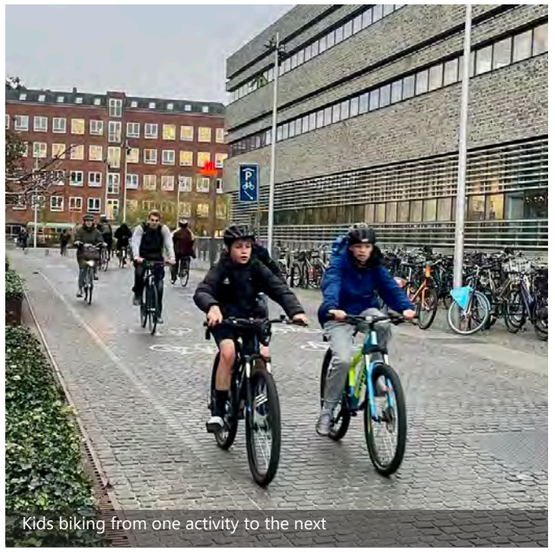
It is the metro station with the highest number of exits leading in different directions. Passengers noted the challenges with wayfinding and guidance in finding the exit for their desired route.

When asked about detractors from the space, some mentioned the overflowing and messy bicycle parking. Others noted that cyclists passing too closely or too quickly made it harder to move around and diminished the overall experience.

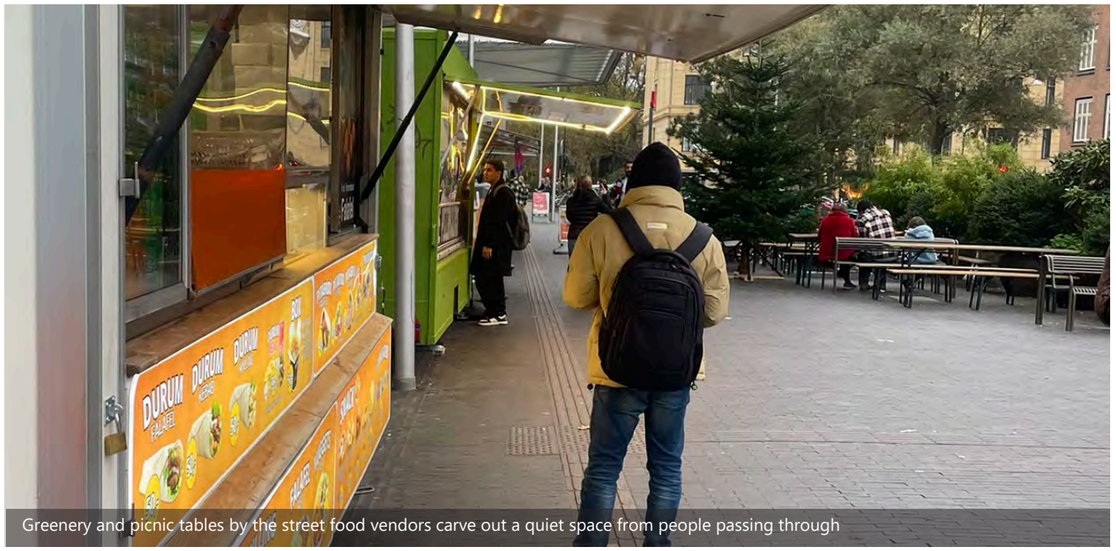

Patrons chatting at a food truck


A student bikes the superhighway

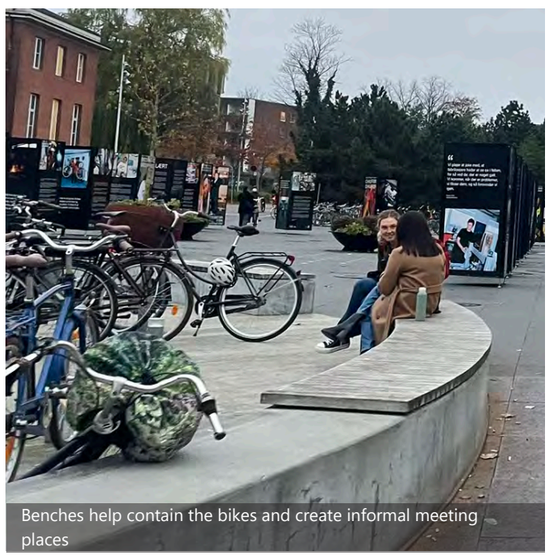

Teenage boys meet outside Frederiksberg Gymnasium

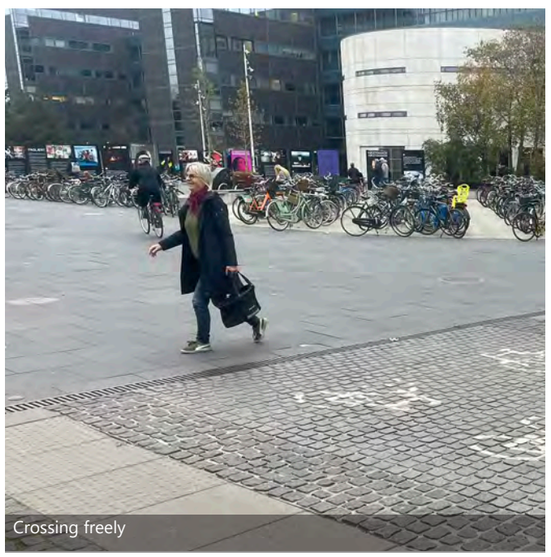

Kids biking from one activity to the next


Lots of kids seats and cargo bikes are spotted



Greenery and picnic tables by the street food vendors carve out a quiet space from people passing through


Benches help contain the bikes and create informal meeting places

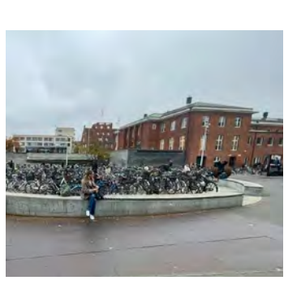
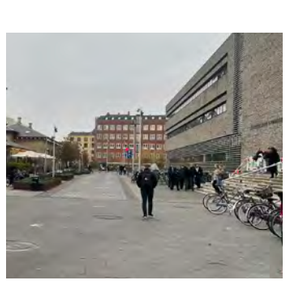

Crossing freely

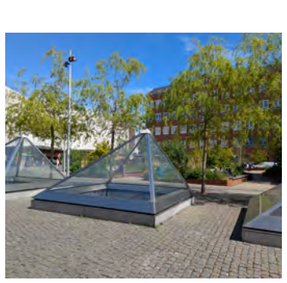
AFFORDANCES

Facilitates











The area blends classical architectural aesthetics with modern installations, creating a visually rich and dynamic environment for movement. A diverse mix of institutions, shops, and public facilities draws many people to the area. This functional diversity and overlapping opening hours supports a balance of place and flow, as well as natural surveillance.

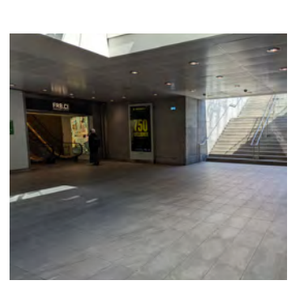
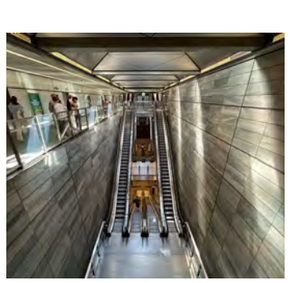
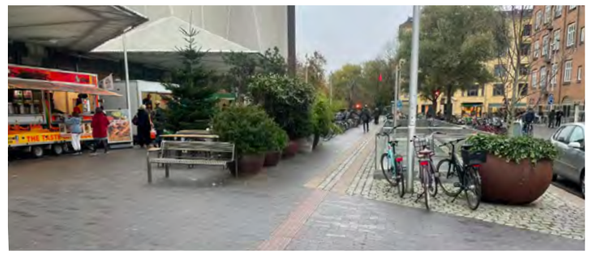
Key features that support active mobility and public life include:

- Clear wayfinding elements like the large “M” metro signs and glass pyramids enhance transit accessibility.
- Traffic calming and pedestrian-friendly design prioritize walkability and comfort.
- Greenery and level changes define human-scale zones that invite rest and interaction.
- Well-designed benches, interesting bike parking, and natural surface materials like compacted gravel for the pathways create relaxed, visually engaging spaces that encourage people to pause, meet, and enjoy the area.

Hinders






The area’s layout and material choices sometimes hinder active mobility and smooth movement. The paving reflects a patchwork of different construction phases and projects, resulting in reduced intuitive navigation. Pedestrians are funneled into narrow walking paths designed mainly for passage rather than lingering or social use.

Key elements that limit active mobility include:

- Inconsistent paving and surface transitions create confusion and interrupt flow.
- Narrow pathways and crowded bike parking areas crowd pedestrians.
- Congested waiting areas with heavy foot traffic and limited room make crossing to adjacent routes, such as the green path, challenging.
- Unclear connections within the Metro station complicate navigation, particularly for new and infrequent users.

QUALITY CRITERIA

Developed from Jan Gehl's 12 quality criteria to include transit and mobility hub navigation, *the table assesses the affordances of the place on the basis of the on-site observations and desk analysis. It details how the spatial arrangement and design facilitate or hinder practices or experiences, collected in 15 parameters across five categories. Each category is summarised in the coloured column to the right.*

MOBILITY HUBS

opportunities for switching

- Facilities for waiting: Lots of benches and stairs/curbs for sitting
- Ample bike parking options, not enough.
- Easy access between the transportation modes
- High frequency of public transport
- The mobility hub offers multimodal transportation with 2 major modes - the metro and the bus.

modefinding

- It is difficult to navigate public transport transfers in the area.
- Transportation options should be easier to navigate and more clearly communicated.
- Although the different modes of transport are visually identifiable, with iconic signage for the metro, they are not the most dominant or eye-catching elements within the hub.
- Confusing, low density of signage for wayfinding

cohesiveness/intuitive design

- There is no clear line of sight between the metro entrances and the bus stops.
- Pedestrian and cycling routes are integrated into the design through a fluid layout that invites shared use.
- The design lacks intuitive structure, with bicycle parking clustered in multiple locations, often going beyond designated areas.
- Pavement variations appear unintentional and lack clear programming.

MOBILITY HUBS summary

The mobility hub supports multimodal transportation with high-frequency connections and exchanges between modes. Improvements could address: bike parking is overflowing and poorly organized; more wayfinding to make switching between modes less confusing; pavement changes and spatial programming appear fragmented, reducing overall orientation.

PROTECTION

against traffic and accidents - feeling safe

- Most of the space is protected from car traffic and feels safe in that regard.
- However, crossing the main street that goes through the hub, as a pedestrian, it can feel unsafe, as people walk and cycle from multiple directions, and the pavement becomes slippery and potentially dangerous in wet weather.

against harm by others - feeling secure

- At the mobility hub itself, there is strong natural surveillance due to its vibrant atmosphere, driven by a wide range of mixed functions.
- In the areas surrounding the hub, the sense of safety can vary significantly with backside alleys, quiet paths, and blind spots, but overall, the lighting is good, and the dense urban environment generally contributes to a feeling of safety.

against unpleasant sensory experiences

- Numerous public facilities and the underground metro line offer protection from unpleasant weather conditions.
- Additionally, the overhangs at the shopping mall and the bus shelters are designed to shield commuters from rain and other harsh weather conditiions.
- Metro exits to inside FRB.C which can be welcome in poor weather

PROTECTION summary

Most of the area is protected from car traffic and feels safe, though crossing the main street can be stressed and unsafe to bike, particularly in wet conditions. Natural surveillance is strong at the hub due to the mixed uses, while surrounding paths vary in perceived safety. Facilities like the metro, bus shelters, and overhangs offer shelter from bad weather. The place offers general safety and protection from unpleasant situations.

LIVABILITY

opportunities for active modes

- Good opportunities for walking and cycling.
- Cyclists frequently use pedestrian areas, blurring intended boundaries.
- Walking and cycling routes are generally short, direct, and diverse.
- Access is not fully inclusive for all potential users of active mobility.
- Some surfaces present challenges for movement and accessibility.

opportunities to stand and linger

- Numerous occupancy zones and edge effects invite people to meet and slow down - both indoors and outdoors.
- There are various spots for standing, offering good overview.

opportunities for sitting

- Numerous occupancy zones and edge effects invite people to take a pause, sit and hang out - both in public and private spaces, indoors and outdoors.
- Benches and curbs are integrated throughout, encouraging people to stop and engage with the space.

LIVABILITY summary

The area offers ample opportunities for walking and cycling, with short and varied routes, though some surfaces challenge accessibility. Cyclists often use pedestrian zones, creating a blur between intended movement flows. Numerous edge zones and benches encourage people to meet, rest, and observe their surroundings.

EXPERIENCE

human-scale

- The scale of the buildings surrounding the hub feels out of proportion, but the wide, open spaces between them and the enhanced greenery, help bring the environment closer to a human scale in terms of sensory experience, movement, and behavior.
- When entering the main street, the dominance of tall buildings and hard surfaces creates a strong sense of being out of scale.

opportunities for enjoying the weather

- Possible to enjoy positive aspects of the weather, as there are both options for open air and sheltered to stand under.
- Public seating and private restaurants/cafe seating, vendor picnic tables, benches, and the casual seating along the pathway heading west.

aesthetic and positive sensory experiences

- Historic, well-maintained architecture adds character to the area, making it both attractive and inviting for users of the hub.

EXPERIENCE summary

The area balances out-of-scale buildings with open spaces and greenery, bringing the environment closer to a human-scale. There are both open-air and sheltered areas, allowing people to enjoy the weather. The underground metro lacks human-scale qualities but provides efficient service with short waiting times. Well-maintained historic architecture adds aesthetic value and contributes to a rich sensory experience.

TOD

priority

- Active modes of transport are prioritized over car traffic within the boundaries of the mobility hub
- Walking and cycling routes are shorter and more direct than those for private vehicles.
- The mobility hub minimizes private car use, integrating cars only through shared drop-off zones also used by taxis.
- Newer mobility solutions, such as bike share bikes, are available and support sustainable transport options.

density

- High density of housing and jobs, as well as critical and leisure services.
- Shared space programming that invites for more organic walking patterns, as the mobility hub is planned with the pedestrians and cyclists as the dominating modes.
- The area around the mobility hub can be defined as TOD within a reach of 1 km.

mix

- The facilities and functions surrounding the mobility hub are mixed-use, supporting a vibrant urban environment.
- The hub serves an established residential area that has evolved into a sub-centre of Copenhagen, offering a wide range of services and shopping opportunities.
- It provides access to multiple modes of transportation, enhancing regional connectivity and everyday convenience.

TOD summary

The mobility hub prioritizes sustainable transport, with direct walking and cycling routes and restrictions on private cars, limited to shared drop-off zones. Solutions like bike share support sustainable mobility. The surrounding area has a high density of housing, jobs, and essential services, promoting consistent everyday use. The space is programmed for fluid pedestrian movement. The hub is vibrant and well connected to its surroundings.

2026