ØRESTAD

COPENHAGEN, DENMARK

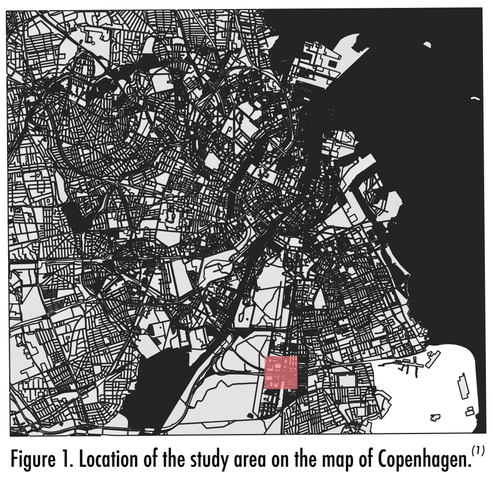

Figure 1. Location of the study area on the map of Copenhagen.[1]

transit-oriented development

The Ørestad activity centre is located in Amager Vest, southern Copenhagen. The development of the urban area began in the 1990s as a governmental project to reduce pressure from the city centre and grow international competitiveness.[2]

Ørestad is designed as transit-oriented development (TOD) of the residential, retail, commercial and recreational mix of facilities. It is an important link between Copenhagen airport (10 minutes by train) and the city centre (7 minutes by train). Moreover, it provides a connection to Malmö and Lund (southern Sweden) by train and motorway via the Øresund Bridge.

Since the first dwellings in 2004 and first 100 residents, the population and the amount of residential area in Ørestad have rapidly increased. In 2019, the number of residents reached 15,500.[3] Ørestad is steadily growing its population while many new employers (including international) decide to relocate their businesses to this area.[2] In addition, many other places, such as schools, shopping centre, local shops and cafes, sports facilities were built to diversify neighbourhood.

Ørestad metro station is the busiest[2] on the Amager island and has 8,300 daily commuters.[4]

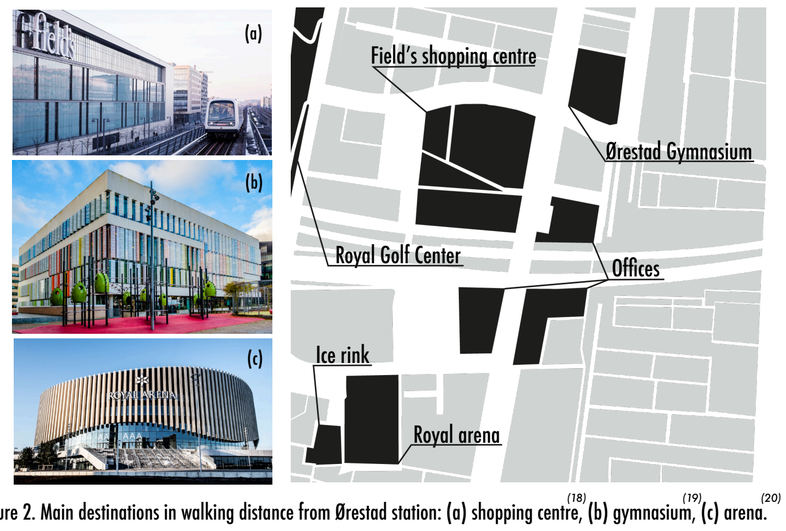

Figure 2. Main destinations in walking distance from Ørestad station: (a) shopping centre,[18] (b) gymnasium,[19] (c) arena.[20]

DENSITY

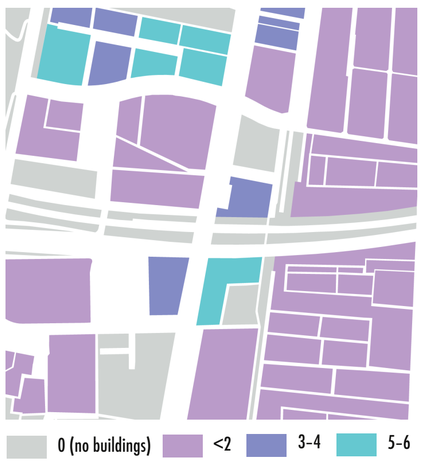

Figure 3. Floor area ratio.[6]

The population density in Ørestad is 4,441[3] people/km² which is a bit higher than total density in Amager Vest (4,117 people/km²) and similar to the density of Copenhagen (4,400 people/km²).[1]

Floor area ratio (FAR) is a relation between the building's total floor area and the size of the lot that building is located on.[5] The major part of the area around the station in Figure 3 has FAR 2 or smaller, especially the eastern residential side which consists mainly of single-family detached homes (FAR 0.5). Higher FAR can be found in the commercial or residential/retail mix lots.

Living space per person varies greatly between different parts of the surrounding area as shown in Figure 4.

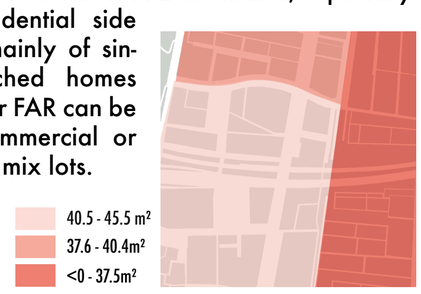

Figure 4. Living space per person in 2015.[7]

MIXED LAND USE

Figure 5. Mix of uses around the station.[9]

The urban mix is an important indicator of TOD as it illustrates the synergy between different functions and activities – places people live, work and play.[8]

Ørestad is planned to provide housing, jobs and education, as well as many 'big' and day-to-day destinations for both locals and visitors. Main reasons for coming to Ørestad are the Royal Arena, the Royal Golf Center and Field's – the largest shopping centre in Scandinavia (green areas in Figure 5). Daily destinations include a variety of small local shops, cafes and restaurants which support living in the neighbourhood (yellow and pink areas).

Ørestad is also quite successful as a fast-expanding employment centre. Large international companies such as Rambøll and Ferring chose to relocate their offices to this area and as a result reinforced the urban mix.[2]

TRANSPORT ACCESS

Figure 6. Modes of public transit in Ørestad.

Interconnected and frequent multi-modal public transit is vital for a place to function as a good TOD.[10] Ørestad station provides an interchange between regional railway services, metro and two bus routes. All interchanges are located in less than 1-minute walking distance from each other. Copenhagen airport and the city centre are highly accessible from the station (less than 10 minutes ride). Buses serve the routes to the destinations which are not reachable by trains (e.g. Dragør). Metro frequency varies from 4-6 minutes in the daytime and 15-20 minutes at night.[11] Buses are less frequent, arriving every 10-15 minutes during peak times and every 20 minutes during off-peak times. Bus 18 stops after 8 pm while bus 33 serves the route every 60 minutes during the night.[12] Trains come every 30-60 minutes.[13]

Nodal connectivity is the ability of transit nodes to act as hubs on the network. Ørestad has a nodal connectivity rate of 174 (the average of Copenhagen is 88).[14]

WALKABLE ACCESS

Figure 7. Figure-ground diagram of Ørestad.

AwaP = 716 m*

*AwaP was calculated in QGIS using AwaP plugin.[16]

Walkability is a key concept for transit-oriented communities. It is closely linked to well-being and sustainability.[15]

Figure-ground map of Ørestad divides the area into white lines which are suitable for walking and a diverse mix of black blocks which become obstacles on the way. Walkable access can be evaluated by measuring the permeability of the area. From all types of permeability measures, the area-weighted average perimeter (AwaP) is the most suitable for assessing a heterogeneous mix of block sizes.[15] AwaP of the area around the Ørestad station is 716 m which is considered to be a low permeability rate.

The main obstacle for pedestrian access is Øresundsmotorvejen (motorway) which crosses the area in the middle. There are 3 overpasses but a large area on the western side still remains inaccessible.

#ACTION 1

CHANGE OFF-STREET CAR PARKS TO HIGH-DENSITY MIXED-USE BUILDINGS

While Ørestad is conceived to be a transit-oriented development, large open spaces used for parking cars does not seem to go along with this idea.

These off-street car parks take approximately 45,000 m² (grey areas in Figure 5) of the area surrounding the station. It is a valuable land from both the property market and residential points of view.

In order to enhance the performance of Ørestad TOD, these car parks should be changed into a mix of dense buildings with multi-storey or underground car parks. Similar type of development can be found on many other sites around the station (yellow areas in Figure 5 and FAR 5-6 in Figure 3).

Additionally, facing actively growing population and employment, Ørestad must be thoughtful about using the given space for development.

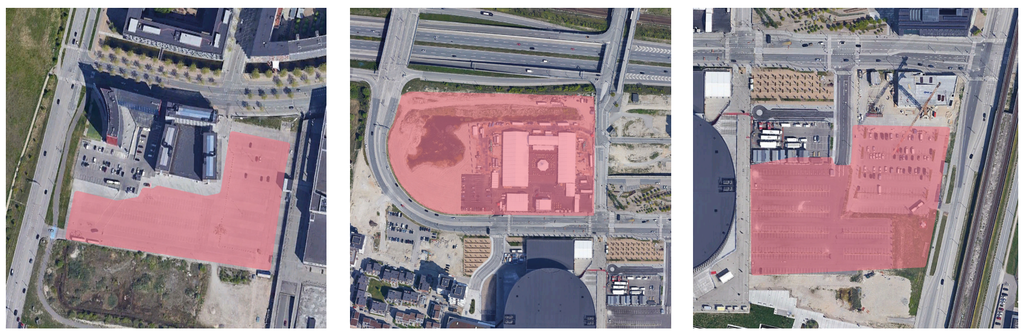

Figure 8. Off-street car parks proposed to be changed into buildings.[17]

#ACTION 2

EXTENSION OF PEDESTRIAN PATHS

Ørestad has a low permeability rate and several clearly visible gaps between the walking paths. Another way to improve the performance of this TOD is to extend the pedestrian lanes as is suggested in Figure 9.

Figure 9. Proposed pedestrian path adjustments.[17]

Adjustment (a) is a pedestrian path extension and an overpass which would improve the connectivity between two parts divided by the motorway and railway. It would be even more crucial after fulfilling the first action and turning the car park into an activity zone.

Adjustment (b) is a bridge above the artificial canal which should be implemented in a similar way as the bridges on the northern side of the canal. This connection would make mixed land use facilities more accessible for the residents.

Both adjustments would help to create a safer and more efficient pedestrian flow through the area.

References

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