5. GLOBAL WARMING

CONSTRUCTED LAKES

During 5 hours of heavy rainfall in the development areas of the ring, it rains enough to fill a lake of 25 HA, or 250.000 M2 in 1.5 meters depth. Combined with constructed wetlands, a strategy of artificial lakes could greatly improve the quality of recreational space in the green areas, while absorbing the increasingly frequent heavy showers. At the same time the new lakes could reduce stress on the run-down sewage system of the city.

CONSTRUCTED LAKES

Iløbet af 5 timers kraftigt regnskyl over udviklingsområderne falder der nok vand til at fylde en sø på 25 Hektar eller 250.000 M2 på 1.5 meters dybde. En strategi for nye kunstige søer ville både kunne absorbere fremtidige regnskyl og booste de rekreative kvaliteter i de grønne områder. Samtidig kan søerne reducere belastningen og dermed energiforbruget på kloaknettet.

6. BIODIVERSITY

ENGINEERED WETLANDS

Engineered wetlands are artificial wetlands, marsh or swamps created as new or restored habitat for native and migratory wildlife. Additionally they are suitable for anthropogenic discharge such as wastewater, stormwater runoff, or sewage treatment: Natural wetlands act as a biofilter, removing sediments and pollutants such as heavy metals from the water, and constructed wetlands can be designed to emulate these features.

KONSTRUEREDE VÅDOMRÅDER

Konstruerede vådområder er kunstige vådområder, sump eller mose, skabt dels for naturlig vandrensningsformål, dels for at genskabe et naturområde og øge biodiversiteten. Områderne tiltrækker frøer og andre krybdyr og er populære ynglesteder for fugle. De er ligeledes anvendelige til at absorbere overfladevand fra kraftige regnskyl. Vådområderne fungerer som et naturligt bio-filter der kan rense både forurenet jord og fjerne tungmetaller fra spildevand.

7. RE-INDUSTRIALIZATION

MICRO-FACTORIES

“The tools of factory production, from electronics assembly to 3-D printing, are now available to individuals, in batches as small as a single unit. They can become a virtual micro-factory, able to design and sell goods without any infrastructure or even inventory...”

(Chris Andersson, Atom are the new bits)

MICRO-FACTORIES

“Maskineriet til industriel produktion, fra elektronisk montage til 3d-print, er nu tilgængelig for alle, i mængder så små som én ekenlt unit. Folk kan skabe virtuelle microfabrikker, og designe og sælge produkter fuldstændig uden infrastruktur eller lager”

(Chris Andersson, Atom are the new bits)

Kan den danske tradition for industriel småproduktion genskabes i en ny form for microindustrier?

8. HEALTH

THE BICYCLE

Denmark and Holland are the countries in EU with the highest use of bicycles as transport form. In dense, flat urban areas the bicycle not only provides fast, reliable and sustainable transport, but also improves public health. We propose to upgrade bicycle infrastructure with smart systems for traffic light control, close integration with the light rail (bycycle paths leading to the platforms) and service stations at strategic points. All combined in a new Health Track running the full lenght of the Loop.

THE BICYCLE

Danmark og Holland er de lande i EU med det hyppigste brug af cyklen som transport form. I tætbebyggede flade områder er cyklen optimal som hurtig, sikker og bekvem transportform. Samtidig forbedrer cykling befolkningens helbred. Vi foreslår en opgraderet cykelinfrastruktur, med intelligente systemer til kontrol af trafiklys, strategisk placerede service startioner og tæt integrering med Letbanen (cykelstier direkte til perronen). Alt sammen kombineret i The Heatlh Track langs hele banens strækning.

9. FOOD

URBAN FARMING

A second green revolution could not only solve the world's food shortage, but also reduce the dependency of polluting fertilizer and large scale farming, leading to a new explosion of diverse small scale productions. This could potentially change the production landscape around Copenhagen from the current mega farms, to a new kind of bio-tech micro productions integrated close to the urban fabric, and allowing for new nature areas in close relation to the city.

URBAN FARMING

En 2. grøn revolution ville ikke bare løse den globale mangel på mad, men også reducere afhængigheden af forurenende kunstgødning og intensivt drevne mega landbrug. Dette kunne potentielt forandre produktionslandskaberne omkring Fingerplanen: De nuværende store landbrug vil blive erstattet af en ny form for bio-tech microproduktioner integreret tættere på byen.

10. MIGRATION

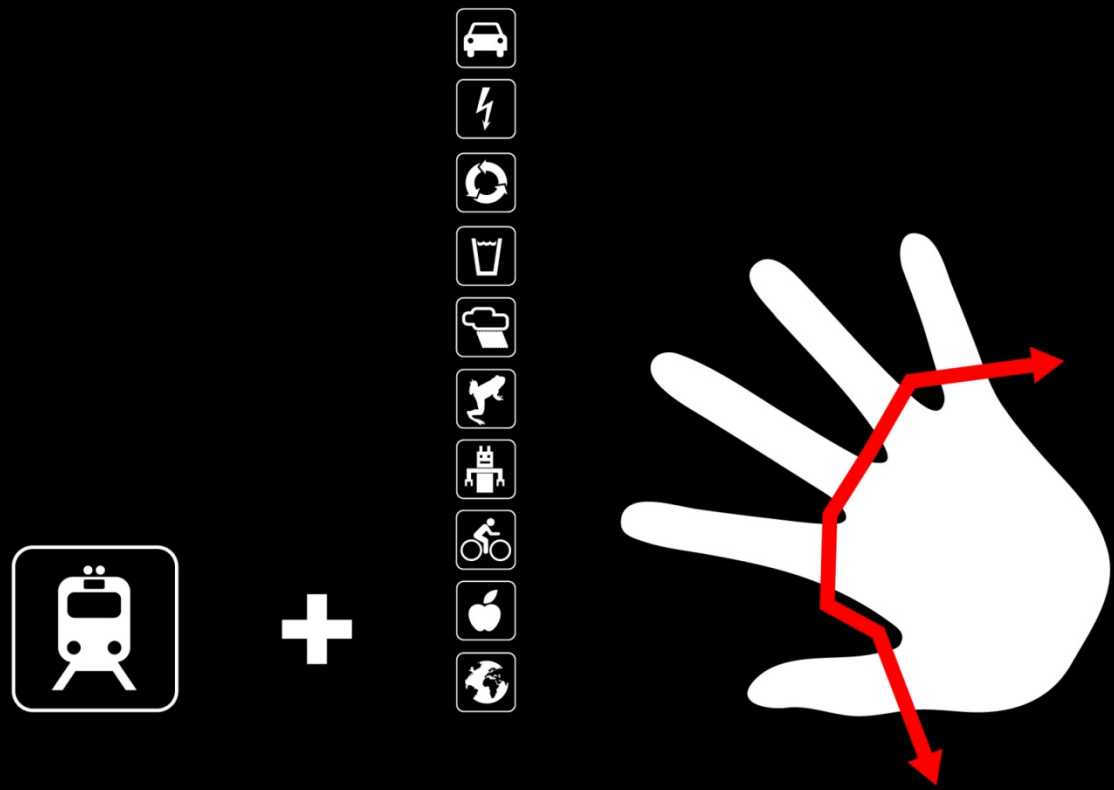
THE BLUE CARD

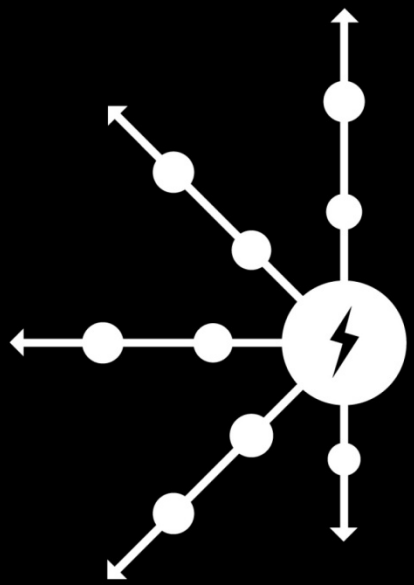
The European Unionfacing a ticking age bomb, and says it will need 20 mio skilled workers during the next 20 years. The European version of the American Green Card, The blue Card, could be one of many strategies to attract a skilled young work force. Others include improved regional infrastructure.

THE BLUE CARD

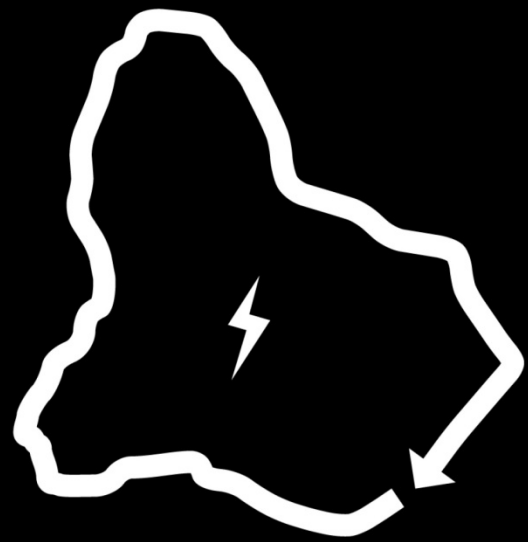
EU står over for en tikkende aldersbombe og vil få brug for 20 mio nye arbejdsdygtige indvandrere i løbet af 20 år. Den europæiske pendant til det amerikanske Green Card, The Blue Card vil være ét af mange tiltag for at tiltrække ung arbejdskraft. Andre muligheder er forbedret regional infrastruktur.

THE TECHNOLOGIES AS A NEW INFRASTRUCTURE
TEKNOLOGIERNE SOM NY INFRASTRUKTUR

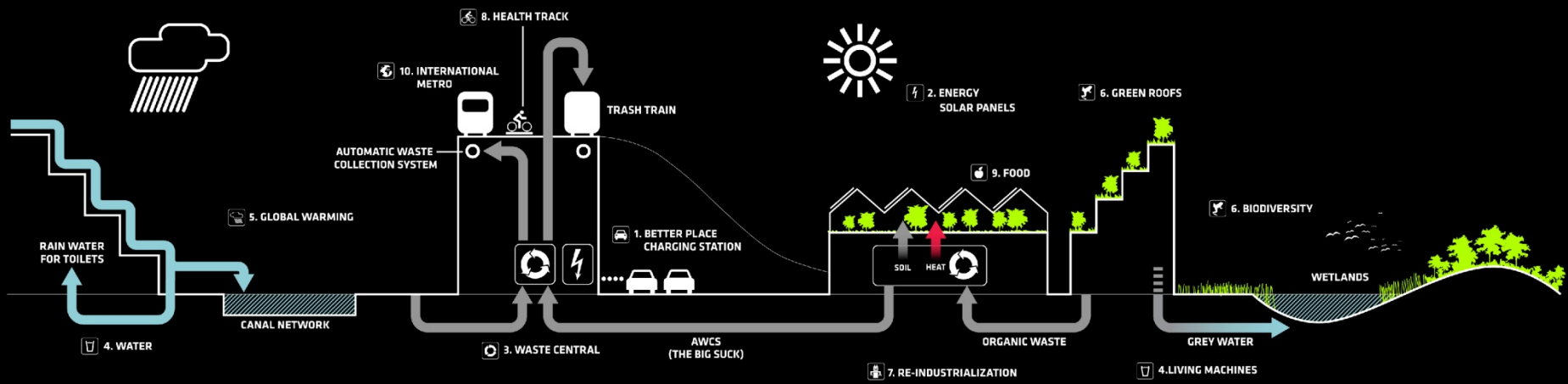




1947
CENTRALIZED CONSUMER GRID

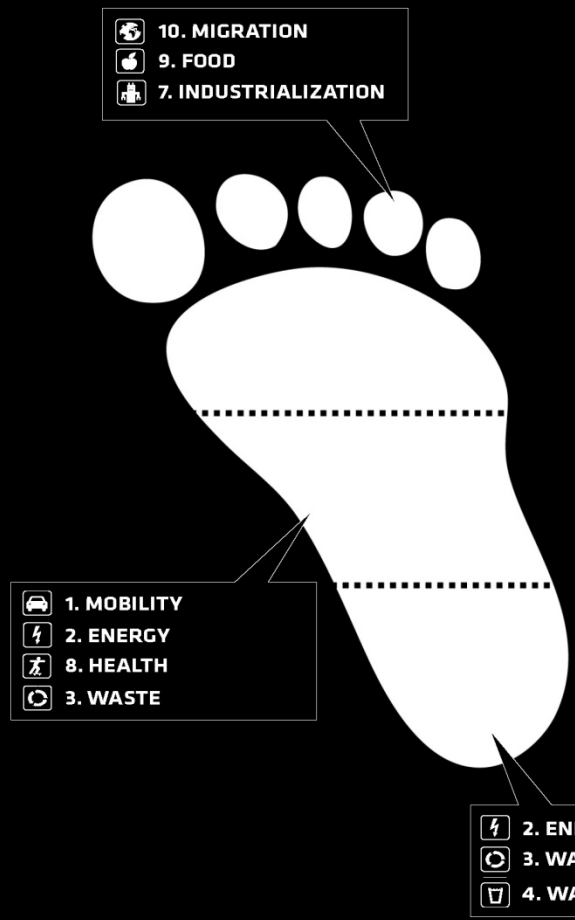


2047
SMART GRID


8. HEALTH TRACK
10. INTERNATIONAL METRO
TRASH TRAIN
AUTOMATIC WASTE COLLECTION SYSTEM
2. ENERGY SOLAR PANELS
6. GREEN ROOFS
9. FOOD
6. BIODIVERSITY
5. GLOBAL WARMING
1. BETTER PLACE CHARGING STATION
RAIN WATER FOR TOILETS
SOIL
HEAT
WETLANDS
CANAL NETWORK
4. WATER
3. WASTE CENTRAL
AWCS (THE BIG SUCK)
ORGANIC WASTE
GREY WATER
7. RE-INDUSTRIALIZATION
4.LIVING MACHINES

The 10 technologies are addressing different aspects of the full carbon footprint of Copenhagen.

De 10 strategier adresserer forskellige aspekter i et samlet CO2 aftryk for København.



SCOPE 3
INDIRECT CONSUMPTION
INTERNATIONAL TRANSPORT
EMBODIED ENERGY IN PRODUCTS

SCOPE 2
INHABITANT CONSUMPTION
INTERNAL TRANSPORTATION.

SCOPE 1
BUILDING CONSUMPTION
URBAN INFRASTRUCTURE CONSUMPTION

STATION DENSIFICATION
STATIONSDENSIFICERING

What type of light rail could we imagine here?

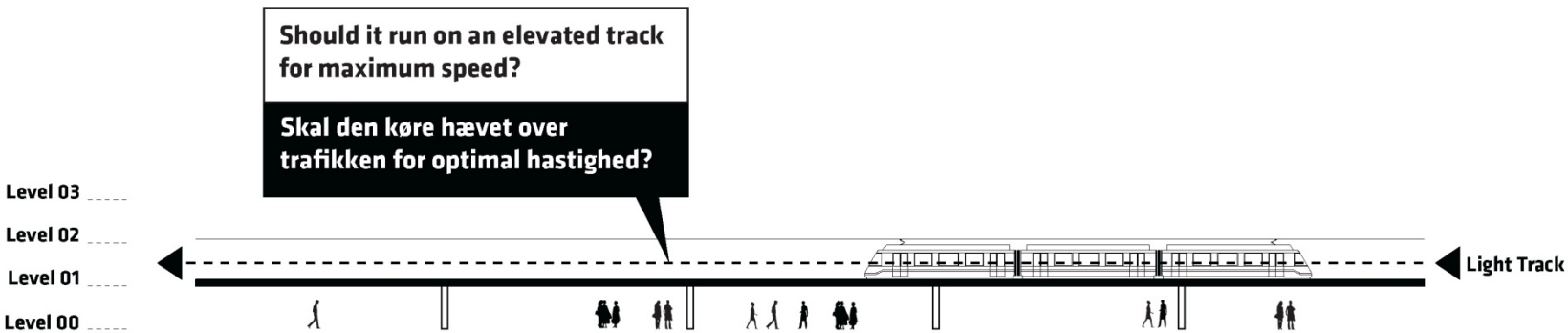
Hvilken type Letbane kunne vi forestille os her?

A light rail is a form of public transport generally with a lower capacity than heavy rail system, but higher capacity than traditional street-running tram systems. The definition ranges from busses that run in separate tracks to real metro systems.

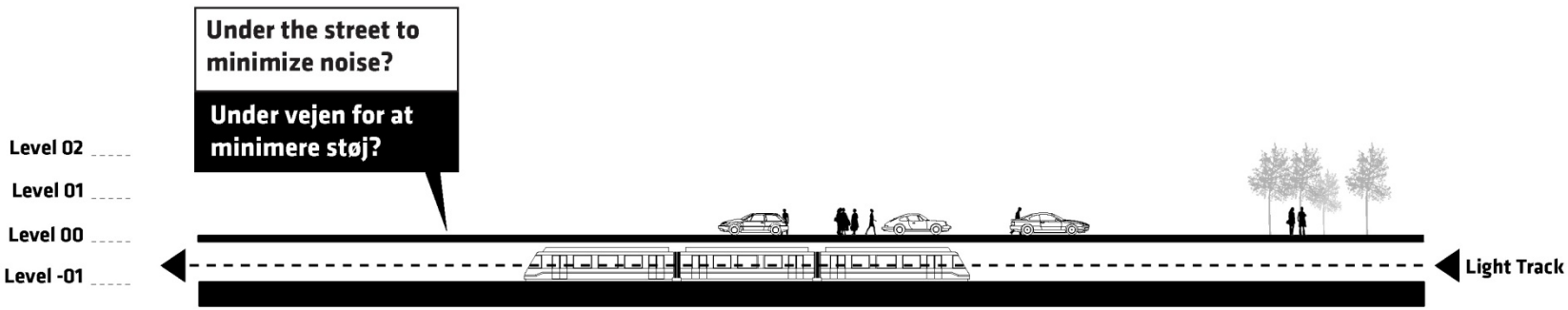
En Letbane er defineret som en form for skinnebåret offentlig transport med en højere kapacitet og hastighed en end sporvogn, men mindre end en traditionel tung jernbane. Det kan være alt fra letbaner der kører på vejen til rigtige førerløse metrosystemer.

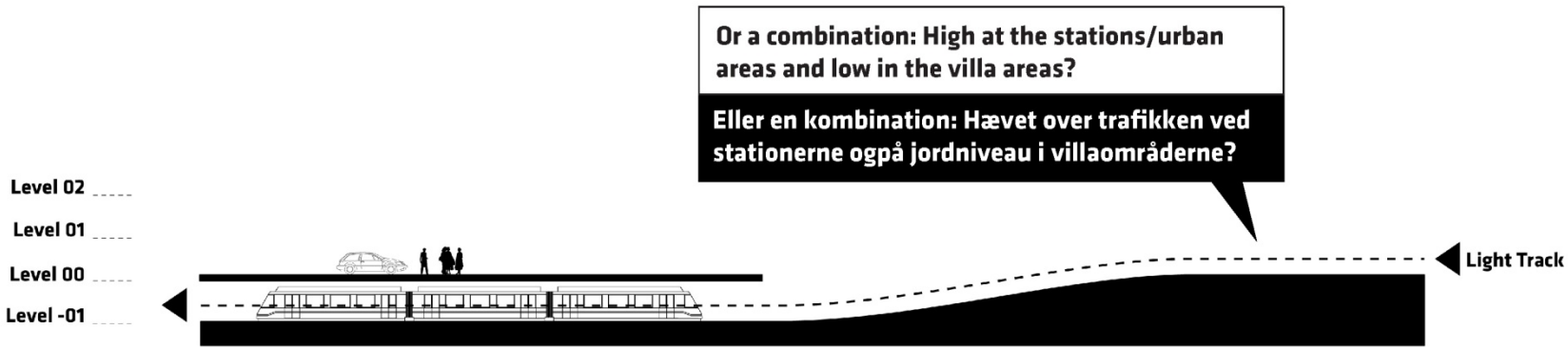
The Copenhagen Metro is a typical light rail.

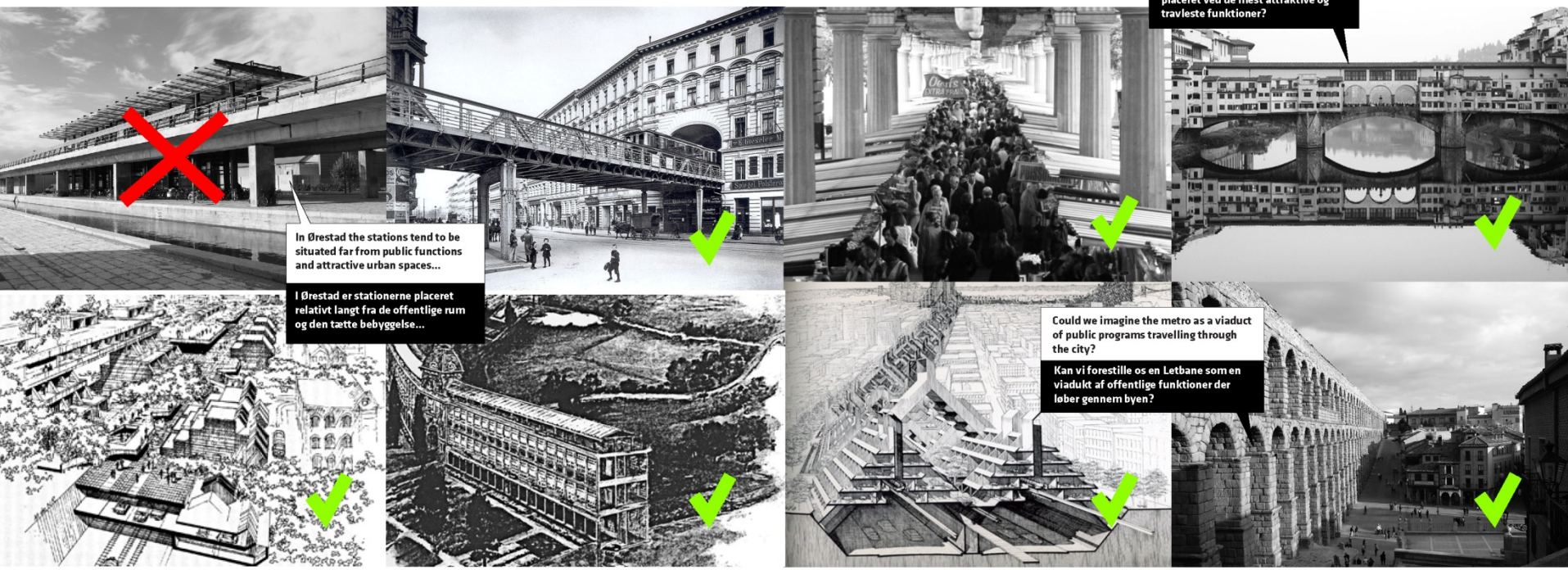
Københavns nye metro er en typisk Letbane.


Should it run on an elevated track for maximum speed?
Skal den køre hævet over trafikken for optimal hastighed?
Level 03
Level 02
Level 01
Level 00
Light Track

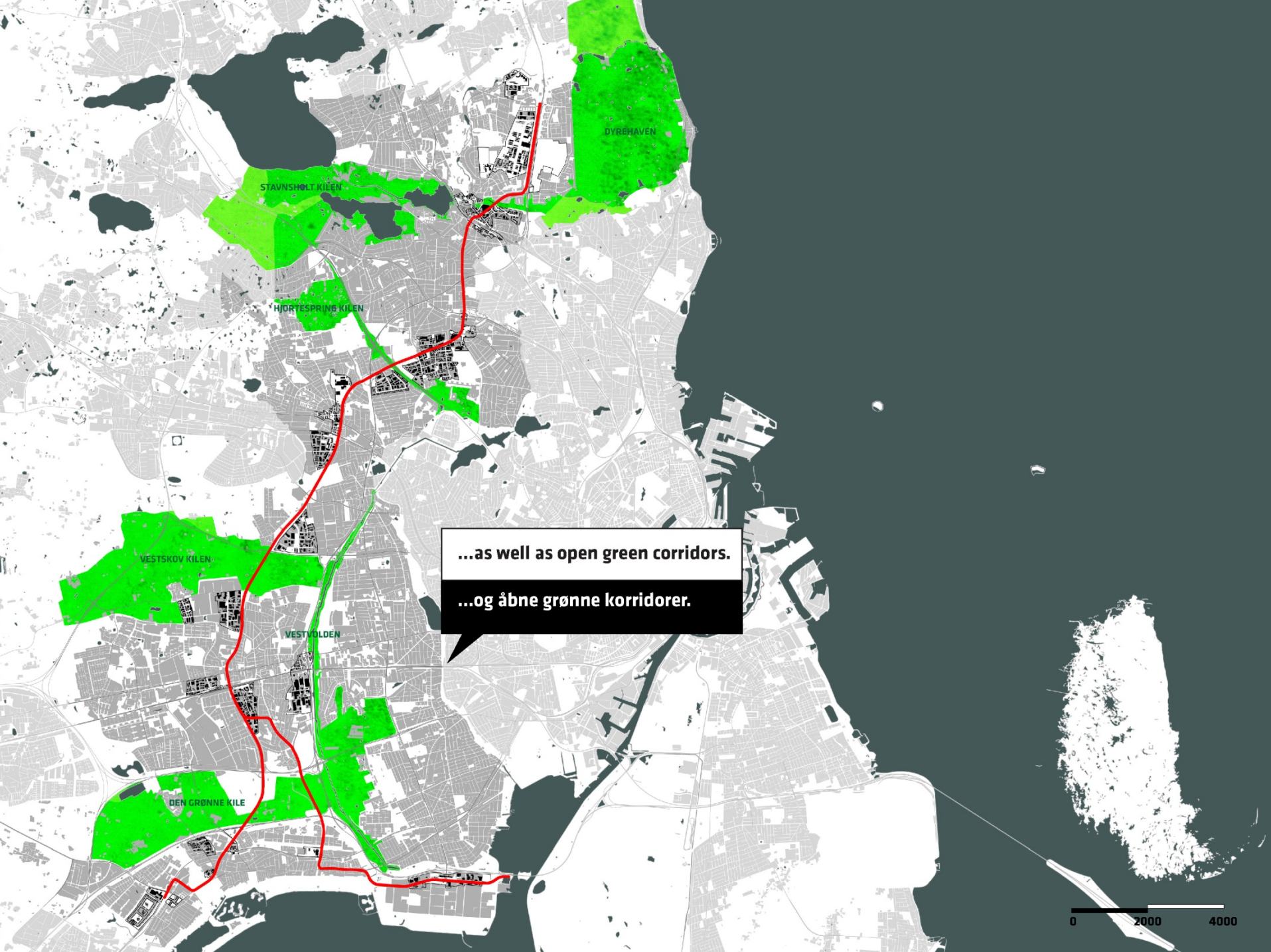

On street level for easy accessibility?
Eller på gadeniveau for maksimal tilgængelighed?
Level 03
Level 02
Level 01
Level 00
Light Track

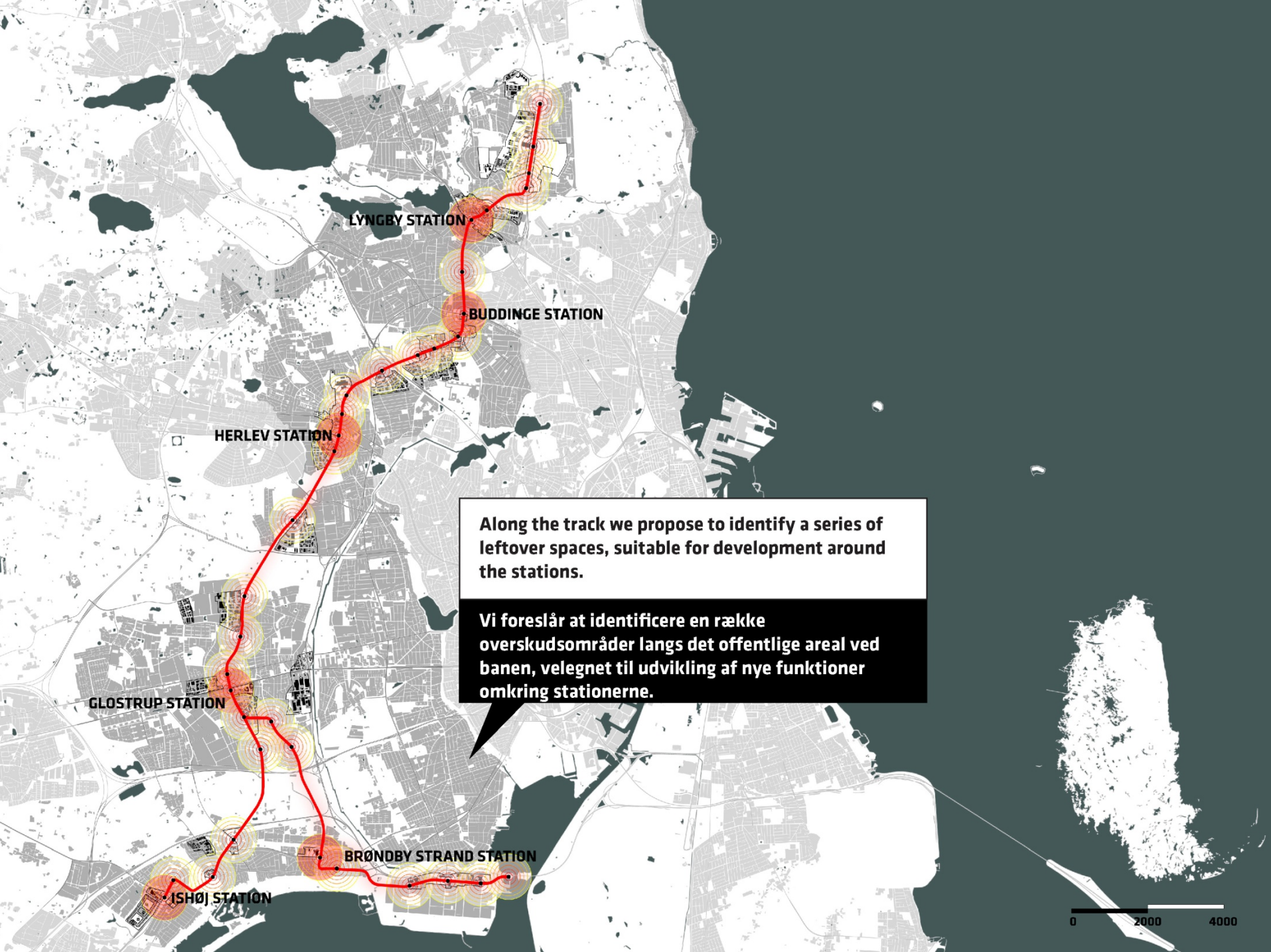

Under the street to minimize noise?
Under vejen for at minimere støj?
Level 02
Level 01
Level 00
Level -01
Light Track

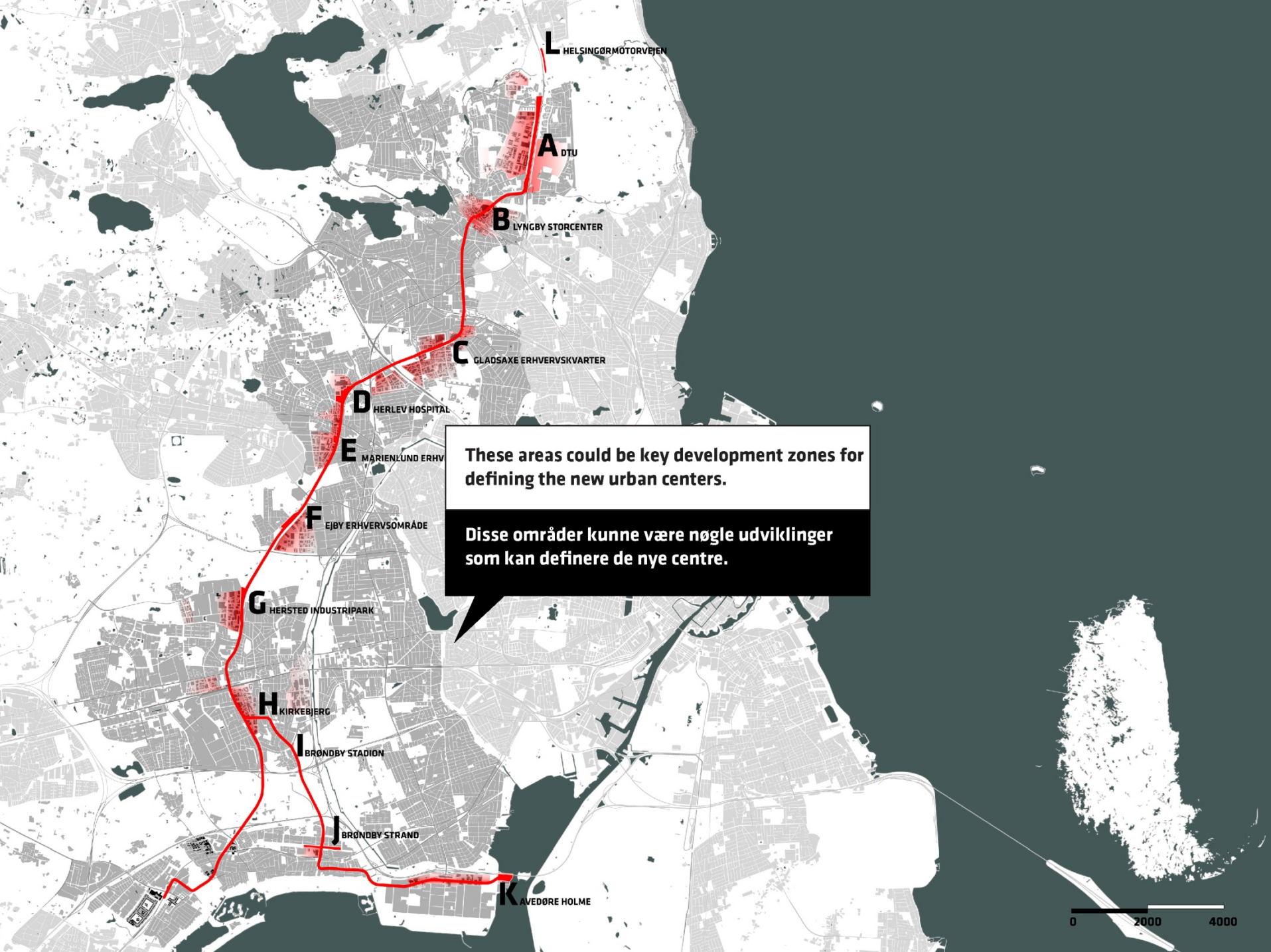

Or a combination: High at the stations/urban areas and low in the villa areas?
Eller en kombination: Hævet over trafikken ved stationerne ogpå jordniveau i villaområderne?
Level 02
Level 01
Level 00
Level -01
Light Track


In Ørestad the stations tend to be situated far from public functions and attractive urban spaces...
I Ørestad er stationerne placeret relativt langt fra de offentlige rum og den tætte bebyggelse...
What if the stations were always located in the most attractive and busiest spot?
Hvad hvis stationerne altid var placeret ved de mest attraktive og travleste funktioner?
Could we imagine the metro as a viaduct of public programs travelling through the city?
Kan vi forestille os en Letbane som en viadukt af offentlige funktioner der løber gennem byen?


If we look at the planned route for the light rail it runs through both dense urban centers...
Hvis vi ser på den planlagte rute for Letbanen, løber den igennem både tætte urbane områder...
0
2000
4000


DYREHAVEN
STAVNSHOLT KILEN
HJORTESPRING KILEN
VESTSKOV KILEN
VESTVOLDEN
DEN GRØNNE KILE
...as well as open green corridors.
...og åbne grønne korridorer.
0
2000
4000


LYNGBY STATION
BUDDINGE STATION
HERLEV STATION
GLOSTRUP STATION
BRØNDBY STRAND STATION
ISHØJ STATION
Along the track we propose to identify a series of leftover spaces, suitable for development around the stations.
Vi foreslår at identificere en række overskudsområder langs det offentlige areal ved banen, velegnet til udvikling af nye funktioner omkring stationerne.
0
2000
4000

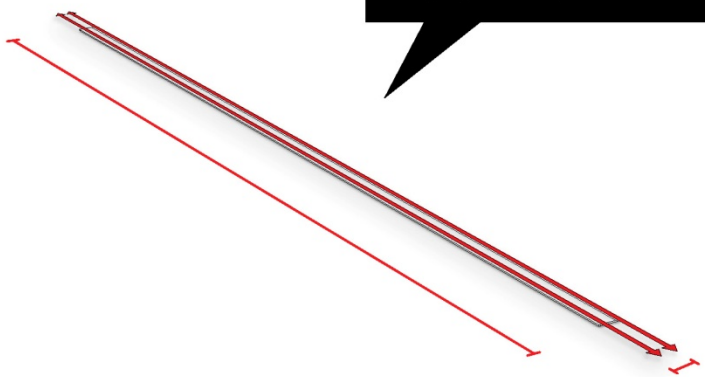

L HELSINGØRMOTORVEJEN
A DTU
B LYNGBY STORCENTER
C GLADSAXE ERHVERVSKVARTER
D HERLEV HOSPITAL
E MARIENLUND ERHV
F EJBY ERHVERVSOMRÅDE
G HERSTED INDUSTRIPARK
H KIRKEBJERG
I BRØNDBY STADION
J BRØNDBY STRAND
K AVEDØRE HOLME
These areas could be key development zones for defining the new urban centers.
Disse områder kunne være nøgle udviklinger som kan definere de nye centre.
0
2000
4000

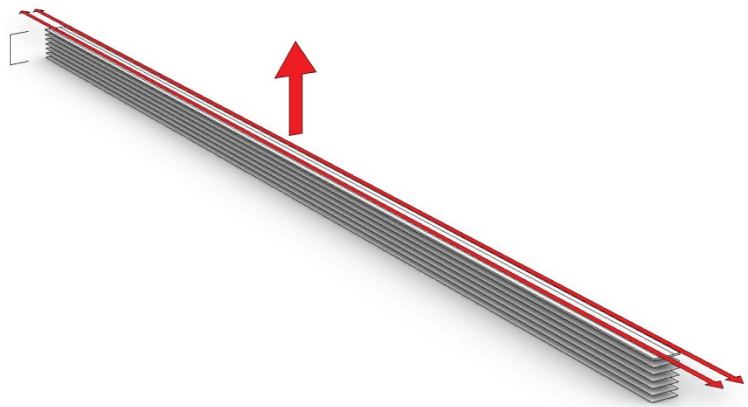
MALAGA METRO SLOPED LINE

This roller-coaster principle for acceleration and deceleration is common for underground metro system, and is used in order to save energy. For example in the Malaga Metro.

An example of a densification around a station, could be to simply extrude the area of the tracks into a new urban block!

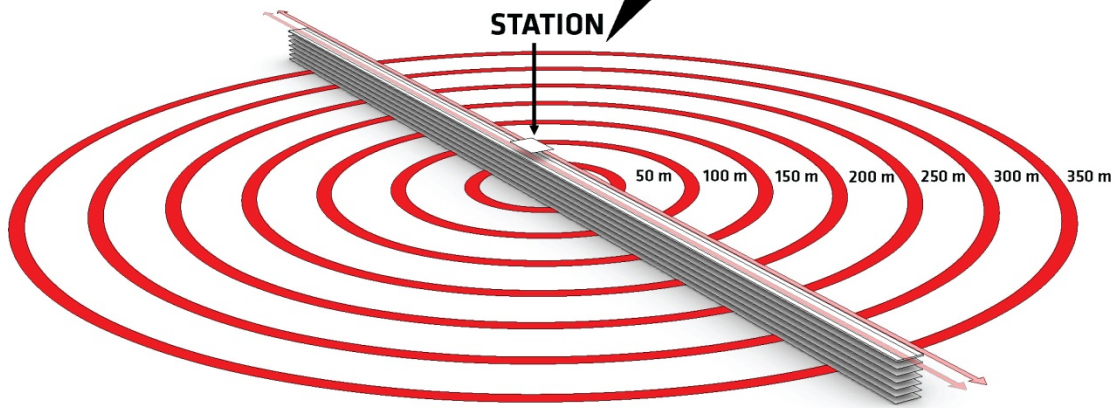
Et eksempel på en udvikling omkring en station kunne være at ekstrudere selve sporet og på den måde skabe en ny bymæssig fortætning.

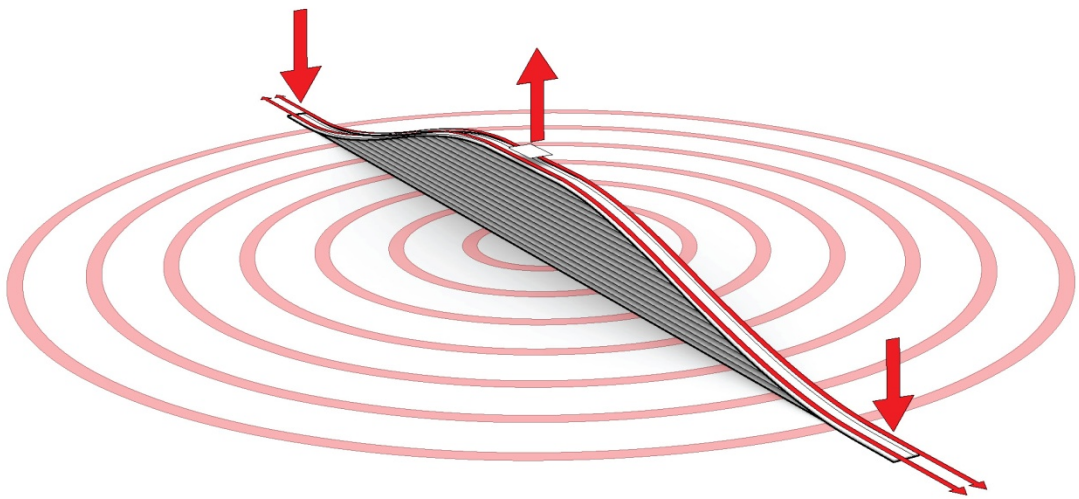




If we translate the station proximity diagram into building height the station become a small hill. The closer to the station, the denser we build!

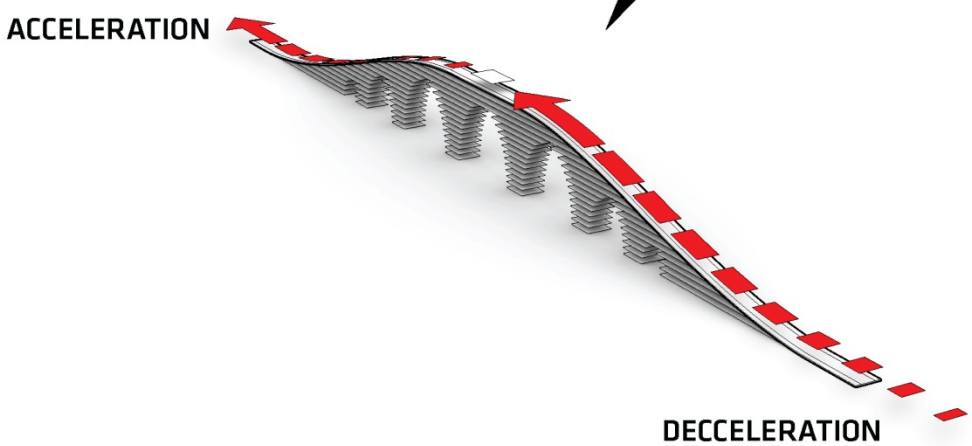
Hvis vi oversætter stationsnærhedsprincippet til bygningshøjder bliver bygningen til en lille bakke. Jo tættere på stationen, jo tættere bebyggelse!

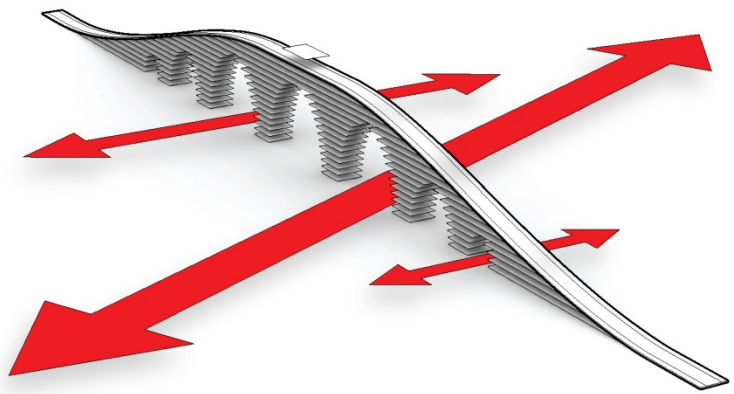


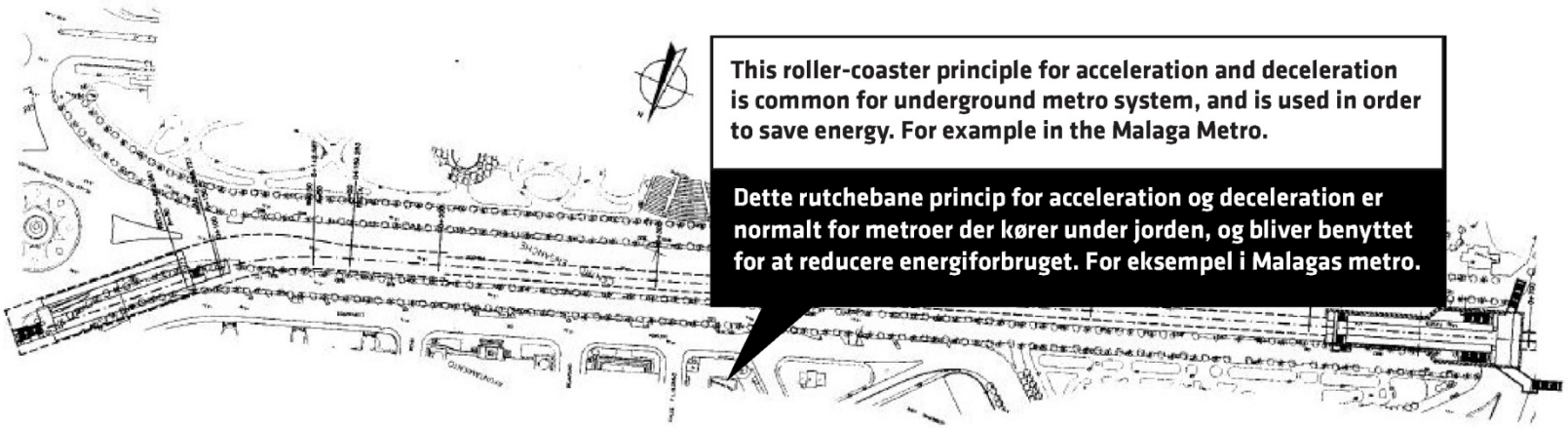


The hill would help the train decelerate at the station, an accelerate when leaving!

Højdeprofilen vil oven i købet hjælpe toget til at bremse ned ved stationen og accelerere igen ned ad bakken.

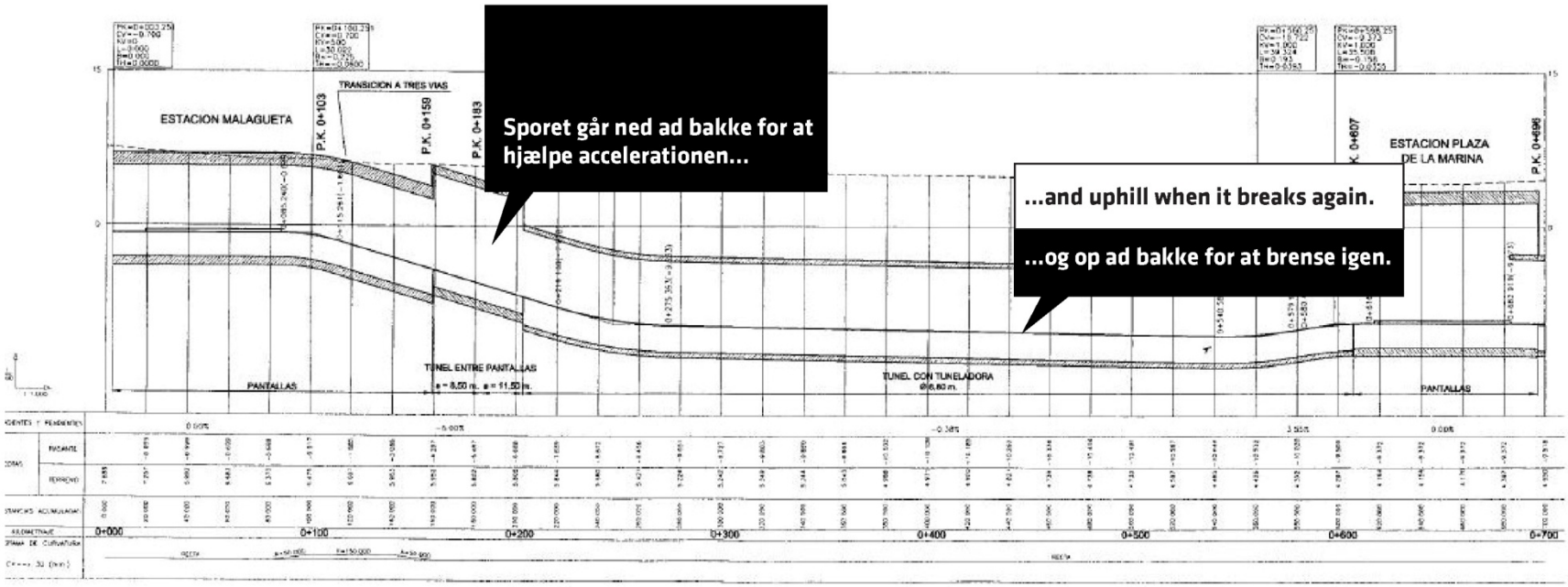






This roller-coaster principle for acceleration and deceleration is common for underground metro system, and is used in order to save energy. For example in the Malaga Metro.

Dette rutchebane princip for acceleration og deceleration er normalt for metroer der kører under jorden, og bliver benyttet for at reducere energiforbruget. For eksempel i Malagas metro.



Sporet går ned ad bakke for at hjælpe accelerationen...

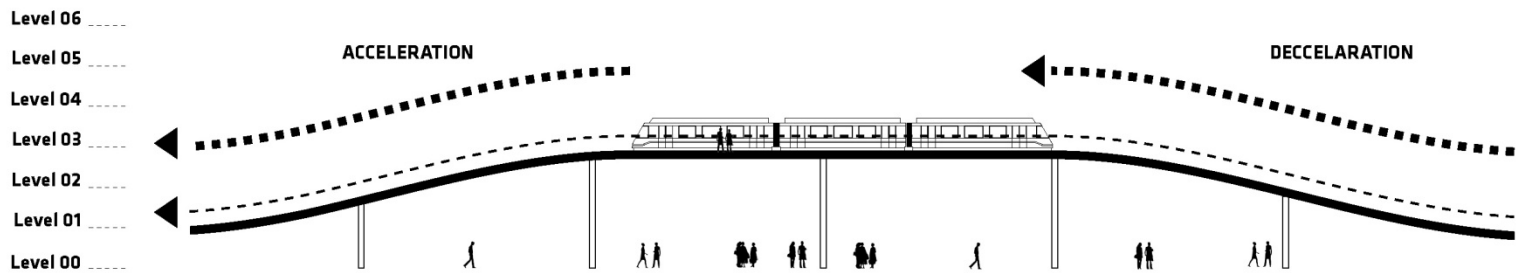
...and uphill when it breaks again.

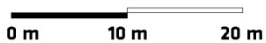
...og op ad bakke for at brense igen.


This image shows the hills inside the tunnel.
Her ses bakkerne inde i tunnelen.

What if we applied this principle to an elevated metro?

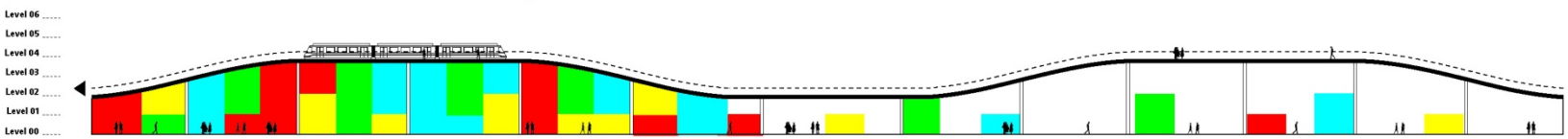
Hvad hvis vi benyttede dette princip på en metro over jorden?





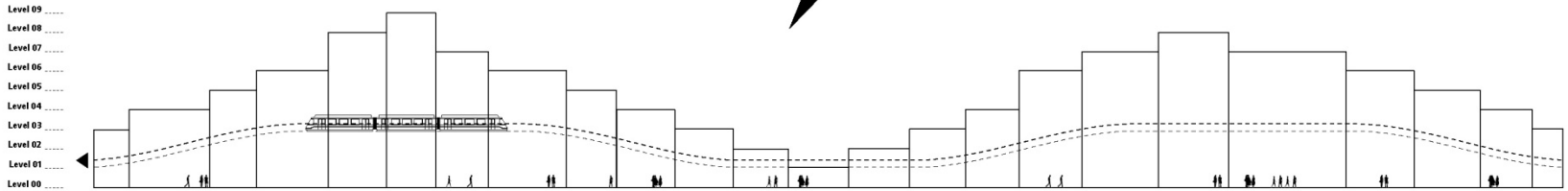
If the area under, on-top and around the rail was programmed...

Hvis vi udnyttede arealet under, ovenpå og omkring sporet...



...the metro could become a physical graph of station proximity!

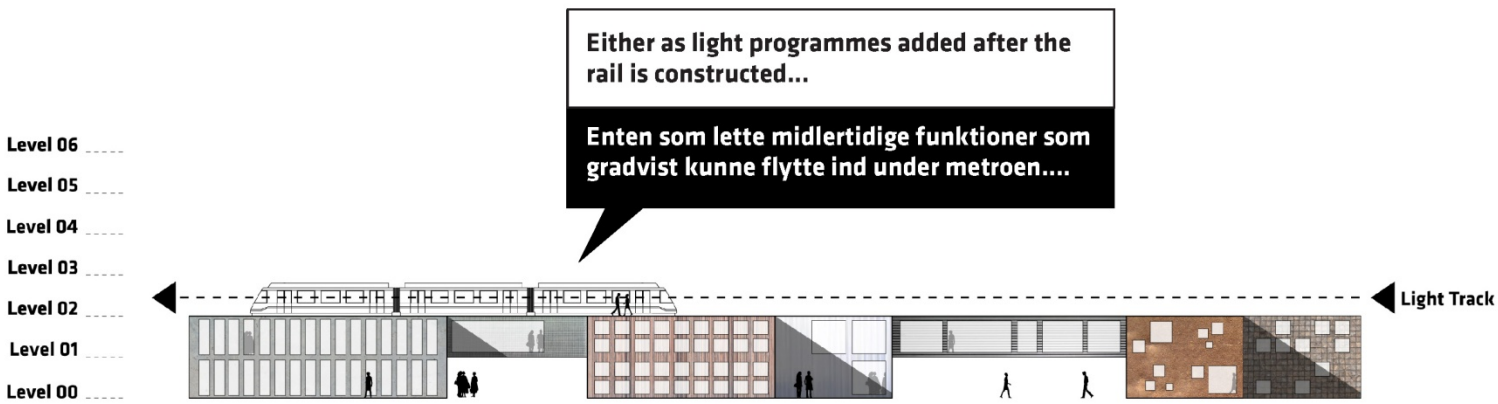
...vil metroen skabe et bygget diagram over stationsnærhed!

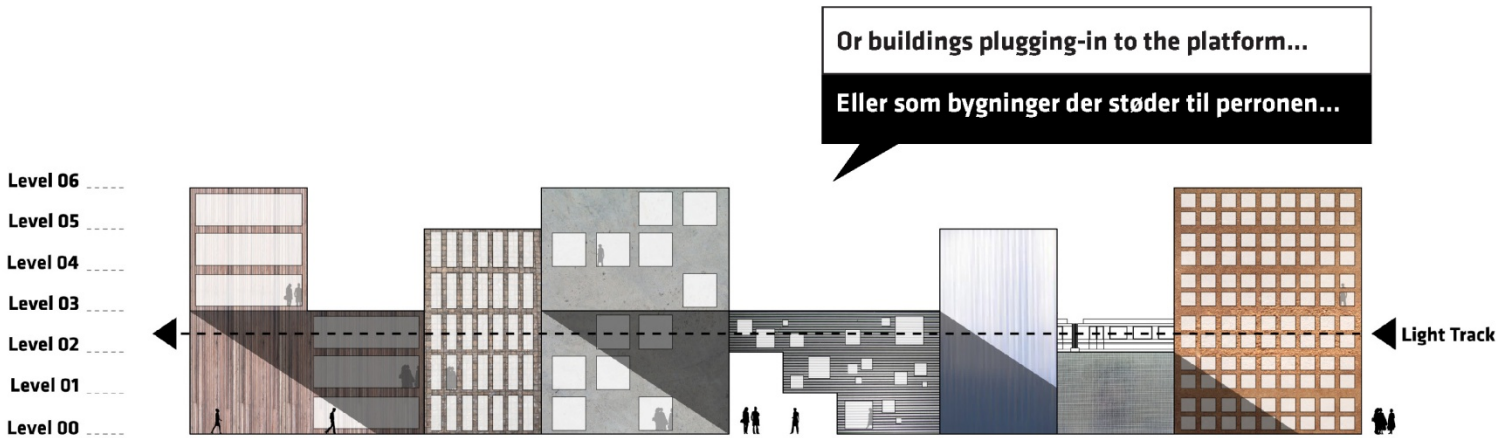


HIGH DENSITY

LOW DENSITY

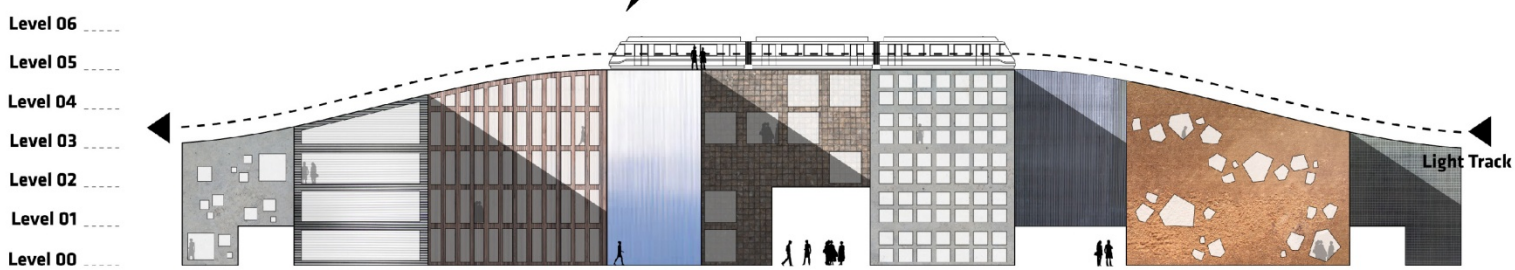
HIGH DENSITY


Either as light programmes added after the rail is constructed...
Enten som lette midlertidige funktioner som gradvist kunne flytte ind under metroen....
Level 06
Level 05
Level 04
Level 03
Level 02
Level 01
Level 00
Light Track

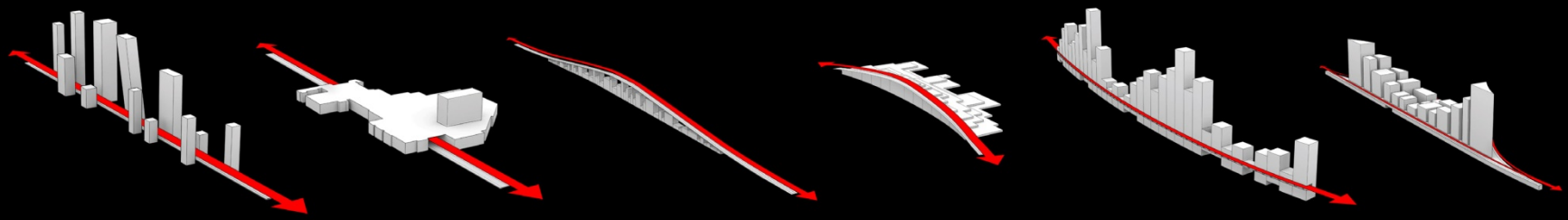

Or buildings plugging-in to the platform...
Eller som bygninger der støder til perronen...
Level 06
Level 05
Level 04
Level 03
Level 02
Level 01
Level 00
Light Track

Or ultimately constructed with the rail to form a real metro building!

Eller ultimativt bygget sammen med sporet som en ægte metrobygning!



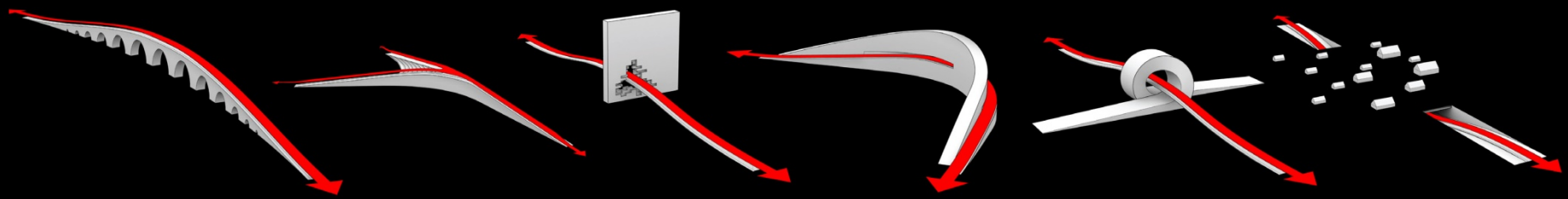
CATALOGUE OF TYPOLOGIES
KATALOG AF TYPER



A: SURROUNDED | B: ENCLOSED | C: INHABITED | D: ATTACHED | E: COVERED | F: SPLIT

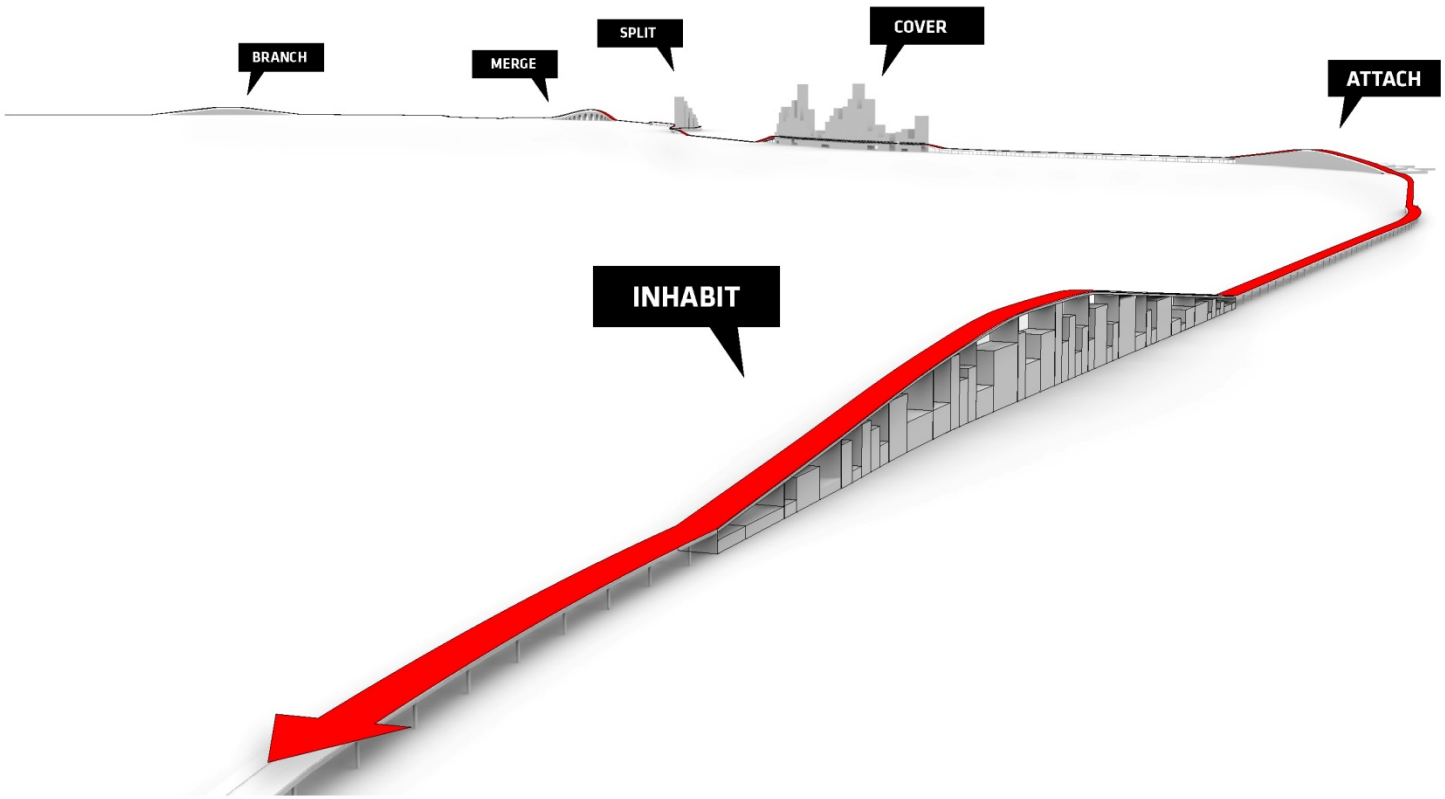
The series of stations could become a catalogue of different ways to combine buildings with stations, ranging from real hybrid solutions to clusters around stations or landmark developments.

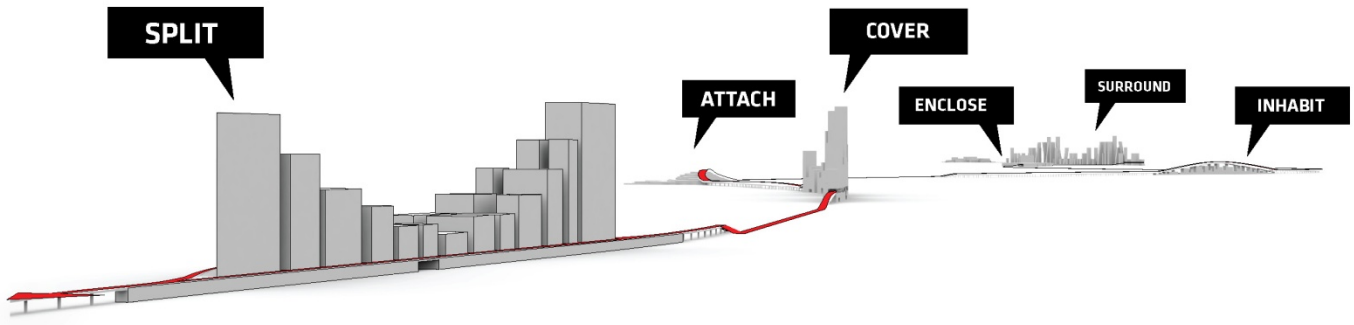
Kæden af stationer kunne blive til et katalog af forskellige måder at kombinere bygninger med stationer. Fra sammenbyggede versioner til små tætheder omkring stationerne eller bymæssige pejlemærker.

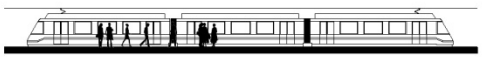


G: MERGED | H: BRANCHED | I: SUPERIMPOSED | J: SANDWICHED | K: WRAPPED | L: HIDDEN

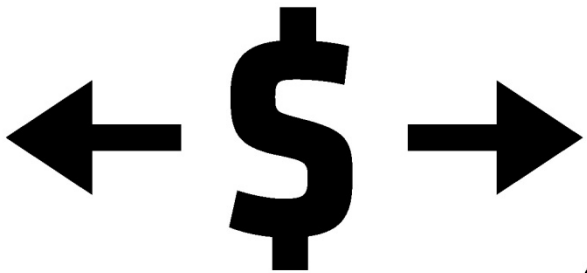
FINANCIAL CONCEPT
FINANCIERINGSKONCEPT

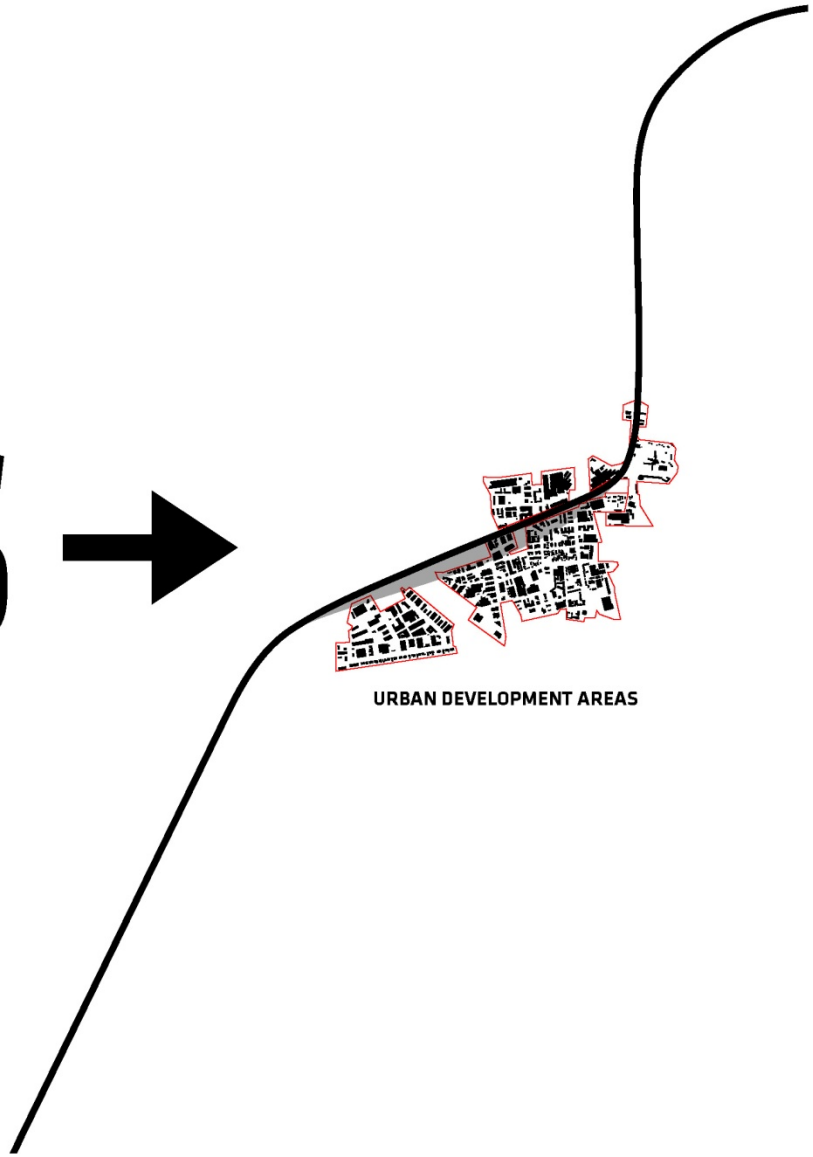



SPLIT
ATTACH
COVER
ENCLOSE
SURROUND
INHABIT



LIGHT TRACK

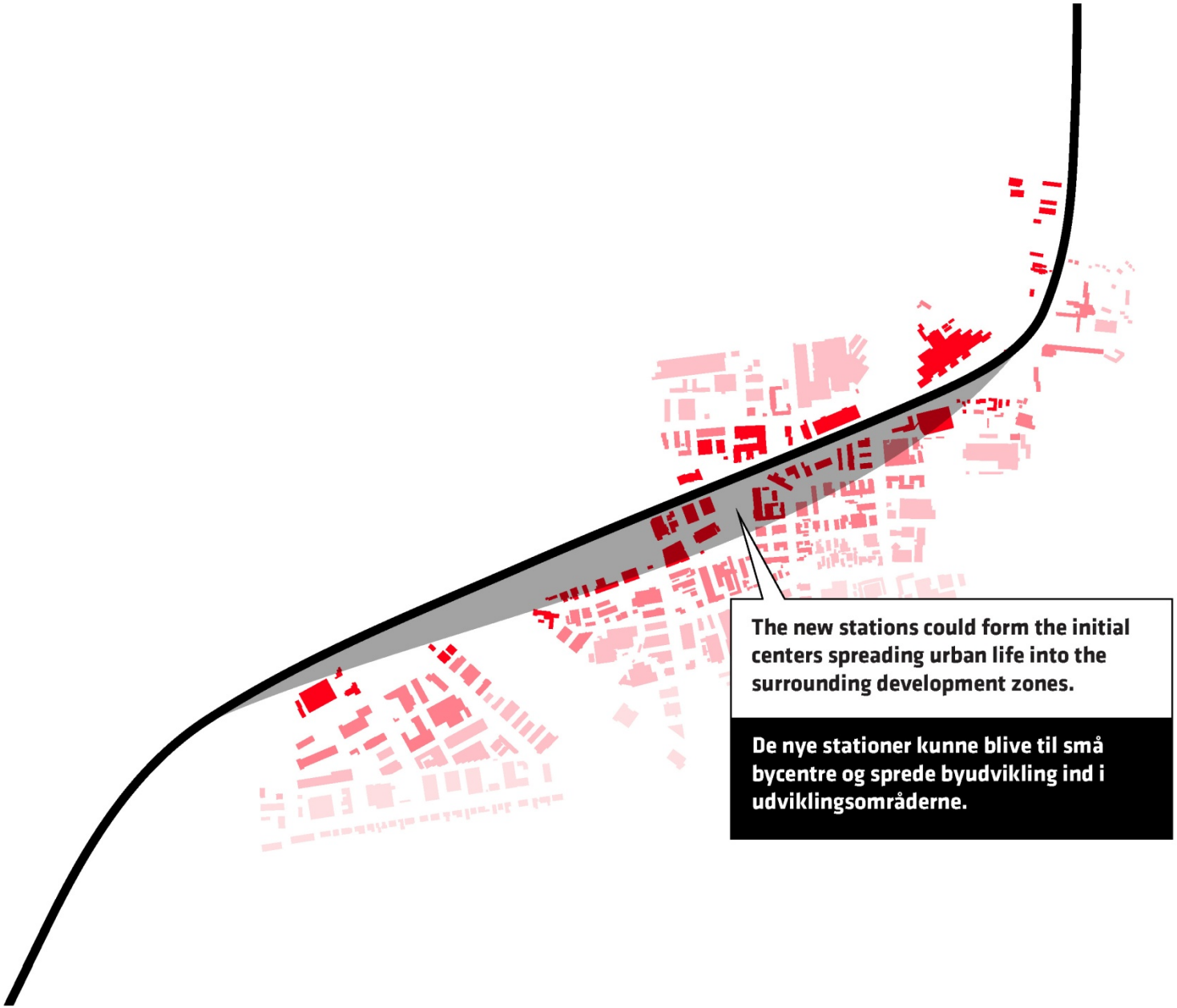




URBAN DEVELOPMENT AREAS

Since the development areas on the track are owned by the municipality, the station buildings could become a financing model for an upgraded metroline!

Området for selve sporet er offentligt ejet, så udviklingen kunne fungere som financieringsmodel for en opgraderet baneløsning!


The new stations could form the initial centers spreading urban life into the surrounding development zones.
De nye stationer kunne blive til små bycentre og sprede byudvikling ind i udviklingsområderne.


CHARGING POINT