



LISBON CES

2019

CIVIL ENGINEERING SUMMIT

24 - 28 SEPTEMBER 2019, LISBOA, PORTUGAL

Friendly Cities?
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Friendly City

My question – what is a friendly city? For me it means.....

- I would like to live there
- I would like to work there
- I would not like to spend time on long and time consuming daily commuting
- I would like to spend leisure time in this city
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Historic developement in Europe

- Round 800 AC few roman cities existed in germany
- Due to merchandise of luxury goods towns were founded to have save market places, from which the developement started
- Lord of the town was usually the owner of the land
- Aricstocrats and bishops started to develop towns
- In 13th nd 14th number of towns increased up to 3000
- Number of inhabitants more than 10000 in 12 towns

townscape

- Marketplace in front of townhall
- Cathedral
- Townhouses and shops / workshops
- Bathhouses
- Hospitals
- City wall surrounding the town

Economic structure

- Workshops – textile, locksmith, carpenters
- Travelling merchants
- Banking system developed
- In medieval times a dense network of trade routes crossed Europe

Townscape today

- Warehouses and office building in the center
- Residential neighborhood on the outskirts
- Separation of living and workplace
- People have to make their way to and from work every day
- Individual traffic
- Public transport

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ORDEN
DOS
ENGENHEIROS



Traffic infrastructure

- Individual traffic – roads, highways



Traffic infrastructure

- Individual traffic – need for parking space



Public transport

Transport by tram



Road transport by bus



Public transport

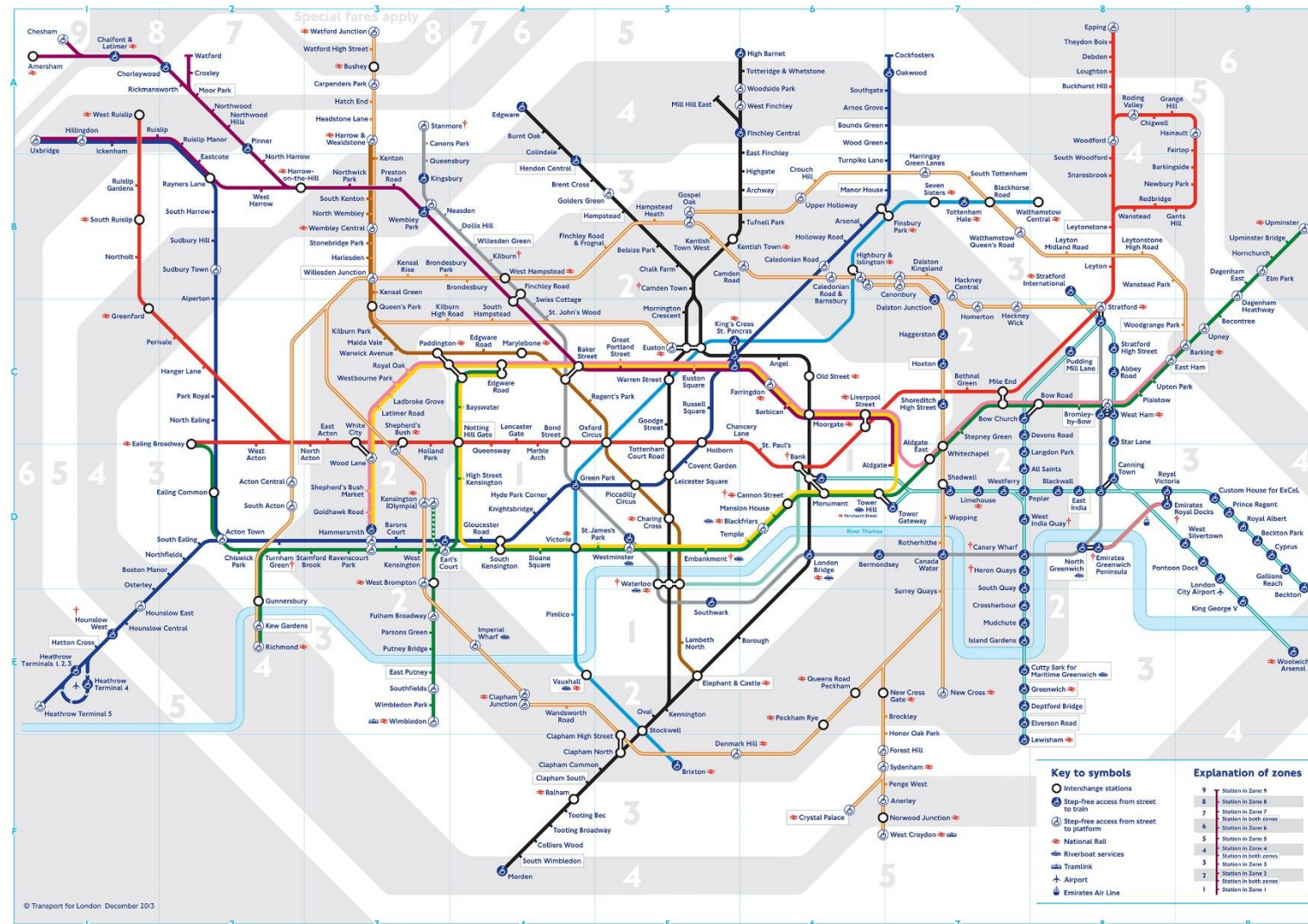
To overcome a difference in altitude
-> funicular





Public transport

Subway system under- and overground



Situation today

- Individual road transport is limited
 - Pollution
 - Noise
 - Space
- Public transport – common systems
 - Underground is expensive
 - Above ground difficult due to space

Future development

- Is autonomous driving a solution?
- Are alternative drive systems the solution? – electric, hydrogen drive?
- Alternative systems?

Autonomous driving

- Positive effect - Greater throughput and more fluid traffic
- No effect – traffic remains with all its disadvantages
- Most important question - Sustainable?

Alternative drive systems

- Electric drive – less pollution, where does electricity come from?
- No effect – traffic remains with all its disadvantages
- Hydrogen drive – not yet ready for mass production

Alternative transport system – ropeways

Positive aspects

- Uses third dimension – above ground, aerial transport
- Less space needed
- Erection cost compared to common systems as road, rail, underground low
- Easy to overcome differences in altitude or obstacles
- Bridging of traffic jam areas to relieve road strain

Alternative transport system – ropeways

realistic aspects

- Meaningful use for distance up to 7 km
- Transport capacity 5000 persons/hour in each direction
- Extension of an existing or planned local public transport system as feeder or distributor
- Number of access points or exits limited
- Number of lines

Alternative transport system – ropeways

weak points

- Limited possibilities
- Limited transport capacity
- Not suitable for longer distances
- Not suitable for strong curves and associated changes

Requirements for ropeways systems

- High availability – 24/7
- High availability – wind stability
- Continuous transport versus pulsing transport

Examples of urban cableways

La Paz



Examples of urban cableways

Medellin



Examples of urban cableways

Constantine



Examples of urban cableways

New York



Examples of urban cableways

Ankara



To improve friendliness of a city

- Reduce Traffic – combine workplace and livingplace
- Combine necessary traffic with a pleasant experience
e.g. ropeway ride
- Make cities green – reduce space for traffic infrastructure

Questions?
Suggestions?

Thank you for your attention!

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