



TOWARDS A HYBRID CITIES LAB

interrogating the changing relationship
between physical and digital spaces in cities

March 2024
LSE Cities Workshop

LSE Cities
London School of Economics and Political Science



01

Introduction

- Towards a Hybrid Cities Lab –

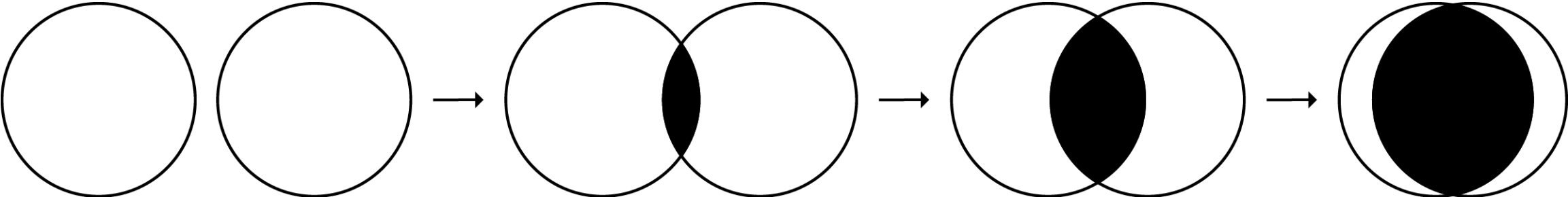
Interrogating **the changing interrelationship between physical and digital spaces** in cities and how this evolving interdependence informs the future trajectory of urban development at multiple scales.

POTENTIAL INQUIRIES

- How are the **physical behaviours** of people changing when a formerly physical space becomes hybrid?
- What circumstances may require **full and exclusive on-site** engagement without any digital connectivity?
- Can hybrid spaces significantly **reduce the need** to travel?
- What has the **regulatory response** to hybridisation of space been to date?



THE SHADES OF URBAN HYBRIDITY



02

Hybrid Disruptions

Business 1 MIN READ NEWS

Apple enters mixed reality with \$3,500 Vision Pro headset

Apple takes its first official step into AR and VR hardware in 2024 with its long-rumored mixed reality headset.

Justin Carter
Contributing Editor

June 05, 2023

Supporting India's economic productivity with digital public infrastructure

Virtual roundtable | Digital Monetary Institute

Mon 13 Nov 2023 12:00 - 13:00

TRAVEL

Italian Island Is Luring Nomads With 3 Months Free Rent

Imperial Business Insights Contributor

culture and food in Europe.

Follow

Sep 15, 2023, 10:49am EDT

Here's What We Learned About the Effects of Remote Work

...into a mass workplace experiment, we can begin to understand more about how work from home affects productivity and the economy.

Academic Year Wrap-Up: How is AI Boosting Hybrid Education Strategies?

hybrid education

Published: June 22, 2023

Meta Quest 3 review: mixed reality's tipping point to major success

★★★★★

Nearly a third of university courses still have hybrid teaching

6 January

OPINION
GUEST ESSAY

'The Era of Urban Supremacy Is Over'

March 15, 2023

...ising Market

FORBES > LEADERSHIP > LEADERSHIP STRATEGY

Business Schools Must Lead By Example On Hybrid Learning

Imperial Business Insights Contributor

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Aug 4, 2023, 10:09am EDT

WeWork Files for Bankruptcy Amid Glut of Empty Offices

The move is a blow for landlords who have rented space to the co-working group, which is planning a "comprehensive reorganization" that includes cutting some of its leases.

CEOs plan to reinvent

BY GLEB TSIPURSKY
October 10, 2023 at 12:52 PM GMT+1

Role

Artificial intelligence can be used to design engaging and interactive public art

Published: August 16, 2023 10:15pm BST

AFFORDABLE HOUSING

The White House Affordable Housing: Convert Empty Office Buildings

The Biden Administration is making it easier to help turn offices into apartments.

Property Market

Wednesday, 26/07/2023 | 11:29 GMT by FM Contributors

'Super commuting' is on the rise — and that spells big trouble for mid-size cities

the Booming Metaverse Property Market

the Booming Metaverse





Hybrid Retail

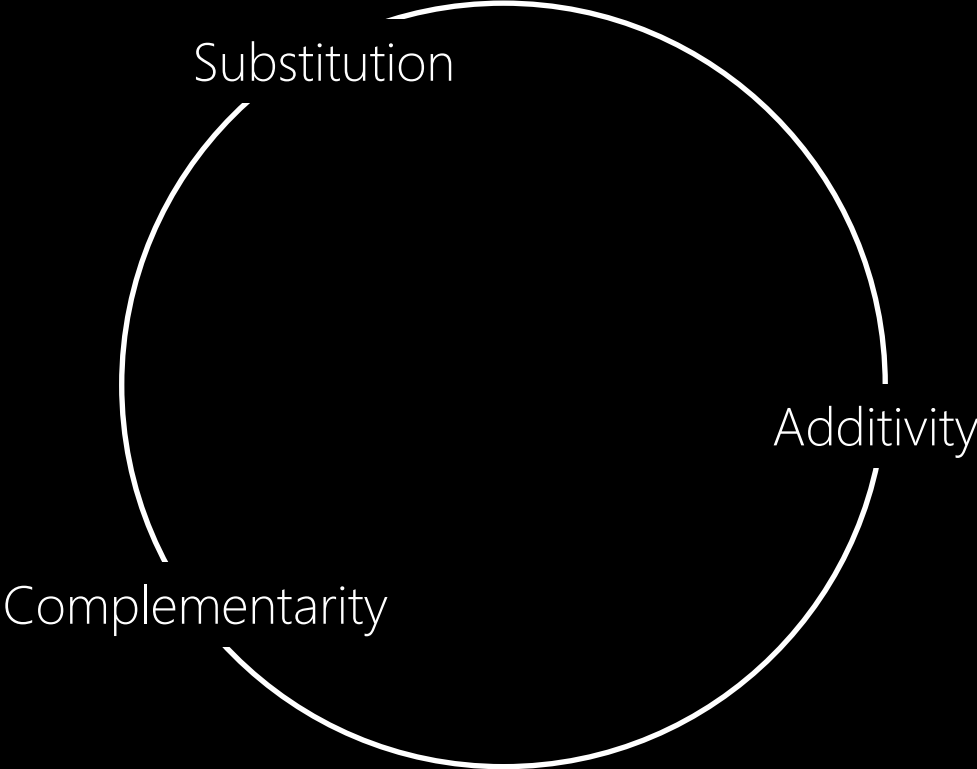
Hybrid Knowledge Work

An aerial photograph of a city street. A black and white zebra crosswalk is visible, with white stripes on a dark asphalt background. Two people are walking across the crosswalk. The person on the left is wearing a dark blue t-shirt and tan pants, looking down at a smartphone. The person on the right is wearing a light blue shirt, dark pants, and a backpack, also looking at a smartphone. A black rectangular box is overlaid on the center of the image, containing the word "Transport" in white text.

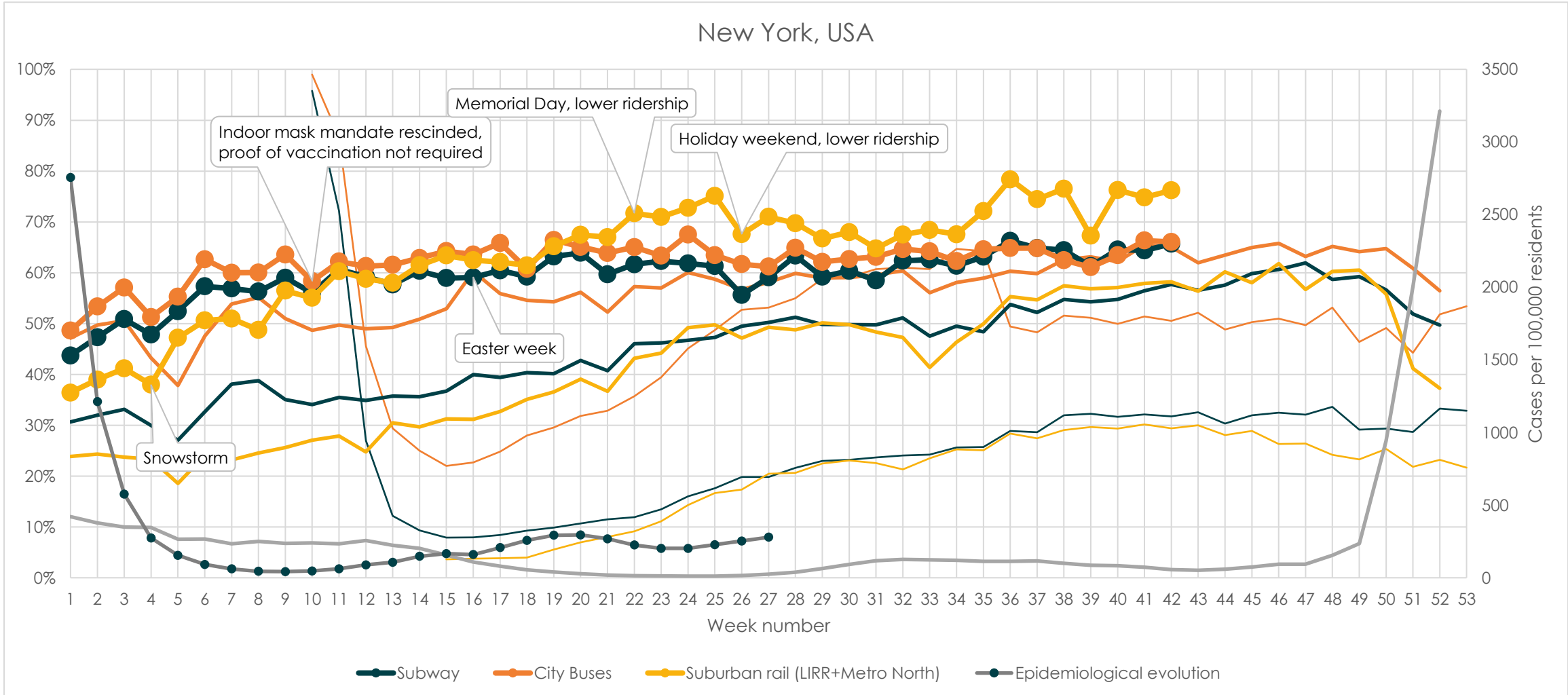
Transport

SPATIAL MOBILITY AND VIRTUAL MEDIA

Source: based on Kellermann 2014



NEW YORK CITY – PUBLIC TRANSPORT USE 2022



*Comparison with 2019 average for corresponding days

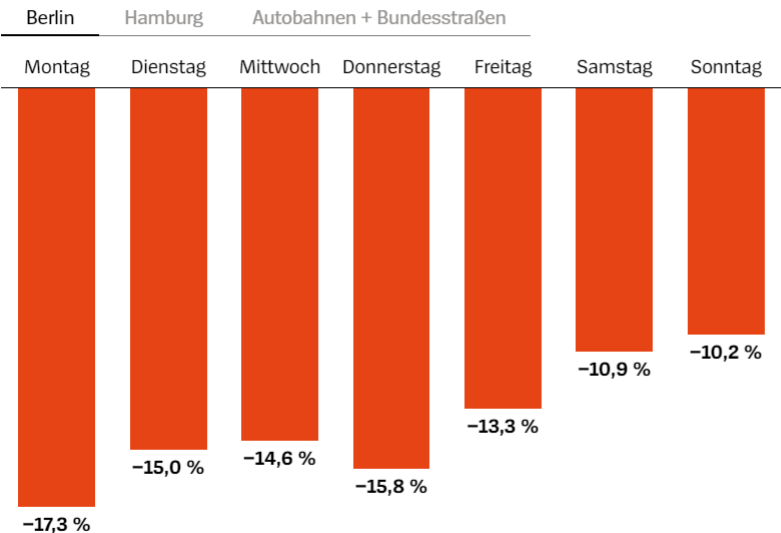
REDUCTION IN CAR USE - GERMANY

Berlin

2023 compared to 2019

Deutschland lässt das Auto stehen

Erfasste Pkw 2023 im Vergleich zu 2019* nach Wochentag



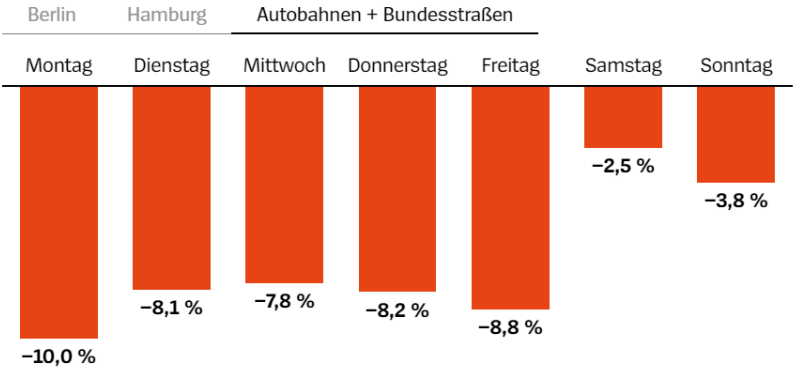
* an 143 Zählstellen in Berlin, jeweils Januar bis Juni
 S-Quelle: [Digitale Plattform Stadtverkehr](#), eigene Berechnungen

Federal Highways and Roads

2023 compared to 2019

Deutschland lässt das Auto stehen

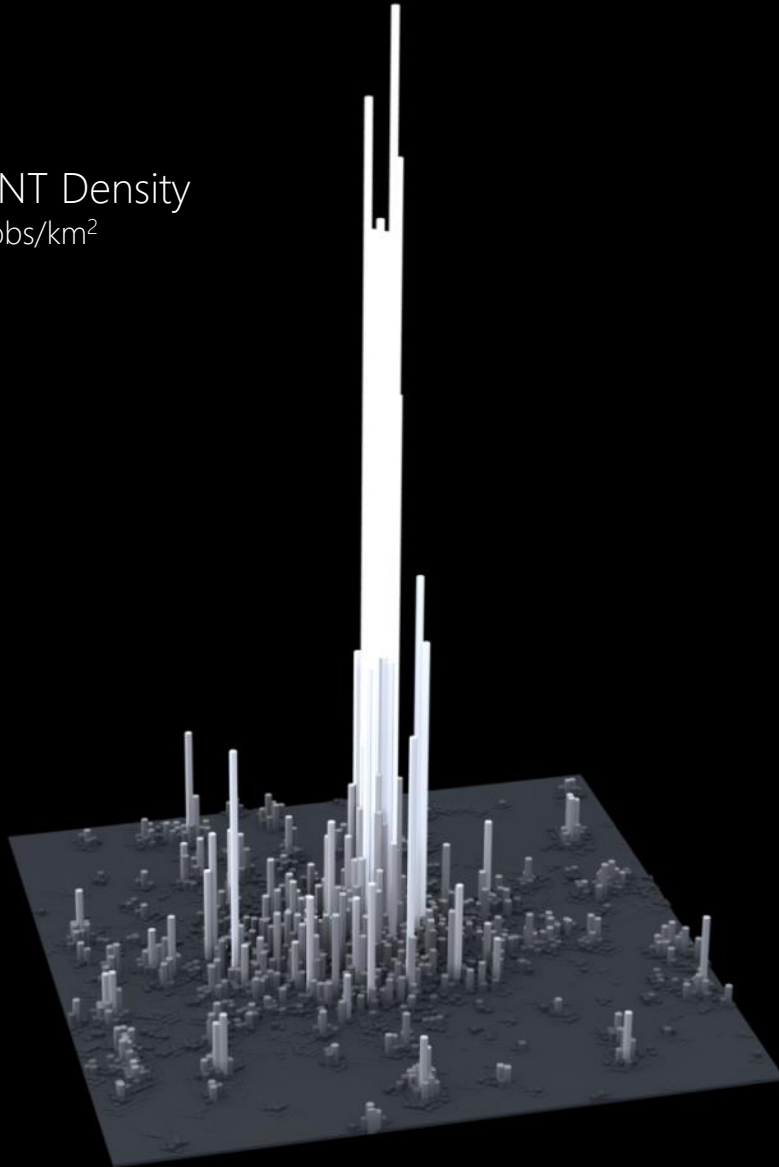
Erfasste Pkw 2023 im Vergleich zu 2019* nach Wochentag



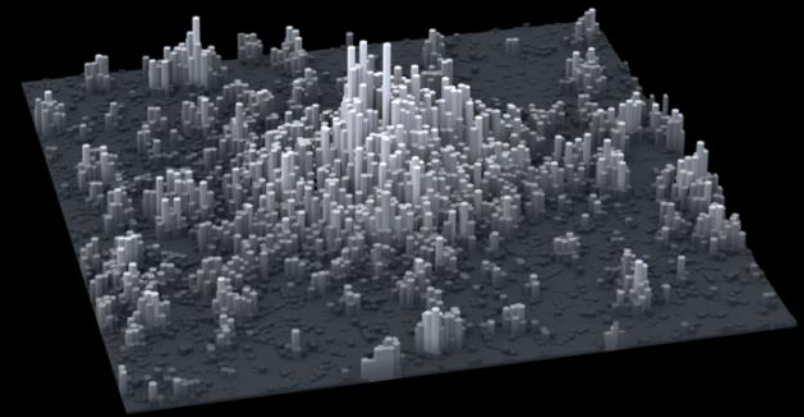
* an 917 Zählstellen auf Autobahnen und Bundesstraßen, jeweils Januar bis Mai
 S-Quelle: [Bast](#), eigene Berechnungen

LONDON: WHERE PEOPLE WORK AND LIVE

EMPLOYMENT Density
PEAK 141,600 jobs/km²

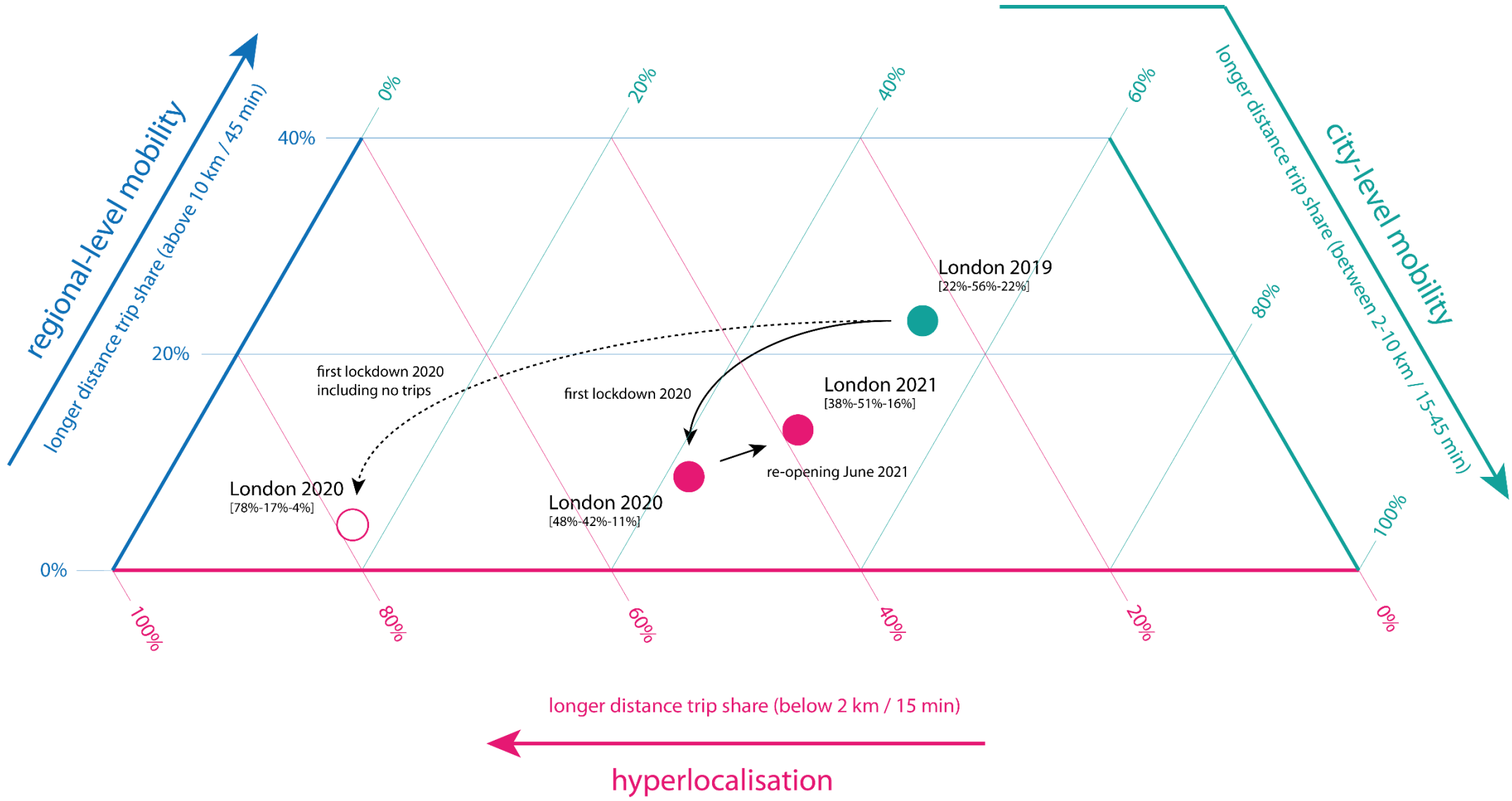


RESIDENTS Density
PEAK 27,100 pp/km²



LONDON HYPERLOCALISATION | 2019-2021

Source: Rode 2021 based on data by Teralytics





Time
8:57

Upcoming Events
10:30 - Meet with architect
12:00 - Lunch with Sarah

LUTCH

03

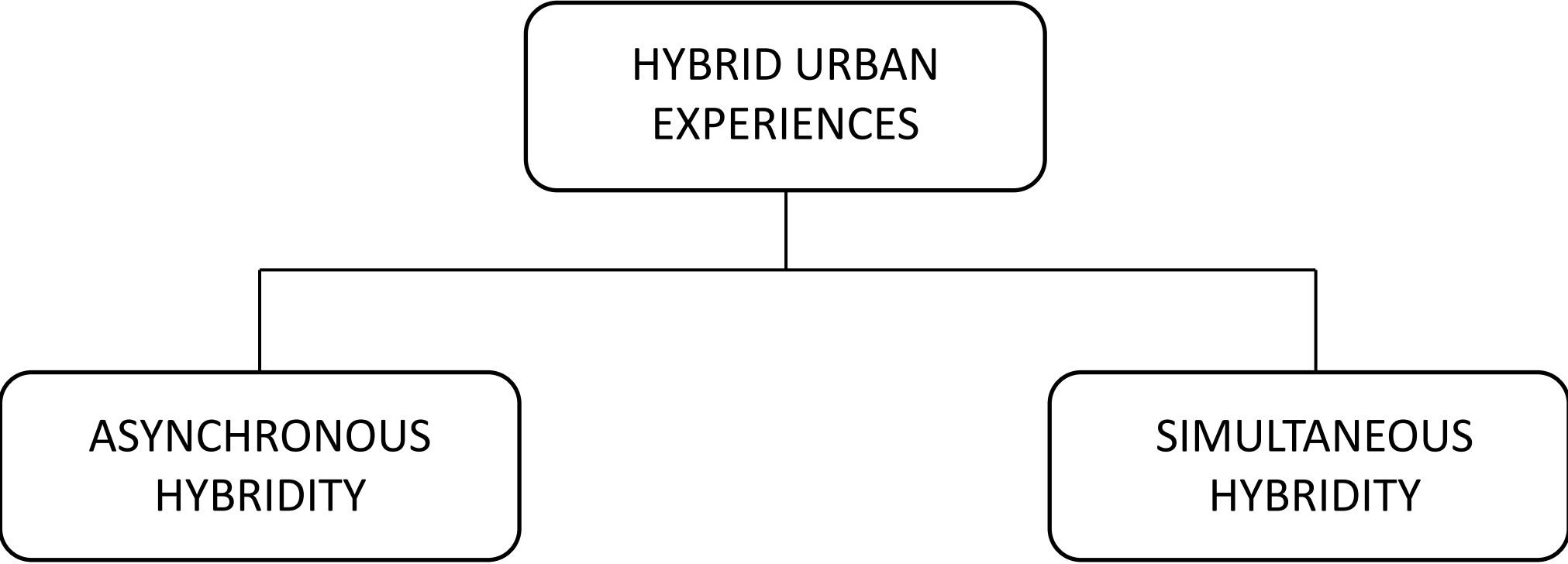
Conceptual Framework







HYBRID CITIES | TOWARDS A CONCEPTUAL FRAMEWORK



ASYNCHRONOUS HYBRIDITY (BACK & FORTH)

A1

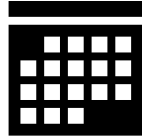


Low Frequency

The combination of related physical and virtual activities over a period of years

- Infrastructure engineering based on virtual design
- Filming followed by virtual editing and effect processing

A2

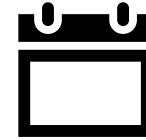


Lower Frequency

The combination of related physical and virtual activities over a period of months

- Discretionary hybrid retail
- Hybrid learning
- Travel planning

A3



Higher Frequency

The combination of related physical and virtual activities over a period of days

- Hybrid dating

A4



High Frequency

The combination of related physical and virtual activities over a period of minutes

- Cash withdrawal
- Navigating

SIMULTANEOUS HYBRIDITY (AT THE SAME TIME)

S1



Hybrid Connection of People

People are physically and virtually connected **at the same time**

- Hybrid meeting
- Hybrid reality game
- Telesurgery
- Hybrid classroom
- Hybrid policing
- Hybrid participation
- Hybrid deliberation

S2



Hybrid Activity of People

Individual people are active in physical and virtual space **at the same time**

- Digital navigation
- Working online on public transport
- Online gaming while traveling
- Platform-based delivery
- Handsfree phone call
- Hybrid multitasking in the home

S3

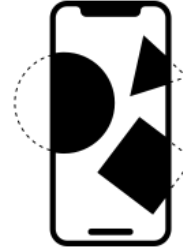


Autonomous Systems

Autonomous systems operate in physical space shared with people

- Autonomous goods vehicles in public spaces
- Autonomous passenger vehicles in public spaces
- Automated factory
- Manufacturing robots
- GoPro drones in sports
- Care/hospital robots
- Autonomous home appliances

S4



Augmented Space

Physical and virtual environments are combined through digital devices

- AR job training
- AR work collaboration
- AR design
- AR real estate
- AR public art
- AR reality games
- Extended reality healthcare
- AR classroom
- AR navigation

S5



Virtual Space

Virtual environments with limited connection to physical space

- VR work
- VR games
- Virtual tourism
- VR healthcare
- Virtual real estate
- Virtual city models

SUMMARY

ASYNCHRONOUS HYBRIDITY | TYPES A



A1
Low Frequency

The combination of related physical and virtual activities over a period of years



A2
Lower Frequency

The combination of related physical and virtual activities over a period of months



A3
Higher Frequency

The combination of related physical and virtual activities over a period of days



A4
High Frequency

The combination of related physical and virtual activities over a period of minutes

SIMULTANEOUS HYBRIDITY | TYPES S



S1
Hybrid Connection of People

People are physically and virtually connected at the same time



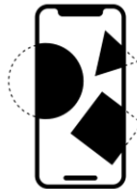
S2
Hybrid Activity of People

Individual people are active in physical and virtual space at the same time



S3
Autonomous Systems in Physical Space

Autonomous systems operate in physical space shared with people



S4
Augmented Space

Physical and virtual environments are combined through digital devices



S5
Virtual Space

Virtual environments with limited connection to physical space

04

Critical Hybrid Cities Ecosystems

HYBRID CITIES MATRIX

Selected academic work by type of hybridity and urban domain

Work
Leisure
Care
Education
Housing
Transport
Retail
Governance

S1



Hybrid Connection of People

Di Marino et al. (2023)
Swist et al. (2017)

Xu et al. (2023)
Djukic, Vlastos, & Joklova (2019)
Trachana (2014)

Miller et al. (2021)
Sabel et al. (2021)
Gallegos-Rejas et al. (2022)

Gil, Martínez, & Sequera (2023)

Innocent & Stevens (2021)
Apostol, Antoniadis, & Banerjee (2013)
Den Akker (2014)

S2



Hybrid Activity of People

Vilhelmson & Thulin (2016)
Schroeder (2010)
Nardi & Whittaker (2002)

De Souza e Silva (2017)
Pucciarelli & Vannini (2018)

López-Fernández, Burgueño, & Gil-Espinosa (2021)
Molenaar (2022)

Aihara, Bin, & Imura (2019)
Aihara et al. (2018)
Moran et al. (2018)

Guo et al. (2019)

Chen (2023)
Servou, Behrendt, & Horst (2023)
Lokot (2019)

S3



Autonomous Systems in Physical Space

Cheng et al. (2021)
Langer, König, & Busch (2020)

Forgas-Coll et al. (2021)

Liu et al. (2022)
Rantanen et al. (2018)

Nicholls & Strengers (2019)
Oh & Lee (2016)

Csepinszky et al. (2015)
Sumalee & Ho (2018)
Yigitcanlar, Wilson, & Kamruzzaman (2019)

S4



Augmented Space

De Souza e Silva (2006)
Boj & Díaz (2008)

Frith (2012)
Vickerman (2021)
Ren & Kwan (2007)
Shaw (2023)

Innocent (2018)
Marqués & Borba (2017)

S5

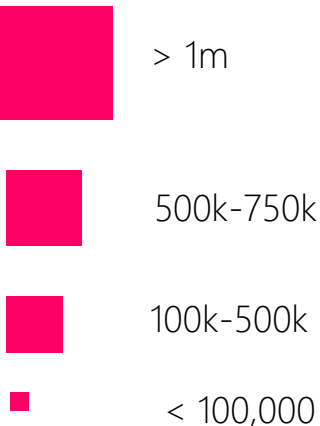


Virtual Space

HYBRID CITIES MATRIX

Web hits by type of hybridity and urban domain (based on related key terminologies)

Legend (web search results)



Work
Leisure
Care
Education
Housing
Transport
Retail
Governance

S1
Hybrid Connection of People



S2
Hybrid Activity of People



S3
Autonomous Systems in Physical Space



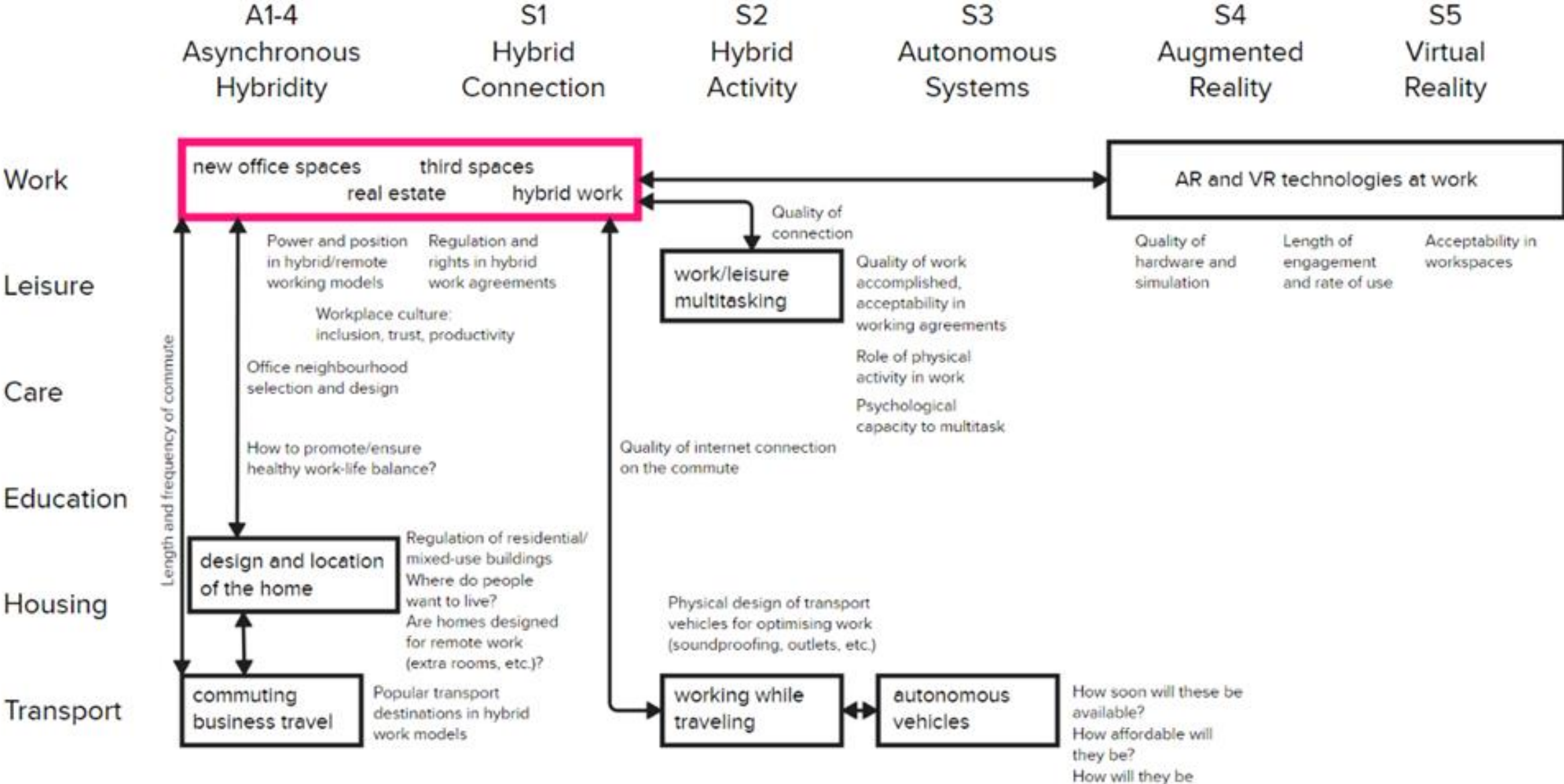
S4
Augmented Space



S5
Virtual Space



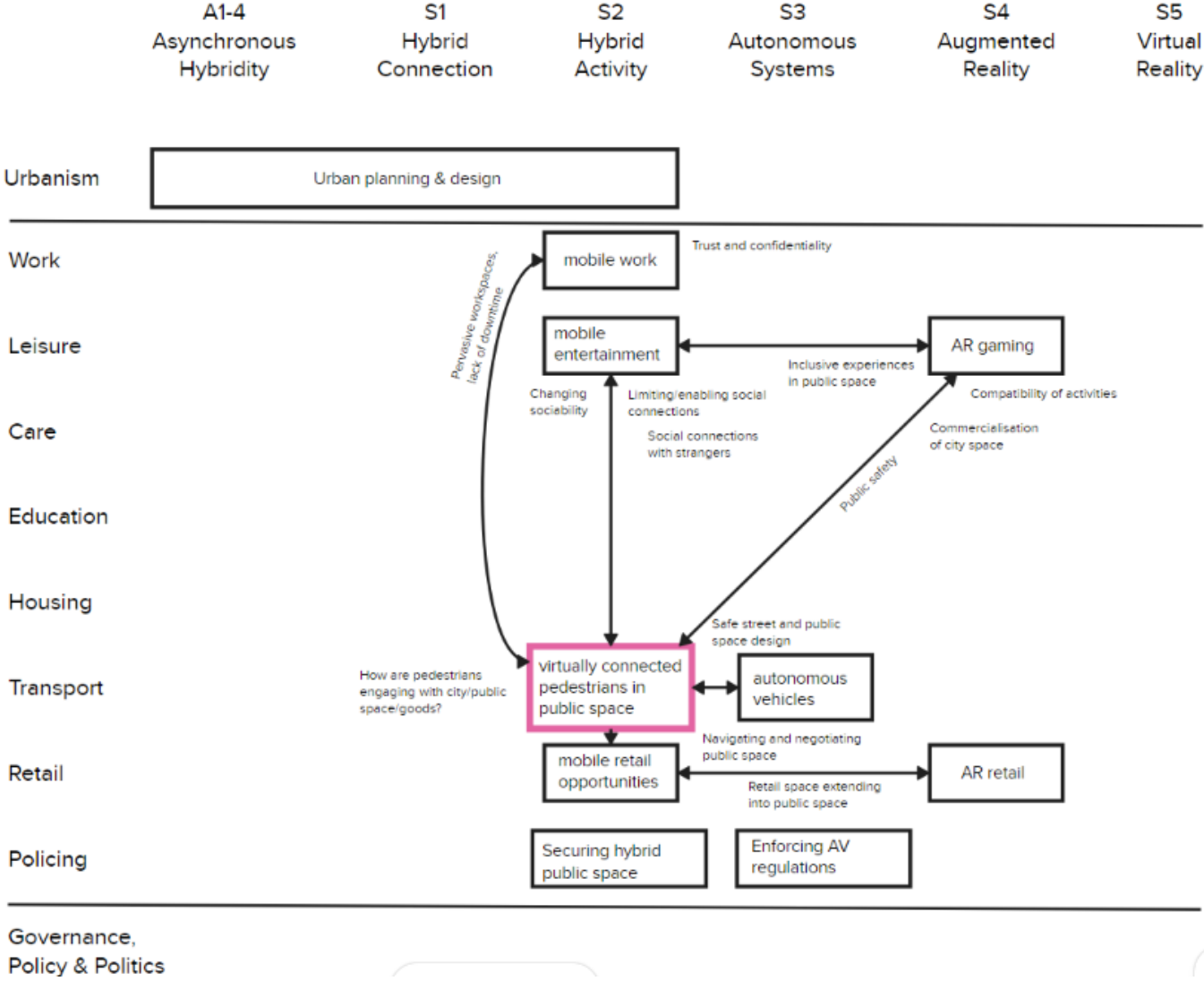
01 | THE EVOLVING GEOGRAPHY OF KNOWLEDGE WORK







02 | PUBLIC SPACE, CONNECTED PEOPLE AND AUTONOMOUS SYSTEMS



WEST END

← Down steps for
BFI IMAX
Waterloo Bridge

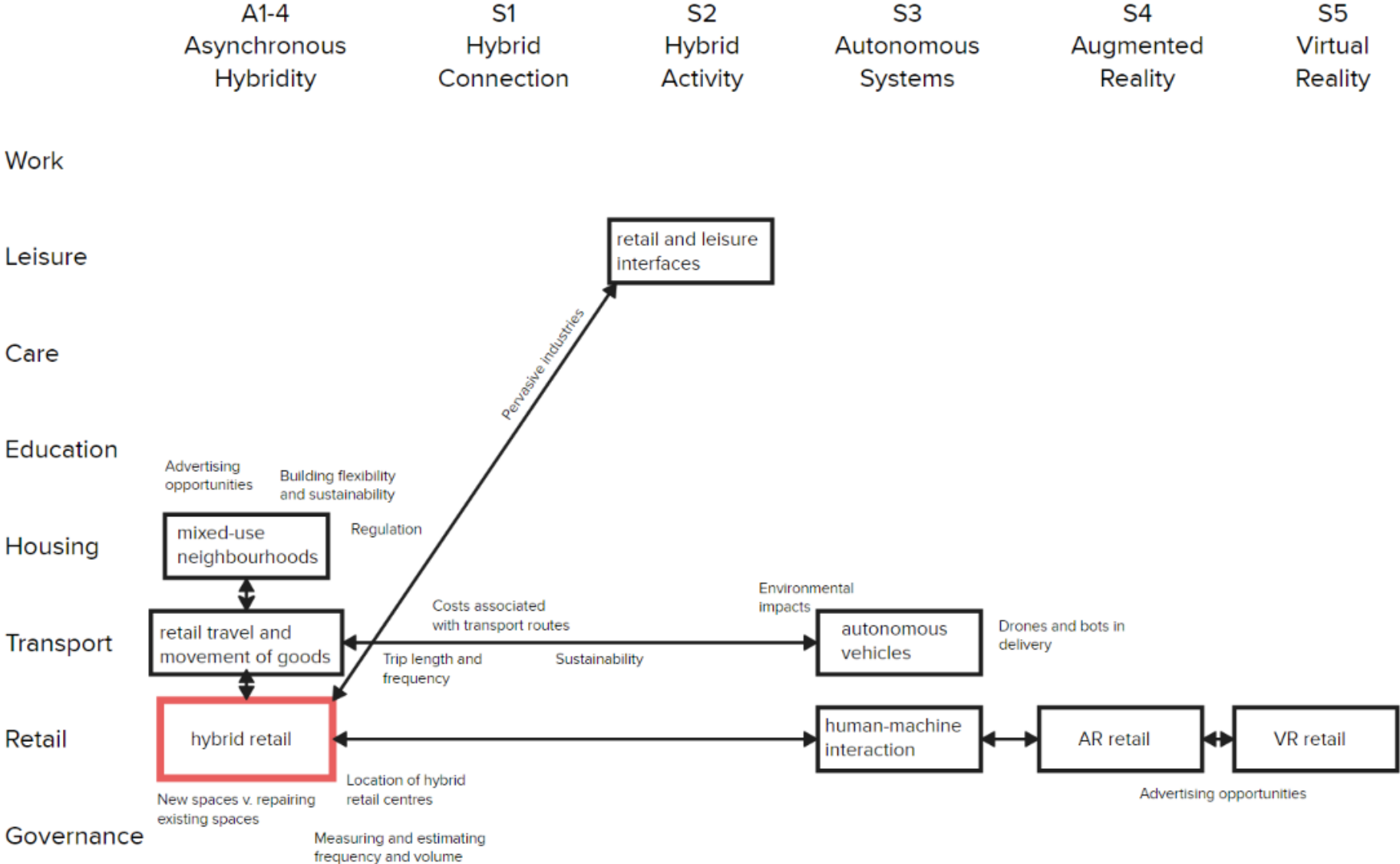
⊕ ♿ Waterloo →



RIVER FRAPPE



03 | HYBRID RETAIL, DELIVERY AND LOGISTICS





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