LSE Cities Briefing Papers

Hybrid Cities Briefing Paper 3: Hybrid Retail, Deliveries and City Logistics

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1 Introduction

Cities are hubs of commercial activity, and the hybrid disruption of establishing fully co-dependent physical and digital spaces involves the everyday practices of providers and consumers of urban goods and services. Traditional rules determining supply and demand are being changed by the growing amount of online retailing, augmented and virtual reality shops (AR and VR) which allow customers to digitally explore material goods, and autonomous delivery with self-driving vehicles. These hybrid technologies are particularly prominent as major cities settle into a new 'post-pandemic' normal, in which shifts in consumer technological adoption were prompted by safety concerns and convenience. Beyond how consumers access and receive goods and services, urban planners must now also consider where consumers prefer and tend to access them – whether in a physical, virtual or hybrid location. Current research initiatives, market investments and policy approaches suggest that the answer to sustainable and resilient urban design lies in the latter category of hybrid locations. Hybridity in urban commercial activity and city logistics constitutes a diverse ecosystem of human and nonhuman actors, industry trends and regulatory concerns. The Hybrid Cities Lab methodology[1] holds the key to understanding this increasingly urgent field of inquiry. Figure 1 depicts the ecosystem constructed around hybrid retail which combines physical, in-person with virtual and online retail. Figure 2 depicts the three lenses of focus that this report explores.
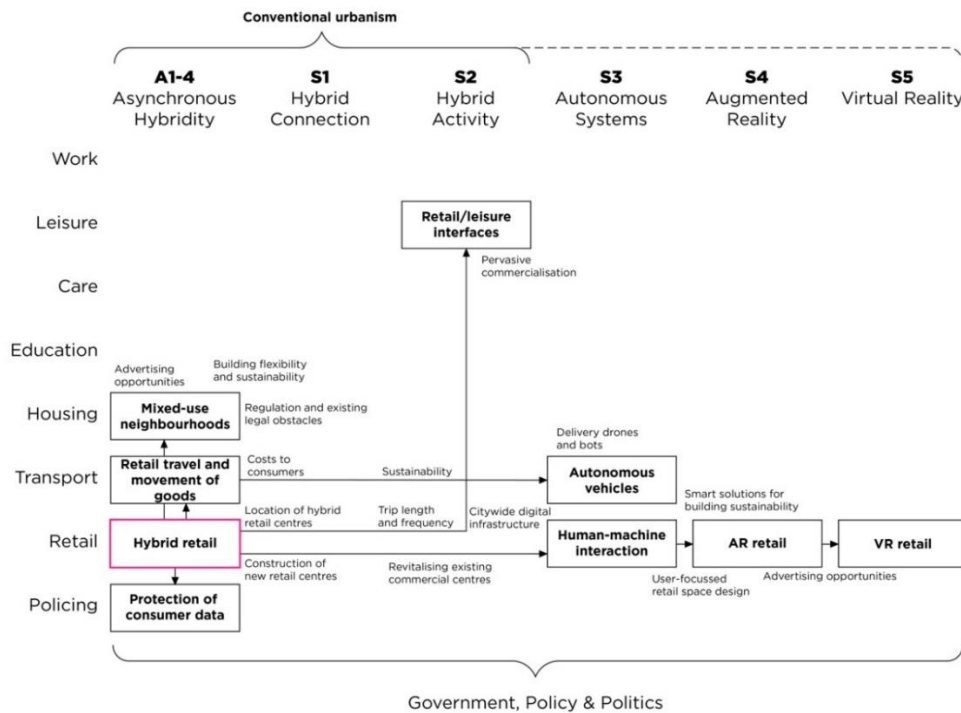

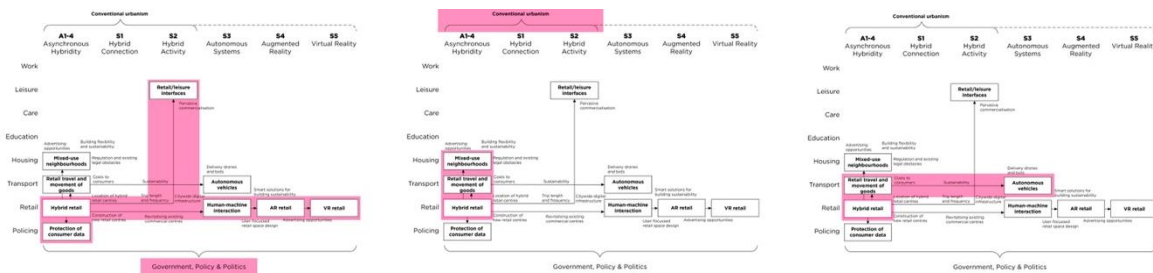**Figure 1. Hybrid retail, deliveries and city logistics ecosystem.**

Figure 2. Three nexuses: (A) Hybridity across retail settings; (B) Real estate and neighbourhood design; and (C) Transport and delivery logistics.

2   Nexus A: Hybridity across retail settings

While some technological advancements in retail, such as e-commerce and online shopping, are not novel in their own respect, the environments in which consumers interact with such technologies are newly equipped with devices capable of edge computing, augmented and virtual commercial spaces, and autonomous retailing systems. The issue of data, both individual and public, remains constant throughout inquiries into hybrid retail as interactions with digital technologies create vast stores of data which, at best, go unused, but can also be exploited without consumers' knowledge. The digital revolution has also now reached previously analogue, unregulated, and/or excluded markets as well as small and medium-sized enterprises (SMEs), which, in turn, has resulted in novel hybrid interactions between retailers, their customers, and the technology they employ.

A 2023 report from the **Organisation for Economic Co-operation and Development** (OECD) cited that digitisation has provided more channels for SMEs to reach consumers, allowing SMEs more control and insight over consumer behaviour; however, challenges remain in global competition and digital readiness (Bianchini and Kwon, 2023). Important platforms include those for payment and logistics, including delivery. This extends to more unorganised global markets, such as those comprised of small retailers in India, in which communication platforms influence retailer-customer interaction by way of experience, efficiency, satisfaction and security (Karthik Ram et al., 2023). When conducting an online survey and experimental study to determine the consumer perspective of online retailing across multiple digital channels, Wagner, Schramm-Klein and Steinmann (2020) found that customer experience was influenced by both technology-related quality and context-related situational benefit. Roggeveen and Sethuraman (2020) provide a classification for customer interfaces across the pre-purchase, purchase, and post-purchase stages. A clearer delineation of the 'online' channel is needed for retailers to better optimise hybrid interactions with customers (Wagner et al., 2020).

Complementing e-commerce channels, advancements in AR, VR and machine learning have enabled consumers to shop in new ways. Empirical research has highlighted changes in customer behaviour, attitudes and product selection in online shopping environments as opposed to brick-and-mortar stores (Titiloye et al., 2023, Verstraeten et al., 2023). Novel augmented and virtual shopping environments have effects on shoppers' cognitive experiences, particularly regarding attention (Chen et al., 2023). Developments in machine learning produce more humanistic chatbots for customer service, which can lead to greater transaction rates from customers due to factors like trust and familiarity (Schanke et al., 2021). Hoyer et al. (2020) approach hybrid retail technologies such as the internet of things (IoT), AR and VR, and virtual chatbots from the lens of the customer journey, providing future research objectives around perceptual dimensions of technologies, factors determining customer experience and the creation of experiential value. Other research avenues which need further empirical research include factors influencing technology adoption among consumers, user experience (UX) design interactions with consumer behaviour, social aspects of AR retail, threats to privacy and well-being, and AR marketing (Kumar, 2022, Chen et al., 2022).

Consumer data remains an understudied and unregulated space within hybrid retail. Data privacy concerns and attitudes towards data safety are key influencers of consumers' decision to shop online versus in-person (Titiloye et al., 2023). Abdullah (2020) proposes a framework for a consumer privacy protection strategy to help businesses avoid the reputational and legal risks associated with privacy breaches and data loss. This issue involves regulatory bodies from those overseeing public spaces in local municipalities (Dodds et al., 2021) to collaborations between international governing bodies. The international ecosystem of data protection laws currently contains multiple gaps in which consumer data can be exploited. While data regulations in specific countries may protect consumers' local data, threats in cross-country externalities remain in an increasingly international online retailing space which is dominated by multinational retailers. This demands the international coordination of data protection

efforts (Cheng et al., 2021). Governing bodies also need to play a role in ensuring that dynamic pricing, reduced menu costs and frequent price changes do not diminish the real effects of monetary policy meant to protect customers (Glocker and Piribauer, 2021).

Physical brick-and-mortar stores are still a central issue in commercial strategy, especially for urban retailers and SMEs (Bianchini and Kwon, 2023, Dekimpe et al., 2023). The physical retail space serves as a hub for aggregating various retailer-customer interaction points, adaptations in value creation and appropriation activities are needed to revamp stores; these include five key innovation areas: in-store technology, sales associates, mobile channels, data analytics, and collaborations (Jocevski, 2020). Dekimpe, Gijsbrechts and Gielens (2023) investigate the role of small-box brick-and-mortar stores in providing convenience-seeking consumers with greater options for in-store shopping. While the impact of small-box stores including convenient stores and small shops on their parent companies is largely determined by market supply and demand, there are implications for online retailing activity (eg, click-and-collect) as well as urban neighbourhood design.

3   Nexus B: Real estate and neighbourhood design

The hybrid disruption has prompted a reorganisation in the location of commercial activity, which has moved in tandem with the places people now tend to live and work. Examining specific neighbourhoods in Oslo, Di Marino and colleagues (2023) present hybridity as interactions between features of the functionally built environment, digital capabilities, and social interactions. The researchers highlight the need for public transportation and other forms of physical mobility such as walking and cycling to enable full citizen/pedestrian engagement with multifunctioning hybrid urban spaces. Empirical evidence from neighbourhoods in central Oslo indicates that successful hybrid real estate developments "overlap with the provision and diversity of services, functions and spaces" (p.31) (Di Marino et al., 2023). Private establishments, such as retail centres and new working spaces, can

generate new types of interactions between the surrounding locale and their neighbourhoods through hybridity.

A 2021 report on hybrid retail across East Asia by Arup, an international engineering and professional services firm, highlights the strategic role played by omnichannel, consistent messaging and flexibility (Wen et al., 2021). The spatial design of malls, particularly in East Asian cities, has the potential to offer more to pedestrian consumers than solely retail, the immediate needs of which can often be fulfilled more efficiently through online shopping. Gomez-Escoda, Armengol and Berra-Sandin (2023) analyse mixed-use activity in urban settings, highlighting 'mixticity' as essential for sustainability and providing tools for interpreting spatial activity mixes. Forces such as telecommuting, multi-local living and emerging industries may offer new opportunities and slow urban shrinkage (Kiviaho and Toivonen, 2023). Focusing on the emerging brewpub market in California, Apardian et al. (2022) highlight the significance of neighbourhood characteristics like median home values and clustering of drinking establishments in explaining the emergence of new retail establishments, with a notable difference in the impact of walkability between urban and non-urban areas.

Hybrid technologies provide a new 'info communicational landscape' to urban planners, industry leaders, and researchers constructed via data assemblages and hybrid interactions (Tarachucky et al., 2021). There exists different approaches to urban neighbourhood mapping which produce different conceptualisations of neighbourhoods, the services and interactions they provide, and who uses them. Through their systematic review of the planned and applied use of location-based technologies for mapping urban environments, Tarachucky and colleagues (2021) identify three types of mapping approaches: reason-oriented (eg, tangible aspects of space), sense-oriented (eg, leaving room for creative reinterpretation of space) and community-oriented (eg, results of bottom-up initiatives). The results of such endeavours hold varying implications in neighbourhood design and development.

Neighbourhood development in the hybrid age must consider building digital infrastructures and

setting data-sharing standards. The Open Data Institute's (ODI) 2020 report on the private sector states sharing data can improve market research, provide better insights, foster collaborative innovation, build consumer trust, and optimise supply chains – ultimately creating value for businesses (D'Addario et al., 2020). In a subsequent ODI report, in collaboration with Arup, exploring approaches to data in the built environment, researchers argue for open infrastructures to promote innovation and increase the overall value of data (Dodds et al., 2021).

Di Marino et al. (2023) state, following their analysis of hybridity in Oslo neighbourhoods, that "there is emerging knowledge and understanding of hybridisation that should be transferred into city planning strategies and initiatives" (p.31). Development efforts ranging from individual storefronts to larger assemblages in the built commercial environment have already begun. Fagan (2022) employed a mix of digital technology and traditional research methods to reimagine and transform a high street storefront in Wigan, UK into a mixed-use space that could serve as both a retail and community space. Rao and Dovey (2021) begin the work of identifying and adapting retail space morphologies, categorising them according to urban compatibility by ways of pedestrianisation and public/private control, but there exists a need for further analysis in the context of online retailing and post-COVID urban retail trends. The latest JLL (Jones Lang LaSalle) UK Capital Markets Review & Outlook (2024) analyses real estate investments across sectors, noting an overall 36 per cent decline in total investment volume. 2023 saw a decline in commercial real estate investments for both retail and office spaces, but a proportional increase for residential space. Despite the trends, the review predicts an increase in investment volumes and a deeper pool of international capital in 2024.

The hybridisation of urban space holds implications for practical urban planning concepts. One such example is the '15-minute city,' which standardises that the distribution of neighbourhood goods and services should be accessible within 15 minutes of residences (Moreno et al., 2021). With hybridised retail, the location of some 'nodes' for certain goods and services may be online, introducing issues around equitable digital access

and the public responsibility of urban planners. Attending to the post-pandemic (re)design of London, the London Assembly Registration and Planning Committee held a meeting on 18 October 2023 in which the importance of understanding community needs was discussed. In the US, research projects such as the Massachusetts Institute of Technology Senseable City Lab's US-15 analyse the extent to which the 15-minute city ideal is already a reality in major US cities and what barriers still exist to achieving that ideal (Ratti, 2024). In designing hybrid neighbourhoods, technology and digital infrastructures must prioritise needs such as flexibility, transport and virtual social interactions.

4   Nexus C: Transport and delivery logistics

Systems of commercial logistics in cities invariably concern the transport of people and delivery of goods along multifunctioning routes. Commercial vehicles share road space with public and private transport and pedestrians, and the optimisation of these overlapping actors is a central ongoing issue for urban planners and policymakers. The COVID-19 pandemic has exposed vulnerabilities in the supply chain, underscoring the importance of innovative logistics solutions (Said et al., 2023). Automation, artificial intelligence (AI) and emerging and innovative uses of airspace involving hybrid technologies provide a suite of potential solutions to promote efficiency and sustainability in transport and delivery logistics.

Technical advancements in drone design and autonomous delivery point toward the potential benefits of these hybrid technologies in practical terms. Bansode et al. (2023) focus on the technical intricacies of the drone's design, employing sensing technologies and AI for rapid and precise deliveries. Carrier-vehicle systems for urban delivery have demonstrated the potential for increased efficiency and sustainability through drone use in urban airspace (Lee et al., 2022, Rossello and Garone, 2020). Figliozzi and Jennings (2020) provide a comprehensive analysis of the cost competitiveness of different types of autonomous delivery vehicles, including drones, in urban areas, highlighting their potential for collaboration and

cost reduction. Airspace is being leveraged by engineers and designers as an emerging avenue for exploitation; however, regulatory efforts are necessary to ensure the fair and equitable use of this space and the continued protection of pedestrian safety and privacy.

Automated delivery has the potential to optimise last-mile logistics, substantially reducing the amount of wasted time and local pollution on city streets, yet more work is needed to better understand interactions with customers and external elements in the built environment (Alverhed et al., 2024). Dieter, Caron and Schryen (2023) suggest a hybrid decision support framework that combines machine learning techniques and conventional optimisation methods to bridge the gap between logistics planning and observed driver behaviour. Advancements on real-life streets are already being made: Ingka Group, the largest IKEA retailer in 31 countries, set a target in 2018 to make all retail home deliveries by zero-emission vehicles by 2025, employing hybrid technologies to enable zero-emission transport in its operations (Mills, 2023). Severino and colleagues (2021) predict that automated transport will have a broader impact on urban transport systems, including the emergence of new mobility- and delivery-related services. The marketplace for urban delivery logistics will cater to new sustainability and optimisation demands from both providers and regulations.

The role played by consumers remains relatively unexplored in this area (Alverhed et al., 2024). Said, Aeschliman and Stathopoulos (2023) explore customer preferences for four types of hybrid delivery technologies: autonomous vehicles, aerial drones, sidewalk robots and bipedal robots. Their analysis found that the factors influencing acceptance of automated delivery modes include age, education level, technology affinity, concerns about package handling, shipment price, and time. Consumers play a clearly defined central role in commercial logistics; therefore, tailoring marketing strategies to consumer preferences is essential for the successful adoption of automation technology.

5   Conclusion

Hybrid disruptions and transitions are already influencing existing practices and innovation trends in the urban commercial economy. New technologies are altering customer experience from engagement with the built environment to the reception of goods and services; producers are now contending with a growing ecosystem of edge computing, machine learning, and autonomous-powered products to streamline and improve commercial interactions. Underpinning these diverse interactions are vast stores of consumer data of yet unrealised value. Cities, both the major destinations of industrial activity and those catering to local communities, must take a proactive stance in this area. For example, a flexible and resilient data infrastructure can allow cities to share in the value created by hybridised retail activity, and active and informed neighbourhood development can direct commercial activity in a way that is beneficial for urban public space and citizen engagement.

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[1] See Rode, P. and Bhargava, S. (2024). Hybrid Cities: Conceptual Framework. LSE Cities Working Paper.