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Viewpoint

Going dark: the post-pandemic transformation of the metropolitan retail landscape

Dark stores are coming

Throughout much of human history, spaces where commercial transactions take place have provided both functional space for purchasing provisions and public space for social gathering. Shops and stores of all sizes – mom-and-pop boutiques, supermarkets, shopping malls, public markets and big-box stores – serve as points of social convergence that bring diverse groups of people together into distinct physical locations in the roles of buyers, sellers, service workers or window-shoppers. Shopping traditionally relies on centrality by attracting a consumer to a central place to select and transact.

Shops are critical establishments woven tightly into the urban fabric, and shopping spaces are the central backbone of most neighbourhoods and districts. Suburban shopping centres serve as nodes that connect residential neighbourhoods. In rural areas, shopping spaces concentrate around village and town centres. Shops of all types and at every scale provide functional, social and recreational value to urban environments.

As consumer behaviours change, however, and as the customary practice of shopping increases risk and exposure to disease, shopping likely will shift from a physical (bricks-and-mortar) endeavour to an Internet-based (digital) model. Consequently, a steadily increasing number of stores will ‘go dark’, and as a result customary urban forms will change to reflect shifts in consumer behaviour and demand. In this Viewpoint, we offer insights into the effects of the COVID-19 pandemic on the retail landscape of cities, introduce the concept of dark stores and explore the impacts on the built environment in cities due to the introduction of dark stores.

Shopping in cities throughout history

Shopping has – in some form – always been an important function of human settlements. Central markets date to medieval cities, where goods were traded in open-air

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squares before mercantile and general stores provided permanent and reliable transaction spaces. Victorian-era department stores modified this ancient model by shifting the focus from goods purveyance to service-based customer interaction. Grand department stores, anchoring commercial districts in cities and adorning European ‘high streets’ and American ‘main streets’, eventually became vital centres of consumption (Davis, 2013). As various waves of urban migration and suburbanisation decentralised urban places, retail shops followed the purchasing population to automobile-friendly suburban ‘branch’ stores. These outposts, along with suburban supermarkets, anchored shopping plazas, which eventually evolved into enclosed shopping malls (Gillette, 1985) that were in turn replaced by big-box discount and club stores (see Figure 1). Over the past 150 years, smaller-scale mom-and-pop shops, curated boutiques and custom shops focused on specialised goods and helped to fill a void for thrill-seeking ‘treasure-hunt’ shoppers on the prowl for unique purchases or irresistible bargains.

Regardless of scale, the fundamentally unchanged shopper-focused central-market paradigm has gradually evolved over the past two centuries, surviving various challenges: material shortages (due to crises such as wars), internationalisation of trade and shifting geopolitical alliances, proliferation of automobiles, suburbanisation and (perhaps most disruptive to the retail sector) the advent of Internet shopping.

Prior to the COVID-19 crisis, shoppers had already begun a slow drift away from bricks-and-mortar retail toward Internet shopping. However, during the coronavirus lockdown period, consumer shopping behaviour changed noticeably, suggesting different shopping tendencies for the coming post-pandemic era. The rapid shift in consumption suggests a broader consumer willingness to pivot away from central-type markets and toward home-delivery-based shopping. This change challenges the



Figure 1
Neighbourhood
supermarket in
Laval, Canada
Source: Vintage
Canadian
Supermarkets and
Discount Stores
(2017)

long-term viability of bricks-and-mortar retail shops, underscored by a decline in retail space in cities and suburbia.

The economic sustainability of bricks-and-mortar retail erodes

The United States is ‘over-retailed’, currently possessing more retail space than anywhere in the world. Encompassing 14.2 billion square feet of retail space, or 46.6 square feet (4.323 square meters) per capita, the United States has more than one million retail establishments (Shedlock, 2011) (see Table 1). The United States has a per capita retail footprint double that of the United Kingdom, 66 per cent greater than that of Canada, and a staggering 95 per cent greater than that of India. Overall, retail space is disproportionately represented in affluent urban and suburban areas.

Table 1 Comparison of retail space

| | Aggregate retail space per capita, ft ² (m ²) |
|----------------|--|
| United States | 46.60 (4.329) |
| India | 2.00 (0.186) |
| Canada | 13.00 (1.208) |
| Mexico | 1.50 (0.139) |
| United Kingdom | 23.00 (2.137) |
| Australia | 6.50 (0.604) |

Source: Data adapted from Shedlock (2011)

Despite this surplus of physical retail space, Internet-based shopping has steadily increased in popularity over the past three decades. The steady increase was punctuated by a sudden leap in 2020 related to COVID-19 lockdowns: in the United Kingdom, Internet shopping currently accounts for 30 per cent of all retail sales, up by eight percentage points from 22 per cent only six months earlier (ONS, 2020). In the United States, Internet-based shopping accounts for 12 per cent of all retail sales, a share that increases by nearly one percentage point each fiscal quarter (Federal Reserve Bank of St. Louis, 2020). Online retail diminishes the need for regular trips to bricks-and-mortar shops. Shopping from home suggests less demand for the experience of in-person shopping, and some consumers seem willing to modify their shopping behaviours in exchange for convenience and time. Hastened by coronavirus lockdowns, when in-person shopping seems unsafe, Internet sales and home delivery services are quickly gaining on bricks-and-mortar retail (Paul and Rosenbaum, 2019; Helm et al., 2020). This leap will likely continue to increase performance pressures on bricks-and-mortar shops.

Pandemic hastens ‘going dark’ as a survival strategy

Dark stores provide one way for traditional bricks-and-mortar retailers to stem diminishing foot traffic and narrowing profit margins.

A ‘dark store’ may resemble a typical supermarket or other big-box retail space in terms of size and location, but dark stores are not open to the public (Verma, 2015). Instead, dark stores are open only to delivery ‘pickers’ or proxy shoppers for services like Shipt, Postmates, Ocado or Instacart, who move through quickly to fill pre-placed digital orders. Operating like fulfilment centres, dark stores reduce the need for customer-facing elements – dedicated cashiers, customer service, elaborate lighting and decor, fancy displays, customer amenities, and point-of-sale information – and may be positioned to drive higher sales (and profitability) per square foot/square meter compared to typical retail outlets (see Figure 2).

Converting consumer-facing retail space to a dark store works with different degrees of efficacy at various scales and across the retail industry. Retail sectors that operate on razor-thin margins may increase overall profit margins by shifting from bricks-and-mortar stores to dark stores that continue to provide local but shop-from-home services. Supermarkets and other big-box stores are already essentially organised as warehouses; going dark requires only small shifts in existing business models. Dark



Figure 2 Pickers select merchandise in a dark store

Source: X5 Retail Group (2019)



Figure 3 Spatial distancing measures at Whole Foods store
Source: Iqbal (2020)

stores, theoretically, can provide better access to goods and greater food security to neighbourhoods historically underserved by bricks-and-mortar retailers.

The international grocery retailer Tesco began experimenting in the United Kingdom with dark-store models in 2006. Prior to the coronavirus pandemic (Morgan, 2020), grocery chains like Whole Foods (Wells, 2020b), Kroger and Stop and Shop in the United States; Woolworths in Australia (Marsh, 2017); and Tesco, Asda, Sainsbury's and Waitrose & Partners (Benedictus, 2014) in the United Kingdom began to experiment with closing lower-performing stores to the public and converting these locations into dark stores available only to delivery service pickers (Meyersohn, 2019). In the United States, an owner of many shopping malls is considering converting former Sears and J. C. Penney stores – both of these chains are in bankruptcy – into Amazon fulfillment centres, a move that would reduce distances between Amazon products and end consumers (Fung and Herrera, 2020).

Since the start of the 2020 crisis, nearly one-third of American households have placed an online grocery order, representing a 200 per cent surge in online grocery shopping, of which more than 26 per cent were first-time online shoppers (Thakker, 2020). The average grocery order increased nearly 20 per cent in volume during the same period. As the coronavirus pandemic took hold, other large grocery retailers

accelerated plans to convert retail stores to dark stores to accommodate the significant surge in demand for curbside pickup and delivery (Coolidge, 2020). Over a two-month period during spring 2020, Whole Foods converted six stores from traditional retail to dark stores to keep up with online order demand (Wells, 2020a).

Concerns brought to bear by the coronavirus pandemic over safe shared (public) spaces that reduce the possibility of disease transmission will likely hasten a transition away from bricks-and-mortar shopping and in turn increase the number of dark stores (see Figure 3). The safety and convenience of being able to shop virtually from home, 24 hours per day and seven days per week, will become even more appealing in a post-pandemic world. Until now, the online shopping sector has been evolving slowly; however, as technology and tools like virtual reality become increasingly more common, digital shopping will become more dynamic and perhaps even more convenient. The high cost of convenience and efficiency becomes evident across the built environment as a rapid decline in demand for storefronts and big-box locations compounds falling demand for office space, restaurant space and other uses that require urban density and foot traffic. The vibrancy and rhythm of the urban shopping experience changes dramatically when these thriving shops are replaced by dark stores (closed to the public), curbside pickup-only zones and self-service operations (including ‘click-and-collect’ centres).

Impacts on main, high and queen streets

Conversion from bricks-and-mortar stores to dark stores will have an impact on the urban form and built environment, but the darkening of mom-and-pop boutiques will have a much greater effect on the long-term viability of shopping districts, central business districts and high streets (and the neighbourhoods they serve). Conversion to dark stores in dense urban settings and pedestrian precincts may affect urban life more significantly than the darkening of suburban big-box retailers. Mom-and-pop boutique shops will likely not be able to sustain a long-term dark-store model, but instead will use it as a transition stage while they shift to an exclusively online model, which in turn will sharply decrease demand for these once coveted retail spaces. In the post-pandemic world, fewer people will likely visit iconic retail destinations – such as Rodeo Drive in Beverly Hills, Fifth Avenue in New York City or Oxford Street in London – because there will be less tourism and intercity travel (in the short term and perhaps even the long term). Similarly, the character of smaller neighbourhood shopping districts will change as shopping behaviours change. Visits to shopping malls to ‘hang out’ or to seek entertainment or leisure activities (cinplexes, bowling alleys, arcades) will quickly seem a quaint pastime of yesteryear.

We predict several impacts on urban and social fabrics stemming from the changing retail landscape fuelled by changes in consumer response to the coronavirus

pandemic. The cumulative impacts of these shifts in consumer shopping behaviour will have longer-range impacts that will be of interest to planners and policy makers.

- Historically, retailers vie for locations that provide high profitability, recognition, visibility and foot traffic and pay a premium to secure these places. These sites become unnecessary in a world of at-home shopping. Visits to bricks-and-mortar shops will take place out of necessity and not for recreation or entertainment.
- The future will likely hold far fewer car-based trips for shopping; however, delivery-related traffic will continue to rise. Access to goods will become more uniform. The post-pandemic retail landscape may include less foot traffic in shopping centres and shopping districts. People will practise spatial distancing, whether voluntarily or (periodically) required by government order.
- Open-air markets may increase in popularity, and new models of open-air shopping may appear.
- Retail delivery to homes by robot or drone – previously thought of as fanciful and futuristic – may come to market sooner than thought.

Furthermore, streetscapes will adapt to shifting shopping practices.

- The demand for curbside pickup can be accommodated in shopping centres and big-box stores and suburban retail locations with parking areas. In urban commercial corridors, street rights of way may be reconfigured to increase possibilities for curbside pickup to sustain small mom-and-pop shops and boutiques.
- Curbside delivery complicates the ‘complete-streets’ and ‘accessible-transport’ movements, which stress non-motorised environments and constraints on automobile use.

And finally, a shift to dark stores may introduce land-use change in cities.

- Big-box retail space may be repurposed as dark-store and warehouse space throughout metropolitan areas.
- Cities and towns should prepare for greater warehousing needs for online shipment centres, more long-distance and local delivery as merchandise in the online shopping sphere moves through various shipment phases and more shipment waste in household trash cycles.
- Disused or vacant retail space may be redeveloped as residential space. Surface parking areas surrounding retail stores could be redeveloped with additional low-density housing and lifestyle-supportive development.

The coronavirus pandemic has changed consumer behaviour related to shopping and will likely continue to drive changes following the pandemic. Some retail shops may not survive beyond COVID-19; however, a new era of at-home shopping may continue to influence consumer behaviour regardless of physical location. This may reinvigorate or reinvent certain retailers, who may no longer maintain traditional stores across a metropolitan area but instead serve customers from dark stores or centrally stocked warehouses. The overhead costs of bricks-and-mortar retail will be replaced

by call-centre staff, AI bots, mechanised ‘picking’ and even autonomous robotic and drone delivery. The need for physical space will shift as efficiencies increase and the proliferation and acceptance of these technologies will likely hasten following the pandemic, altering centuries-old urban shopping experiences.

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