

Fulfilment Speed Redefining Logistics Economics and Sustainable Supply Chain Performance

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ABSTRACT

The relentless pursuit of convenience is reshaping logistics into an increasingly demanding system in which faster fulfilment generates benefits for customers while simultaneously creating substantial economic, operational, technological, environmental, and social pressures. Growing expectations for rapid delivery, flexible service, real time visibility, and effortless returns have compressed fulfilment windows and intensified the resources required across warehousing, transportation, last mile distribution, and reverse logistics. A critical examination of these developments reveals five interconnected challenges involving deteriorating fulfilment economics, volatile capacity requirements, increasing technological dependence, expanding reverse logistics activity, and environmental pressures associated with fragmented urban delivery. The analysis challenges the assumption that maximum delivery speed should remain a universal indicator of logistics excellence and instead advances a differentiated approach to fulfilment based on customer value, urgency, transaction economics, geographic conditions, and resource productivity. Strategic priorities include value based service segmentation, adaptive capacity management, productivity oriented digital investment, integrated forward and reverse logistics, and fulfilment decisions based on total system value. Greater use of parcel lockers, collection points, flexible capacity, intelligent routing, automation, and alternative delivery configurations can preserve convenience without requiring every transaction to consume the resources associated with maximum responsiveness. Ultimately, sustainable logistics performance depends not on continuously reducing delivery time, but on achieving economically intelligent responsiveness in which the value created through convenience remains proportionate to the financial, operational, human, and environmental resources required to deliver it.

Keywords: Convenience, Fulfilment, Logistics, Responsiveness, Sustainability

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1. INTRODUCTION

Convenience has become one of the most influential competitive currencies in contemporary commerce. Consumers increasingly evaluate purchasing experiences not only through price and product quality, but also through how quickly, reliably, and effortlessly orders reach their preferred locations. This transformation has intensified the strategic importance of fulfilment speed and placed logistics systems under growing pressure to accommodate increasingly fragmented and time sensitive demand. González-Romero et al., (2026) observe that expanding e-commerce activity has substantially increased last mile operations while retailers continue to prioritise service performance and faster delivery. Beck et al., (2025) similarly demonstrate that customer choices have become integral to the design of last mile logistics, requiring distribution models to accommodate consumer preferences alongside sustainability and data considerations. Pahwa and Jaller (2025) further establish that expedited shipping under dynamic and stochastic demand creates complex tradeoffs among economic viability, environmental efficiency, responsiveness, and social equity. The resulting convenience economy has therefore created a fundamental logistics paradox. Faster fulfilment can strengthen customer experience and competitive positioning, yet every reduction in delivery time potentially demands greater inventory proximity, transportation responsiveness, technological coordination, labour flexibility, and network capacity. Speed is consequently not a costless service enhancement but an operational promise whose consequences extend throughout the logistics system. Risk-sensitive managerial judgement is therefore increasingly important when fulfilment commitments are made under volatile demand and operational uncertainty (Yusof & Razali, 2020).

The economic consequences of this transformation become particularly visible within last mile distribution, where individual customer expectations interact with some of the most expensive and operationally difficult activities in the fulfilment process. Increasing parcel volumes require logistics providers to coordinate greater numbers of delivery points, smaller shipment sizes, restrictive delivery windows, urban congestion, and unpredictable customer availability. Recent empirical evidence demonstrates that e-commerce parcel characteristics, destination patterns, delivery density, travel speed, and urban conditions directly influence the operational efficiency of delivery tours. Tran and Gavade (2025) similarly identify economic and technical considerations as particularly influential when evaluating sustainable last mile alternatives, while parcel lockers and collection points can provide viable alternatives to conventional home delivery. Kundu et al., (2025) further show that combining home delivery with out of home options can improve profitability while simultaneously creating consumer and environmental value. These findings challenge the assumption that greater convenience must always be achieved through faster door to door delivery. The more strategically important question concerns whether fulfilment networks are being designed around economically sustainable convenience or simply absorbing additional operational complexity to satisfy increasingly demanding service expectations. This pressure also reinforces the strategic role of warehouse management in coordinating service performance across changing supply chain conditions (Abdullah et al., 2020).

Speed also changes the physical architecture required to fulfil customer orders. Traditional distribution networks were largely designed around consolidation, predictable replenishment cycles, transportation efficiency, and economies of scale. Accelerated fulfilment compresses these decision horizons and increases the importance of inventory positioning, decentralised capacity, real time

information, and dynamic routing. Ekren et al., (2025) demonstrate that e-grocery fulfilment decisions involve interconnected tradeoffs among product availability, delivery costs, and emissions, illustrating why faster service cannot be evaluated independently from wider network consequences. Pahwa and Jaller (2025) similarly find that alternative last mile strategies respond differently to expedited and uncertain demand, with multi echelon configurations improving market responsiveness while potentially increasing costs. Contemporary quick commerce research further demonstrates the growing importance of dynamic routing capabilities when same day orders are continuously added, modified, or cancelled during fulfilment operations. These developments indicate that convenience is progressively shifting logistics from planned efficiency towards continuous responsiveness. Such responsiveness can create competitive advantage, but it can also generate duplicated capacity, lower consolidation opportunities, higher technological requirements, and greater operational volatility. The real cost of faster fulfilment must therefore include the structural resources required to sustain speed rather than considering transportation expenditure or delivery time in isolation. Warehouse operating discipline remains important because accelerated fulfilment cannot be sustained without reliable control of the physical activities supporting order flow (Yusof, 2022).

The pressure for convenience extends beyond outbound delivery because customer friendly commerce increasingly includes flexible and inexpensive returns. Reverse flows can substantially increase logistics complexity by requiring additional collection, transportation, inspection, handling, storage, repackaging, and reintegration activities. Marriott et al., (2025) demonstrate that fashion e-commerce returns create significant economic and environmental challenges, particularly when consumer behaviours such as bracketing increase reverse logistics activity. Karl (2025) similarly identifies the growth of e-commerce consumer returns as an increasingly important operational problem and highlights the emerging role of data driven forecasting in managing return volumes. Research on customer to customer returns logistics further shows that conventional returns processing imposes substantial warehousing, labour, packaging, transportation, and inventory consequences on online retailers. Convenience should therefore be interpreted as a bidirectional logistics commitment. An order may travel rapidly towards the consumer and subsequently return through another expensive sequence of logistics activities. When organisations compete simultaneously through rapid delivery, easy returns, narrow delivery windows, and high service availability, the apparent simplicity experienced by customers is achieved through considerably greater complexity behind the interface. Evaluating fulfilment performance only at the moment of successful delivery consequently understates the total economic burden created by convenience oriented service models.

Environmental and urban consequences further complicate the economic justification for relentless fulfilment acceleration. Faster delivery can reduce opportunities for shipment consolidation, intensify vehicle activity, increase network fragmentation, and place additional pressure on already constrained urban transport systems. Van Vliet et al., (2025) demonstrate that growing parcel demand contributes to congestion, emissions, and increasing freight logistics costs, while the effectiveness of alternative delivery methods varies according to geographical and consumer conditions. Nogueira et al., (2025) similarly identify important economic and environmental challenges associated with expanding B2C last mile distribution. More recent analysis by González-Romero et al., (2026) argues that last mile optimisation should simultaneously incorporate

economic, environmental, and social performance because service oriented distribution strategies can otherwise prioritise customer responsiveness while neglecting broader sustainability consequences. These findings demonstrate that the true cost of faster fulfilment extends beyond the financial accounts of retailers and logistics providers. Congestion, emissions, urban space consumption, workforce pressures, and infrastructure utilisation represent additional consequences that may be displaced beyond conventional delivery cost calculations. The convenience economy therefore creates a broader strategic challenge in which privately attractive service promises can generate operational and societal costs that remain insufficiently visible within traditional logistics performance measures.

Rethinking faster fulfilment requires a shift from treating delivery speed as an unquestioned indicator of logistics excellence towards evaluating whether additional speed produces sufficient value to justify its total economic, operational, environmental, and social consequences. Recent scholarship increasingly supports this broader interpretation. Tran and Gavade (2025) emphasise the need to balance multiple sustainability criteria when selecting last mile solutions, rather than optimising a single performance objective. Pahwa and Jaller (2025) demonstrate that expedited delivery strategies generate materially different outcomes across cost, responsiveness, externalities, and demand conditions. González-Romero et al., (2026) further argue for integrated last mile planning that simultaneously addresses economic, environmental, and social impacts. Collectively, these developments suggest that the future of logistics should not be defined simply by how rapidly an order can reach the customer. Greater attention must be directed towards the resources consumed, complexity generated, emissions produced, reverse flows created, and profitability sacrificed to achieve that speed. Against this background, the central concern is whether convenience driven fulfilment has progressed beyond economically rational responsiveness and begun to undermine the logistics systems required to sustain it.

2. LITERATURE REVIEW

Accelerated fulfilment has fundamentally altered the operating logic of modern logistics by compressing the time available for inventory positioning, order processing, warehouse execution, transportation planning, and final delivery. The expansion of digital commerce has intensified this transformation as consumers increasingly expect logistics services to combine speed with reliability, visibility, flexibility, and accessibility. Mogire et al., (2025) identify rising costs, environmental concerns, increasing customer expectations, delivery efficiency, and technological innovation as dominant themes within current last mile delivery research. Castillo et al., (2025) further demonstrate that fulfilment capacity becomes more difficult to manage when uncertain customer demand interacts with uncertainty in available delivery resources. Meanwhile, Pourmohammadreza et al., (2025) establish that last mile logistics remains among the most expensive and inefficient components of contemporary supply chains despite its critical contribution to customer service. The literature therefore presents convenience as a strategic paradox rather than an unqualified improvement in logistics performance. Greater speed can enhance customer value and competitive responsiveness, but sustaining that speed requires increasingly sophisticated coordination across distribution networks. Five interconnected streams are particularly important for understanding this transformation: convenience driven fulfilment, last mile economics, warehouse responsiveness, reverse logistics, and intelligent sustainable delivery.

2.1 Convenience Driven Fulfilment Reshaping Customer Service Expectations

Consumer expectations are progressively redefining the meaning of logistics performance as digital purchasing environments make delivery speed, flexibility, and accessibility increasingly visible components of the customer experience. Convenience is no longer created solely through product availability or proximity to physical stores. It increasingly depends on the ability of logistics networks to provide multiple fulfilment options while maintaining reliable and predictable service. Beck et al., (2025) demonstrate that customer choices have become integral to last mile logistics design because delivery preferences interact directly with operational and sustainability outcomes. Castillo et al., (2025) add that fulfilment capacity becomes particularly challenging when uncertain customer demand must be matched with uncertain delivery resources, illustrating how convenience expectations create operational consequences beyond the customer interface. Mogire et al., (2025) similarly identify increasing customer expectations as one of the principal challenges associated with contemporary e-commerce delivery. These findings indicate that accelerated fulfilment is not simply a matter of reducing transportation time. Every service promise must be supported by inventory availability, warehouse throughput, labour capacity, transportation resources, digital visibility, and responsive exception management. The competitive pursuit of convenience therefore increases the number of logistics activities that must operate simultaneously within increasingly narrow fulfilment windows, making service speed dependent on the performance of the entire logistics architecture rather than any single operational function.

Convenience can nevertheless be delivered through different service configurations, challenging the assumption that faster home delivery represents the highest form of customer value. Pourmohammadreza et al., (2025) demonstrate through a systematic review of 257 publications that alternative delivery locations have become an important area of last mile logistics research because conventional home delivery creates significant financial, environmental, and social challenges. Zhang and Demir (2025) similarly establish that parcel lockers can reduce delivery bottlenecks and traffic congestion while improving personnel utilisation and operational efficiency. These alternatives reveal that customer convenience can emerge from accessibility, predictability, choice, and control rather than speed alone. A customer willing to collect an order from a strategically located locker may receive greater practical convenience than one required to remain available during a narrow home delivery window. This distinction has important implications for fulfilment strategy because organisations can potentially preserve customer value without continuously shortening delivery lead times. Differentiated fulfilment options also provide opportunities to consolidate deliveries, improve vehicle utilisation, and reduce failed delivery attempts. The literature consequently supports a broader interpretation of convenience in which logistics providers create multiple service pathways according to customer preferences instead of assuming that every order requires maximum delivery acceleration.

2.2 Escalating Last Mile Fulfilment Economics Under Speed Pressure

The financial burden associated with faster fulfilment becomes particularly pronounced during the last mile because this stage combines fragmented destinations, small shipment quantities, uncertain traffic conditions, customer availability, restrictive delivery windows, and considerable labour requirements. Pourmohammadreza et al., (2025) characterise last mile logistics as an essential yet comparatively expensive and ineffective component of contemporary supply chains, with consequences extending beyond direct financial expenditure to environmental and social

externalities. Mogire et al., (2025) similarly identify rising costs as one of the principal challenges generated by the expansion of e-commerce delivery. Castillo et al., (2025) demonstrate another source of economic pressure by showing that firms using combinations of private and crowdsourced delivery capacity must manage uncertainty in both customer demand and labour supply. Such conditions can encourage organisations to maintain additional delivery capacity as protection against demand peaks, even when that capacity is underutilised during normal periods. Faster fulfilment can also reduce opportunities for route consolidation because orders must leave the network before sufficient delivery density develops. The economic cost of speed should therefore incorporate capacity utilisation, labour volatility, delivery density, failed attempts, technological requirements, route productivity, and service recovery rather than being represented solely through transportation expenditure.

Cost pressure becomes more strategically significant when organisations attempt to provide similar service speeds across customers, products, locations, and order values despite substantial differences in fulfilment economics. Alternative delivery networks provide evidence that universal home delivery is not necessarily the most economically rational mechanism for satisfying convenience expectations. Zhang and Demir (2025) find that parcel lockers can contribute to cost reduction and operational efficiency while addressing important sustainability concerns. Pourmohammadreza et al., (2025) likewise identify alternative delivery locations as increasingly significant mechanisms for addressing weaknesses associated with conventional last mile distribution. Castillo et al., (2025) further demonstrate the importance of flexible capacity arrangements when delivery demand becomes volatile. Together, these studies suggest that fulfilment economics can be strengthened through service segmentation rather than continuous universal acceleration. High value or genuinely urgent orders may economically justify premium delivery capacity, whereas customers with greater flexibility can be offered collection points, wider delivery windows, or consolidated delivery schedules. Such differentiation allows logistics providers to allocate expensive fulfilment resources according to the value generated by speed. The strategic objective consequently shifts from achieving the shortest possible delivery time towards identifying the level and form of convenience that produces the strongest relationship between customer value and logistics resources consumed.

2.3 Warehouse Responsiveness Driving Technological Costs Under Speed Pressure

Fulfilment acceleration places substantial pressure on warehouse operations because the delivery clock begins long before a vehicle departs for the customer. Orders must be received digitally, inventory located accurately, items retrieved, consolidated, packed, labelled, sorted, and transferred to transportation within increasingly compressed processing windows. Research on robotic mobile fulfilment systems demonstrates how automation is being adopted to address this challenge. Recent evidence shows that mobile robots can transport storage pods directly between storage areas and picking stations, reducing human movement and potentially improving efficiency, flexibility, and scalability. Wenzel et al., (2025) similarly demonstrate the growing importance of robotic mobile fulfilment systems within e-commerce environments characterised by demand fluctuations and extensive product variety. Mogire et al., (2025) identify technological innovation as a major research stream within contemporary last mile and e-commerce logistics, reflecting the increasing dependence of fulfilment performance on intelligent operational capabilities. These developments demonstrate that faster delivery is partly produced inside warehouses rather than exclusively on roads. The ability to compress customer lead time increasingly depends on whether fulfilment

facilities possess sufficient information accuracy, picking productivity, automation, labour flexibility, and process integration to release orders rapidly without sacrificing accuracy or creating operational congestion.

Technological responsiveness, however, introduces costs and implementation challenges that must be incorporated into any realistic evaluation of faster fulfilment. Robotic mobile fulfilment systems can improve warehouse efficiency, yet the literature also identifies significant capital investment, operational restructuring, and workforce retraining among their implementation requirements. Wenzel et al., (2025) further indicate that the performance of these systems depends on complex interactions among operational parameters, demonstrating that automation does not automatically translate into optimal fulfilment performance. Galkin et al., (2025) show that digital twins are attracting increasing attention within logistics because they can support the modelling and analysis of increasingly complex systems and contribute to smart and sustainable logistics development. These capabilities can strengthen real time visibility, simulation, coordination, and operational decision making, but they also expand the technological infrastructure required to sustain increasingly demanding service levels. The hidden cost of faster fulfilment therefore includes more than additional warehouse labour or equipment. It includes software integration, automation investment, data infrastructure, system maintenance, analytical expertise, cybersecurity, process redesign, and workforce capability development. Technology creates substantial strategic value when it improves overall logistics productivity, but its economic justification becomes weaker when expensive technological capacity is primarily required to support service speeds that generate insufficient incremental customer or financial value.

2.4 Reverse Logistics Creating Double Movement Across Convenience Operations

The economics of convenience become considerably more complex when the movement of products after delivery is incorporated into fulfilment analysis. Digital commerce has normalised customer friendly return policies, allowing consumers to purchase multiple products, evaluate them after delivery, and return unwanted items with relatively limited effort. Karl (2025) identifies the substantial growth of e-commerce consumer returns and demonstrates increasing research interest in forecasting these flows through customer data and machine learning. Reverse logistics consequently represents more than an administrative extension of customer service. Returned products can require collection, transportation, receiving, inspection, sorting, repackaging, storage, refurbishment, resale, recycling, or disposal before their remaining economic value can be recovered. Each activity consumes logistics capacity and can substantially alter the profitability of the original transaction. The significance of this problem increases when organisations simultaneously compete through rapid outbound delivery and highly permissive return policies. In such circumstances, the same product may generate multiple logistics movements while producing revenue from only one successful final transaction. Fulfilment efficiency can therefore be overstated when performance measures terminate at successful customer delivery. A more complete economic perspective should evaluate the expected logistics life cycle of an order and recognise that the convenience provided during purchasing can create additional resource requirements after the initial fulfilment process has apparently been completed. Warehouse management systems can also strengthen resilience and competitiveness by improving coordination and information visibility across supply chain activities (Yusof et al., 2025).

Improved information and forecasting capabilities provide opportunities to manage reverse flows more systematically, although they do not eliminate the structural cost created by high return volumes. Karl (2025) demonstrates that advancements in customer data and machine learning have opened new opportunities for predicting e-commerce returns, potentially allowing organisations to anticipate reverse logistics requirements more accurately. Such predictive capability can support labour planning, transportation scheduling, warehouse capacity allocation, inventory disposition, and decisions concerning the recovery of returned products. The wider implication is that returns should be integrated into fulfilment design rather than managed as an isolated activity after customer delivery. Organisations that promote faster fulfilment without understanding the probability and cost of subsequent returns may systematically underestimate the economic consequences of convenience. Product characteristics, customer behaviour, return frequency, recovery value, handling requirements, and disposition options should therefore influence fulfilment economics at the point where service strategies are designed. Reverse logistics also reinforces the importance of differentiation because products with high return probabilities may require different service, packaging, inventory, or customer information strategies from products with stable purchasing behaviour. The real cost of convenience consequently emerges from both forward and reverse movement, making fulfilment profitability dependent on the complete logistics journey rather than the speed of the initial delivery alone.

2.5 Intelligent Sustainable Fulfilment Beyond Maximum Delivery Speed

Environmental performance has become inseparable from the debate surrounding fulfilment acceleration because increasingly fragmented logistics activity can intensify vehicle movements, congestion, energy consumption, emissions, and competition for limited urban infrastructure. González-Romero et al., (2026) argue that last mile delivery should be evaluated simultaneously through economic, environmental, and social dimensions rather than concentrating on a single operational objective. Ekren et al., (2025) similarly demonstrate within e-grocery fulfilment that product availability, delivery cost, and emissions represent interconnected performance dimensions requiring coordinated consideration. Pourmohammadreza et al., (2025) further identify environmental and negative social externalities as significant weaknesses associated with conventional last mile logistics. These findings reveal why maximum speed cannot serve as a universal indicator of superior logistics performance. A service model capable of delivering an order within hours may appear operationally impressive while simultaneously requiring low vehicle utilisation, duplicated capacity, greater energy consumption, or disproportionately expensive urban movements. Sustainable fulfilment therefore requires a broader value calculation in which customer responsiveness is considered alongside resource productivity and external consequences. The strategic question becomes not simply whether logistics networks can deliver faster, but whether the additional speed generates sufficient economic and customer value to justify the resources and externalities required to produce it.

Intelligent logistics technologies and alternative delivery configurations provide a potential pathway towards reconciling convenience with economic and environmental discipline. Galkin et al., (2025) identify digital twins as an expanding logistics capability with potential relevance to smart cities, supply chains, and sustainable development. Mogire et al., (2025) similarly identify sustainability, delivery efficiency, and emerging technological innovations as three dominant themes shaping last mile delivery research. Zhang and Demir (2025) demonstrate that parcel lockers combine digital

technology with alternative parcel handling arrangements that can reduce bottlenecks and congestion while improving personnel utilisation. Pourmohammadreza et al., (2025) reinforce this direction by showing the growing strategic importance of alternative delivery locations within last mile logistics. The emerging evidence therefore supports a transition from indiscriminate acceleration towards intelligent fulfilment differentiation. Technology can be used to determine which orders genuinely require immediate delivery, which customers value alternative collection arrangements, where inventory should be positioned, and how delivery resources can be consolidated without materially weakening customer experience. The future competitiveness of convenience oriented logistics may consequently depend less on continuously reducing delivery time and more on developing the intelligence required to provide the appropriate fulfilment speed, channel, and resource commitment for each logistics context.

3. STRUCTURAL PRESSURES SHAPING CONVENIENCE DRIVEN FULFILMENT SYSTEMS

The pursuit of ever faster fulfilment has created a growing disconnect between what customers experience as convenience and what logistics systems must absorb operationally to provide it. Speed appears simple at the customer interface, yet behind every shortened delivery window lies a more demanding combination of warehousing capacity, inventory availability, transportation resources, digital coordination, labour responsiveness, urban infrastructure, and reverse logistics capability. Mogire et al., (2025) identify rising costs, customer expectations, sustainability concerns, and technological innovation as interconnected challenges within contemporary last mile delivery. Pourmohammadreza et al., (2025) similarly demonstrate that last mile logistics continues to face substantial economic, environmental, and social challenges despite its increasingly important role within e-commerce fulfilment. Amaya et al., (2025) further show that consumer delivery preferences and sustainability attributes influence the viability of alternative last mile arrangements, suggesting that convenience cannot be evaluated solely through delivery time. The resulting problem is structural rather than temporary. Logistics networks are increasingly required to deliver greater responsiveness while preserving profitability, reliability, workforce capacity, and environmental performance. Five issues are particularly important: the erosion of fulfilment economics, capacity pressure, technological and operational strain, the expansion of reverse logistics, and the external costs created by increasingly fragmented urban delivery.

3.1 Fulfilment Economics Erosion Under Accelerating Delivery Speed Pressure

The first major issue concerns the financial sustainability of service promises that continuously compress delivery time without ensuring that customers generate sufficient economic value to offset the additional logistics resources required. Faster fulfilment can reduce consolidation opportunities because orders must be dispatched before delivery density reaches an economically efficient level. It can also require additional vehicles, labour, local inventory, microfulfilment capacity, and technological infrastructure that remain available even when utilisation fluctuates. Mogire et al., (2025) identify cost escalation as one of the central challenges associated with contemporary e-commerce last mile delivery. Pourmohammadreza et al., (2025) similarly describe last mile logistics as particularly challenging from economic, environmental, and social perspectives, reinforcing the need to consider the total resources consumed in achieving customer convenience. Kundu et al., (2025) demonstrate that combining home delivery with alternative out of home arrangements can generate economic, consumer, and environmental benefits, illustrating that universal doorstep

fulfilment is not necessarily the most efficient configuration. These findings expose an increasingly significant contradiction. Firms may strengthen service competitiveness by accelerating delivery while simultaneously weakening unit economics when the additional revenue generated by speed remains lower than the incremental fulfilment cost. Convenience can therefore become commercially destructive when service promises expand faster than the economic capacity of logistics networks to support them.

A related difficulty is the increasing normalisation of rapid delivery as a standard service rather than a differentiated service for which customers accept an appropriate price. Once faster fulfilment becomes an expected baseline, logistics providers face limited ability to recover additional operating costs through premium charges. The economic burden then shifts internally towards retailers, fulfilment operators, carriers, or platform providers. Amaya et al., (2025) demonstrate that customers consider multiple characteristics when choosing sustainable last mile alternatives, indicating that speed is only one component of delivery value. Risberg (2026) similarly examine consumer steering in omnichannel retailing and highlight the relevance of delivery fees and fulfilment choices in influencing last mile behaviour. Pahwa and Jaller (2025) show that expedited fulfilment strategies require careful trade-offs between responsiveness, cost, sustainability, and uncertain demand. The significance of this tradeoff has increased as the convenience economy accelerates. Dispatching immediately protects customer speed but sacrifices consolidation opportunities, whereas waiting improves logistics productivity while potentially weakening the customer promise. The economics of convenience therefore deteriorate when every order is treated as urgent regardless of margin, customer value, delivery density, or willingness to pay for accelerated service.

3.2 Capacity Volatility Increasing Strain Across Delivery Resources

The second issue arises from the difficulty of maintaining sufficient fulfilment capacity when demand is both time sensitive and uncertain. Traditional logistics systems can use aggregation, scheduling, and planned capacity to smooth fluctuations, whereas accelerated fulfilment substantially reduces the time available to absorb unexpected demand. Capacity shortages can produce missed delivery promises and customer dissatisfaction, but excessive capacity can create underutilised vehicles, labour, warehouse space, and local fulfilment infrastructure. Castillo et al., (2025) demonstrate that last mile planning becomes particularly complex when uncertainty in customer demand interacts with uncertainty in the availability of delivery resources. Their findings reinforce the challenge of matching capacity with rapidly changing fulfilment requirements rather than planning against predictable demand. Marzolf et al., (2026) further show that demand for last mile fulfilment services changes over time and across market contexts, indicating that fulfilment networks require considerably more adaptive capacity strategies. Sakai et al., (2026) similarly demonstrate diversity in the evolution of last mile delivery systems across cities, suggesting that delivery structures cannot be standardised independently of local operating conditions. These findings expose the vulnerability of fulfilment models that promise identical speed regardless of demand intensity, location, order density, and available logistics capacity.

Workforce requirements further intensify this capacity problem because accelerated fulfilment depends on human resources capable of responding during increasingly narrow operating windows. Drivers, warehouse personnel, pickers, packers, dispatchers, and platform workers must absorb demand volatility while meeting strict delivery deadlines. Greater flexibility can be obtained through

crowdsourcing and platform based labour, yet such models introduce uncertainty surrounding workforce availability and working conditions. Longoni et al., (2025) examine the implications of working conditions in digitally enabled operational environments and reinforce the importance of considering social consequences alongside performance objectives. Sallnäs and colleagues' broader research stream on consumer influence and last mile sustainability also demonstrates that convenience expectations can affect multiple actors rather than logistics organisations alone. Recent work by Sallnäs et al., (2026) explicitly examines impatience and urgency within last mile delivery and highlights the need to understand interactions among customers and delivery actors more holistically. The operational consequences are substantial. When service windows become increasingly compressed, workers may experience greater scheduling volatility, route pressure, workload concentration, and reduced flexibility in handling exceptions. Faster fulfilment can therefore shift the cost of convenience from customer waiting time into workforce intensity, creating a service model whose apparent efficiency may partly depend on increasingly demanding human operating conditions.

3.3 Technology Dependence Increasing Instant Fulfilment Operational Fragility

The third issue concerns the growing dependence of faster fulfilment on complex digital and automated systems. Real time routing, predictive analytics, warehouse automation, robotic picking, dynamic dispatch, artificial intelligence, and digital twins can substantially increase responsiveness, but they also create new forms of operational dependence. Kahalimoghadam et al., (2025) develop an intelligent multi agent approach for last mile logistics, illustrating how advanced computational systems can support increasingly complex logistics decision environments. Mogire et al., (2025) likewise identify emerging technologies as a major theme shaping e-commerce last mile delivery, reflecting the growing connection between technological capability and fulfilment performance. Alshmlani et al., (2026) further review recent innovations involving drones, autonomous technologies, and optimisation approaches within last mile delivery. The issue is that rapid fulfilment increasingly becomes difficult to sustain without continuous investment in these technologies. Organisations can consequently enter a technological escalation cycle in which faster service requires greater system sophistication, greater system sophistication creates additional fixed and integration costs, and these investments then encourage further volume growth to justify the installed capacity. Technological capability can improve efficiency, but it can also make convenience oriented logistics more capital intensive and structurally dependent on complex digital infrastructure.

Technology dependence also creates operational fragility when data quality, system integration, or algorithmic recommendations fail to reflect rapidly changing physical conditions. Automated optimisation can calculate technically efficient routes, but real world fulfilment remains exposed to congestion, unavailable customers, address ambiguity, vehicle breakdowns, weather disruptions, inventory discrepancies, and unexpected order changes. Mohammad et al., (2025) demonstrate the continuing development of automated parcel and mobile delivery approaches, while emphasising optimisation within complex last mile operating environments. Yun et al., (2025) similarly develop routing strategies for last mile delivery that address operational optimisation under contemporary delivery requirements. Recent research on artificial intelligence assisted routing further suggests that conventional distance and time based optimisation may require additional contextual evaluation when applied to complex real world delivery conditions. The convenience economy therefore creates a paradoxical form of technological vulnerability. Logistics systems become technologically more

capable yet simultaneously less tolerant of system failure because customers expect near immediate fulfilment. A disruption that might previously have produced a modest delay can now violate an extremely narrow delivery promise. Speed consequently reduces operational slack, making accurate data, system reliability, cybersecurity, interoperability, and rapid human intervention increasingly important components of fulfilment resilience.

3.4 Reverse Logistics Multiplying Costs Across Fulfilment Operations

The fourth issue is the expanding economic burden created when convenient outbound fulfilment is combined with equally convenient product returns. Fast delivery encourages rapid purchasing decisions, while permissive return policies reduce the perceived risk associated with ordering products remotely. The resulting transaction may involve not one logistics movement but several. Marriott et al., (2025) demonstrate that fashion e-commerce returns produce substantial economic and environmental consequences and highlight the significance of consumer behaviours such as ordering multiple alternatives and returning unwanted products. Karl (2025) similarly identifies the growth of e-commerce consumer returns as an increasingly important operational problem and demonstrates the growing relevance of return forecasting for retailers. Nozari and Szmelter-Jarosz (2026) further develop an advanced decision support approach for reverse logistics that integrates agentic artificial intelligence and evolutionary optimisation, illustrating how complex reverse flows have become strategically important enough to require sophisticated analytical support. These developments demonstrate that fulfilment speed cannot be evaluated economically at the moment an order reaches the customer. The original delivery can be followed by collection, transportation, inspection, sorting, repackaging, storage, refurbishment, resale, recycling, or disposal, each of which creates additional cost and resource requirements.

Returns also create uncertainty because reverse flows are less predictable than conventional replenishment and outbound demand. Returned products may arrive at different times, in different conditions, through multiple channels, and with different possibilities for resale or recovery. Nogueira et al., (2025) show that the environmental sustainability of B2C e-commerce must account for wider logistics activities and impacts rather than focusing narrowly on outbound distribution. Research on omnichannel delivery by Pålsson and Olsson (2026) similarly emphasises the importance of considering reverse logistics and customer segments when evaluating environmentally sustainable delivery configurations. Marriott et al., (2025) reinforce the point by showing how e-commerce return behaviours can materially influence the carbon and operational burden associated with online retail. The issue therefore extends beyond managing returns more efficiently. Convenience oriented logistics can unintentionally stimulate additional reverse flows when easy return policies become part of the competitive service proposition. Organisations may consequently spend resources accelerating outbound delivery only to incur another sequence of costs recovering the same merchandise. Without transaction level visibility across forward and reverse movements, fulfilment profitability can appear stronger than it actually is, concealing the extent to which customer convenience multiplies logistics activity without producing equivalent additional revenue.

3.5 Urban Congestion Environmental Externalities Limiting Sustainable Delivery Speed

The fifth issue concerns the wider environmental and urban consequences of logistics models built around increasingly individualised and accelerated delivery. Faster service can reduce opportunities

for shipment consolidation, increase vehicle movements, intensify competition for kerb space, and create additional congestion within cities already facing substantial mobility pressure. Toniolo et al., (2025) examine the decarbonisation of last mile logistics through both environmental and justice perspectives, demonstrating that logistics sustainability cannot be evaluated solely through internal operating cost. Moradi et al., (2025) similarly analyse autonomous delivery vehicles within sustainable two echelon last mile logistics, reflecting the growing search for technological alternatives capable of reducing conventional delivery externalities. van Vliet et al., (2025) demonstrate that parcel demand influences congestion, emissions, and freight logistics costs, while delivery alternatives can produce different outcomes depending on geographic and customer conditions. These findings reinforce the argument that the environmental cost of convenience is strongly influenced by how fulfilment networks are configured. The customer sees only the delivery outcome, whereas cities absorb vehicle activity, emissions, noise, infrastructure pressure, and competition for limited urban space generated by thousands of individually convenient transactions.

The sustainability challenge becomes even more complex because reducing one externality can sometimes create another. Electric vehicles can reduce local emissions but do not automatically solve congestion or inefficient route fragmentation. Parcel lockers can consolidate deliveries but may generate additional customer travel. Cargo bikes can reduce emissions and road space consumption, yet their economic viability depends on shipment characteristics, density, distance, and local infrastructure. Amaya et al., (2025) demonstrate that consumer choices influence the performance of sustainable last mile alternatives, illustrating why environmentally preferable systems must also accommodate behavioural realities. Pålsson and Olsson (2026) similarly show that sustainable omnichannel delivery requires careful alignment between delivery configuration, customer behaviour, and environmental performance. Wang et al., (2023) provide earlier evidence that consumer participation in self collection can influence last mile behaviour, reinforcing the importance of customer involvement in alternative fulfilment systems. Yun et al., (2025) further demonstrate the continuing importance of route optimisation in controlling last mile delivery performance. Faster fulfilment therefore reaches a sustainability limit when additional speed requires disproportionate economic resources and external costs. The central issue is no longer whether logistics can become faster, but whether the convenience produced is valuable enough to justify everything that must move, consume, emit, and operate more intensively to create it.

4. REBALANCING DELIVERY SPEED CAPACITY LOGISTICS SYSTEM VALUE

The pressures identified within the convenience economy reveal that faster fulfilment can no longer be evaluated as an isolated improvement in customer service. Its strategic value depends on whether the additional responsiveness generated for customers exceeds the financial, operational, technological, environmental, and human resources required to produce it. Castillo et al., (2025) demonstrate that last mile capacity planning becomes considerably more complicated when demand uncertainty interacts with uncertain delivery resources, while Mogire et al., (2025) identify cost, sustainability, customer expectations, and technological development as interconnected dimensions of contemporary last mile logistics. Y. Qi et al., (2025) further demonstrate that customer priorities and collaborative transportation configurations influence logistics scheduling decisions, reinforcing the need to evaluate fulfilment according to differentiated service requirements rather than universal speed expectations. These findings suggest that the fundamental challenge is not simply excessive logistics activity, but a misalignment between service promises and the economic architecture

required to sustain them. The discussion therefore requires a broader interpretation of fulfilment performance in which profitability, capacity productivity, technological resilience, reverse logistics exposure, and environmental consequences become integral to decisions concerning delivery speed. Five strategic dimensions are particularly important for understanding how logistics systems can preserve convenience without allowing accelerated fulfilment to progressively undermine their economic and operational foundations.

4.1 Reframing Delivery Speed Through Economic Service Choice

The erosion of fulfilment economics suggests that organisations should reconsider the assumption that shorter delivery time automatically produces superior logistics value. Different orders generate different margins, customer expectations, urgency levels, fulfilment costs, and strategic importance, yet convenience oriented logistics frequently applies similar service promises across heterogeneous transactions. Park et al., (2025) demonstrate that integration between retailers and last mile delivery platforms can expand same day fulfilment opportunities, illustrating how delivery capability has become increasingly embedded within online sales strategy. However, the availability of faster delivery does not establish that maximum speed is economically appropriate for every transaction. Kundu et al., (2025) show that out of home delivery arrangements can generate important people, profit, and environmental benefits compared with conventional home delivery under appropriate conditions. Liu et al., (2025) similarly demonstrate that consumer participation through self collection and social delivery can transform last mile services into more collaborative logistics marketplaces. These findings support a differentiated fulfilment architecture in which delivery speed becomes an economic decision rather than an unconditional customer entitlement. Orders with high urgency, strong margins, or strategic importance may justify premium capacity, while flexible orders can be consolidated or redirected towards alternative fulfilment channels. Such differentiation allows logistics resources to follow customer value and operational necessity instead of allowing every order to consume the expensive capacity associated with maximum responsiveness.

A value based interpretation of speed also requires organisations to recognise that customers may evaluate convenience through dimensions other than immediacy. Reliability, delivery visibility, collection flexibility, accessibility, predictable arrival times, and control over fulfilment arrangements can generate meaningful value without requiring continuous reductions in delivery lead time. Riahi Samani et al., (2025) demonstrate that consumer preferences differ across autonomous delivery robots, crowdsourced delivery, and automated parcel lockers, with cost sensitivity and product characteristics influencing acceptance of alternative modes. Klink and Schweizer (2025) similarly establish that consumer attitudes towards last mile delivery modes depend on multiple behavioural drivers rather than a single preference for speed. Q. Qi et al., (2025) further find that willingness to participate in crowdsourced delivery varies across transportation modes and is influenced by delivery characteristics and travel contexts. Consequently, the strategic question should shift from asking how logistics can make every order faster towards determining which combination of speed, reliability, flexibility, and cost creates the greatest perceived value for particular customer segments. This approach would allow organisations to preserve convenience while reducing economically unnecessary acceleration. Fulfilment strategies could consequently offer genuinely urgent customers premium responsiveness while providing other customers with financially and environmentally efficient options that remain convenient but do not impose disproportionate logistics costs.

4.2 Building Adaptive Capacity Without Institutionalising Operational Excess

The capacity pressures generated by accelerated fulfilment demonstrate why logistics networks require greater flexibility rather than permanently maintaining enough resources to accommodate every potential demand peak. Excessive fixed capacity can protect service performance during periods of high demand but becomes financially inefficient when vehicles, facilities, equipment, and labour remain underutilised during normal operations. Castillo et al., (2025) demonstrate that combining private and crowdsourced delivery creates a two sided uncertainty problem because customer demand and crowdsourced labour availability can fluctuate simultaneously. Cao et al., (2025) similarly develop an order fulfilment model integrating crowdsourcing within a two echelon distribution structure, illustrating how independent delivery resources can supplement conventional capacity under expanding e-commerce demand. Jiang et al., (2026) extend this logic by integrating self owned and crowdsourced delivery within e-order fulfilment optimisation, demonstrating how multiple capacity sources can be coordinated to improve fulfilment performance. These findings suggest that logistics resilience should not be built exclusively through permanent capacity expansion. A more financially sustainable architecture combines stable core capacity with flexible resources capable of responding when demand exceeds normal operating requirements. Such arrangements can reduce the need to maintain expensive assets solely for occasional peaks while preserving the responsiveness expected within convenience oriented markets. Capacity therefore becomes a dynamic portfolio of internal, contracted, crowdsourced, and technologically enabled resources rather than a fixed quantity designed around maximum possible demand.

Adaptive capacity must nevertheless be managed carefully because flexibility can transfer operational pressure from physical assets towards workers and external service providers. The pursuit of speed becomes problematic when capacity shortages are repeatedly absorbed through overtime, intensified workloads, unrealistic routing expectations, or unstable employment arrangements. Çelik et al., (2026) examine crowdsourced courier performance through user comments and demonstrate the importance of understanding service performance from actual delivery experiences rather than relying solely on optimisation models. Mutambik (2025) similarly argues that future last mile systems should be evaluated through sustainable urban logistics and smart city perspectives, indicating that technological and operational development must remain connected with broader social requirements. Hong et al., (2025) show that collaborative systems involving drones and public transportation can provide alternative mechanisms for improving delivery time performance without relying exclusively on conventional human driven freight vehicles. The wider implication is that capacity flexibility should originate from intelligent network design rather than persistent labour intensification. Organisations can combine workforce planning, crowdsourcing, collaborative transportation, microfulfilment, alternative delivery points, and automated technologies to create capacity that expands and contracts according to demand. This can protect service responsiveness while preventing the convenience economy from institutionalising operational excess or transferring the hidden cost of faster fulfilment disproportionately towards logistics workers.

4.3 Converting Technology Investment Into Higher Logistics Productivity

The growing dependence on technology within accelerated fulfilment creates an important distinction between digital capability that genuinely improves logistics productivity and technology adopted primarily to preserve increasingly demanding service promises. Artificial intelligence,

automation, autonomous vehicles, predictive analytics, and digital twins can improve routing, resource allocation, visibility, and responsiveness, but these technologies also require capital investment, integration capability, data infrastructure, maintenance, and specialist expertise. Galkin et al., (2025) demonstrate the growing role of digital twins in logistics, particularly in relation to smart cities and sustainable development. Jiang and Chang (2025) similarly integrate machine learning, reinforcement learning, and queueing theory for dynamic last mile routing, demonstrating the potential of intelligent systems to respond to changing operational conditions. Huang (2025) further applies reinforcement learning with reward shaping to last mile dispatch efficiency, illustrating how advanced optimisation can improve dynamic delivery decisions. These developments indicate that digitalisation becomes strategically valuable when it enables logistics systems to achieve better resource productivity rather than merely greater speed. The appropriate measure of technological success should therefore include vehicle utilisation, delivery density, labour productivity, energy efficiency, route stability, service reliability, and cost per successful fulfilment alongside delivery time. Technology that shortens delivery time but simultaneously increases fixed costs or operational complexity may create impressive responsiveness without generating corresponding economic improvement.

Technology can also strengthen fulfilment resilience by creating the visibility and simulation capability required to anticipate disruptions before they translate into service failure. Intelligent logistics systems can continuously analyse traffic conditions, demand patterns, inventory availability, delivery capacity, and route performance, allowing decisions to be adjusted as conditions evolve. Estil-Les et al., (2026) develop a digital twin approach that integrates optimisation and simulation for last mile delivery, enabling rerouting when unexpected events such as congestion or road closures occur. Y. Qi et al., (2025) similarly examine air-ground collaborative logistics scheduling under customer priority requirements, demonstrating how coordinated transport resources can support more responsive fulfilment planning. Kahalimoghadam et al., (2025) further develop an intelligent multi-agent system for last-mile logistics, supporting the broader move towards adaptive decision architectures. Such capabilities are particularly important within the convenience economy because compressed delivery windows leave limited operational slack for recovering from disruption. However, intelligent systems should strengthen rather than eliminate managerial judgement. Algorithmic recommendations remain dependent on data quality, model assumptions, infrastructure reliability, and the organisation's ability to interpret changing conditions. Digital capability should consequently be evaluated according to whether it increases decision quality and operational resilience while controlling total logistics cost. The strategic objective is not maximum automation, but a technology architecture capable of producing economically sustainable responsiveness under increasingly complex fulfilment conditions.

4.4 Integrating Reverse Logistics Within Customer Convenience Economics

The expansion of e-commerce returns demonstrates that the economics of fulfilment cannot be accurately understood when outbound and reverse logistics are managed as separate systems. A transaction that appears profitable after rapid customer delivery can produce a substantially different financial outcome once collection, transportation, inspection, repackaging, storage, and product disposition are included. Karl (2025) demonstrates that increasing e-commerce returns have intensified the need for improved forecasting, particularly as customer data and machine learning provide new opportunities to anticipate reverse flows. Mishra and Dutta (2026), reviewing 240

studies, similarly identify return management, reverse logistics, packaging waste, reuse, recycling, and product disposition as increasingly important concerns within digital commerce. Recent research on sustainable reverse logistics further demonstrates that uncontrolled e-commerce returns can increase supply chain costs, goods movements, traffic, and environmental pressures. These findings suggest that fulfilment profitability should be evaluated across the complete logistics journey of an order rather than terminating financially at successful delivery. Expected return probability, reverse transportation cost, product recovery value, handling intensity, and resale potential should therefore become part of the original fulfilment decision. An order associated with a high probability of costly return may justify a different service configuration from an order with stable purchasing behaviour and low reverse logistics exposure.

Greater integration between forward and reverse logistics can also transform returns from an unpredictable downstream burden into a manageable component of fulfilment strategy. Data generated during purchasing, delivery, customer interaction, and previous return behaviour can support more accurate predictions of which transactions are likely to generate reverse flows. Karl (2025) highlights the potential of machine learning and customer data to strengthen e-commerce return forecasting, while research on sustainable reverse logistics identifies return policy, return location, transportation strategy, information management, and performance measurement as interconnected design variables. Mishra and Dutta (2026) further emphasise that effective return handling, reuse, and recycling can contribute to more sustainable online supply chains. The managerial implication is that convenience should be designed across the complete transaction rather than maximised independently at each stage. Extremely rapid outbound fulfilment combined with unrestricted free returns may create an attractive customer proposition while generating weak transaction economics. More sophisticated strategies could differentiate return conditions according to product characteristics, customer behaviour, order value, recovery potential, and environmental impact. Integrated forward and reverse visibility would also enable organisations to calculate the true logistics contribution of each transaction. This approach can prevent apparent sales growth from concealing fulfilment models in which repeated product movements consume substantial capacity without producing equivalent economic value.

4.5 Redefining Logistics Excellence Through Total System Value

The environmental and urban consequences associated with accelerated fulfilment demonstrate why logistics excellence should be evaluated through total system value rather than delivery time alone. Convenience oriented networks operate within cities where road capacity, kerb space, infrastructure, energy, and environmental tolerance are finite resources. Bjørgen et al., (2025) argue that expanding home and near home deliveries create important implications for urban planning because many residential environments were not originally designed to accommodate increasing freight activity. van Vliet et al., (2025) similarly demonstrate that parcel demand influences vehicle kilometres, emissions, congestion, and freight logistics costs, while the relative performance of delivery alternatives differs across geographical contexts. Wang et al., (2025) further examine the location of urban logistics distribution centres in connection with public transportation services, highlighting opportunities to integrate freight more effectively with existing urban mobility systems. These findings indicate that fulfilment optimisation cannot remain confined within the organisational boundaries of retailers and logistics providers. A delivery strategy may reduce customer waiting time while simultaneously increasing pressure on urban infrastructure or generating external costs

that are not reflected within conventional logistics accounting. Total system value therefore requires simultaneous consideration of customer experience, profitability, resource utilisation, emissions, congestion, infrastructure requirements, and broader societal consequences when determining the appropriate level of fulfilment speed.

Alternative technologies and delivery configurations provide opportunities to reconcile convenience with wider system performance, but their adoption should be guided by contextual economics rather than technological enthusiasm. Chu et al., (2025) demonstrate that drones can provide cost and efficiency advantages for selected urban express logistics applications, although performance depends on operating configuration and deployment conditions. Zang et al., (2025) show that parcel lockers can reduce delivery time and costs when integrated appropriately with urban delivery time windows. Y. Qi et al., (2025) demonstrate that air-ground collaborative logistics can support scheduling under customer priority requirements, while Kahalimoghadam et al., (2025) develop an intelligent multi-agent system for last-mile logistics that supports more adaptive operational decision making. Collectively, these studies reinforce a broader principle: sustainable convenience does not require every order to travel through the same channel at the same speed. Logistics networks can instead combine home delivery, lockers, collection points, crowdsourcing, electric vehicles, drones, automated systems, and consolidated delivery according to location, urgency, customer preference, and economic value. The strongest fulfilment system is therefore not necessarily the fastest system. It is the system capable of allocating the appropriate level of speed and resources to each transaction while protecting profitability, resilience, customer value, workforce sustainability, and environmental performance. Under this interpretation, logistics excellence shifts from winning the race for maximum speed towards designing convenience that the entire fulfilment ecosystem can economically and operationally sustain.

5. STRATEGIC PATHWAYS SUPPORTING SUSTAINABLE FULFILMENT PERFORMANCE OUTCOMES

The evidence developed across the current issues and discussion indicates that the central challenge facing modern logistics is not the existence of faster fulfilment itself, but the indiscriminate application of speed across transactions with fundamentally different economic, operational, and customer characteristics. Last mile logistics already represents one of the most resource intensive components of contemporary supply chains, while growing e-commerce demand continues to intensify pressures involving cost, capacity, sustainability, customer expectations, and technological investment. Pourmohammadreza et al., (2025) demonstrate that alternative delivery locations are increasingly important because conventional last mile structures remain economically and operationally challenging. Castillo et al., (2025) further establish that delivery capacity decisions become considerably more complex when organisations simultaneously confront demand uncertainty and uncertainty in available crowdsourced labour. Consumer evidence also shows that customers differ materially in their preferences for delivery technologies, speed, accessibility, and cost (Riahi Samani et al., 2025). Logistics strategy should therefore move beyond the assumption that every reduction in delivery time represents progress. The more sustainable objective is to determine where speed creates sufficient value, where flexibility can replace immediacy, and where alternative fulfilment arrangements can preserve convenience while reducing resource consumption. Five strategic priorities are proposed to rebuild this balance across service design, capacity, technology, reverse logistics, and sustainable urban fulfilment.

5.1 Establish Value Based Fulfilment Instead of Universal Speed

Organisations should replace universal speed commitments with differentiated fulfilment architectures that explicitly connect delivery responsiveness to customer value, order economics, product characteristics, urgency, and willingness to pay. Treating every transaction as equally time critical encourages expensive capacity to be consumed by orders that may generate insufficient margin to justify accelerated processing and transportation. Riahi Samani et al., (2025) demonstrate that consumers display heterogeneous preferences across autonomous delivery robots, crowdsourced delivery, and automated parcel lockers, while perceived benefits, ease of use, commodity characteristics, and delivery costs influence acceptance. Klink and Schweizer (2025) similarly show that attitudes towards last mile delivery modes are shaped by multiple drivers rather than a universal preference for one fulfilment configuration. Amaya et al., (2025) further establish that willingness to use sustainable delivery alternatives depends on consumer decision factors and operational attributes. These findings provide a strong basis for segmentation. Organisations should classify fulfilment demand according to urgency, profitability, customer sensitivity, product type, geographic density, delivery complexity, and service expectations. Premium rapid delivery can then be reserved for transactions where speed generates demonstrable economic or strategic value, while standard orders can be assigned to consolidated routes, collection points, parcel lockers, or wider delivery windows. Such differentiation would preserve customer choice without forcing the entire logistics network to operate continuously at maximum speed.

The commercial architecture supporting these differentiated services should also make the economic consequences of convenience more visible to customers and managers. Free and rapid fulfilment can obscure the resources required to deliver an order, encouraging service expectations that progressively detach customer convenience from logistics economics. Consumer research indicates that delivery preferences involve tradeoffs among speed, cost, accessibility, technology, and sustainability rather than a singular preference for immediacy (Riahi Samani et al., 2025). Recent research on logistics service and sustainability likewise demonstrates that consumers evaluate tradeoffs involving delivery, returns, cost, corporate responsibility, and environmental performance. Organisations should therefore develop transparent service menus that provide genuine choices such as premium express delivery, scheduled home delivery, environmentally preferred consolidated delivery, and collection based fulfilment. Appropriate incentives can encourage customers to select options that reduce logistics intensity when speed is unnecessary. Information presented during checkout can also communicate the relative environmental or operational implications of available choices. Evidence from pre-delivery interventions indicates that consumer information can influence the selection of parcel lockers, although adoption ultimately depends on practical accessibility and perceived value. Fulfilment strategy would consequently move from selling maximum speed towards managing a portfolio of convenience propositions in which customers receive meaningful choice while organisations retain control over the economic resources allocated to each transaction.

5.2 Build Flexible Capacity Around Variable Demand Requirements

Fulfilment capacity should be redesigned as an adaptive portfolio rather than a permanently expanded asset base constructed to accommodate occasional demand peaks. Maintaining excessive vehicles, warehouse capacity, labour, and local fulfilment infrastructure can protect delivery promises during periods of exceptional demand but creates substantial underutilisation when order

volumes decline. Castillo et al., (2025) demonstrate that last mile capacity planning must account simultaneously for uncertainty in delivery demand and crowdsourced labour availability, showing that decisions based solely on unit delivery cost can produce suboptimal capacity choices. Odeh et al., (2025) similarly address time critical and budget constrained last mile environments through a crowdsourced allocation framework incorporating ground vehicles and drones, demonstrating the potential of heterogeneous resources for responding to demanding service conditions. Organisations should therefore establish a stable core of internal capacity for predictable baseline demand while developing flexible arrangements that can expand when demand volatility increases. Contracted transport, crowdsourced resources, temporary fulfilment capacity, collaborative distribution, and selected automated technologies can supplement core operations when justified. Forecasting should continuously determine the appropriate balance between permanent and flexible capacity according to demand variability, service risk, labour availability, geographic requirements, and the cost of failed fulfilment. This architecture can protect responsiveness without embedding the cost of maximum demand permanently within everyday logistics operations.

Capacity flexibility should also extend beyond the number of vehicles or workers available because network design determines how effectively existing resources can be utilised. Parcel lockers, collection points, microfulfilment facilities, shared logistics infrastructure, and differentiated delivery windows can reshape demand before additional transport capacity becomes necessary. Zhang and Demir (2025) identify parcel lockers as a promising mechanism for reducing bottlenecks, congestion, and inefficient personnel utilisation while improving delivery efficiency. Pourmohammadreza et al., (2025), after reviewing 257 publications, similarly conclude that alternative delivery locations have considerable strategic relevance for improving last mile logistics. However, alternative delivery infrastructure should not be deployed uniformly because its performance depends on location, demand density, and customer behaviour. Van Vliet et al., (2025) find that pick up points perform particularly well in dense urban areas, whereas conventional van delivery can remain preferable in peripheral locations. This evidence supports geographically differentiated capacity design. Dense markets may justify lockers, collection points, cargo based solutions, and highly consolidated routes, whereas lower density areas may require scheduled conventional delivery. Capacity planning should therefore begin with the structure of demand and geography rather than with a predetermined commitment to one fulfilment model. This can improve asset productivity while reducing the operational redundancy created by universal rapid delivery.

5.3 Direct Digital Investment Towards Productivity Decision Intelligence

Technology investment should be governed by its contribution to total logistics productivity rather than by its ability to reduce delivery time alone. Artificial intelligence, autonomous systems, predictive analytics, warehouse automation, and advanced routing can provide substantial operational benefits, but they also create acquisition costs, integration requirements, maintenance obligations, data dependencies, and capability demands. Seghezzi et al., (2025) demonstrate that artificial intelligence can influence multiple e-commerce logistics processes and provide benefits across planning and operational activities. Smart last mile technologies such as unmanned aerial vehicles and autonomous delivery robots can similarly improve selected aspects of delivery performance, although their suitability depends on operational context, infrastructure, weather, pedestrian interaction, and other constraints. Organisations should consequently require technology investments to demonstrate measurable improvements across several dimensions, including cost per

order, delivery density, vehicle utilisation, picking productivity, energy consumption, service reliability, error reduction, labour productivity, and customer value. A system that produces faster fulfilment while increasing total cost disproportionately should not automatically be interpreted as successful digital transformation. Investment governance should therefore compare technological expenditure against the economic value created throughout the fulfilment process. This would prevent technology from becoming an escalating response to service expectations that may themselves require strategic reconsideration.

Decision intelligence should become the more important objective of logistics digitalisation because the greatest value of advanced analytics may lie in determining when speed is necessary rather than merely making every activity faster. Artificial intelligence can support demand prediction, route optimisation, fulfilment allocation, returns forecasting, customer segmentation, and dynamic resource deployment. Seghezzi et al., (2025) identify extensive opportunities for AI applications across e-commerce logistics processes, demonstrating that digital capability can influence multiple stages rather than a single operational activity. Karl (2025) similarly shows that machine learning and customer data create new possibilities for forecasting e-commerce returns, allowing reverse flows to be anticipated more systematically. Zhang and Demir (2025) further identify AI enabled innovation as an emerging dimension of parcel locker research and last mile optimisation. Organisations should integrate these capabilities into a unified fulfilment decision architecture. Systems could evaluate each order according to urgency, margin, inventory position, customer preference, route capacity, return probability, emissions implications, and available delivery alternatives before assigning the appropriate fulfilment pathway. Managers would then use analytical recommendations to determine whether express delivery, scheduled home delivery, locker collection, consolidation, or another option produces the strongest overall value. Digitalisation would consequently evolve from an instrument for accelerating logistics into an intelligence infrastructure for allocating scarce fulfilment resources more economically.

5.4 Integrate Forward Reverse Logistics Within Transaction Economics

Reverse logistics should be incorporated directly into fulfilment economics because customer convenience does not end when the initial delivery is completed. The expansion of e-commerce returns means that a transaction can generate additional collection, transportation, inspection, sorting, storage, repackaging, resale, recycling, and disposal activities after apparently successful fulfilment. Karl (2025) documents the substantial growth of e-commerce consumer returns and demonstrates the increasing importance of forecasting reverse flows. Mishra and Dutta (2026), based on a comprehensive review of 240 studies, similarly identify return management, reverse logistics, packaging waste, product disposition, reuse, and recycling as significant challenges associated with expanding online commerce. González Romero et al., (2025) further identify return policy, return location, demand and return density, validation points, return destinations, transportation strategy, and information management as important components of sustainable reverse logistics design. Organisations should therefore calculate expected transaction profitability after incorporating the probability and likely cost of returns rather than evaluating performance only after outbound delivery. This approach can reveal products, customer segments, and service policies where apparent sales growth generates weak economic contribution because repeated product movements absorb substantial logistics resources. Fulfilment decisions would then reflect the complete economic journey of each transaction rather than only the visible cost of getting the order to the customer.

Return prevention should receive equal strategic attention because the most efficient reverse logistics movement is often one that does not need to occur. Better product information, accurate sizing, improved images, customer guidance, product comparison tools, packaging design, and targeted purchasing recommendations can reduce avoidable returns before they enter the logistics system. Where returns remain necessary, organisations should create differentiated pathways according to product value, condition, recovery potential, geography, and environmental consequences. Research on sustainable reverse logistics shows that return location and collection point density can materially influence sustainability outcomes, while transportation strategy and information management remain central design considerations. González Romero et al., (2025) additionally emphasise collaboration among retailers, customers, transportation providers, and institutions because each stakeholder influences important elements of reverse logistics performance. Organisations should therefore establish integrated forward and reverse visibility capable of linking the original order with subsequent return activities and recovery outcomes. Managers could monitor transaction level metrics including delivery cost, return probability, reverse transportation cost, recovery value, time to resale, packaging consumption, and final margin. Such visibility would expose where generous convenience policies are economically sustainable and where they unintentionally encourage excessive logistics activity. Reverse logistics would consequently become an integral component of customer service design rather than a downstream cost centre managed after the commercial decision has already been made.

5.5 Redesign Convenience Around Sustainable Total System Value

The final recommendation is to redefine logistics performance around total system value so that delivery speed is evaluated alongside cost, customer experience, emissions, congestion, infrastructure utilisation, workforce implications, and long term network resilience. Urban logistics cannot indefinitely absorb increasingly fragmented vehicle movements without considering the external consequences generated beyond organisational boundaries. Van Vliet et al., (2025) establish that growing parcel demand contributes to congestion, emissions, and increasing freight logistics costs, while the effectiveness of delivery alternatives varies across urban and peripheral environments. Research on urban freight published in 2026 further demonstrates that spatial characteristics such as urban density, compactness, and street network configuration can substantially influence delivery costs, vehicle kilometres, productivity, and carbon emissions. Toniolo et al., (2025) broaden this argument by demonstrating that decarbonising last mile logistics should incorporate life cycle consequences and just transition considerations rather than relying exclusively on technological efficiency improvements. Organisations should therefore establish fulfilment scorecards combining financial and service measures with environmental and resource productivity indicators. Delivery time would remain important, but it would no longer dominate performance evaluation independently of the resources consumed to achieve it. Such measurement can expose service models that appear highly responsive while generating weak economic or environmental outcomes.

Sustainable fulfilment also requires collaboration because retailers and logistics providers cannot independently resolve every constraint created by the convenience economy. Urban authorities influence road access, kerb space, charging infrastructure, zoning, consolidation facilities, and the location of collection infrastructure. Consumers determine whether alternative delivery

arrangements achieve sufficient adoption. Technology providers shape the capabilities available for routing, automation, visibility, and low emission transportation. Zhang and Demir (2025) show that parcel locker effectiveness depends on operational design, sustainability considerations, user acceptance, and integration with wider urban logistics systems. Amaya et al., (2025) demonstrate that consumer willingness remains critical to the adoption of sustainable last mile alternatives. Liu et al., (2025) further show that consumers can participate directly in logistics value creation through self collection and social delivery, expanding the possibilities for more collaborative fulfilment arrangements. Organisations should consequently develop fulfilment ecosystems that combine home delivery, collection points, lockers, consolidation, low emission vehicles, flexible capacity, intelligent routing, and customer participation according to local conditions. The objective is not to eliminate speed, but to prevent speed from becoming the default solution to every logistics requirement. Convenience becomes strategically sustainable when customers receive appropriate service while the fulfilment system preserves profitability, capacity productivity, resilience, workforce viability, and environmental performance.

Ultimately, the convenience economy requires a fundamental transition from maximum responsiveness towards economically intelligent responsiveness. Faster fulfilment should remain available where urgency, customer value, competitive significance, or transaction economics justify it, but it should no longer determine the architecture of the entire logistics network. The evidence from current research consistently demonstrates that last mile performance depends on the interaction among capacity uncertainty, customer preferences, alternative delivery infrastructure, technology, reverse flows, and environmental conditions (Castillo et al., 2025; Pourmohammadreza et al., 2025). Consumer preferences are heterogeneous rather than uniform, supporting differentiated service configurations instead of universal acceleration (Riahi Samani et al., 2025; Klink & Schweizer, 2025). At the same time, sustainability research demonstrates that rapid delivery can generate environmental and societal consequences that remain invisible when logistics performance is assessed primarily through customer waiting time (Toniolo et al., 2025). The strategic recommendations proposed here therefore converge on a common principle: fulfilment should be designed according to the total value created relative to the total resources consumed. By segmenting service speed, building adaptive capacity, directing technology towards productivity, integrating forward and reverse logistics, and incorporating total system consequences into decision making, organisations can preserve the benefits of convenience without allowing the pursuit of immediacy to progressively weaken the logistics systems on which that convenience ultimately depends.

6. CONCLUSION

The convenience economy has transformed logistics by making speed, flexibility, visibility, and effortless service central elements of customer value. Yet the analysis demonstrates that faster fulfilment cannot be treated as an unlimited source of competitive advantage. Every improvement in responsiveness requires supporting resources across inventory, warehousing, transportation, technology, labour, and network capacity. When these requirements grow faster than the value created for customers, convenience begins to weaken rather than strengthen logistics performance. The fundamental challenge is therefore not simply achieving faster delivery, but determining where speed genuinely creates sufficient value to justify its economic and operational consequences. Sustainable logistics performance requires firms to recognise that different products, customers,

locations, and transactions demand different levels of responsiveness. This shifts managerial attention away from universal speed towards economically intelligent fulfilment.

A more sustainable response requires logistics networks capable of balancing customer expectations against resource productivity, operational resilience, and environmental responsibility. Value-based service segmentation can differentiate genuinely urgent orders from transactions where customers may accept slower or alternative delivery options. Adaptive capacity can provide responsiveness during demand fluctuations without creating excessive permanent resources, while digital technologies should improve productivity, visibility, forecasting, and decision quality rather than merely accelerate individual activities. Integrated forward and reverse logistics are equally important because the true economics of convenience extend beyond successful delivery to include returns, recovery, additional transportation, handling, and inventory consequences. Parcel lockers, collection points, automation, intelligent routing, flexible capacity, and alternative delivery configurations can therefore support convenience more efficiently when they are selected according to customer behaviour, geographic conditions, transaction characteristics, and total system requirements.

Ultimately, the future of convenience-oriented logistics should not be defined by a continuous race towards the shortest possible delivery time. Competitive advantage is more likely to emerge from fulfilment systems that provide the right level of responsiveness for the right transaction using the right combination of resources. This perspective changes logistics excellence from a narrow measure of speed into a broader capability for creating customer value without sacrificing profitability, resilience, workforce sustainability, or environmental performance. The strategic objective is not to reduce convenience, but to redesign how convenience is created and delivered. Firms that successfully align service promises with capacity, technology, customer value, reverse flows, and wider system consequences will be better positioned to maintain both responsiveness and long-term performance. The convenience economy can therefore remain commercially valuable, but only when logistics decisions ensure that the value created through convenience remains proportionate to the resources and consequences required to provide it.

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2. Conflict of Interest

The author declares no financial, professional, personal, or other competing interests that could have influenced the development, interpretation, or presentation of this article.

3. Author Contribution Statement

Mohamed Suhaimi Yusof was solely responsible for the conceptualization, literature review, critical analysis, development of the arguments, formulation of strategic recommendations, manuscript preparation, revision, and final approval of the article.

4. Ethics Statement

This study was conducted in accordance with applicable ethical principles and research standards. As this is a conceptual study based on published literature, no human participants or primary data collection were involved. Therefore, ethical approval and informed consent were not applicable. All sources used in the study were appropriately acknowledged in accordance with academic research standards.

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