

Is Theme Park Logistics Inspired by City Logistics Practices and Strategies?

Gilles Paché
CERGAM
Aix-Marseille University

Despite its significant importance, theme park logistics remains underexplored in management research. There are noteworthy similarities with city logistics, particularly in areas such as managing visitor flows, product supply, waste management, and the application of smart technologies. Product supply is informed by established pooling practices, which involve centralized deliveries to hubs and optimized inventory management. Waste management also draws from sustainable urban strategies, including sorting and recycling. Furthermore, smart technologies facilitate real-time monitoring of visitor flows, allowing for fine-tuning logistical operations, although this raises ethical questions like those encountered in smart cities. These innovative practices, which have not been adequately studied, aim to enhance the efficiency of theme park logistics while ensuring a high-quality customer experience.

Keywords: city logistics, customer experience, flow optimization, smart cities, sustainability, theme (amusement) park, waste management

INTRODUCTION

Theme parks, or amusement parks, are emblematic destinations for entertainment, where visitors seek thrills, relaxation, and shared moments with family and friends (see the contributions gathered by Wood [2017]). However, behind the allure of rides, shows, and immersive environments lies a far more complex reality: logistics. Managing a theme park encompasses much more than coordinating recreational activities or welcoming guests. It relies on a series of organizational, technical, and human processes that often resemble city management. A theme park serves as a microcosm where a multitude of activities and services coexist, all essential to ensuring a seamless customer experience. It operates on a hybrid model of entertainment consumption—combining rides with material goods such as souvenirs and food (Liang & Li, 2023)—and its rigorous management is rooted in logistical principles that may well parallel those found in city logistics management over the past two decades.

City logistics emphasizes the efficient management of product movement, supply, and distribution in areas where space is limited, creating specific constraints to ensure the well-being of residents and, more broadly, all who frequent these spaces for work or leisure (Taniguchi, 2014). The context of theme park logistics provides an apt comparison to city logistics, as theme parks are also situated on compact grounds while accommodating thousands or tens of thousands of visitors daily. The challenge is formidable: how can we ensure that every visitor enjoys a pleasant experience without facing long queues, encountering overcrowded recreational areas, and simultaneously guaranteeing that all necessary infrastructure for the park's smooth operation is adequately supplied? The solution appears to lie in high-level operations

management, drawing from the best practices of city logistics and tailored to the unique characteristics of these recreational environments.

This article examines the various dimensions of theme park logistics, analyzing how the principles of city logistics are applied and adapted to address the unique challenges of these environments. Paradoxically, this topic has not generated a substantial body of research despite its significance. In France, for example, Delaitre *et al.* (2010) highlighted the urgent need for studies on theme park logistics in the early 2010s, yet their call has gone largely unanswered. A similar trend can be observed in the Anglo-Saxon literature, where available resources are primarily limited to professional websites.¹ For example, none of the 17 chapters in the edited book coordinated by Freitag *et al.* (2023) on key concepts associated with theme parks addresses logistics. To help fill the gap, our theoretical reflection, complemented by a case study of PortAventura World, aims to explore the many facets of this specific type of logistics. We will focus on visitor flow management, queue optimization, product supply for numerous points of sale, and waste management. Each of these elements is crucial to the organization of a theme park and directly influences the quality of the customer experience.

GENERAL BACKGROUND

Flow management in theme parks, much like in urban environments, has become a critical issue as these leisure destinations attract increasingly larger crowds. Such massive influxes inevitably lead to congestion, impacting both the quality of the customer experience and operational efficiency. To address these challenges, theme parks are leveraging proven logistical strategies, incorporating pedestrian flow planning techniques to ensure visitors' smooth movement, along with efficient supply of products and waste management. Numerous ecological and technological innovations play a fundamental role in this often-overlooked aspect of logistics, optimizing resource use to minimize the ecological impact of theme parks. By adopting logistical smart solutions, these parks can enhance the customer experience and foster a sustainable approach that is becoming more prevalent in tourism marketing, thereby ensuring a balance between enjoyment and environmental responsibility.

Flow Monitoring

In traditional urban environments, managing human flows is essential to prevent congestion in public spaces, which can lead to significant inefficiencies. Congestion represents a major waste source for individuals and businesses, as it extends journey times and delays deliveries. Additionally, congestion contributes to higher energy consumption and greenhouse gas emissions, exacerbating air pollution and public health issues (Patier & Routhier, 2020). The stress caused by congestion, along with the subsequent decline in quality of life, negatively impacts the overall well-being of residents. Although the circumstances differ somewhat for theme parks, many visitors still require efficient direction through the various park zones to avoid congestion (Xu *et al.*, 2015). Theme park logistics draws on urban planning strategies that utilize pedestrian circulation techniques like those employed in urban settings. These techniques include flow separation (distinct entry and exit points), creating gathering and waiting areas, and installing information points and signage to facilitate mobility.

Theme Park ticketing systems are also inspired by urban transport, particularly through the implementation of online reservations and electronic tickets. Like public transport, which employs prepayment or reservation systems to manage passenger flow, theme parks often adopt comparable systems to regulate attendance and enhance the customer experience. For example, some theme parks, such as Disney, have introduced hourly reservation systems for attractions, known as *Fast Pass*, to minimize queues and optimize visitor flow throughout the park. This approach facilitates a better distribution of visitors across various attractions and reduces overall congestion within the park (Li & Li, 2023). The concept parallels strategies for managing pedestrian flow in smart cities, where technologies such as artificial intelligence and the Internet of Things (IoT) are utilized to improve movement patterns and avoid congested areas, resulting in smoother and more efficient management.

While the flow of people is a crucial aspect of theme park logistics, the flow of goods is equally important for meeting visitors' food and recreational needs. Such as urban environments, where supplies to shops, restaurants, and residents must be managed efficiently, theme parks require meticulous procurement management. Food products, souvenirs, maintenance equipment, and other goods need to be transported to various outlets and warehouses within the park without disrupting the customer experience (Raluca & Gina, 2008). One of the primary challenges is minimizing logistical operations' impact on visitor flows; in other words, logistics must remain “invisible.” To achieve this, theme parks are adopting models inspired by city logistics, such as pooling deliveries and optimizing routes. For example, at Disneyland Paris, off-peak deliveries and the use of electric vehicles help to reduce carbon footprints and noise pollution, aligning with the principles of sustainable city logistics, as we will discuss later.

Finally, waste management is a critical aspect of utilizing urban spaces or theme parks that should not be overlooked. This issue is addressed in numerous studies on sustainable city logistics (Saucedo Martinez *et al.*, 2019), and the insights gained could benefit the organization of theme parks. With hundreds of thousands of daily visitors in a confined area, theme parks generate substantial volumes of waste that must be collected, sorted, and disposed of efficiently. Some parks, such as Disney World in Florida, have implemented underground waste management systems akin to the pneumatic collection systems used in several European cities (Farré *et al.*, 2023), including the Sant Martí district in Barcelona and the Hammarby Sjöstad district in Stockholm. These networks allow waste to be transported directly to treatment centers without disturbing surface visitors. They enhance cleanliness, optimize space, reduce noise and visual disturbances, and significantly improve the efficiency of the waste management process.

Ecological and Technological Innovations

Environmental challenges have prompted many cities to adopt more sustainable logistical strategies, including encouraging electric vehicles, developing cycling infrastructure, and optimizing public transport to reduce CO₂ emissions (Schliwa *et al.*, 2015). The push for ecological innovation is unmistakable, and a parallel can be drawn with certain theme parks that have recognized the need to minimize their carbon footprint. This strategic approach aims to attract a new generation of customers increasingly concerned about climate and environmental issues. For example, Disneyland Paris has introduced electric shuttles to transport visitors from the parking lots to the park entrance, thereby reducing greenhouse gas emissions. Additionally, theme parks are striving to optimize their energy consumption by utilizing renewable energy sources such as solar and wind power and integrating low-energy buildings into their infrastructures—efforts that mirror the initiatives of cities aiming for greater sustainability.

As with high-density urban spaces (Li & Bergen, 2018), theme parks must efficiently manage natural resources, particularly water (Sharma, 2022). Fountains, water attractions, and green spaces require significant water consumption, necessitating optimization to reduce waste. Many theme parks have implemented water recycling systems inspired by those used in cities, allowing water to be reused for garden irrigation or for operating attractions. For example, at Europa-Park in Rust, Germany, rainwater and wastewater from water attractions are collected, treated, and reused for watering plants. Another notable example is Alton Towers in the United Kingdom, which employs similar strategies to limit water consumption while maintaining functional and attractive green spaces and water attractions. These solutions are increasingly common in cities seeking to better manage their water resources and reduce dependence on external sources, especially in the face of climate change and growing water scarcity.

While theme parks are at the forefront of significant environmental innovations, integrating new technologies to optimize logistics is equally noteworthy. With the rise of digital technologies, smart cities now utilize automated management systems to monitor and regulate traffic flows, product deliveries, and even energy consumption (Sanchez Gracias *et al.*, 2023). Similarly, theme parks are increasingly adopting smart technologies to enhance visitor flows. For example, using sensors and real-time data collection allows them to adjust material and human resources as needed. This approach mirrors that of cities, which employ traffic monitoring systems to guide users toward the fastest routes. In theme parks, this can involve redirecting visitors to less crowded attractions, providing dynamic wait time updates through mobile apps,

or reallocating maintenance teams to prevent overload in specific areas, contributing to better visitor experiences and smoother operations.

The most remarkable developments, however, are occurring with the IoT, highlighting the clear convergence between city logistics and theme park logistics. Intelligent sensors and connected systems enable monitoring equipment conditions, prevention of breakdowns, and planning preventive maintenance, thereby minimizing service interruptions. For example, theme parks like Universal Studios use a network of sensors to monitor ride conditions and attendance in real time, triggering alerts for potential malfunctions (Zhao *et al.*, 2024). Similarly, in urban environments, the IoT is employed to monitor public infrastructure—such as roads, bridges, and lighting systems—facilitating quick predictions and resolutions of issues, some of which parallel those encountered in theme parks (the key difference being that these are private infrastructures). More broadly, predictive maintenance enabled by the IoT reduces costs and enhances safety and the customer experience, whether in a theme park or a city.

ILLUSTRATION

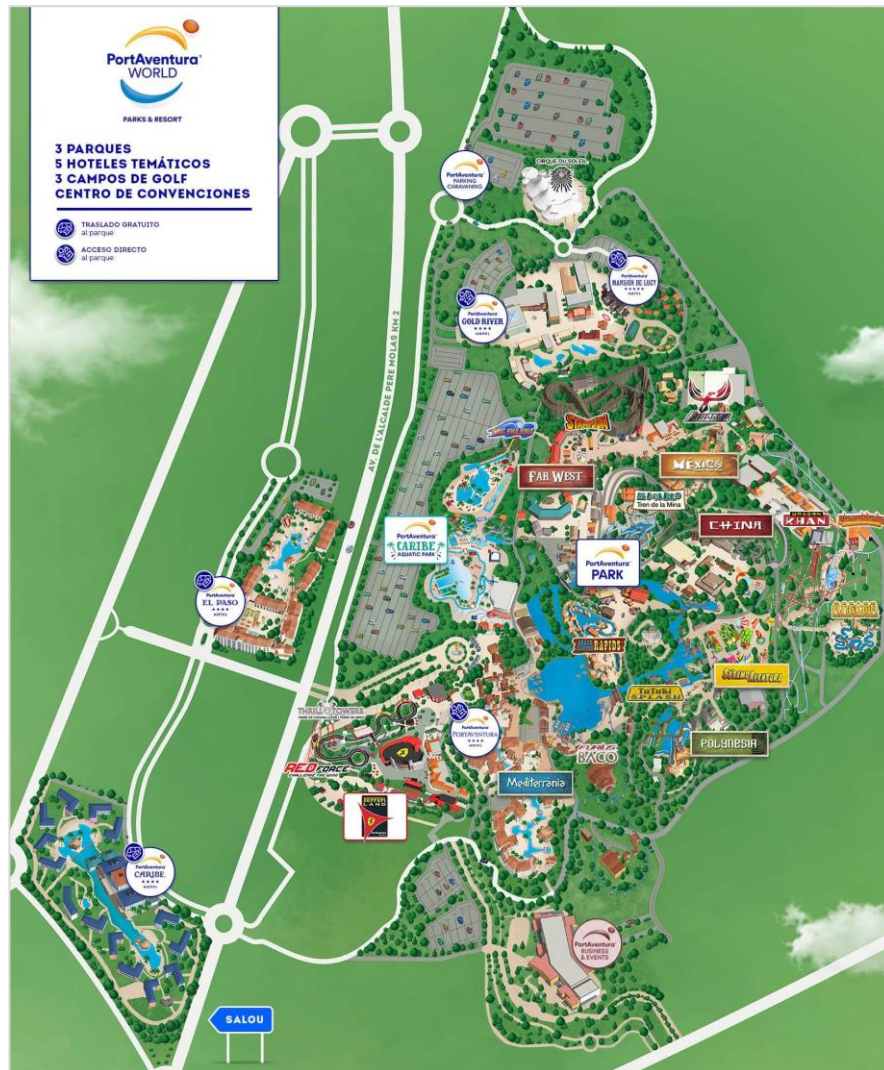
To illustrate the strong parallels between theme park logistics and city logistics, a case study of PortAventura World was selected.² Located near Barcelona, Spain, PortAventura World is one of Europe's largest theme parks, spanning 119 hectares (see Figure 1), and attracting 5.5 million visitors by 2023—a figure that continues to rise. This park serves as an excellent example of how city logistics practices and strategies influence theme park logistics. Four key dimensions can be analyzed: visitor flow management, product supply, waste treatment systems, and sustainable initiatives. By examining these aspects, we can highlight how PortAventura World optimizes the customer experience while minimizing the environmental impact of its operations. The methods employed to manage crowds, inventory management for restaurants and stores, and waste sorting and collection demonstrate a strong commitment from PortAventura World, Investindustrial and Kohlberg Kravis Roberts & Co. owners to the operational and environmental efficiency characteristic of city logistics.

A Diligent Management of Mobility

Like large cities that must manage millions of daily movements, PortAventura World has implemented effective strategies to control and regulate the flow of visitors, thereby avoiding traffic jams that can arise from uncontrolled crowd dynamics (as seen during the Hajj [Paché, 2023]). The park is divided into six thematic zones, each featuring its own attractions, restaurants, and shows. This territorial segmentation mirrors the approach used in European cities, where districts are specialized according to their functions—residential, commercial, administrative, etc.—echoing the principles of French architect Le Corbusier (1933/1973). By distributing attractions across different zones, PortAventura World mitigates the excessive concentration of visitors in any single area, akin to urban planning initiatives aimed at alleviating congestion in city centers. To further enhance navigation within the park, clear signage has been installed, inspired by practices in European cities, allowing visitors to swiftly find their way to the various zones and thereby reducing crowding.

In terms of queue management, the theme park has adopted the *Fast Pass* system—modeled after urban transport reservation systems and ticketing systems used in museums in major cities—to regulate the influx of visitors to its most popular attractions. This system allows visitors to reserve a time slot for accessing certain attractions, effectively avoiding long waits that can extend to minutes or even hours, thereby enhancing the customer experience while optimizing flow management within the park. Like many airports where queues can be pre-booked to streamline boarding, PortAventura World implements a logistical strategy that alleviates potential frustrations for impatient visitors, particularly those with young children, while also helping distribute crowds throughout the park. This proactive management model enhances visitor comfort and maximizes attraction utilization, contributing to a more enjoyable overall experience.

FIGURE 1
PORTAVENTURA WORLD



Source: Document company (2024).

A Theme Park Supplied as a City

Like in large cities, where effective delivery management is crucial for the smooth operation of shops and restaurants, PortAventura World must ensure that its more than 75 points of sale—including souvenir stores, food stalls, and restaurants—are consistently stocked. Failing to do so risks diminishing customer satisfaction and incurring economic losses. To address this challenge, the theme park employs logistical tools like those used in urban centers, centralizing deliveries from its warehouse approximately 5 km away and optimizing delivery routes to minimize distances and reduce the number of trips. By adopting a well-known pooling model, akin to that seen in the Principality of Monaco (Armand *et al.*, 2013), vehicles deliver products to a central hub within the park, from which they are redistributed to various zones. To minimize the impact of deliveries on the customer experience, PortAventura World prioritizes logistical operations outside of opening hours or during off-peak times, mirroring the practices of many cities where delivery trucks are restricted to certain hours to avoid inconveniencing residents.

Optimizing product storage space is another significant challenge for PortAventura World, much like for any commercial enterprise in an urban setting. The theme park must balance the limited storage

capacities of its shops and restaurants with the necessity of maintaining sufficient stock to meet customer demand, which can be somewhat unpredictable. By implementing automated management systems inspired by urban distribution centers, PortAventura World enhances its inventory management at the centralized warehouse. The Park utilizes demand forecasting software to adjust stock levels accordingly, reducing warehousing costs and improving product availability. Furthermore, this proactive approach allows the park to minimize waste and ensure fresh products are always available for guests. Additionally, by analyzing seasonal trends and special event programming, PortAventura World can better anticipate fluctuations in demand, ensuring that visitors consistently find what they are looking for throughout their experience.

A Real Emphasis on Environmental Responsibility

Such as many other European cities, including Copenhagen in Denmark, Amsterdam in the Netherlands, and Bristol in the United Kingdom, PortAventura World has implemented effective solutions to address the significant waste generated by its influx of visitors. With an estimated 30,000 to 40,000 meals served daily and around 40 tons of organic and inorganic waste produced, effective waste management is a crucial concern for the theme park. Inspired by urban waste management models, PortAventura World has a dedicated team focused on waste collection and management, utilizing electric vehicles to minimize noise and air pollution. These soft mobility solutions for waste management mirror practices found in cities like Oslo, Norway, and Valencia and Madrid in Spain. Additionally, the theme park initiates awareness programs to encourage guests to sort their waste and adopt eco-friendly behaviors, featuring recycling stations throughout the park and educational campaigns targeting both adults and children, thereby helping to instill long-term sustainable habits.

This comprehensive approach aims not only to green operations but also to raise public awareness—particularly among children—about pressing environmental issues. Following the lead of major metropolises striving to reduce their carbon footprint, PortAventura World is committed to sustainable development by employing intelligent automated irrigation systems for its green spaces, optimizing water resource usage in a European country (Spain) severely impacted by global warming. The theme park is also notable for its initiatives to minimize plastic use, opting for biodegradable packaging in its restaurants and stores. These efforts align with urban ecological strategies that seek to balance spatial utilization with environmental respect. By integrating sustainable development practices, PortAventura World aspires to serve as a model for other theme parks, demonstrating that profitability and sustainability can indeed coexist harmoniously.

An Effective Integration of Smart Technologies

Just as smart cities utilize sensor networks to monitor traffic flows, PortAventura World employs intelligent systems to adjust its logistical operations in real time. These advanced technologies facilitate dynamic management of visitor influx, maximizing operational efficiency while significantly enhancing the customer experience. However, it is crucial to acknowledge that these systems often face substantial societal criticism. One prominent critique comes from Zuboff (2019), who discusses the emergence of an economic model predicated on collecting and exploiting personal data. In her view, this pervasive surveillance raises fundamental ethical questions regarding privacy and consent. Beyond these concerns, technologies like presence sensors enable PortAventura World to closely track guest movements and respond accordingly. For example, by adjusting showtimes to prevent crowd congestion, the park provides a more enjoyable customer experience and ensures visitor safety. The analogy with the management of North American cities is striking; they too employ similar technologies to regulate the flow of vehicles and pedestrians, optimize public transportation, reduce traffic congestion, and, in some cases, combat crime (Pick, 2017).

While smart systems provide clear logistical benefits, they also raise debates about the boundaries of tracking. For PortAventura World, this has been a central issue since the late 2000s, with a strong focus on using information management to implement personalized one-to-one marketing (Hervás *et al.*, 2011). In smart cities, collecting real-time data raises questions about its use and who truly benefits from it (Fabrègue & Bogoni, 2023). The line between efficient management and privacy invasion can often blur,

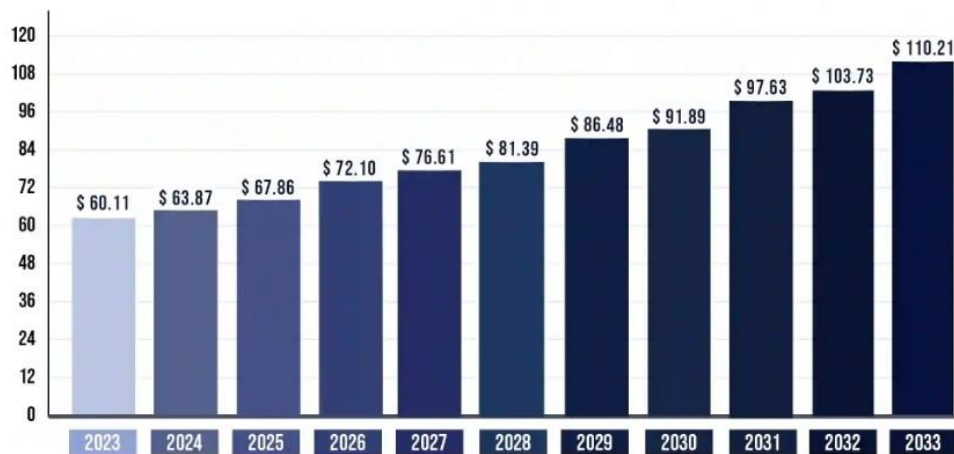
requiring a careful balance. While PortAventura World—and other famous parks—leverage technology to improve operations, it is vital to remain mindful of the ethical implications of tracking and ensure transparency. A proactive approach that builds trust between park managers and visitors can help ease concerns and foster open conversations about surveillance technologies. By engaging with their audience, theme parks can create a more informed environment, promoting a better understanding of how these systems function. In the end, finding a balance between innovation and respect for individual rights is a challenge all stakeholders must confront, as technology becomes ever more intertwined with leisure experiences.

DISCUSSION

Theme parks are complex environments where logistics is crucial in ensuring smooth operations and enhancing the customer experience. The relationship between logistics efficiency and customer satisfaction is well documented and widely studied (Burity, 2021). From managing visitor flow to overseeing product supply, infrastructure, and resources, theme parks encounter logistical challenges like those in urban centers. Paradoxically, despite their growing significance in the global economy and tourism industry, theme park logistics remains a relatively underexplored area of research. This is surprising, especially considering that by 2024, there will be approximately 5,000 theme parks worldwide, ranging from large operations like Disney parks to smaller regional and local venues.

Furthermore, as Figure 2 shows, the theme park market size should continue to grow significantly until 2033. Understanding why this lack of academic interest in such a dynamic sector is essential: are theme parks merely viewed as leisure facilities rather than intricate logistical systems? Consequently, significant opportunities exist for research in logistics and SCM within this context.

FIGURE 2
EXPECTED GROWTH IN THEME PARK MARKET SIZE FROM 2023 TO 2033 (IN U.S. BILLION DOLLARS)



Source: Precedence Research (2024).

Understanding Academic Indifference

One of the main challenges in researching theme park logistics is that it remains a relatively new and underdeveloped field. While sectors such as SCM in the agri-food or automotive industries benefit from extensive literature and established methodologies, theme park logistics has yet to achieve the same level of academic depth and recognition. This is partly due to the hybrid nature of the logistics involved, which combines service management, visitor flow management, and product supply systems in a unique manner. In an academic environment that often values ultra-specialization, particularly for publication in top-ranked

journals, the multifaceted nature of this area requires a conceptual versatility that risks being criticized for fragmentation and lack of coherence. This challenge is further compounded by the diversity of logistical models employed by various theme parks, which hinders the development of a universally applicable framework, despite attempts at modeling to achieve such a goal (Reyes *et al.*, 2020). Additionally, the rapid evolution of technology and changing consumer preferences continually reshape the landscape, making it imperative for researchers to stay abreast of trends and innovations.

Unlike the industrial and retail sectors, where logistical standards and universal practices have developed over time, theme park logistics varies significantly based on each park's size, location, theme, and specific objectives. For example, the logistical demands of a large park like PortAventura World in Spain differ greatly from those of a smaller regional water park such as Aquaparc Isis in France's Jura region, which offers just a few slides, pools, and relaxation areas. This diversity complicates the creation of logistical models that apply to all theme parks, forcing researchers to tailor their analyses to specific contexts. As a result, comparing and generalizing findings to formulate a cohesive "logistics theory of theme parks" is challenging, especially given the recreational and emotional factors that influence visitor behavior. Many studies on theme parks simply acknowledge the importance of designing and planning logistics, but often do not go beyond this basic observation (Lo & Leung, 2015).

The last reason for the academic disinterest in theme park logistics is difficulty accessing data, including through visitor questionnaires. Due to confidentiality concerns, theme parks operate in a highly competitive market and are often reluctant to share detailed information about their logistical operations. This poses a significant challenge for the analysis of visitor and product flows, as well as supply systems. By being hesitant to collaborate with researchers, many parks appear to focus on finding tailored solutions to their specific challenges, considering their unique infrastructure, location, and visitor numbers. Often driven by short-term financial priorities, theme parks may not prioritize academic research, which typically requires long-term planning and may be incompatible with the fast-paced and often seasonal nature of theme park logistics. Despite these difficulties, important research opportunities in this area should not be overlooked.

Research Avenues

Emerging technologies present exciting opportunities for research in theme park logistics, particularly in managing visitor flow. Advances in smart tourism, coupled with the use of sensors, real-time data, and artificial intelligence, are significantly enhancing mobility optimization within theme parks. The key question is: how can these technologies be leveraged to predict and anticipate peak attendance, manage queues more efficiently, and better distribute visitors across different park areas? Analyzing Big Data from smartphones, e-ticketing systems, and sensors offers a unique opportunity to study visitor behavior, paving the way for developing simulation models that can optimize park design and provide personalized itineraries based on real-time attendance. Furthermore, predictive analytics and machine learning algorithms can forecast visitor preferences, allowing operators to dynamically adjust their offerings. This not only improves the overall guest experience but also boosts operational efficiency. Voss *et al.* (2008) have also emphasized the positive impact of effective service operations design on the quality of the customer experience.

Sustainability represents another crucial research avenue for theme park logistics. As environmental concerns intensify and ecological standards become increasingly significant, theme parks must adopt more environmentally friendly logistical approaches. They need to explore strategies for minimizing their carbon footprint, optimizing energy consumption, and integrating sustainable waste and water management practices by drawing on successful initiatives from other sectors. The most significant error would be viewing the entertainment industry solely as a provider of memorable experiences, reducing theme parks to mere spaces for the "dramatization of enchanted consumption," as Ritzer (2010) suggested. While it is true that visitors are immersed in environments meticulously designed to evoke specific emotions through fictional worlds, any logistical failure can lead to profound disenchantment. Logistics may be invisible when operations run smoothly, but it becomes glaringly apparent when a restaurant runs out of stock or an attraction experiences breakdowns due to inadequate maintenance.

This leads to a final research avenue concerning the operational management of flows and inventories in theme parks. Theme parks, like large online and offline retailers, must meet fluctuating demand for food products, souvenirs, and equipment while optimizing logistical costs to ensure profitability. Research should therefore focus on integrating JIT supply methods and optimizing storage space, drawing inspiration from industrial practices. Additionally, supply chain risk management must be considered, as unforeseen events such as pandemics or economic and geopolitical upheavals can significantly impact theme parks' ability to source products efficiently. In this context, enhancing the logistical resilience of theme parks appears urgent in a business landscape that is increasingly volatile, uncertain, complex, and ambiguous. Furthermore, exploring advanced inventory management systems, including automated stock monitoring and predictive algorithms, could enhance responsiveness to fluctuating visitor demands, ensuring that parks are better equipped to handle sudden supply and demand patterns shifts.

CONCLUSION

Theme Park logistics remains a largely underexplored topic, despite the existence of approximately 5,000 theme parks worldwide. While disciplines such as marketing, sociology, and anthropology have extensively examined this subject, producing a wealth of literature on the foundations of memorable experiences, researchers in logistics and SCM have shown limited interest in theme parks. One hypothesis put forward by Bayang *et al.* (2022) suggests that the excitement felt by visitors when attending a theme park is so intense that it may lead to an acceptance of logistical failures, making further exploration of these issues seem unnecessary. Moreover, it is important to recognize that theme park owners have not fully acknowledged the potential benefits that academic research could provide. Now more than ever, there is a pressing need to foster dialogue between academics and practitioners, particularly to draw lessons from the body of work conducted over the last thirty years in city logistics. In fact, theme park logistics, despite its recreational context, is significantly influenced by the practices and strategies found in city logistics. Ultimately, city logistics and theme park logistics share a common goal: continuously innovating to deliver a smooth and enjoyable experience for customers.

The growing interest in theme park logistics should encourage the development of a new organizational culture that prioritizes flow management as a fundamental pillar of the customer experience. This shift could lead to a redefinition of priorities within theme parks; by investing in innovative logistical solutions, they can not only enhance profitability but also provide memorable and enriching experiences free from issues such as supply disruptions, frequent customer congestion, or attractions that are unavailable due to insufficient maintenance. There is no doubt that theme park logistics is a field rich with potential and promising prospects. By exploring synergies among technology, sustainability, and risk management, it is possible to revitalize this sector, which holds significant economic stakes, and to meet the increasingly demanding expectations of visitors, particularly regarding reliability and the quality of service. Furthermore, implementing advanced data analytics and real-time monitoring can offer deeper insights into visitor behaviors, allowing for more effective planning and resource allocation, ultimately enhancing overall operational performance.

Theme Park logistics underlines valuable insights for other entertainment industries, such as festivals and sporting events. Like theme parks, these sectors must manage large volumes of visitors while ensuring a pleasant customer experience. Optimizing visitor flow, managing queues, and effectively collecting and disposing of waste are common challenges all face. For example, at rock music festivals, where thousands of attendees converge over a short period, flow management principles derived from theme parks could significantly reduce congestion and adjust services according to real-time demand (Salaun, 2024). Similarly, venues hosting major sporting events, such as the Olympic Games, can implement comparable strategies to enhance access to infrastructure and prevent bottlenecks at entrances, catering points, or sanitary facilities (Herold *et al.*, 2020). The logistical innovations developed within theme parks serve as a robust model for all entertainment industries seeking to improve operational efficiency and enhance the customer experience. From this perspective, it would benefit a substantial stream of research to focus on these industries in the coming years, fostering collaboration and the exchange of best practices.

ENDNOTES

1. For example, see <https://thrillsyndicate.com/adventure-parks-logistics-and-throughput-are-essential-to-customer-satisfaction-to-and-roi/> (accessed September 10, 2024).
2. Information about PortAventura World was gathered from the following online journals: *Capital*, *L'Echo Touristique*, *Les Echos*, *Le Figaro* and *Le Monde*.

REFERENCES

- Armand, P., Evrard Samuel, K., & Cung, V.D. (2013). Logistique urbaine: une création de valeur par des partenariats multi-acteurs. *Revue Française de Gestion Industrielle*, 32(4), 53–72.
- Bayang, M., Anuar, N.-A., Mohi, Z., Amir, A.-F., & Azemi, K.-M. (2022). Examining the visitors' experience of theme park services and its influence on their revisit intention. *Journal of Academic Research in Business & Social Sciences*, 12(11), 1002–1025.
- Burity, J. (2021). The importance of logistics efficiency on customer satisfaction. *Journal of Marketing Development & Competitiveness*, 15(3), 26–35.
- Delaitre, L., Leloup, J., & Molet, H. (2010). Centre de distribution urbaine unique: Opportunité ou illusion? Eléments de réponses à partir d'une analogie avec un parc d'attraction. *Revue Française de Gestion Industrielle*, 29(2), 49–70.
- Fabrègue, B., & Bogoni, A. (2023). Privacy and security concerns in the smart city. *Smart Cities*, 6(1), 586–613.
- Farré, J.-A., Mateu, C., Teixidó, M., & Cabeza, L. (2023). Pneumatic urban waste collection systems: A review. *Applied Sciences*, 13(2), Article 877.
- Freitag, F., Carla-Uhink, F., & Anton Clavé, S., Eds. (2023). *Key concepts in theme park studies: Understanding tourism and leisure spaces*. Cham: Springer.
- Herold, D., Breitbarth, T., Schulenkorf, N., & Kummer, S. (2020). Sport logistics research: reviewing and line marking of a new field. *International Journal of Logistics Management*, 31(2), 357–379.
- Hervás, M., Rodon, J., Planell, M., & Sala, X. (2011). From theme park to resort: customer information management at Port Aventura. *Journal of Information Technology Teaching Cases*, 1(2), 71–78.
- Le Corbusier (1933/1973). *The Athens charter*. New York: Grossman Publishers.
- Li, J., & Li, Q. (2023). Analysis of queue management in theme parks introducing the fast pass system. *Heliyon*, 9(7), Article e18001.
- Liang, Z., & Li, X. (2023). What is a theme park? A synthesis and research framework. *Journal of Hospitality & Tourism Research*, 47(8), 1343–1370.
- Liu, L., & Jensen, M.B. (2018). Green infrastructure for sustainable urban water management: Practices of five forerunner cities. *Cities*, 74, 126–133.
- Lo, J., & Leung, P. (2015). The preferred theme park. *American Journal of Economics*, 5(5), 472–476.
- Paché, G. (2023). Urban logistics associated with religious tourism: The case of the Hajj in Mecca, Saudi Arabia. *Journal of Strategic Innovation & Sustainability*, 18(3), 1–15.
- Patier, D., & Routhier, J.L. (2020). Urban logistics in the light of sustainable development: Still a long way to go. *Transportation Research Procedia*, 46, 93–100.
- Pick, J. (2017). Smart cities in the United States and worldwide: a rich arena for MIS studies. *Journal of Information Technology Case & Application Research*, 19(3), 133–144.
- Raluca, D.-C., & Gina, S. (2008). Theme park—The main concept of tourism industry development. *Annals of the University of Oradea: Economic Science Series*, 17(2), 641–646.
- Reyes, A.Y., Ochoa-Zezzatti, A., Sandoval-Chávez, D.-A., & Teran, E. (2020). Intelligent touristic logistics model to optimize times at attractions in a thematic amusement park. In Rodrigues, J., Cardoso, P., Monteiro, J., & Ramos, C. (eds.), *Smart systems design, applications, and challenges* (pp. 341–362). Hershey (PA): IGI Global.
- Ritzer, G. (2010). *Enchanting a disenchanted world: Continuity and change in the cathedrals of consumption* (3rd ed.). Newbury Park (CA): Sage.

- Salaun, V. (2024). Logistical transition in temporary organisations: The case of the event industry. *Supply Chain Forum: An International Journal*, 25(2), 165–179.
- Sanchez Gracias, J., Parnell, G., Specking, E., Pohl, E., & Buchanan, R. (2023). Smart cities—A structured literature review. *Smart Cities*, 6(4), 1719–1743.
- Saucedo Martinez, J.A., Mendoza, A., & del Rosario Alvarado Vazquez, M. (2019). Collection of solid waste in municipal areas: Urban logistics. *Sustainability*, 11(19), Article 5442.
- Schliwa, G., Armitage, R., Aziz, S., Evans, J., & Rhoades, J. (2015). Sustainable city logistics—Making cargo cycles viable for urban freight transport. *Research in Transportation Business & Management*, 15, 50–57.
- Sharma, V. (2022). Sustainability plan for amusement parks—A case study. *Journal of Scientific & Engineering Research*, 9(12), 154–161.
- Taniguchi, E. (2014). Concepts of city logistics for sustainable and liveable cities. *Procedia—Social & Behavioral Sciences*, 151, 310–317.
- Voss, C., Roth, A., & Chase, R. (2008). Experience, service operations strategy, and services as destinations: Foundations and exploratory investigation. *Production & Operations Management*, 17(3), 247–266.
- Wood, J., Ed. (2017). *The amusement park: history, culture and the heritage of pleasure*. London: Routledge.
- Xu, H., Li, Q., Chen, X., Chen, J., Guo, J., & Wang, Y. (2015). Logistical routing of park tours with waiting times: Case of Beijing Zoo. *Tourism Geographies*, 17(2), 208–222.
- Zhao, Z., Song, W., Wang, H., Sun, Y., & Luo, H. (2024). Development and application of IoT monitoring systems for typical large amusement facilities. *Sensors*, 24(14), Article 4433.
- Zuboff, S. (2019). *The age of surveillance capitalism*. New York: PublicAffairs.