INSTITUTE OF RETAIL ECONOMICS

THE BUSINESS EFFECTS OF LOW-EMISSION ZONES: THE NON-CASE OF STOCKHOLM, SWEDEN

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HFI WORKING PAPER No 45

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21 May 2026

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Abstract. In 2024, a Class 3 low-emission zone (LEZ) was announced for central Stockholm, permitting only electric, fuel-cell, and Euro VI gas vehicles. While LEZs are often associated with environmental benefits, knowledge of their economic effects on local businesses remains limited. We address this research gap through both a structured literature review and a longitudinal treatment–control survey targeting firms inside and outside Stockholm's proposed Class 3 LEZ. The literature review suggests that, unlike policies that operate through pricing mechanisms or those that physically reshape urban space, LEZs primarily operate through technological restrictions that may generate more unevenly distributed economic effects. The original survey design aimed to compare business expectations before and after implementation of the LEZ. However, shortly after completion of the first survey wave, the proposed zone was suspended and ultimately cancelled. This created a rare opportunity to study responses not only to anticipated environmental regulation, but also to its withdrawal. A central finding is that retail, restaurant, and service sector firms within the proposed LEZ were simultaneously more skeptical of the policy's economic consequences for the firm and for Stockholm's economic development *and* substantially more likely to adapt operations well before implementation. Firms located within the proposed LEZ were more likely to exit the area than firms outside the zone, but this difference became statistically insignificant once we accounted for underlying differences in firms' business conditions. Following the cancellation, firms within the LEZ area became more optimistic about Stockholm's future economic development. In contrast, a complementary survey conducted in a pedestrianization zone elsewhere in Stockholm revealed that firms inside the affected area expressed more positive attitudes the zone than firms outside it. The findings suggest that business responses to environmental access policies depend heavily on policy design, local context, and perceived compatibility with existing commercial structures.

Keywords: Low emission zone, environmental regulation, institutional design, business activity, polycentricity

[1] Corresponding author: niklas.elert@hfi.se. We are grateful for useful comments and suggestions from participants at a seminar at the 2025 EPCS conference in Madrid and much practice-relevant input from members om the reference group. We gratefully acknowledge research funding from The Swedish Retail and Wholesale Council (Handelsrådet).

1. Introduction

Low-emission zones (LEZs), first introduced in Sweden in 1996, have become an increasingly common policy instrument in European cities seeking to reduce urban air pollution and accelerate the transition toward cleaner vehicle technologies. By restricting access for certain types of vehicles, such zones are intended to improve local environmental conditions while encouraging firms and households to adopt cleaner transport solutions. While a growing body of research suggests that LEZs can generate substantial environmental and health benefits, considerably less is known about their economic consequences, particularly for local businesses.

From a regulatory perspective, LEZs primarily operate through technological restrictions rather than price signals. Compared to instruments such as congestion charges or emissions pricing, such restrictions may impose more direct compliance costs and offer less flexibility for affected actors. Economic effects are therefore likely to depend heavily on how these policies interact with local business structures, accessibility patterns, and existing institutional arrangements. Yet existing evidence on the economic effects of LEZs remains limited and fragmented. Much of the literature focuses on environmental outcomes, public attitudes, or aggregate welfare effects, while relatively few studies examine how firms perceive and adapt to these policies in practice. Moreover, previous research rarely captures anticipatory responses that emerge before implementation, despite the fact that environmental regulations are often announced well in advance.

In this article, we contribute to filling this gap in two ways, we undertake a structured review of the emerging literature on LEZs and related urban access policies, including congestion charges, pedestrianization, and parking fees, with a specific focus on economic effects and acceptance. The review shows that LEZs differ from many comparable policies in that they primarily operate through technological restrictions rather than price signals or spatial redesign. While the environmental benefits of LEZs are relatively well established, the economic literature points to heterogeneous and unevenly distributed effects. Existing studies suggest that LEZs may generate compliance costs, affect logistics and accessibility, shift consumption between physical and online retail, and become capitalized into housing markets. At the same time, much of the firm-level evidence remains descriptive or survey-based, with relatively limited causal identification. Compared to congestion charges and pedestrianization, LEZs also appear more likely to be perceived as rigid and disruptive by directly affected firms, particularly in contexts where the policy is viewed as poorly aligned with existing local economic structures.

Moreover, we examine business responses to a planned Class 3 low-emission zone in central Stockholm. While Greater Stockholm is already covered by a Class 1 LEZ with pollution limits for buses and trucks, the Class 3 variety is far more restrictive, as it allows only electric vehicles, fuel-cell vehicles, and Euro VI gas vehicles to operate. To study the expected consequences of the policy, we designed a longitudinal treatment–control survey targeting owners and managers in the retail, restaurant, and service sectors both inside and outside the proposed zone.

The policy process, however, took an unexpected turn. Following completion of the first survey wave, the Stockholm County Administrative Board (2025) suspended the implementation of the proposed zone and, after a prolonged legal process, ultimately cancelled it (SVT Nyheter 2024). As a result, the Stockholm Class 3 LEZ became what might be described as a non-case: a policy that was widely anticipated, debated, and partially adapted to, but never implemented.

Paradoxically, this sequence of events created a valuable opportunity to study how firms respond not only to environmental regulation itself, but also to the anticipation and subsequent withdrawal of regulation. The results reveal a striking pattern. Firms located within the proposed zone were consistently more skeptical regarding the policy's economic consequences than firms outside it, but also far more likely to report having already adapted operations well before the planned implementation date. The findings therefore suggest that skepticism and adaptation are not necessarily opposites: firms may perceive a policy as economically problematic while still treating it as sufficiently credible to require adjustment.

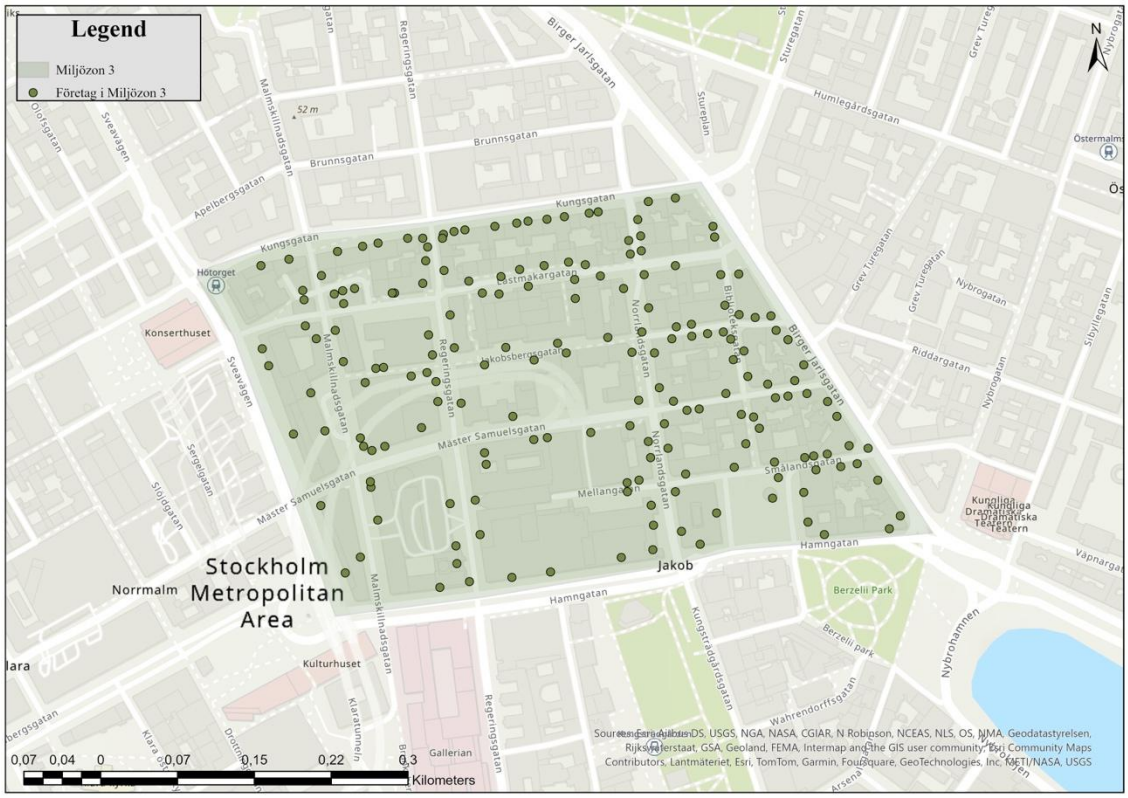
To place these findings in perspective, the article also draws on a complementary survey conducted in connection with a pedestrianization-oriented access policy introduced in the SOFO district of Stockholm. In contrast to the Class 3 LEZ, firms located within the SOFO area expressed more positive views of the intervention than firms outside it. The comparison suggests that business responses to environmental access policies depend heavily on local context, prior policy trajectories, and perceived compatibility with existing commercial structures.

The Stockholm case highlights an often overlooked aspect of environmental regulation: the economic and behavioral dynamics that emerge before implementation. More broadly, the findings suggest that business responses to environmental access policies depend not only on environmental objectives, but also on policy design, local context, and perceived compatibility with existing commercial structures. More broadly, the case illustrates how firms may begin adapting to environmental regulation long before implementation, implying that important economic effects can emerge already during the anticipation phase of the policy process. For researchers, the case underscores the importance of studying anticipatory adaptation and policy trajectories rather than focusing exclusively on implemented interventions.

2. Background and theory

The core idea behind low-emission zones (LEZ) is to improve local air quality by restricting or banning vehicles with relatively high emissions from entering designated urban areas (Rodríguez-Rey et al., 2022). While the specific design varies widely across cities—some combine bans with congestion pricing or time-of-day restrictions—the underlying regulatory logic is similar. Swedish class-3 environmental zones, for example, are closely aligned with schemes previously implemented in Paris, Copenhagen, Berlin, and Madrid.

FIGURE 1. Companies operating within the geographical area of the zone in 2024



Retailers and other service businesses form the economic base of a metropolitan area. Figure 1 shows register data from Dun & Bradstreet on the number of actors in the retail, tourism, and service industries who, in the fall of 2024, operated within the borders of Stockholm's proposed LEZ (companies at the same address are represented by a single point).

Environmental regulation is typically motivated by negative externalities, where polluters do not bear the full social costs of emissions (Pigou, 1932; Kolstad, 2010). Policymakers can address such externalities through either price-based instruments, such as taxes and congestion charges, or command-and-control instruments, such as technological standards (Keohane & Olmstead, 2016). Stockholm's proposed Class 3 LEZ belongs to the latter category, since access depends on vehicles meeting specific technological requirements.

This classification has important implications. Compared to incentive-based tools, technological standards can be expected on theoretical grounds to offer less flexibility, assign fixed compliance burdens, and typically achieve abatement at higher marginal cost (Kolstad, 2010; Keohane & Olmstead, 2016). They may also "lock in" particular technological trajectories and crowd out alternative innovations (cf., Jaffe et al. 2003).

LEZs belong to a broader set of urban transport and access policies – together with, e.g., congestion charges, parking fees, and pedestrianization initiatives – which affect a wide range of stakeholders whose interests, constraints and adjustment margins may differ substantially. Stakeholder theory suggests that the economic and political effects of such policies therefore depend not only on aggregate welfare outcomes, but also on how costs and benefits are distributed and perceived across groups. This perspective may be particularly relevant for LEZs because they operate primarily through technological restrictions rather than price signals. Access is conditional on vehicles meeting specific technological standards, implying direct

compliance costs through fleet upgrading, changes in logistics, or operational adjustment (Rodríguez-Rey et al., 2022). Compared to price-based instruments such as congestion charges, technological standards typically provide less flexibility and may impose disproportionately high burdens on smaller firms with limited adaptive capacity (Kolstad, 2010; Keohane & Olmstead, 2016).

A growing literature emphasizes that the success of such interventions depends critically on achieving sufficient support and compliance among affected stakeholders, which in turn requires that perceived benefits are both salient and equitably distributed (Oltra et al., 2021; Ceccato, Rossi, & Gastaldi, 2024). Trust in institutions, perceived fairness, and beliefs about policy effectiveness have been shown to play a central role in shaping public attitudes (Oltra et al., 2021).

Yet LEZ costs are unlikely to be distributed evenly. Small retailers, independent service providers and local logistics firms may face greater difficulties adjusting to new requirements due to tighter margins, limited access to capital and lower organizational flexibility (Chittenden et al. 2002). At the same time, firms differ substantially in their dependence on vehicle access, delivery systems and customer mobility patterns.

Importantly, responses to LEZs may emerge already at the announcement stage. When policies are announced well in advance, firms may begin adjusting operations before implementation, particularly if the policy is perceived as credible (Malani & Reif, 2015). Such anticipatory adaptation may include changes in logistics, investment timing or operational planning. At the same time, uncertainty regarding implementation, timing or durability may induce postponement or "wait-and-see" behavior, particularly when investments are partly irreversible (Dixit & Pindyck, 1994; Bloom, 2009).

The effects and acceptance of LEZs also depend heavily on institutional and spatial context. Urban environmental regulation operates within polycentric governance systems involving municipalities, transport authorities, regional actors and national regulations (Ostrom, 2010). Consequently, similar environmental measures may generate very different outcomes depending on local economic structure, prior policy trajectories and the presence of complementary institutions such as public transport, logistics infrastructure and established mobility patterns.

From this perspective, acceptance is not merely an attitudinal outcome, but closely linked to firms' ability and willingness to adapt to the policy environment. This provides a natural link between economic effects, anticipatory adaptation and political feasibility.

3. Literature review: economic effects of low-emission zones and related urban policies

3.1. Low-emission zones

A large and growing literature documents that low-emission zones (LEZ) improve air quality and generate associated health benefits (e.g. Malina & Scheffler, 2015; Jonidi Jafari et al., 2021;

Bruyneel et al., 2025). However, while the environmental effects of LEZ are relatively well established, evidence on their economic impacts remains more limited and fragmented (Tarriño-Ortiz et al., 2023; Delgado-Lindeman et al., 2025; Allan & Rooney, 2026).

As summarized in Table 1, Panel A, LEZ primarily operate through technology-based restrictions on vehicles, generating adjustment costs and heterogeneous effects across sectors and groups. At the sectoral level, the evidence points to reallocation rather than clear aggregate effects. Using transaction data, Galdon-Sánchez et al. (2023) show that physical retail consumption declines within regulated areas while online consumption increases, consistent with substitution rather than a net reduction in demand. At the same time, mobility-based evidence suggests that footfall may increase locally, particularly in more deprived areas, indicating a shift toward more localized consumption patterns (Wu et al., 2025).

In logistics and related sectors, LEZs impose direct compliance costs, particularly through requirements to upgrade vehicle fleets. Survey-based evidence indicates that this can reduce the number of active delivery firms in regulated areas, with smaller and less capitalized operators more likely to exit or scale down (Dablanc & Montenon, 2015). More broadly, firm-level outcomes appear heterogeneous, with variation driven by firm characteristics such as size, location, and customer composition (Tarriño-Ortiz et al., 2023).

Importantly, the empirical literature on firm-level effects remains limited in terms of identification strategies. Much of the available evidence relies on cross-sectional or one-off surveys without pre–post comparisons or explicit control groups, which constrains causal interpretation. Survey-based studies (e.g. Dablanc & Montenon, 2015; Tarriño-Ortiz et al., 2023) provide useful insights into perceived effects and mechanisms, but offer limited leverage for identifying causal impacts. By contrast, a smaller set of studies employs quasi-experimental designs or high-frequency data, providing more robust evidence on behavioral and consumption responses (e.g. Galdon-Sánchez et al., 2023; Wu et al., 2025).

A complementary strand of the literature examines welfare effects using simulation-based approaches. For example, Börjesson et al. (2021) simulate the costs and benefits of a proposed LEZ in Stockholm and find that, under certain design assumptions, adjustment costs—particularly those associated with vehicle replacement—may exceed the monetized health benefits. While such findings depend on modelling assumptions and local conditions, they highlight that LEZ can entail substantial private and social costs.

At the same time, there is growing evidence that LEZ effects are capitalized into housing markets. Quasi-experimental studies show that rents increase within regulated areas, reflecting improved environmental quality (Gruhl et al., 2025). Related evidence indicates that these effects interact with accessibility, as areas with good public transport connections become relatively more attractive when car use is restricted (Aydin & Rauck, 2023).

Across these domains, a central feature of LEZ is the presence of distributional effects. Adjustment costs are disproportionately borne by low-income households, small firms, and car-

dependent actors, who face higher barriers to compliance and fewer alternatives (Börjesson et al., 2021). These distributional patterns are closely linked to policy acceptance. Empirical studies consistently show that attitudes toward LEZ depend on perceived costs, accessibility, and fairness, with opposition concentrated among directly affected groups and support higher among those benefiting from environmental improvements (Oltra et al., 2021).

Taken together, the literature suggests that LEZ do not primarily reduce economic activity, but rather restructure it, through reallocation across sectors and locations, capitalization into property markets, and uneven distribution of costs and benefits.

3.2. Comparison with related urban policies

Pedestrianization

Pedestrianization differs from LEZ by physically transforming urban space. As summarized in Table 1, Panel B, this tends to generate more visible and localized economic effects. A substantial empirical literature shows that pedestrianization increases footfall and local attractiveness, often capitalized into higher property values (Yoshimura et al., 2022; Mihaescu, 2026). However, effects on firm performance are mixed. While some sectors benefit—particularly restaurants and cafés—others, especially car-dependent retail, may experience negative or neutral outcomes (Mihaescu et al., 2023).

Pedestrianization also generates strong local distributional effects, including displacement of small firms due to rising rents and changes in business composition (Özdemir & Selçuk, 2017; Villar-Abeijon et al., 2026). While several studies use quasi-experimental designs, firm-level outcomes remain sensitive to local context and measurement, contributing to mixed findings across settings.

In contrast to LEZ, acceptance is often relatively high among residents and visitors, reflecting immediate improvements in urban amenities (e.g. Brownrigg-Gleeson et al., 2023). However, firms exhibit more mixed attitudes, and long-term acceptance depends on realized economic outcomes (Yasin et al., 2021). Compared to LEZ, pedestrianization produces more immediate and visible local gains, but also sharper local trade-offs.

Congestion charges

Congestion charging schemes differ from LEZ in that they operate through pricing rather than technical restrictions, targeting traffic volumes rather than emissions. As summarized in Table 1, Panel C, this literature provides relatively clear evidence on system-level effects. A body of work, often based on ex post evaluations and cost–benefit analyses, finds positive welfare outcomes driven by reduced congestion and travel time savings (Börjesson et al., 2012; Eliasson et al., 2009).

In contrast to LEZ, the economic effects on local activity appear small or neutral in aggregate. Retail studies find no significant impact on overall turnover, despite changes in traffic patterns

(Daunfeldt et al., 2013; Quddus et al., 2007). Instead, the main adjustment occurs through behavioral responses, such as changes in travel mode, timing, or route.

Distributional effects remain important, as higher-income individuals are better able to adapt, while lower-income groups are more likely to reduce travel (Craik & Balakrishnan, 2023). Acceptance is typically low prior to implementation but increases once benefits become visible (Eliasson et al., 2009; Selmoune et al., 2020). Relative to LEZ, this literature relies more extensively on quasi-experimental and ex post designs, resulting in clearer estimates of aggregate welfare effects, but offering less insight into sectoral restructuring.

Parking fees

Parking fees operate through price-based restrictions on car use at a local level, typically affecting short-term access to commercial areas. As shown in Table 1, Panel D, their effects are highly localized and strongly linked to car dependence.

Empirical evidence suggests that increased parking costs reduce customer flows for businesses that rely on car access, particularly small shops and restaurants without dedicated parking. At the same time, businesses with their own or free parking may benefit from customer reallocation (Chowdhury et al., 2025; Hymel, 2014). These effects are strongest in car-dependent areas and weaker in central locations with good transport alternatives.

Parking costs may also be partly passed on to consumers through higher prices (Inci et al., 2018). As with LEZ, distributional effects are pronounced, with car-dependent households and low-income groups more negatively affected. Acceptance patterns mirror these effects. Opposition is strongest among directly affected groups, but support increases when policies improve perceived accessibility or are linked to visible benefits (Kirschner & Lanzendorf, 2020). Compared to LEZ, parking fees generate more immediate but narrower economic effects, concentrated on specific sectors and locations.

3.3. Summary of evidence

Table 1 (Panels A–D) summarizes the evidence on economic effects and acceptance across policy types (detailed results are available in Table A1 in the Appendix). A consistent finding across policies is that acceptance depends less on aggregate welfare effects than on how costs and benefits are distributed and perceived. A key distinction concerns policy design. Congestion charges and parking fees operate through prices and primarily induce behavioral adjustment, while pedestrianization reshapes the physical environment and affects local attractiveness.

In contrast, LEZ impose technology-based restrictions, requiring costly adaptation and generating more uneven effects across actors. As a result, LEZ stand out in two respects. First, their economic effects are characterized by reallocation and adjustment costs rather than clear aggregate gains or losses for firms within the retail, restaurant, and service sectors. Second, these effects are more unevenly distributed, particularly affecting small firms, low-income groups, and car-dependent actors.

Overall, the literature provides limited causal evidence on how these economic effects translate into firm-level perceptions and behavioral responses. This gap is particularly pronounced for LEZ, where much of the existing evidence relies on descriptive or cross-sectional data. The present study contributes by systematically comparing responses between affected and non-affected firms, allowing for a more structured analysis of perceived effects and adaptation.

Table 1. Literature review summary

Policy	Economic effects	Acceptance
Low-Emission Zones *Zones restricting access for high-emission vehicles based on technical standards*	• In some cases reduced physical retail and increased online sales (substitution) (Galdon-Sánchez et al., 2023) • Logistics: fewer operators and higher costs (Dablanc & Montenon, 2015) • In some cases increased footfall (Wu et al., 2025) • Higher housing prices/rents (Gruhl et al., 2025; Aydin & Rauck, 2023) • Distributional effects (Börjesson et al., 2021): – small firms, low-income groups and car-dependent people are more negatively affected	• Most negative among directly affected groups (e.g. small firms, car-dependent actors) (Oltra et al., 2021) • Closely linked to perceived costs and accessibility (Oltra et al., 2021; Tarriño-Ortiz et al. 2021) • More positive among groups perceiving benefits (e.g. improved air quality)
Pedestrianization *Conversion of streets into car-free areas prioritizing walking and public space use*	• Often increased footfall (Yoshimura et al., 2022) • Higher property prices/rents (Mihaescu, 2026) • Mixed effects on turnover: – cafés/restaurants benefit – car-dependent retail is negatively affected – sometimes no effect (Mihaescu et al., 2023) • Increased firm turnover and reduced diversity (Villar-Abeijon et al., 2026) • Distributional effects: – small firms may be displaced (Özdemir & Selçuk, 2017) – property owners and new entrants benefit – strongly localized effects	• Often high acceptance among residents and visitors (Brownrigg-Gleeson et al., 2023) • Mixed acceptance among firms (Yasin et al., 2021) • Linked to perceived accessibility • Long-term acceptance depends on economic outcomes • Clear conflict line: consumers vs. some firms
Congestion charges *Pricing schemes charging vehicles for entering congested urban areas*	• Welfare gains (time savings, efficiency) (Börjesson et al., 2012; Eliasson et al., 2009) • Small or no effects on retail activity (Daunfeldt et al., 2013; Quddus et al., 2007) • Behavioral adjustments: – changes in mode, timing, or route (Eliasson et al., 2009) • Distributional effects: – high-income groups adapt more – low-income groups reduce travel (Craik & Balakrishnan, 2023) • Limited evidence on local property or firm effects	• Often low initial acceptance (Selmoune et al., 2020) • Increases after implementation (Eliasson et al., 2009) • Linked to perceived benefits (e.g. travel time) • Influenced by perceived fairness • Less overt conflict, but differences in ability to adapt matter

Parking fees *Charges for on-street or public parking aimed at managing demand and space use*	• Restaurants and small shops without own parking lose customers when fees are introduced (Chowdhury et al., 2025; Hymel, 2014) • Shops with own/free parking benefit relatively (customer reallocation) (Chowdhury et al., 2025) • Effects stronger in car-dependent areas and weaker in central areas with alternatives (Hymel, 2014) • Parking costs may be passed on to prices (Inci et al., 2018) • Car-dependent customers and low-income groups are most negatively affected (Chowdhury et al., 2025)	• Car-dependent households and local businesses often most negative (Kirschner & Lanzendorf, 2020) • Acceptance increases when accessibility is perceived to improve (e.g. easier parking) (Kirschner & Lanzendorf, 2020) • Higher support when linked to visible improvements (e.g. urban environment, alternatives) (Kirschner & Lanzendorf, 2020) • Strongly dependent on perceived fairness across groups

Taken together, the literature suggests that LEZ affect firms through three main channels: (i) compliance costs related to vehicle and operational adjustment, (ii) changes in demand and accessibility, and (iii) reallocation of activity across locations and sectors. However, existing evidence provides limited insight into how firms perceive and respond to these mechanisms in practice, as much of the literature relies on aggregate outcomes or cross-sectional survey data without clear identification strategies. The empirical analysis therefore focuses on how firms anticipate, experience and adapt to these mechanisms, based on a structured comparison between affected and non-affected firms.

3. The survey

3.1. Research design and policy timeline

The survey study was designed to examine how firms perceive and adapt to Stockholm's proposed Class 3 low-emission zone (LEZ). The original policy process followed an unusual trajectory. In spring 2024, the City of Stockholm announced that a Class 3 LEZ would be introduced in central Stockholm, with implementation planned for 31 December 2024. However, on 29 November 2024, the County Administrative Board paused the implementation pending legal review, and on 26 May 2025 the proposal was cancelled altogether (County Administrative Board of Stockholm, 2025).

This sequence created both methodological challenges and analytical opportunities. Because the zone was announced well in advance, firms could adjust expectations and operations before implementation. Such anticipation effects complicate conventional pre–post evaluation designs, since behavioral responses may occur before the formal treatment begins (Malani & Reif, 2015). At the same time, the later cancellation constituted an unexpected reversal of a policy widely perceived as imminent, creating a rare opportunity to study responses not only to anticipated regulation, but also to its sudden withdrawal.

In the empirical analysis, we therefore focus on three related dimensions: expectations regarding the proposed zone, anticipatory adaptation prior to implementation, and responses to

the cancellation of the policy. Across two survey waves, firms located within the proposed LEZ are compared to similar firms located nearby but outside the zone.

3.2. Survey design, sampling and implementation

The survey follows a treatment–control design intended to compare firms located inside the planned environmental zone with comparable firms located nearby but outside the zone. The design approximates the logic of a difference-in-differences framework, where developments among affected firms are benchmarked against contemporaneous developments among non-affected firms (Angrist & Pischke, 2009).

The Stockholm LEZ was announced well before its planned implementation, creating scope for anticipatory adaptation. To capture such effects, the survey explicitly asked firms whether they had already begun adjusting operations in response to the proposed regulation.

The questionnaire was deliberately kept short, requiring approximately five minutes to complete. While most questions were multiple-choice, the end of the survey featured an AI-assisted open-ended component in which respondents could elaborate on their answers through short conversational follow-up prompts. Table A2 in the appendix lists all Wave 1 survey items.

An initial online pilot distributed through business registers produced a response rate of approximately five percent, insufficient for the purposes of the study. We therefore adopted an in-person recruitment strategy; during off-peak hours, interviewers visited stores and workplaces inside and outside the proposed zone and asked to speak with managers or owners. To reduce topic-based self-selection, interviewers initially described the survey as a short study on "conditions for running a business in central Stockholm," without explicitly mentioning the LEZ.

Participation rates proved high once the appropriate contact person was reached. Most respondents completed the survey immediately on a tablet provided onsite, while others requested that interviewers return soon. Pilot testing during the first weeks of fieldwork revealed no major problems with question wording or survey structure, and we retained pilot responses in the final sample.

Treatment classification required some judgment, since several respondents were uncertain whether entrances or delivery access points technically fell within the proposed zone. Firms were therefore classified as treated if either (i) the customer entrance was clearly located inside the zone, or (ii) respondents reported that an entrance or delivery point was inside the zone and this was geographically plausible. Alternative classifications produced qualitatively similar results.

3.3. Wave 1: expectations and anticipatory adaptation

The first survey wave was conducted between 30 August and 29 November 2024 and yielded 104 completed questionnaires.[2] Among participating firms, 36 were classified as located within the environmental zone and 65 outside it.

[2] During this period, we visited an additional 79 stores and restaurants one or more times without obtaining a completed response. In most of these cases, the manager or owner was not present or was unavailable (e.g., in

Table 2 presents the main results. Firms inside and outside the zone displayed broadly similar assessments of both earlier business development (Q2) and expected future development (Q3). This suggests that the treatment and control groups were relatively balanced in terms of underlying business sentiment.

Table 1. Survey results from the first wave

Wave 1 (fall 2024), 104 responses	In zone	Outside	Difference
Q2: Earlier development? (1-5)	3.41	3.48	-0.07
Q3: Future development? (1-5)	3.55	3.70	-0.15
A Class 3 LEZ has been announced in Stockholm. How will the zone affect …			
Q6: your business revenue? (1-5)	2.73	3.11	-0.38***
Q7: your business employment? (1-5)	2.88	3.00	-0.13
Q8. Stockholm's economic development? (1-5)	2.37	2.80	-0.42**
Q9. And have you begun adjusting to the zone? (1/0)	0.22	0.07	0.15***

Note: Q1 refers to the role of the person answering the questions, Q4 asks what proportion of sales are online, and Q5 relates to if the firm has an entrance or goods reception within the LEZ. See Table A2 in Appendix for details.

By contrast, substantial differences emerged regarding the expected effects of the LEZ itself. Firms located within the zone were significantly more pessimistic about the LEZ's effects on their own revenues (Q6) and on Stockholm's broader economic development (Q8). Differences regarding expected employment effects (Q7) were smaller and statistically insignificant.

The strongest treatment–control difference concerned anticipatory adaptation. Firms within the zone were substantially more likely to report having already begun adjusting operations in response to the proposed regulation (Q9). Among firms reporting adaptation, the most common adjustments concerned delivery logistics and transportation arrangements.

Taken together, the first wave suggests that firms inside and outside the zone were similar in general business outlook, but differed sharply in how they perceived the consequences of the proposed LEZ. The findings also indicate that anticipatory adaptation had already begun before implementation.

Ironically, the final day of data collection coincided with the announcement that the implementation of the LEZ would be postponed. Because this decision was unexpected, it is unlikely to have affected Wave 1 responses.

3.4. Policy reversal and redesign of Wave 2

On 29 November 2024, the County Administrative Board paused Stockholm's proposed environmental zone pending legal review, and on 26 May 2025 the proposal was cancelled altogether. This substantially changed the empirical setting.

meetings). Only 15 firms offered a firm refusal, indicating a high general willingness to participate when the appropriate contact person was available.

Rather than studying reactions to an implemented regulation, we instead altered the Wave 2 to capture responses to the sudden reversal of a policy that many firms had already treated as credible and imminent. Wave 1 results support this interpretation: firms inside the zone were substantially more likely to report anticipatory adaptation despite the policy not yet having been implemented. The overall structure of the survey remained largely unchanged, however, allowing comparisons across waves while adapting the wording of policy-specific questions to the new institutional context. Table A3 in the appendix lists all Wave 2 survey items.

3.5. Wave 2: cancellation effects and persistence of attitudes

The second survey wave was conducted during summer 2025 and produced 118 completed responses, 59 of which came from firms located within the proposed zone. Due to turnover among firms and respondents, only 40 businesses from Wave 1 participated this time; however, responses among these firms did not differ in any significant way in either way from responses for the overall group.

As in Wave 1, firms inside and outside the zone reported very similar assessments of both earlier and expected future business development (Q2–Q3). Overall business optimism increased substantially between waves, likely reflecting broader economic developments rather than the cancellation itself.

Results are available in Table 3, and reveal that the treatment–control differences regarding the LEZ remained remarkably stable, even though questions now concerned the cancellation instead of the introduction. Firms inside the zone were somewhat more positive regarding the cancellation's effect on revenue and employment, although these differences were small and statistically insignificant. However, firms inside the zone were significantly more positive than controls regarding the zone cancellation's effect on Stockholm's broader economic development (Q8). Importantly, the magnitude of this treatment–control difference was almost identical to the corresponding difference in Wave 1, where firms inside the zone had instead been more pessimistic regarding the effects of implementation. This suggests that responses primarily capture stable underlying attitudes toward the LEZ rather than short-term fluctuations in expectations.

Table 2. Results from the second survey wave (summer 2025), 118 responses.

	In zone	Outside	Difference
Q2: Earlier development? (1-5)	3.57	3.54	0.03
Q3: Future development? (1-5)	4.06	4.06	0.00
The announced Class 3 LEZ in Stockholm has been canceled. How will the cancellation affect …			
Q6: your business revenue? (1-5)	3.10	3.02	0.09
Q7: your business employment? (1-5)	2.98	2.93	0.05
Q8. Stockholm's economic development? (1-5)	3.09	2.67	0.41**
Q9. And had you begun adjusting to the zone? (1/0)	0.25	0.02	0.24***

Note: Q1 refers to the role of the person answering the questions, Q4 asks what proportion of sales are online, and Q5 relates to if the firm has an entrance or goods reception within the LEZ. See Table A3 in Appendix for details.

Anticipatory adaptation also remained concentrated among treated firms. Approximately one quarter of firms within the zone reported that they had begun adjusting operations before the cancellation, while adaptation rarely occured among firms outside the zone. This indicates that most operational adjustments occurred during the anticipation phase rather than after the policy reversal.

Taken together, the two survey waves reveal a consistent pattern: firms inside and outside the proposed LEZ remained broadly similar in general business outlook, while differing systematically in their attitudes toward the policy and in their likelihood of anticipatory adaptation.

3.6. Heterogeneity and exit analysis

No significant differences could be observed between stores that were part of a chain and standalone stores, which was somewhat unexpected given that previous theory and empirics suggest that adaptation costs should fall heavier on smaller actors. Nor were there any differences between retailers and restaurants.

As part of the second survey wave, we also examined whether firms participating in Wave 1 were still operating at the same location. Exit rates differed substantially between groups. Among control firms, 4 out of the 65 had exited (either closed down or relocated) by Wave 2, compared to 11 of the 36 treated firms. This substantially higher exit rate among treated firms raises the question of whether the zone contributed to business closures, as another means of adaptation. Some respondents did state in open-ended responses that the proposed LEZ created concerns regarding relocation or survival. However, firms that later exited already reported substantially weaker business conditions (Q2 and Q3) in Wave 1, while their differences in LEZ-specific attitudes compared to survivors were comparatively small and insignificant. Hence, while the difference in exit rate is noticeable, the overall pattern appears more consistent with underlying business fragility in a high-churnining part of the city center than with a direct effect of the proposed LEZ or the surrounding policy uncertainty.

To examine this question further, we estimate logit equations

$$Pr(Exit = 1) = f(DLEZ, X),$$

where *DLEZ* is a dummy taking the value 1 if the firm was treated in the first round, zero otherwise; and *X* is a vector containing responses to questions from the first round. Findings are available in Table 3 and reveal that firms located within the proposed LEZ exhibited higher exit probabilities than firms outside, corresponding to a substantially higher estimated odds of exit and an increase in exit probability of 10-15 percentage points. However, once controls capturing firms' expectations and perceptions (Q2 and Q3) were included, the treatment effect became statistically insignificant, although it remained positive across specifications.

Table 3. Logit estimations of the likelihood of exit.

Model	Controls included	Odds ratio	AME (dy/dx)	p-value
(1) Baseline	None	3.53	0.149	0.042
(2) Expectations controls	Q2, Q3	2.99	0.102	0.137

Taken together, the results do not provide robust evidence that the proposed environmental zone increased firm exits. Although the estimated treatment effect remains consistently positive across specifications, the small sample size and limited number of exits imply substantial statistical uncertainty, making it difficult to distinguish any potential effect from random variation. The results should therefore be interpreted cautiously.

3.7. Additional SOFO survey

To assess whether the skepticism observed toward the proposed Class 3 LEZ was unusual, we conducted an additional survey in summer 2025 in connection with the introduction of a separate environmental policy in the SOFO district of Södermalm. Unlike the Class 3 LEZ, the SOFO intervention primarily resembled a pedestrianization measure. The area had previously hosted seasonal car-free summers, and the new policy largely made this arrangement permanent. The measure therefore represented continuity rather than disruption and aligned closely with the area's existing pedestrian-oriented commercial structure.

Table 4 summarizes the results from this supplementary survey (38 responses). As in the main survey waves, firms inside and outside the zone displayed similar background assessments regarding business development. However, the treatment–control differences regarding the policy's expected economic effects were strikingly different from those observed for the LEZ. Firms inside the SOFO zone were more optimistic than those outside regarding effects on both revenue and Stockholm's broader economic development. The difference was especially large for Q8, where the treatment–control gap approached one full point on the five-point scale.

Several factors likely contributed to these positive assessments. First, the policy built on earlier seasonal pedestrianization measures and therefore reduced uncertainty. Second, the local business structure—characterized by cafés, boutiques, restaurants, and high pedestrian flows—was well aligned with reduced car traffic. Third, the policy likely resonated with existing local norms and expectations, increasing perceived legitimacy.

The SOFO findings reinforce a broader theme of the paper: environmental policies cannot be understood independently of their institutional and spatial context. While the proposed Class 3 LEZ was perceived as a disruptive technological restriction generating adaptation costs and uncertainty, the SOFO intervention was instead experienced as an extension of an already familiar and locally compatible urban environment.

Table 4. Results from City Environmental Zone survey wave (summer 2025), 38 responses

	In zone	Outside	Difference
Q2: Earlier development? (1-5)	3.53	3.29	0.24
Q3: Future development? (1-5)	3.72	3.35	0.37
A permanent city environmental zone has been introduced at Södermalm. How will the zone affect …			
Q6: your business revenue? (1-5)	3.78	3.31	0.47
Q7: your business employment? (1-5)	3.05	2.94	0.11
Q8. Stockholm's economic development? (1-5)	3.80	2.86	0.94***
Q9. And have you begun adjusting to the zone? (1/0)	0.30	0.00	0.30**

3.7. AI interviews

The survey also included an AI-assisted open-ended component in which respondents could elaborate on their views through short follow-up prompts. Although responses varied substantially in length and detail, several clear patterns emerged. Firms located within the proposed LEZ generally expressed a combination of cautious support and concern. Their responses were typically concrete and closely tied to everyday business operations, focusing particularly on delivery logistics, customer accessibility, and potential economic consequences. By contrast, firms outside the zone were more often broadly positive toward the policy, while also providing shorter and more general responses with less direct reference to their own operations.

The qualitative patterns were similar across survey waves. In both cases, respondents focused primarily on the perceived direct consequences of the environmental zone itself rather than on policy uncertainty as such. This is particularly notable in Wave 2. Although the survey in this wave added a question that explicitly sought to capture reactions to the cancellation and surrounding uncertainty, many respondents instead seemed to answer the more concrete question of what would happen if the zone were implemented. The cancellation therefore appears to have produced some degree of relief among affected firms, but relatively limited reflection on regulatory uncertainty in itself.

The open-ended responses also help illustrate the distributional and sector-specific concerns identified in the literature review. Several respondents questioned whether the expected environmental gains justified the economic costs imposed on firms and consumers. One respondent argued that the policy "creates bigger problems than the small positive climate effect it produces," and suggested that broader national measures related to fuel, electricity, or infrastructure would be both cheaper and more effective. Another respondent emphasized that "some businesses will need to raise prices to meet higher costs … which affects smaller actors more strongly." One firm owner stated that "in general I think it is a good idea, but we also have many older customers who prefer to drive to us. Deliveries would also become more expensive." Such responses were common among firms located inside the zone, where support for environmental goals often coexisted with concern regarding operational costs, accessibility, and customer behavior.

Taken together, the AI-assisted responses reinforce the broader quantitative findings of the survey. Firms located within the proposed LEZ were not uniformly opposed to the policy, though substantially more likely to perceive it through the lens of concrete operational constraints and uneven economic consequences.

4. Discussion and Conclusions

Urban environmental regulation operates within what Ostrom (2005) terms polycentric governance, where multiple semi-autonomous decision-making centers interact under shared rules. Cities, transport agencies, environmental authorities, county boards, and supranational frameworks all influence whether LEZ rules are feasible, legitimate, and enforceable. Such

polycentric systems allow experimentation, with cities often acting as "policy laboratories" (Ostrom, 2010).

This article examined how local firms responded to Stockholm's proposed Class 3 low-emission zone (LEZ) during a policy process marked by announcement, anticipation, legal contestation and eventual cancellation. While the environmental benefits of LEZs are well established in the literature, previous research provides more limited evidence on how firms perceive and adapt to such policies, particularly in real time and under conditions of prolonged anticipation. Several key findings emerge.

First, stores and restaurants located within the proposed LEZ differed systematically from firms outside the zone in how they perceived the policy and in their likelihood of anticipatory adaptation. The two main survey waves reveal a stable attitudinal gap between firms inside and outside the planned zone. Already before the planned implementation date, firms inside the zone were significantly more pessimistic regarding the expected effects on revenue and Stockholm's broader economic development, despite being otherwise similar in general business outlook. At the same time, however, firms within the proposed LEZ were also substantially more likely to report having already adjusted operations, primarily through changes in delivery logistics. These findings suggest that, in practice, the "treatment" began when the policy was announcement rather than implemented.

This contrast suggests that skepticism and adaptation are not necessarily opposites. Firms within the proposed LEZ were consistently more pessimistic regarding the policy's economic consequences, yet also substantially more likely to adapt operations long before implementation. This suggests that anticipatory adaptation may reflect perceived credibility and expected compliance rather than policy acceptance in any straightforward sense.

Second, the supplementary survey in SOFO demonstrates the importance of institutional and spatial context. In contrast to the Class 3 LEZ, firms within the SOFO environmental zone were more optimistic than firms outside the area regarding both local business effects and Stockholm's broader economic development. Importantly, the SOFO intervention differed fundamentally in design and context: it largely extended an already familiar pedestrianization policy in an area characterized by high footfall and pedestrian-oriented commerce. The contrast between the two cases therefore suggests that business skepticism toward environmental regulation is not inevitable; attitudes depend on local fit, prior policy trajectories and perceived compatibility with existing economic structures.

Taken together, the findings align with and inform the broader literature reviewed in Table 1. Relative to congestion charges and parking fees, LEZs differ in that they operate through technology-based restrictions rather than price signals. Compared to pedestrianization, they tend to impose more direct compliance costs while generating less immediate and visible local benefits. The proposed Stockholm LEZ fits this broader pattern. Firms inside the proposed zone primarily perceived the policy through the lens of operational constraints, logistics costs and accessibility concerns, whereas the SOFO pedestrianization was interpreted as reinforcing rather than disrupting existing patterns of urban use.

However, in contrast to previous evidence, we could observe no significant differences between stores that were part of a chain and standalone stores, which was somewhat unexpected given that previous theory and empirics suggest that adaptation costs should fall heavier on smaller actors. Nor were there any differences between retailers and restaurants.

While firms within the proposed environmental zone exhibited higher exit probabilities than firms outside the zone, the estimated effects became statistically insignificant once controls for firms' expectations and perceptions were included. This suggests that any relationship between the proposed zone and firm exits should be interpreted cautiously. At the same time, the consistently positive treatment estimates across specifications indicate that the possibility of adverse business effects cannot be ruled out entirely. More generally, the results do not support the idea that the prolonged regulatory process itself generated large observable economic effects through policy uncertainty alone.

From a theoretical perspective, the Stockholm case illustrates how technological standards in a dense urban core can become focal points for concern among affected firms. Our results align with the literature suggesting that such standards tend to be perceived as rigid and potentially costly, but we find no clear evidence suggesting that smaller actors with limited capacity to adjust would be more skeptical of the policy. Although firms within the proposed environmental zone exhibited higher estimated exit probabilities, the estimates were imprecisely measured and became statistically insignificant once controls for firms' expectations and perceptions were included. This suggests that perceived risk and fragility did not translate into clearly observable negative outcomes within the relatively short time window we study. Nevertheless, the consistently positive treatment estimates across specifications imply that modest adverse business effects cannot be ruled out entirely.

More broadly, the findings underscore the importance of policy sequencing and institutional fit in urban environmental governance. Policies that build on existing practices and align with local commercial structures may generate relatively high legitimacy even when they restrict traffic. By contrast, policies perceived as technologically rigid or poorly adapted to local conditions risk generating resistance.

The article also contributes methodologically to the literature on LEZs. The previous survey research relies either on ex post simulations or cross-sectional surveys without explicit treatment–control comparisons. By following firms across announcement, anticipation and cancellation phases, the present study provides rare evidence on how expectations and adaptation evolve during the policy process itself.

Several limitations should nevertheless be noted. The study relies primarily on survey-based and expectational outcomes rather than realized long-term economic effects, since the LEZ was ultimately not implemented during the study period. In addition, the sample size limits the scope for detailed sectoral analysis. Future research would benefit from combining longitudinal firm-level data with survey evidence in settings where LEZs are implemented under more stable institutional conditions.

The Stockholm Class 3 LEZ ultimately became a policy that was anticipated, debated and partially adapted to, but never introduced. Yet precisely because of this, it offers a valuable

window into how firms respond not only to environmental regulation itself, but also to the expectations and adaptations that precede implementation. At the same time, the SOFO case illustrates that environmental access policies can generate positive business expectations when they are perceived as locally compatible and institutionally familiar. For policymakers, the broader lesson is therefore not simply whether environmental zones "work," but under what institutional and spatial conditions they are likely to gain legitimacy and acceptance among affected firms. More generally, the study suggest that studies of environmental regulation may overlook important behavioral and economic responses if they focus exclusively on implemented policies rather than on the anticipation and credibility of regulation itself.

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Appendix

Table A1. Detailed overview of studies in the literature review.

Panel A. Low-Emission Zones (LEZ)

Study	Outcome	Main finding	Method
Börjesson et al. (2021)	Welfare economics: total costs vs. benefits	Costs may outweigh benefits depending on design	Model/simulation
Sarmiento et al. (2023)	Subjective well-being	May decrease despite environmental gains	Causal study
Galdon-Sánchez et al. (2023)	Retail consumption	Less in-store shopping, more online	DiD
Wu et al. (2025)	Urban activity: footfall	Increases locally, unevenly distributed	Quasi-experiment
Dablanc & Montenon (2015)	Logistics: delivery firms	Fewer operators	Survey
Tarriño-Ortiz et al. (2023)	Retail: firm outcomes	Heterogeneous effects	Survey/model
Tarriño-Ortiz et al. (2021)	Public attitudes toward LEZs	Acceptance depends on perceived fairness, effectiveness, and direct exposure to the policy	Survey
Oltra et al. (2021)	Acceptance: public attitudes	High public support for the Barcelona LEZ; perceived fairness, effectiveness and process	Survey + path analysis

		legitimacy strongly shaped acceptance	
Gruhl et al. (2025)	Housing rents	Increase (~2%)	Quasi-experiment
Aydin & Rauck (2023)	Housing accessibility/prices	Premium near public transport	Empirical
Poulhès et al. (2025)	Distributional effects	Low-income groups affected more	Empirical
De Vrij & Vanoutrive (2022)	Accessibility	Some groups experience worse access	Empirical/qualitative

Panel B. Pedestrianization

Study	Outcome	Main finding (simplified)	Method
Yoshimura et al. (2022)	Retail sales	Increase (≈5–15%)	Empirical
Yoshimura et al. (2025)	Retail sales	Short-run increase + spillovers	Quasi-experiment
Mihaescu (2026)	Real estate prices	Increase near pedestrian streets	Quasi-experiment
Mihaescu et al. (2023)	Retail: firm outcomes	Small net effects, substantial variation	Empirical
Özdemir & Selçuk (2017)	Retail rents/structure	Higher rents, displacement	Case study
Murakami et al. (2021)	Retail activity	Limited effects	Empirical
Villar-Abeijon et al. (2026)	Market structure	Higher turnover, lower diversity	Quasi-experiment
Shahmoradi et al. (2023)	Retail sales	Mixed effects	Empirical
Brownrigg-Gleeson et al. (2023)	User experience	High acceptance among users	Survey
Yasin et al. (2021)	Business attitudes	Mixed acceptance	Survey

Panel C. Congestion Charges

Study	Outcome	Main finding (simplified)	Method
Börjesson et al. (2012)	Welfare effects	Positive net effects	Cost-benefit analysis
Eliasson et al. (2009)	Traffic volumes	Reduced traffic	Empirical
Daunfeldt et al. (2013)	Retail turnover	No effect	DiD
Quddus et al. (2007)	Retail activity	No aggregate effect	Empirical
Green et al. (2016)	Traffic accidents	Reduction	Empirical
Selmoune et al. (2020)	Public attitudes	Low acceptance before implementation	Survey
Eliasson et al. (2009)	Public attitudes	Acceptance increases after implementation	Panel data
Craik & Balakrishnan (2023)	Distributional travel effects	Differences across groups	Empirical

Panel D. Parking Fees

Study	Outcome	Main finding (simplified)	Method
Chowdhury et al. (2025)	Retail footfall	Declines without parking access	Empirical
Hymel (2014)	Retail demand	Effects depend on parking capacity	Empirical
Inci et al. (2018)	Retail prices	Costs passed on into prices	Theoretical
Kirschner & Lanzendorf (2020)	Public attitudes	Low acceptance of parking fees	Survey
Liu (2020)	Welfare effects	Potential system-wide gains	Model

Table A2. First wave questionnaire.

Question	Responses
1. What is your role in the business?	Multiple choice: owner/manager/employee/ other
2. How has your store/restaurant developed over the past six months compared to the same period last year? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much better/better/about the same/worse/much worse/don't know/not applicable
3. How do you think the store/restaurant will develop over the coming six months compared to the same period last year? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much worse/worse/about the same/better/much better/don't know/not applicable
4. Approximately what percentage of your sales is made online? If the store/restaurant is part of a chain or corporation, only answer for the specific location.	0/1-10 percent/10-30 percent/More than 30 percent/don't know
5. Will your customer entrance or goods reception be included in the new environmental zone being introduced in central Stockholm at the turn of the year? You can read more about the environmental zone at the link below.	Yes/No/don't know
6. How do you think your turnover will be affected in the coming year by the introduction of the environmental zone? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much worsened/worsened/neither better or worse/improved/much improved/don't know
7. How do you think the number of employees will be affected in the coming years by the introduction of the environmental zone? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much fewer employees/somewhat fewer employees/unchanged/somewhat more employees/much more employees/don't know
8. How do you think the zone will affect the economic development of Stockholm's city center?	Likert: much worse development/somewhat worse development/unchanged/somewhat better development/much better development/don't know
9. Have you already begun to adapt to the introduction of the environmental zone? If so, how?	No/Yes, by adjusting deliveries/Yes, by educating the employees/Yes, by moving the business/Yes, in other ways.
10. Do you have any responses you would like to elaborate on or any final thoughts about the introduction of the environmental zone that you haven't had the opportunity to express?	AI-led, up to three follow-ups.

Table A3. Second wave questionnaire.

Question	Responses
1. What is your role in the business?	Multiple choice: owner/manager/employee/ other

2. How has your store/restaurant developed over the past six months compared to the same period last year? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much better/better/about the same/worse/much worse/don't know/not applicable
3. How do you think the store/restaurant will develop over the coming six months compared to the same period last year? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much worse/worse/about the same/better/much better/don't know/not applicable
4. Approximately what percentage of your sales is made online? If the store/restaurant is part of a chain or corporation, only answer for the specific location.	0/1-10 percent/10-30 percent/More than 30 percent/don't know
5. The previously announced environmental zone in Stockholm City has been cancelled. Was your customer entrance or goods reception going to be inside the zone? You can read more about the environmental zone at the link below.	Yes/No/don't know
6. How do you think your turnover will be affected in the coming year by the cancellation of the environmental zone? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much worsened/worsened/neither better or worse/improved/much improved/don't know
7. How do you think the number of employees will be affected in the coming years by the cancellation of the environmental zone? If the business is part of a chain or corporation, only answer for the specific location.	Likert: much fewer employees/somewhat fewer employees/unchanged/somewhat more employees/much more employees/don't know
8. How do you think the zone's cancellation will affect the economic development of Stockholm's city center?	Likert: much worse development/somewhat worse development/unchanged/somewhat better development/much better development/don't know
9. Had you already begun to adapt to the introduction of the environmental zone? If so, how?	No/Yes, by adjusting deliveries/Yes, by educating the employees/Yes, by moving the business/Yes, in other ways.
10. Has the uncertainty surrounding the environmental zone affected your business operations? I would appreciate it if you could answer as thoroughly as possible.	AI-led, up to one follow-up.
11. Do you have any responses you would like to elaborate on or any final thoughts about the introduction of the environmental zone that you haven't had the opportunity to express?	AI-led, up to three follow-ups.