Advancing Zero- and Low-Emission Zones:

Local Levers to Decarbonize Urban Freight Using Existing Authority

URBAN FREIGHT LAB
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Tom Maxner
Kelly Rula
Ben Rosenblatt
Jake Paulsen
Arsalan Esmaili
Anne Goodchild

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EXECUTIVE SUMMARY

As U.S. cities face mounting pressure to reduce greenhouse gas emissions, improve air quality, and manage the impacts of rising e-commerce, interest is growing in Zero- and Low-Emission Zones (Z/LEZs). These zones restrict or discourage the most polluting vehicles from entering designated areas, supporting broader goals around climate, health, and urban livability. While widely adopted in Europe as part of national decarbonization strategies, Z/LEZs remain largely out of reach in the U.S. due to legal, regulatory, and governance barriers. Unlike European cities, who benefit from cohesive transportation authorities, consistent emissions standards, and strong legal mandates, U.S. municipalities must navigate a patchwork of federal preemptions, constitutional limitations, and fragmented freight oversight. Nevertheless, U.S. cities are finding creative pathways to advance the intent of Z/LEZs through local tools that lead to cleaner freight movement, even without full regulatory authority.

In this paper, the Urban Freight Lab proposes a **four-pronged** toolkit that U.S. cities can use to accelerate progress toward zero-emission freight goals. Two of these align with "pull" strategies, wherein cities offer **incentive-based programs** and pursue **shared space strategies**. Providing positive incentives such as rebates, grants, and access to a well-designed public realm can encourage adoption of Zero- and Low-Emissions Vehicles (Z/LEVs). Shared spaces that balance freight, pedestrians, and micromobility also make streets safer and more vibrant, while supporting a shift to cleaner deliveries. Relevant examples from Portland, OR, and Washington, DC, are provided in this paper.

The other two are aligned with "push" strategies, which rely on regulatory levers to discourage the use of higher-emission vehicles. In this framework, cities hold regulatory power to apply push measures such as **access restrictions** and **fee-based programs** that discourage higher-emission vehicles. When used strategically through vehicle size rules, time-of-day limits, or congestion-based fees, these tools can shift behavior and reduce pollution in priority areas. Together, these approaches form a flexible playbook to advance zero-emission freight within existing legal frameworks. Relevant examples from New Orleans, LA, and New York, NY, are provided in this paper.

To help cities translate this framework into action, the white paper concludes by outlining five key takeaways:

- **Use a suite of strategies to achieve Z/LEZ goals:** No single policy will deliver the full benefits of a Z/LEZ. Cities should combine tools into a cohesive toolkit to make measurable progress.
- **Communicate clearly on definitions and outcomes:** Define terms clearly, communicate desired results transparently, and highlight co-benefits like safety, equity, and economic development.
- **Collaborate early and often with industry to target achievable wins:** Engage freight and logistics providers to align policies with real-world operations and electrification timelines, supporting both large and smaller carriers.
- **Play the long game with clear plans, milestones, and pilots:** Develop roadmaps with interim goals and pilot projects that build the evidence base before scaling efforts.
- **Mobilize a whole-of-government approach to collaborate with the private sector:** Coordinate across public agencies and foster partnerships with diverse private stakeholders to design practical, inclusive, and future-ready solutions.

Ultimately, it is up to cities to set the tone for effective public-private collaboration. Advancing Z/LEZs for urban freight requires strong partnerships that reflect the operational realities of logistics stakeholders. By providing clear guidance, coordinating across agencies, and engaging proactively with diverse players in the industry, cities can create the conditions for Z/LEZ strategies to succeed and for zero-emission freight systems to take root.

Introduction and Purpose

Cities across the United States are under increasing pressure to reduce greenhouse gas emissions, improve air quality, and mitigate the congestion and safety challenges of their transportation systems. As local governments explore decarbonization strategies, attention is turning to Zero-Emission Zones (ZEZs) and Low-Emission Zones (LEZs), collectively referred to as Z/LEZs in this paper. Z/LEZs are policy tools that restrict or discourage the most polluting vehicles from entering designated areas. Such tools are often packaged with other public realm and economic development investments to enhance the attractiveness of the zones. While these areas are often discussed in terms of their environmental and public health benefits, they have direct implications for urban freight and last-mile delivery systems.

Z/LEZs represent a critical intersection between transportation policy and goods movement. Globally, cities implementing these zones have had to carefully consider freight access, delivery timing, private sector partnerships, and the availability of cleaner delivery technologies. As e-commerce demand continues to rise, so too does the number of delivery vehicles competing for limited curb space in dense urban environments, intensifying the emissions, noise, and safety impacts associated with last-mile logistics. At the same time, freight operators face growing pressure to improve efficiency, lower costs, and meet corporate sustainability targets.

In this paper, the Urban Freight Lab (UFL) examines how Z/LEZs are defined and executed, with a specific focus on their implications for urban freight. The goal is to help U.S. cities understand how these zones function, both abroad and domestically, and to identify tools and strategies that can support decarbonization and improved air quality in local regulatory and operational contexts. In the U.S., regulatory limitations pose a significant barrier to Z/LEZs, as cities currently lack the authority to restrict access to public streets based on fuel type, making direct implementation of international models far more complex.

This paper presents four categories of tools that U.S. cities can already use to move toward Z/LEZs, all in the context of impacts to and benefits for freight movement: **(1) access restrictions; (2) fee-based mechanisms; (3) incentive-based programs;** and **(4) shared space strategies.** Each category is defined in the body of the paper, and relevant examples are provided.

The UFL's private sector partners contributed insight into the challenges and opportunities of Z/LEZ-related transportation network changes. This paper covers how the private sector can play a key role in partnering with local governments to make Z/LEZs successful for a range of stakeholders. It then concludes with eight key takeaways from the UFL, informed by its private and public sector members. These takeaways can serve as a practical framework for U.S. city leaders and transportation agencies to evaluate how Z/LEZs can help advance decarbonization and air quality goals, while maintaining efficient, reliable, and equitable goods movement.

What are Zero or Low Emission Zones?

Zero-Emission and Low-Emission Zones (Z/LEZs) are designated areas where access is limited to zero- or low-emission vehicles (Z/LEVs), pedestrians, and cyclists. These zones aim to accelerate decarbonization and improve local air quality [1]. While implementation varies significantly in different cities and across national borders, Z/LEZs typically share five defining characteristics:

1. **Allowed Vehicles and Timing**
   Z/LEZs define which vehicles can enter, and when. Rules often differentiate between passenger and commercial vehicles, with delivery access permitted during limited windows or requiring specific emissions standards.

2. **Boundaries**
   Z/LEZs are usually implemented in dense, popular, and/or high-pollution areas, allowing cities to target smaller zones first - especially before fleets undergo transitions to cleaner technologies at scale - and gradually expand to larger or additional zones.

3. **Access Restrictions**
   Restrictions are based on emissions standards (e.g., Euro 6) or vehicle age/type. Requirements are published and clearly signed at entry points. Restrictions, and corresponding enforcement activities (see below) are typically digital, rather than physical.

4. **Enforcement**
   Most systems use automatic, camera-based license plate or decal recognition to monitor compliance and issue fines to non-

compliant vehicles. In some cases, physical gates or bollards are installed.

5. **Z/LEV Marketplace**
   The success of a Z/LEZ depends on the availability of compliant vehicles, which include typical large commercial vehicles (trucks and cargo vans) along with increasingly popular forms of cargo bicycles and tricycles, along with smaller 4-wheeled electric vehicles. Cities must assess market readiness across vehicle types, especially for commercial fleets, and consider how mature the market is for Z/LEVs across vehicle classes.

Global Successes, American Challenges

While cities around the world, particularly in Europe, have implemented Z/LEZs as part of their broader decarbonization strategies, **no U.S. city has yet introduced a full-scale Z/LEZ modeled on these international examples**. European cities like London, Milan, and Amsterdam have successfully deployed zones that restrict access based on vehicle emissions standards, enforce penalties for non-compliance, and support the transition to cleaner freight fleets through infrastructure and policy tools [2]. These "true" Z/LEZs have been enabled by national and local regulations, consistent emissions standards, and centralized transportation authorities that allow for coordinated local implementation.

What's working well in Europe? The continent's top-down regulatory approach is more aggressive, with climate reduction targets, EU-wide fuel economy laws, road and area pricing schemes, and increasingly, Z/LEZ restrictions that have naturally followed [3]. Unlike most U.S. cities, European municipalities more consistently include urban logistics in their broader Sustainable Urban Mobility Plans (SUMPs) [4,5]. Clear policy and communication from cities provides more predictability to private enterprises, allowing them to innovate on form factors and adapt more readily. European cities also tend to be denser and older, creating infrastructure pressures that encourage smaller delivery vehicles that are powered by zero-emission technologies. Finally, Europe's emission standards are well-established and accepted, with clear public messaging emphasizing health, safety, and urban vibrancy [6]. This framing helps broaden support for Z/LEZ policies beyond climate benefits alone, reducing legal challenges and highlighting co-benefits for public health and economic vitality.

London's Ultra Low Emission Zone (ULEZ). Source: Reuters, 2023. Available from: *https://www.reuters.com/sustainability/london-mayors-plans-expand-clean-air-zone-lawful-uk-court-2023-07-28/*

In contrast, U.S. cities face significant regulatory and legal hurdles that limit their ability to adopt similar approaches. Although some cities have piloted Zero-Emission Delivery Zones, which restrict specific curb spaces or loading zones to electric or low-emission vehicles, these efforts are limited in scope and typically voluntary or incentive-based. No U.S. city has enacted an emissions-based access restriction that applies to all vehicles within a defined geographic boundary, as is common in Europe.

Three primary legal constraints restrict U.S. cities from implementing European-style Z/LEZs [7]:

1. The **Clean Air Act (CAA)** and **Energy Policy and Conservation Act (EPCA)** give federal agencies, namely the EPA and U.S. Department of Transportation, authority over vehicle emissions and fuel economy standards. Local efforts to regulate emissions risk being preempted by these federal laws, though California's unique

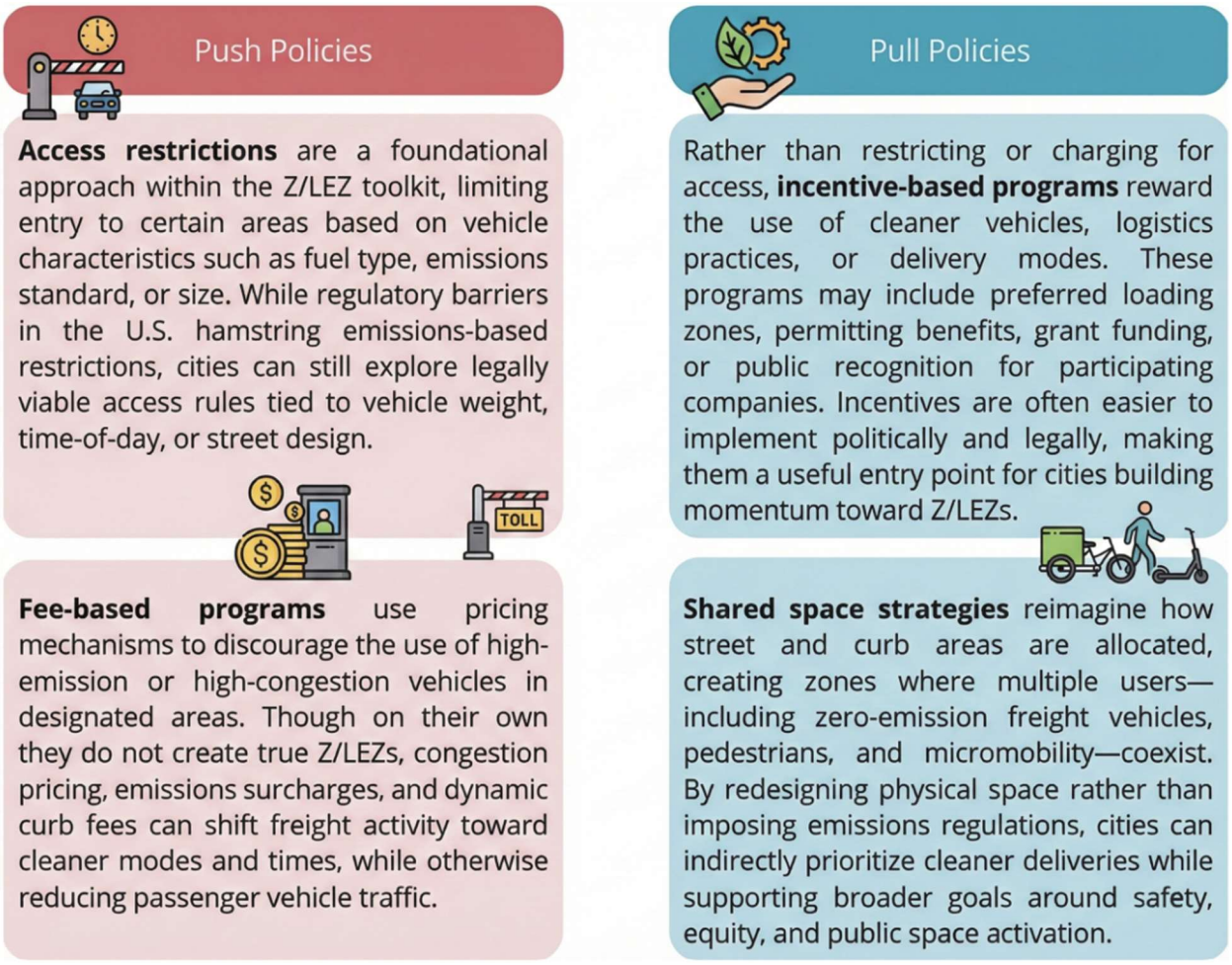
waiver under the Clean Air Act allows stricter emissions standards that other states may also adopt.

2. The **Dormant Commerce Clause** of the U.S. Constitution limits states and cities from enacting laws that place an undue burden on interstate commerce. Since freight carriers and vehicle manufacturers operate across state lines, city-level Z/LEZs may be viewed as interfering with national markets.
3. The **Federal Aviation Administration Authorization Act (FAAAA)**, interpreted in cases such as *American Trucking Associations, Inc. v. City of Los Angeles*, restricts local governments from regulating the price, route, or service of motor carriers. Emissions-based access restrictions could impact all three areas, creating legal risk. However, cities may regulate vehicle size or weight - which generally correlates with emissions - as a legally less-contested way to reduce pollution and decarbonize freight movement.

Further complicating U.S. efforts is the fragmented governance structure around freight. Unlike Europe, U.S. metropolitan areas rarely have a single authority with jurisdiction over goods movement, complicating coordination and comprehensive policy implementation. **Despite these challenges, U.S. cities are exploring alternative strategies that align with the intent of Z/LEZs, and which can support decarbonization, including from the freight and logistics sector.** The next section of this paper explores those tools in greater detail.

What tools do U.S. cities have?

Although legal and regulatory constraints limit U.S. cities from implementing full-scale Z/LEZs like those seen internationally [6], a range of practical tools exist that can help advance zero-emission freight and delivery goals today. Based on a broad review of global Z/LEZ policies alongside U.S. city regulations and planning efforts, in addition to conversations with members and city stakeholders, the Urban Freight Lab has identified four key categories of tools: access restrictions, fee-based programs, incentive-based programs, and shared space strategies. **These approaches often overlap or work in tandem, providing cities with flexible options to encourage cleaner, safer, and more efficient movement of goods without requiring new federal authority.** The four categories are briefly introduced below and then unpacked in detail with case study examples in the following sections.



Access Restrictions

Access restrictions refer to regulatory controls that cities impose to manage which vehicles, including freight and delivery vehicles, may operate in particular areas, when, and along which routes. In American practice, these controls typically include designated truck routes, vehicle size or weight limits, time-of-day delivery windows, and local access-only zones. These tools are legally supported through municipal traffic codes, transportation department regulations, and street use permitting systems. Together, they give cities real authority to shape traffic flow and mitigate negative freight impacts such as congestion, emissions, and safety risks.

Cities often ground access restrictions not in permissive policy statements but in their traffic or vehicle and transportation codes. For example, Chicago's Municipal Code, Title 9: Vehicles, Traffic and Rail Transportation, includes chapters on traffic control devices, movement of traffic, and vehicle type regulations [8]. These collectively form the legal basis for route designations, time restrictions, and permitted vehicle types. Similarly, Chapter VIII of the Los Angeles Municipal Code governs traffic management, including oversize vehicle restrictions and anti-gridlock zone enforcement [9]. These examples illustrate how traffic code authority enables cities to regulate vehicle access based on operational and planning goals.

New York City provides another clear example. Under Section 4-13 of the Rules of the City of New York, commercial vehicles are required to follow a network of designated truck routes and comply with posted restrictions on vehicle size, height, and weight [10]. Vehicles that exceed these thresholds must apply for daily permits to access non-truck routes or over-dimensional corridors [11]. These restrictions are designed to minimize the impact of heavy vehicles in dense or sensitive areas while maintaining goods access to commercial districts.

Cities also hold authority to restrict vehicle access under exceptional circumstances. The City of Chicago, for instance, issues Street Closure Permits for festivals, parades, block parties, and even business-led street activation efforts such as weekend dining streets [12]. These closures are governed by formal application processes. They allow the city to temporarily suspend vehicle access in the interest of public safety, mobility management, or economic activity.

During the COVID-19 pandemic, broader traffic restrictions became more common. Seattle's Stay Healthy Streets and Oakland's Slow Streets programs limited motor vehicle access on residential corridors [13,14]. These programs prioritized walking, biking, and neighborhood

safety. While designed primarily for active transportation, such programs also created opportunities for low-emission freight and micromobility solutions to operate more effectively in reduced-traffic environments.

Though emissions-based access restrictions remain legally challenging for most U.S. cities, these more established traffic control mechanisms—grounded in municipal and traffic code—give local governments practical, flexible levers to influence urban freight behavior and advance decarbonization goals within their existing powers. By employing such access restrictions, cities can begin to advance key elements of Z/LEZs even if a formal Z/LEZ designation is not in place. This approach allows for incremental progress toward cleaner urban environments and freight movement, within existing legal frameworks.

Access Restrictions Case Study: French Quarter, New Orleans, LA

In recent years, New Orleans has taken steps to limit general motor vehicle access in the French Quarter (particularly along Bourbon Street) to prioritize pedestrian activity and enhance the area's livability while improving the flow of deliveries and strengthening the local economy. City officials, responding to crowding concerns and growing pressure to improve safety and air quality in the historic district, have explored a range of access restriction strategies. These include limiting vehicle entry during peak pedestrian hours and using physical barriers to control access points, with exceptions for authorized users such as emergency responders, commercial deliveries, and residents.

A 2025 report commissioned by the City of New Orleans recommends formalizing these strategies into a comprehensive access control plan. It calls for the installation of bollards at key entry points and structured scheduling for commercial vehicle access, allowing deliveries during limited time windows and restricting general traffic at most other times [15]. While motivated in part by public safety concerns, the recommendations also aim to manage curb use more effectively and create a more predictable environment for zero- and low-emission delivery vehicles and service providers operating in the Quarter’s constrained urban fabric.

Retractable bollards on Bourbon Street, New Orleans. Source: The Advocate, 2017. Available from: https://www.theadvocate.com/new_orleans/news/video-get-a-look-at-bollards-headed-to-bourbon-street-in-new-orleans-how-they/article_530509ac-e1ae-11e7-ab8c-97139527600d.html

Fee-Based Programs

Fee-based programs apply pricing mechanisms to influence vehicle behavior in designated zones. Although by themselves they do not amount to full Z/LEZs, tools such as congestion pricing, emissions surcharges, dynamic curb fees, and permit charges can push freight operations toward cleaner modes, off-peak hours, or consolidated loads, while also reducing passenger vehicle traffic. Because U.S. legislation preempts area-based restrictions tied directly to vehicle emissions or fuel type, fee-based programs offer cities a legally viable alternative to influence behavior and reduce emissions through cost mechanisms [16].

In the U.S., cities already leverage many types of road-use and vehicle fees. One increasingly popular tool globally, but only recently in the U.S., is congestion pricing. These programs impose fees levied on vehicles entering dense urban areas, often with rates that vary by time of day, vehicle type, or weight class [17]. At the regional level, tolls on bridges, tunnels, and expressways introduce variable costs for freight passing through dense urban cores. In some jurisdictions, cities charge differentiated pickup or drop-off fees: for example, some airport concession or TNC programs reduce the surcharge for electric vehicles. At the curb, dynamic

pricing or variable fees based on time, location, or emissions class can prioritize cleaner deliveries and discourage heavy trucks during congested hours.

Cities may also impose operating or permit fees on fleets, charging per vehicle, per trip, or based on vehicle miles traveled (VMT). Weight-distance tolls (WDT) combine weight and distance factors, typically reflecting that heavier vehicles emit more per mile than lighter ones. Some jurisdictions adopt indirect source rules, placing fees or requirements on warehouses and distribution centers whose operations generate downstream vehicle traffic; revenue from those fees can be reinvested in emission-reduction programs or infrastructure [18].

In practice, fee-based tools can provide revenue that is earmarked for zero-emission delivery infrastructure (e.g., charging or loading zones), public realm improvements, or transit support. While politically and legally more viable than full access restrictions based on emissions, fee-based programs require careful calibration—rate structure, exemptions, equity impacts, enforcement capacity, technology—to avoid undue burden on small businesses or undermining freight service reliability.

Fee-Based Programs Case Study: Congestion Pricing Program, New York, NY

In January 2025, New York City became the first U.S. city to implement congestion pricing, marking a significant step in traffic management through fee-based programs [19]. The city's approach relies on traditional tolling principles by charging fees differentiated by vehicle class, with heavier trucks paying more than passenger cars, and larger trucks incurring higher charges than smaller ones. This structure does not directly target vehicle emissions like a true Z/LEZ scheme, but effectively incentivizes reduced discretionary driving trips, which advances decarbonization. Freight operators must now consider the cost of entering the congestion zone during peak hours, which encourages shifts to off-peak delivery times, route optimization, and potentially cleaner vehicle choices over time.

Early analyses of the program's impact on freight activity reveal promising trends. Despite concerns that congestion charges might increase delivery costs or lead to freight diversion, data shows many freight operators are adjusting routes and schedules to minimize fees, reducing traffic and emissions during peak periods [20]. Additionally, the revenue generated from congestion pricing is earmarked to support public transit and sustainable infrastructure investments, creating complementary benefits. New York's model exemplifies how fee-based tools can serve as flexible, politically viable mechanisms to manage vehicle

miles traveled (VMT), including freight movement, and reduce emissions within complex urban environments, even without direct emission-based vehicle restrictions.

Changes in freight travel time following congestion pricing implementation, New York, NY. Source: Geotab, 2025. Available from: https://www.geotab.com/press-release/nyc-congestion-report/

Incentive-Based Programs

Transportation is often one of the largest sources of urban greenhouse gas emissions, and shifting transportation behavior is essential to meeting local climate goals. Incentive-based programs offer cities a politically and legally viable way to influence those behaviors without directly restricting access or imposing fees. These programs reward cleaner vehicles and logistics practices by reducing costs, streamlining operations, or offering preferential treatment in public space. By altering the economics of urban delivery, incentives can encourage fleet transitions to low- or zero-emission modes while advancing broader goals around air quality, congestion, and safety.

Direct incentives include vehicle purchase rebates, grant funding for fleet upgrades, or subsidized access to zero-emission delivery vehicles like e-cargo bikes. Some cities also offer financial assistance for installing charging infrastructure or retrofitting fleet depots, directly reducing capital costs for private carriers transitioning to cleaner technologies. Others have piloted indirect incentives that reduce operating costs for Z/LEVs: examples include preferential curb access through green loading zones, public EV charging infrastructure that removes the burden of private investment, and discounted or free parking for electric delivery vehicles. Cities are also experimenting with microhubs and consolidation centers, which enable freight companies to transfer goods to cleaner, smaller vehicles for the last mile. When paired with policy incentives or city support like subsidized space or priority curb access, these facilities can serve as effective catalysts for Z/LEV adoption in dense urban areas.

Physical infrastructure also plays a role in incentivizing cleaner modes. Cities can provide high-quality on-street parking for electric bikes and cargo bikes, sometimes paired with secure, covered bike storage lockers. Even small changes, such as reserving curb space closer to destinations for zero-emission vehicles, can reinforce behavior change while minimizing disruption to freight service.

While incentives alone may not guarantee sweeping shifts in delivery practices, they can help cities build political and commercial momentum toward broader regulatory programs. By reducing barriers and aligning benefits with climate goals, incentive-based strategies serve as a foundational step toward zero-emission freight systems, especially when paired with more restrictive or revenue-generating tools.

Incentive-Based Programs Case Study: Portland, OR Zero-Emission Delivery Zones Pilot

In 2024, the Portland Bureau of Transportation (PBOT), with support from a USDOT SMART grant, launched what is among the first regulated Zero-Emission Delivery Zones (ZEDZ) in the United States. Over a six-month demonstration period from September 19, 2024, to March 19, 2025, PBOT converted five existing truck loading zones in downtown Portland into zones prioritized for zero-emission and low-emission commercial vehicles. The program was backed by a new permit system and monitored using parking sensors. Delivery vehicle operators could obtain a free ZEDZ permit during the pilot, which was separate from existing truck loading permits. The permit system was established under a pre-existing section of Portland's municipal code related to official and reserved parking zones. The pilot also

included curb use monitoring, technology integration, and stakeholder engagement to evaluate the program's performance [21].

Early findings from the pilot offer useful insight for cities exploring incentive-based or hybrid zero-emission zone strategies. PBOT reported issuing approximately 66 ZEDZ permits and engaging with more than 40 stakeholders during the pilot. Observations from curb sensors and video monitoring showed that 75 percent of parking events in the ZEDZ spaces still involved vehicles without permits. This highlights the importance of considering enforcement strategies and user education when designing future programs. Despite this challenge, the pilot demonstrated how cities can begin to prioritize cleaner freight activity using existing permitting authority. It also provided real-world data to inform future curb management, vehicle incentive, and enforcement approaches as part of broader zero-emission freight strategies.

(left) Parking sign displayed at Zero-Emission Load Zones (ZELZs) in Portland, OR. (right) Map describing the locations of the ZELZs. Source: Portland Bureau of Transportation (2025)

Shared Spaces

Shared space strategies reallocate streets and curbs to prioritize a mix of users: pedestrians, cyclists, travelers on micromobility devices, freight carriers, and in some cases, private

passenger vehicles. They are implemented in the US without relying on hard access restrictions or emissions-based mandates. By redesigning physical space, cities can support cleaner transportation modes, including freight movement, while advancing safety, equity, and vibrant public realms.

Such strategies are often implemented with a goal of flexibility, allowing cities to adapt rules about which types of vehicles are permitted and when access is allowed. Coordination with private sector logistics partners is especially important in this approach, since the details around allowed vehicles and access times can vary widely depending on local conditions and operational needs.

These strategies often involve limiting general vehicle access during key times or redesigning streets to reduce vehicle dominance and encourage slower speeds. These changes create safer, more inviting environments where zero-emission delivery vehicles like cargo bikes and small electric trucks can operate effectively and reliably—sometimes even more so than larger, legacy delivery vans or trucks. For example, streets with restricted vehicle access during peak pedestrian hours create windows when freight operators can schedule quieter, smaller-scale deliveries with fewer conflicts.

Design features like widened sidewalks, raised crossings, and narrowed lanes reduce vehicle speeds and foster coexistence between freight and other users. Additionally, providing preferred curb access or dedicated loading zones within these shared spaces can incentivize the use of zero-emission vehicles by improving operational efficiency and reducing delivery friction.

By prioritizing physical redesign over regulatory enforcement, shared space strategies offer cities a flexible way to integrate zero-emission freight into a broader vision of safe, equitable, and active public streets. This is especially true in dense urban centers where curb space is limited and competing demands are high, since driving large vehicles is already less operationally effective to begin with.

Shared Spaces Case Study: The Wharf, Washington DC

The Wharf in Washington DC operates as one of the largest shared space developments in the U.S., blending pedestrian promenades, mixed-use retail, restaurants, and waterfront access with freight needs. Its design includes curbless shared streets where pedestrians, cyclists, and vehicles share space, but vehicle speed and traffic flow are carefully managed

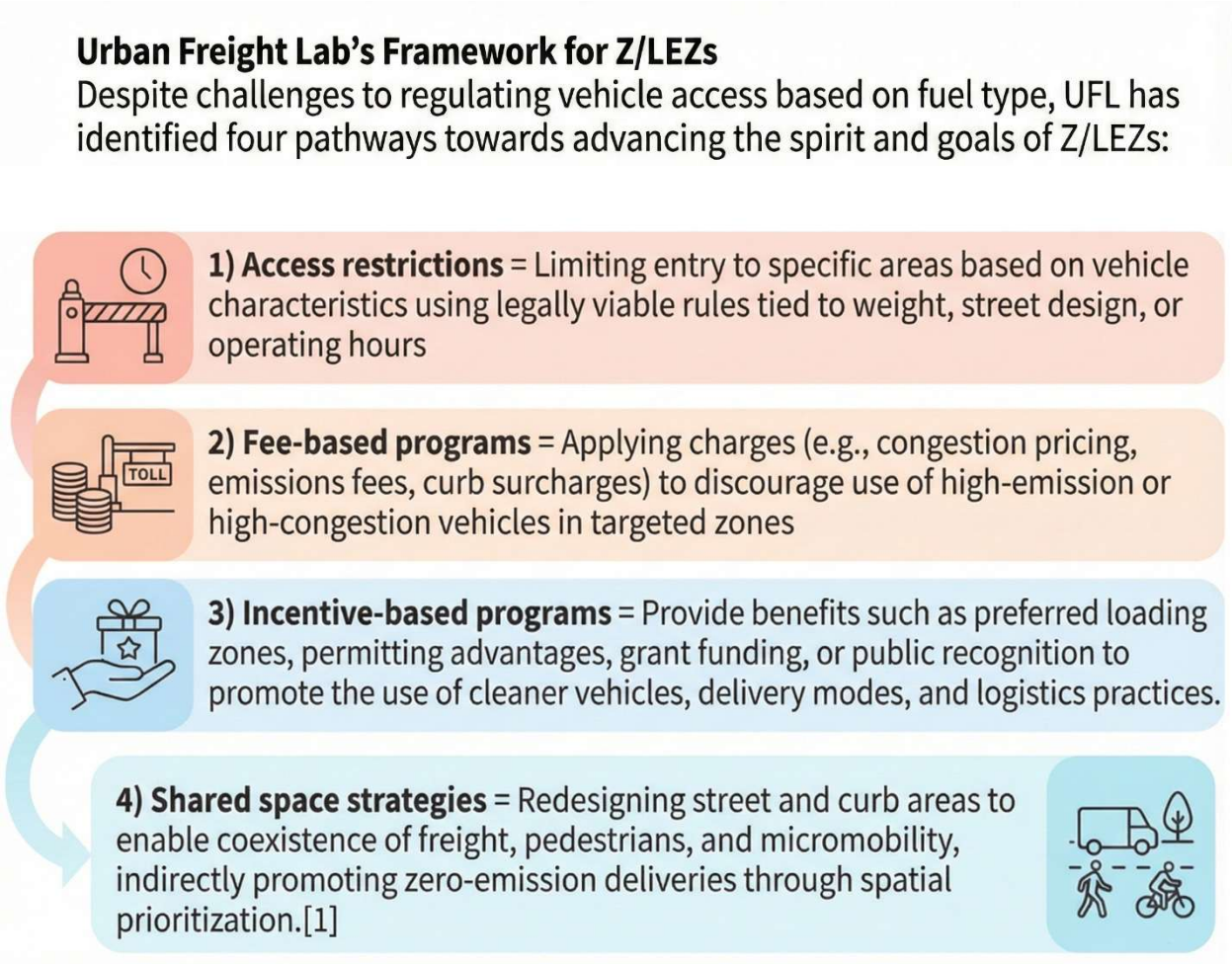
using paving treatments, street furniture, bollards, and signage. From the outset, The Wharf was planned with dedicated service access for trucks making deliveries to restaurants, shops, and other commercial establishments. Larger freight vehicles use service alleys and designated access points for loading and unloading, keeping them out of pedestrian-priority areas. Additional delivery activity is concentrated along perimeter roadways, where commercial curb space allows for freight drop-offs and pick-ups without disrupting the central shared zones.

The site's developer has worked closely with logistics providers and public agencies to cluster delivery locations and encourage off-peak scheduling whenever possible. These strategies help maintain reliable freight operations while reducing conflict and supporting a more walkable, accessible environment [22]. The Wharf demonstrates how shared space designs can integrate freight needs with broader goals for safety, cleaner delivery modes, and vibrant public streets. While not technically a Z/LEZ, the area has become a de-facto Low-Emission Zone at most times of day due to street design and thoughtful planning.

Shared spaces allow for delivery access in The Wharf, Washington DC. Source: Greater Greater Washington, 2019. Available from:: https://ggwash.org/view/65639/how-are-the-wharfs-shared-spaces-working-out

TAKEAWAYS: How Cities Can Use This Framework

Here in 2025, cities in the U.S. are not yet positioned to implement European-style Z/LEZs that restrict vehicle access based on fuel type. However, this should not discourage action. The tools already available to local governments, as outlined in this paper, can and already do support meaningful reductions in transportation emissions, including from freight. Rather than waiting for legislative breakthroughs or expanded regulatory authority, cities can take practical steps now to pilot, refine, and scale strategies that advance their decarbonization and air quality goals while also building a cleaner, more efficient urban delivery ecosystem.



The following takeaways highlight practical steps American cities can take to implement elements of Z/LEZs, using tools available today.

1. Use a suite of strategies to achieve Z/LEZ goals
No single policy will achieve the objectives of a Z/LEZ. The strategies outlined in this paper may have limited impact individually, but combining multiple approaches can significantly reduce transportation emissions. Cities should adopt a comprehensive toolkit to make measurable progress.

2. Communicate clearly on definitions and outcomes
Terms like "zero emission area," "pedestrian zone," and "low pollution neighborhood" can have varied interpretations. Cities should not let the semantics of Z/LEZ terminology bog them down. It is crucial to define strategies and what constitutes success clearly, and to communicate outcomes transparently to all stakeholders. This also includes sharing information on relevant grants and funding opportunities, and singing the praises of co-benefits to safety, economic development, and equity.

3. Collaborate early and often with industry to target achievable wins
Ongoing dialogue with freight and logistics companies helps cities understand operational realities and carrier capabilities, ensuring policies align with real-world conditions and electrification timelines. Partnering with well-resourced carriers can deliver early emissions reductions; cities can also target equitable partnerships with smaller operators through tailored incentives or phased requirements..

4. Play the long game with clear plans, milestones, and pilots
Implementing Z/LEZs is part of a broader, long-term evolution of city streets and public spaces. They are not a simple "switch on" quick policy shift. Cities should develop and share clear roadmaps with interim milestones that chart progress toward emissions goals. Pilot projects are ideal to test ideas, gather data, and build the evidence base needed before scaling up.

5. Mobilize a “whole of government” approach to collaborate with the private sector
DOTs can’t create Z/LEZs alone. Decarbonizing urban freight requires coordination across multiple public agencies and close partnership with diverse private sector stakeholders, from large carriers to smaller businesses. Transparency and a customer service orientation on both sides will go a long way in fostering trust and achieving beneficial policy design for all.

ENGAGING WITH THE PRIVATE SECTOR

Carriers, logistics providers, real estate owners, and retailers all have roles in shaping how delivery operations adapt to new public policies and urban constraints. However, private operators often face challenges that fall outside their direct control, such as limited real estate for staging or charging, unclear permitting processes, or restrictive regulations around vehicle types and equipment (for example, battery storage for e-bikes in parking garages). These obstacles can complicate the shift to cleaner delivery models, particularly for smaller carriers without dedicated facilities or influence in policy discussions.

COLLABORATIVE APPROACH

To address these issues, the private sector should take a holistic approach to working with public agencies. That includes engaging not only with transportation departments, but also with building officials, permitting offices, traffic enforcement, and sustainability teams. Coordinated, early communication can surface operational concerns and help shape public programs that reflect the realities of freight logistics. This is especially important due to the heterogenous, diverse nature of the players in the freight sector [23].

CITY RESPONSIBILITY & GUIDANCE

At the same time, cities have a responsibility to offer clear, consistent guidance for private operators navigating new rules and expectations. When roles are well defined and communication is transparent, cities and companies can collaborate on solutions—such as shared infrastructure, adjusted regulations, or phased implementation—that make zero-emission freight adoption more achievable.

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