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Street Safety in the Era of Micromobility

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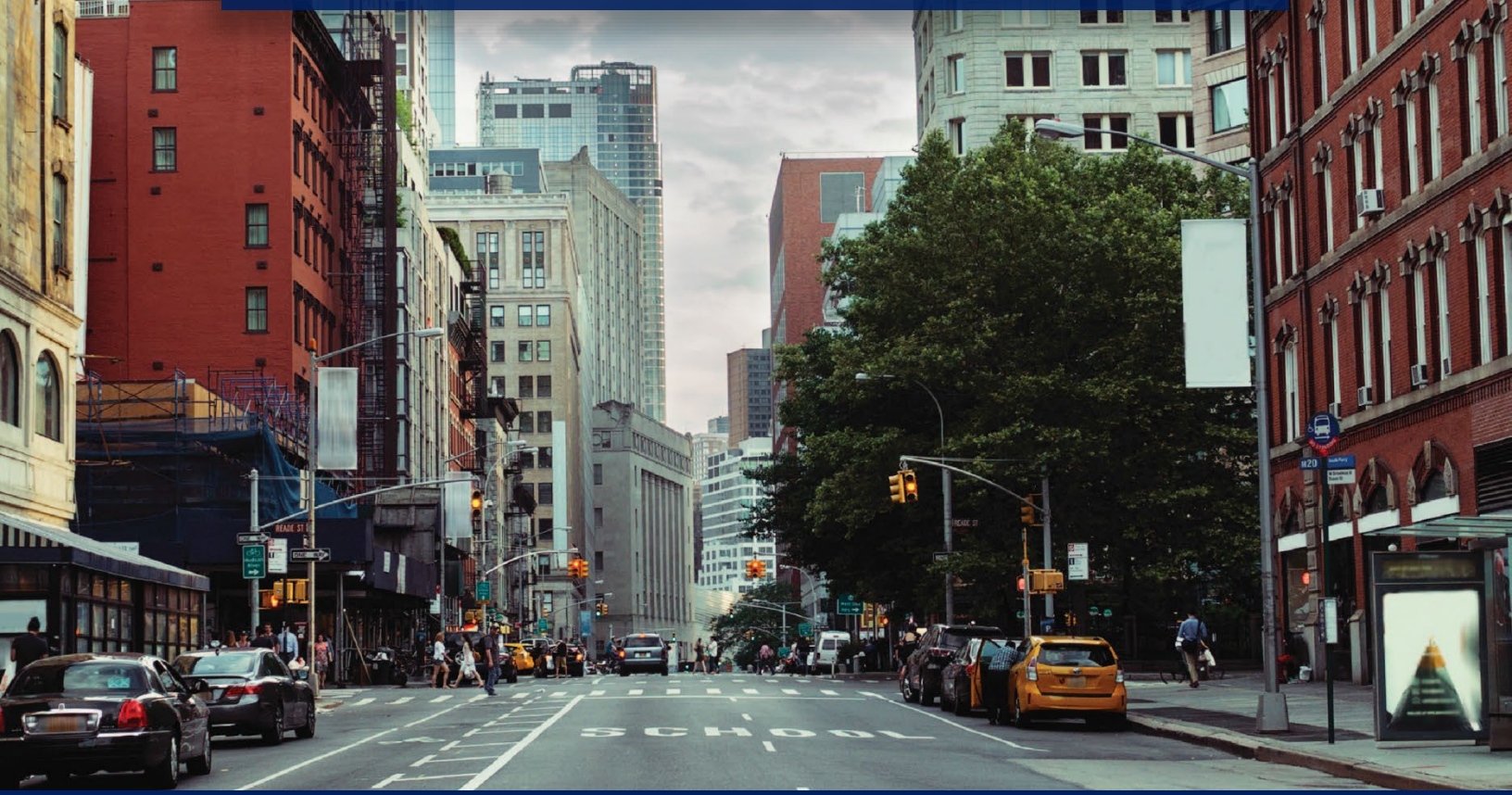

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Executive Summary

The use of "micromobility" vehicles – including e-bikes, mopeds, and e-scooters – has skyrocketed in recent years.[1] With the legalization of e-bikes and e-scooters, the exponential growth of app-based food delivery companies, and the proliferation of low-cost electric mopeds, e-bikes, and batteries, more and more New Yorkers are utilizing micromobility options to get around the city and make a living.

Unfortunately, New York City's regulatory regime, enforcement efforts, and infrastructure have failed to keep pace with the influx of these vehicles. The increased presence of micromobility vehicles has fueled a sense of chaos, disorder, and lawlessness on city streets and heightened anxiety among New Yorkers about street safety. The parking of micromobility devices on sidewalks and in crosswalks has made navigating these spaces more difficult, especially for pedestrians and people with disabilities. The presence of new, motorized modes of transportation has also triggered a backlash, with a May 2024 *New York Times* headline posing the question, "Have E-Bikes Made New York City a 'Nightmare'?" These trends demand a more effective and proactive management approach to create more predictability on city streets, ensure mopeds and micromobility operate safely and legally, and protect everyone on the roads and sidewalks.

Over the last few years, the City and State passed several laws and implemented regulations to respond to the rising popularity of micromobility devices and motorized two-wheeled vehicles, but significant regulatory gaps and enforcement challenges remain. As micromobility devices continue to grow in popularity, it is essential for the City and State to confront these challenges head-on and advance a strategic regulatory framework that improves safety and quality of life, utilizes enforcement in a just and strategic manner, and advances a culture of respect on the streets of New York City.

Key Findings

Street Safety

This report grounds attention to micromobility safety in real data about the impacts of e-bikes, scooters, and mopeds on riders and pedestrians. Data on crashes, fatalities, and injuries involving these devices from 2010 to 2023 reveals:

- E-bikes, stand-up scooters, and mopeds account for 1.8% of all pedestrian fatalities between 2020 to 2023, or eight out of 449; and roughly 4.5% of all pedestrian injuries, or 1,276 out of 28,450 total injuries.[2]
- Though they account for a small overall share, fatalities and injuries involving e-bikes, stand-up scooters, and mopeds have seen a significant uptick from virtually none in 2020, when the state legalized e-bikes.

- The safety risks of e-bikes, e-scooters, and mopeds are especially acute for the riders of these vehicles compared to pedestrians and other road users.

Micromobility Management Challenges

Managing the influx of micromobility vehicles on New York City streets is a complex task that requires coordination between different government agencies, all three levels of government, and the private sector. Understanding the following challenges associated with managing and regulating micromobility is essential for developing and refining policy solutions:

- The e-bike and battery market has been flooded in recent years with low-cost, unsafe products due to low standards for imported equipment and the high cost of legal, safe alternatives.
- The rise of the mobile app-based food delivery industry has fueled reliance on e-bikes and mopeds among a large population of low-wage, precarious workers, with no accountability for the app companies profiting from those trips.
- Enforcement and oversight responsibilities are dispersed across multiple levels of government and different agencies, resulting in coordination challenges.
- Despite improvements in regulatory efforts to address the safety of e-bike batteries, battery fires in residential buildings persist, killing four people and injuring 88 others in the first ten months of 2024.[3, 4]
- Existing strategies to enforce traffic laws are not effectively deterring dangerous or illegal behavior among riders.
- Infrastructure and street design have not kept pace with the growing popularity of micromobility.
- The sharp rise in popularity of micromobility, combined with a void in proactive management or effective enforcement, has contributed to a sense of chaos, disorder, and lawlessness on city streets.

Summary of Recommendations

The City can improve safety and curb the sense of chaos on city streets by advancing the following recommendations:

1. **Cut off the supply of unsafe, illegal devices** in New York City and beyond through strategic enforcement action at the city, state, and federal levels:
    a. Expand capacity at the Department of Consumer and Worker Protection (DCWP) and Fire Department of New York (FDNY) to levy fines, enforce additional penalties, and shut down illegal retailers.

b. Enhance DMV and state-level efforts to enforce new laws and penalties against moped retailers who violate the law.
c. Support federal-level action to cut off the import, manufacture, and sale of unsafe and illegal e-bikes.

2. **Create a City-administered licensing program that regulates app-based delivery companies** and requires them to:

    a. Share real-time, anonymized data with DOT about popular routes, pick-up and drop-off locations, times of day, and driver speeds to inform City infrastructure and street safety investments.

    b. Fund and implement mandatory City-administered education and safety training programs for delivery workers, including technical support and access to incentives for purchasing safe and legal vehicles and equipment.

    c. Regulate the algorithms used by app-companies to prohibit the kinds of trips that incentivize speeding and reckless driving and impose strong penalties to hold app-companies accountable.

    d. Implement a safe operation accountability protocol, featuring standards developed in partnership between the City, the app-based delivery companies, and worker representative organizations.

    e. Pay a sizable disposal fee/penalty for illegal mopeds seized while operating on a trip for the app, that cannot be passed on to the worker.

    f. Increase pay transparency, including the provision of clear, upfront information about how the app calculates total pay, tips, and on-call and active time to workers.

    g. Protect workers from arbitrary deactivations, to dramatically reduce erratic and irresponsible behavior that is largely driven by unreasonable expectations for delivery worker productivity and efficiency.

    h. Fund and construct Deliverista Hubs in neighborhoods with high volumes of deliveries to provide workers with refuge from inclement weather, access to safe charging infrastructure, and other resources.

    i. Levy strict violations against app companies for violating deactivation protections, labor, and safety standards stipulated under the app-based delivery company licensing program.

3. **Require restaurants to certify that the delivery workers they directly employ are using safe, street-legal equipment,** and hold those restaurants accountable when workers are found to be using illegal equipment.

4. **Curb reckless driving and enhance accountability for moped riders who violate traffic laws through more predictable, consistent, and strategic enforcement.** Enforcement should target the most high-risk behaviors (e.g. driving on sidewalks and in bike lanes, forging licenses, obscuring license plates, and operating illegal vehicles). The City should also explore establishing a reckless driving education and accountability program for moped riders repeatedly cited for violating traffic laws aimed at changing rider behavior. Fines collected for e-bike and moped traffic violations should provide dedicated funding for micromobility safety initiatives.

5. **Invest in high-quality infrastructure, street design, and curb management solutions** to support the safe integration of micromobility into New York City streets, including wider protected bike lanes, traffic calming, e-bike parking, and neighborhood loading zones.

6. **Ensure and expand the use of safe, affordable e-bikes and batteries** by increasing funding for a battery swap program established in Fall 2023 by Local Law 131 and passing State legislation to establish a rebate program for e-bikes and e-scooters.[5]

7. **Expand safe, convenient e-bike charging facilities** to support widespread adoption of Underwriter Laboratory (UL)-certified equipment by investing in additional safe charging sites via expansion of the City's E-Bike Battery Charging Pilot and prioritizing the installation of on-street e-bike charging stations in the outer boroughs, where many delivery workers reside.[6]

8. **Create a program to provide guidance on the process of obtaining a driver's license and registering mopeds**, directed at delivery workers and low-income New Yorkers.

9. **Collect and publicly report accurate, detailed data** about crashes, injuries, fatalities, violations, and illegal vehicle seizures involving e-bikes, stand-up scooters, mopeds, and other devices.

Equipment Overview

The term "micromobility" describes a diverse range of vehicles, including e-bikes and e-scooters. Mopeds are not technically micromobility vehicles under state law, but riders may use them in a similar manner, so we include them here.

E-bikes, mopeds, scooters, and other powered two-wheeled devices vary considerably in terms of size, price, weight, speeds, and legal status. Heavier, faster vehicles pose a greater safety risk to riders and other road users compared to smaller vehicles with relatively low top speeds. The high cost of lab-certified, street legal e-bikes combined with the limited number of convenient charging locations in New York City has allowed illegal, unsafe devices to proliferate. It is important to understand the different types of powered two-wheelers on city streets and ensure regulations reflect the distinctions.

Mopeds

State law defines mopeds as limited use motorcycles with two or three wheels and subjects them to the same requirements as motorcycles.[7] Mopeds are not legally designated as micromobility devices. Mopeds must have a vehicle identification number (VIN) and a license plate. Riders are required to register their vehicles with the state Department of Motor Vehicles (DMV) and hold a valid New York State driver's license in order to operate them. Unlicensed or non-legal mopeds can be seized and not returned. The law also divides mopeds into three classes, A through C, based on their top speeds. Riders of mopeds capable of reaching speeds of 30 mph or higher must wear helmets. In New York City, all moped riders are legally required to ride in vehicle lanes and cannot operate in bike lanes. A new state-level law requiring registration of mopeds at the point-of-sale will go into effect in January 2025.

Electric Bikes (E-bikes)

Electric bikes are legal in NYC, as of a 2020 state law allowing people to operate bicycles with electric motors and pedal assist on city streets.[8] New York state law defines an e-bike as a bicycle with an electric motor of no more than 750 watts and operable pedals. The law set a speed limit of 25 mph, prohibited e-bike usage on sidewalks, and empowered the City of New York to enact further regulations. Most e-bikes have a maximum speed of 20 to 25 mph.[9] Electric bikes that provide motorized assistance at speeds above 25 mph are not street-legal; as with non-legal mopeds, they can be seized and not returned. State law does not require the registration of e-bikes and riders do not need to have a driver's license or license plate to ride one.

Street-legal e-bikes enable riders to cover longer distances, provide last-mile connections in areas lacking transit options, and allow delivery workers to carry heavier cargo loads—all without increasing traffic congestion or carbon emissions. These devices are also lightweight and top out at relatively low speeds of 15 to 25 mph. E-bike sales started growing exponentially in 2020, due largely to their convenience as a mode of travel during the pandemic years and legalization in

multiple states and cities. In 2022, 1.1 million e-bikes were sold in the United States, four times the number sold in 2019.[10] New York City's bike share system, Citi Bike, manages a fleet of 20,000 e-bikes whose speeds are capped at 18 mph.[11] Citi Bike's e-bikes see three times as many rides per day compared to traditional bikes, reflecting their growing popularity.[12]

Electric Scooters and Other Devices

In 2020, state law legalized the operation of electric scooters in NYC at a maximum of 15 miles per hour. E-scooters do not require registration or a driver's license to operate.[13] Segways, electric skateboards, hoverboards, and electric unicycles are currently illegal to operate in New York City.

NYC DOT oversees a shared e-scooter program to supplement micromobility transportation options in neighborhoods not served by Citi Bike. Launched in the East Bronx in August 2021 as a pilot, the program has seen nearly 4 million rides and over 150,000 unique users. Three companies, Bird, Lime, and Veo, participate in the program and now provide up to 2,000 e-scooters for shared use. In summer 2024, DOT expanded the program to Eastern Queens.[14]

Safety Data

The increasing popularity and visibility of micromobility devices in New York City has raised concerns about the street safety impacts of these vehicles. Anecdotal reports and concerns about reckless riding behavior among e-bike and moped riders are abundant. Data provided by DOT about crash fatalities among both micromobility riders and pedestrians involving micromobility vehicles, as well as data provided by Crash Mapper NYC on injuries, reveals that such incidents have increased since the statewide legalization of e-bikes in 2020. **Fatality data demonstrates that the majority of deaths involving micromobility devices are among their own riders.** Micromobility poses a relatively low but growing safety risk to pedestrians and other road users.

Rider Safety

Since 2021, NYC DOT has published data on crash fatalities involving e-mobility and other motorized two-wheeled devices in a single category covering stand-up e-scooters and moped-like vehicles. Fatalities among e-bike riders are counted as cyclist fatalities.[15] Data on fatalities, injuries, and crashes available from NYPD, including the Motor Vehicle Collisions table available on NYC Open Data, categorizes vehicles using an outdated standard.[16] Internally, NYC DOT holds crash fatality data that accurately distinguishes between different types of motorized two-wheelers, verified based upon photos provided by emergency response. Table 1 reflects this data from years 2010-2023, with fatalities among people riding e-bikes, stand-up scooters, and mopeds highlighted.

Table 1: Crash Fatalities by Mode (2010-2023)

Year	Ped	Trad Bike	E-bike	Stand-up Scooter	Moped	Motor-cycle	Off-Road	Other	Motor Vehicle
2023	103	7	23	10	29	31	7	0	55
2022	124	10	9	8	19	32	5	0	56
2021	128	8	11	4	15	40	7	1	62
2020	94	15	11	0	7	44	2	0	69
E-BIKES LEGALIZED IN NY STATE									
2019	124	23	5	0	2	22	1	0	43
2018	117	9	3	2	2	32	4	0	37
2017	108	24	2	0	0	31	1	0	58

Year	Ped	Trad Bike	E-bike	Stand-up Scooter	Moped	Motor-cycle	Off-Road	Other	Motor Vehicle
2016	149	18	3	0	1	15	0	0	46
2015	139	14	1	0	1	22	2	0	55
2014	140	20	1	0	0	34	4	0	60
VISION ZERO BEGINS									
2013	184	12	0	0	3	41	1	0	58
2012	152	18	0	0	1	32	5	0	71
2011	143	22	0	0	1	30	2	0	52
2010	153	19	0	0	1	39	3	0	58

Source: NYC Department of Transportation

As Table 1 reflects, crash fatalities involving micromobility vehicles became more common after the legalization of e-bikes in 2020. There were 29 fatalities among riders of e-bikes, stand-up scooters, and mopeds between 2010 and 2020, compared to 146 afterwards. The number of such fatalities has increased year-to-year, with fatalities among moped riders higher and increasing at a greater rate than for any other mode. This is due likely to mopeds' higher speeds and heavier weights relative to other forms of micromobility.

Pedestrian Safety

As e-bikes, mopeds, and e-scooters have become more popular, New Yorkers have raised concerns about the impacts of these vehicles on pedestrian safety. Table 2 contains data on the number of pedestrian fatalities attributable to different types of vehicles. Deaths among pedestrians due to motorized two-wheelers were nearly nonexistent prior to the legalization of e-bikes in 2020. Since that time, there have been five pedestrian fatalities involving an e-bike, stand-up scooter, or moped over a four-year period.

Motor vehicles are still responsible for nearly all deaths among pedestrians. In total, pedestrian deaths in crashes involving e-bikes, stand-up scooters, and mopeds account for 1.8% (8 out of 449) of all pedestrian fatalities between 2020 to 2023. Total numbers year-over-year remain too low to ascertain any clear trends.

Table 2: Pedestrian Fatalities by Vehicle Type involved in Crash

Year	Bike	E-bike	Stand-up scooter	Moped	Motor-cycle	Off-road	Other	Motor Vehicle
2023	0	2	0	0	1	0	0	100
2022	2	1	1	0	1	0	0	119
2021	0	2	0	1	1	0	0	124
2020	0	0	0	1	2	0	0	91
E-BIKES LEGALIZED IN NY STATE								
2019	2	0	0	0	0	0	0	122
2018	0	0	0	0	0	0	0	117
2017	1	0	0	0	1	0	0	106
2016	0	0	0	0	3	0	0	146
2015	0	0	0	0	1	0	0	138
2014	0	1	0	0	0	0	0	136
VISION ZERO BEGINS								
2013	0	0	0	0	4	0	0	179
2012	0	0	0	0	2	0	0	150
2011	0	0	0	0	2	0	0	141
2010	0	0	0	0	1	0	0	152

Source: NYC Department of Transportation

Regular public reporting on injuries to pedestrians involving micromobility vehicles would provide a clearer picture of safety impacts. According to NYC DOT, the methodology for collecting and categorizing this information has changed over time and year-to-year comparisons are not possible at the same level of precision as with fatalities.

Data from Crash Mapper NYC, an independent, non-profit source on traffic crashes derived from NYPD data, provides an approximation of injuries to pedestrians involving e-bikes, scooters, or mopeds (Table 3). This data does not differentiate between crashes caused by e-bikes and e-scooters, or between mopeds and motorcycles, and the categorization of micromobility vehicles may not match legal definitions. Mopeds may be erroneously categorized as e-bikes or e-scooters

or vice versa. However, this data provides a sense of trends around micromobility and pedestrian safety.

Table 3: Pedestrian Injuries by Vehicle Type involved in Crash

	Bicycle	E-bike/ e-scooter	Moped/ motorcycle	Car	SUV	Truck	Bus/Van
2024*	233	212	215	2,570	2,131	366	158
2023	261	328	223	3,437	3,069	444	219
2022	231	329	164	3,726	2,921	398	224
2021	196	19	120	3,093	2,520	355	161
2020	193	24	69	2,943	2,301	335	147
E-BIKES LEGALIZED IN NY STATE							
2019	277	73	80	4,687	3,860	482	238
2018	247	13	76	4,787	3,756	571	147

Source: Crash Mapper NYC

*through September 2024

Crash Mapper NYC data indicates that injuries to pedestrians in crashes involving e-bikes or e-scooters were rare before 2022. Higher numbers of injuries in the "Moped/Motorcycle" column prior to 2022 are likely attributable to motorcycles (Table 2). The number of pedestrian injuries involving e-bikes and e-scooters jumped dramatically in 2022, two years after their statewide legalization, and has remained elevated since. However, injury numbers for 2024 are on track to be slightly lower than in the past two years. As of September 2024, injuries to pedestrians involving mopeds and motorcycles are likely to surpass those involving e-bikes or e-scooters for the first time since 2021.

While cars, SUVs, and trucks are responsible for the overwhelming majority of injuries to pedestrians, the growing number attributable to mopeds and micromobility vehicles fuels a sense of chaos and unease on city streets. Stemming this trend calls for a comprehensive approach to securing street safety.

Micromobility Management Challenges

Managing the growing number of micromobility devices on New York City's streets is a complex task that involves coordination between multiple government entities, cooperation from the private sector, and innovative legislative and regulatory actions. Thoughtful, effective management of micromobility first requires understanding the root cause of safety concerns and regulatory challenges related to these emerging modes of transportation.

The e-bike and battery market has been flooded in recent years with low-cost, unsafe products due to low standards for imported goods and the high cost of legal, safe alternatives.

Street-legal e-bikes can cost anywhere from $1,000 to $6,000. E-bike batteries carrying Underwriter Laboratory (UL)-certification, a recognized standard for consumer safety, can cost hundreds of dollars alone. Many New Yorkers seeking a convenient, low-cost mobility option have turned to illegal e-bikes and mopeds as alternatives. These illegal vehicles typically do not meet minimum consumer safety standards, making them cheaper than street-legal alternatives. Buyers can purchase such e-bikes for as little as a few hundred dollars. Illegal e-bikes do not fall within the three-class system used to regulate these devices in state law and lack UL-certification, while illegal mopeds have no vehicle identification number (VIN) and cannot be registered. Illegal e-bikes are more likely to exceed safe speeds and cause fires.[17] Complicating matters further, many retailers advertise illegal mopeds as e-bikes, misleading customers about the legal requirements to purchase and ride one.[18]

These products are imported to U.S.-based customers from foreign countries. U.S. trade law allows shipments valued up to $800 to enter the country duty-free and bypass inspections by federal agencies, including Consumer Product Safety Commission (CPSC). In contrast, the threshold for such shipments to bypass tax inspections is much stricter in other countries: $170 in the European Union and just $10 in Canada. This loophole allows US-based businesses and consumers to directly purchase foreign-manufactured e-bikes, mopeds, and uncertified batteries (which are generally valued below $800) that are not street-legal without having to go through federal inspections. Popular moped companies based in New York City import component parts from China and assemble them in the United States.[19] Eliminating the widespread use of unsafe and often illegal mobility devices in New York relies on preventing these products from entering the country in the first place and enforcing at the point of sale in New York City and State.

Enforcement and oversight responsibilities for e-bikes and mopeds are dispersed across multiple levels of government and agencies.

Responsibility for regulating micromobility is spread across multiple city, state, and federal agencies. Generally, the federal government regulates vehicle design, manufacturing, and safety standards; states are responsible for licensing and registration; and municipalities enforce traffic laws. Regulations concerning e-bikes and mopeds touch all three of these areas and necessitate

a high degree of coordination between all three levels of government, creating challenges for enforcement and oversight.

City-Level

In New York City, the Department of Transportation (DOT) leads on street safety matters while the Fire Department of New York (FDNY) and Department of Consumer and Worker Protection (DCWP) oversee equipment safety. DCWP is also responsible for enforcing laws impacting food delivery workers who overwhelmingly rely on e-bikes and mopeds to do their jobs. The New York Police Department (NYPD) has the authority to enforce traffic laws and directly confiscate unregistered or illegal mobility devices directly from sellers and riders.

City law empowers FDNY and DCWP to fine and shut down dealerships selling uncertified e-bike batteries as well as illegal mopeds. Local Law 39 requires retailers to only sell battery-powered mobility devices that have been certified by an accredited testing laboratory in compliance with industry standards or pay a $1000 per item penalty after the first violation.[20] Since the law went into effect in September 2023, the City issued fines to 250 brick and mortar stores and 25 online retailers for selling uncertified or illegal devices.[21] However, City agencies report struggling to rein in businesses, especially large retailers like Amazon, that are undeterred by fines.[22] Agencies could only issue warnings for initial violations, making deterrence difficult. Furthermore, customers seeking uncertified, cheaper products can easily purchase or have them delivered to out-of-state locations. Local Law 50, a new law allowing FDNY and DCWP to increase penalties for selling illegal equipment and seal the premises of businesses repeatedly cited for doing so, went into effect in September 2024.[23]

State-Level

The New York State Department of Motor Vehicles (DMV) is responsible for licensing drivers, registering mopeds, and regulating motor vehicle dealerships. The agency works with law enforcement agencies to conduct investigations of unauthorized dealerships and can impose civil penalties. A state-level bill sponsored by Senator Hoylman-Sigal requiring the registration of mopeds at the point of purchase will go into effect in January 2025.[24] Accompanying legislation, introduced by Senator Kruger, proposes doubling fines against retailers selling illegal mopeds from $1,000 to $2,000 (this law has yet to pass).[25] Together, these laws will close an important loophole allowing riders to leave their vehicles unregistered and shift the burden from individual buyers onto businesses to ensure they are following legal requirements.

Federal-Level

Federal agencies, namely the CPSC and National Highway Traffic Safety Administration (NHTSA), are responsible for setting safety requirements for mobility devices and ensuring manufacturers meet these standards. The CPSC is currently in the process of updating its rules about the classification and regulation of e-bikes. This process could result in federal agencies adopting the three-class system used by many states, including New York, shifting oversight of higher-speed e-bikes to NHTSA, or instituting stricter safety standards.

New York City lacks adequate safe, convenient e-bike charging facilities, leading to battery fires in residential buildings.

With the rise of e-bikes, the city also experienced an increase in the number of fires started by uncertified lithium-ion batteries, especially in residential buildings. These fires are attributable to overcharging and the use of batteries that do not meet basic safety standards but are sold at cheaper prices.[26] There were 222 such fires in New York City in the first ten months of 2024, killing 4 people and injuring 88 others.[27] Many landlords have banned the storage and charging of e-bikes in residential buildings due to concerns about battery fires, pushing riders to use mopeds in their place.

The City has established multiple programs, including an E-bike Battery Charging Pilot, to expand safe access to safe equipment, charging facilities, and e-bike storage areas.[28] These initiatives are in the early phases of implementation and remain very small in scale.

The rise of the mobile app-based food delivery industry has fueled reliance on e-bikes and mopeds among a large population of low-wage, precarious workers.

In New York City, the popularity of micromobility is closely linked to the rise of app-based food delivery services. Between 2020 and 2022 alone, investors poured more than $5.5 billion into New York City-based instant delivery companies.[29] There are over 65,000 delivery workers citywide, almost all of whom are reliant on micromobility for their work.[30] Many of these workers are contracted gig workers who do not have the benefit of a traditional employee-employer relationship. Furthermore, many are immigrants from Latin America, South Asia, West Africa, and China without legal status in the United States. App delivery companies' business models require workers to complete high volumes of orders as quickly as possible, and workers who do not complete a certain number of orders within a fixed time face the risk of having their accounts deactivated. These unreasonable productivity and efficiency requirements incentivize delivery workers to engage in risky riding behavior to meet their quotas or risk losing work. As a result, delivery workers experience very high rates of on-the-job injuries and fatalities. Data collected by DCWP reveals that workers who rely on e-bikes and mopeds to make deliveries on behalf of app companies experience a rate of fatal occupational injuries five times higher than that of construction workers, traditionally one of the most dangerous industries.[31] The establishment of a new minimum wage for the industry in 2023, spearheaded by then-Council Member Brad Lander, enabled delivery workers to exercise caution on the road.[32] However, workers must now compete for a limited number of shifts and accept a higher volume of orders under duress of deactivation.[33]

Existing strategies to enforce traffic laws are not effectively deterring dangerous or illegal behavior.

In New York City, the NYPD is responsible for conducting traffic enforcement. An additional automated enforcement system, administered by NYC DOT, issues tickets for speeding and red-light camera violations. Unregistered mopeds can easily evade automated enforcement and are more likely to be owned and operated by unlicensed riders, many of whom are recent arrivals to the United States and may be unaware of legal requirements.[34]

The NYPD has confiscated and destroyed tens of thousands of mopeds and e-bikes over the past three years.[35] Since 2022, the City reports seizing over 42,000 devices, 13,000 (30%) of which were confiscated in the first six months of 2024. While their owners retrieve some of these devices after receiving the required registration and insurance, over half are destroyed and disposed of in landfills at the expense of taxpayers. NYPD stations officers at key checkpoints including bridges, tunnels, and other points of crossing as part of a strategy to seize illegal vehicles directly from riders. This approach targets delivery workers, many of whom are undocumented and rely on their vehicles for their livelihoods, while doing little to incentivize moped users to acquire legal devices. The strategy also fails to target, let alone change, dangerous driving behavior like driving in bike lanes or on sidewalks. Police enforcement is inconsistent, and riders can easily purchase new illegal mopeds to replace confiscated devices.

Infrastructure and street design interventions have not kept pace with the growing popularity of micromobility.

The presence of faster, motorized vehicles in pedestrian spaces and bike lanes creates new points of conflict and potential safety risks. Similarly, micromobility users report feeling unsafe amidst car traffic, especially at higher speeds. Improving safety and addressing the quality-of-life challenges requires addressing multiple, interrelated issues around infrastructure, equipment standards, and traffic enforcement.

New York City has made a great deal of progress on street safety since the adoption of Vision Zero in 2014 and the implementation of hundreds of projects to keep pedestrians, cyclists, and vehicle occupants safe. However, these projects have not necessarily been designed or implemented with e-bikes or other emerging micromobility options in mind. For instance, narrow, unprotected bike lanes are designed to accommodate a small volume of traditional bicycles without consideration for the influx of higher speed e-bikes on City streets that may require small but meaningful upgrades, like the widening of lanes. Updating infrastructure and street design standards to further account for micromobility can help improve safety outcomes and enhance comfort for all road users. A comprehensive approach to micromobility safety will require a combination of infrastructure, regulatory, and traffic enforcement measures.

The sharp rise in popularity of micromobility, combined with a void in proactive management, has contributed to a sense of chaos, disorder, and lawlessness on city streets.

Many New Yorkers report feeling that e-bikes and mopeds have made city streets more dangerous and are unaccountable to existing traffic laws.[36] The phenomenon of “bikelash,” or backlash against infrastructure and policies prioritizing road users outside of automobiles, has been a fixture of New York City transportation politics since at least 2010. The current iteration directed against e-bikes and micromobility comes amidst a time when New Yorkers’ perceptions of safety and quality of life in the city have precipitously declined.[37] The void of proactive management around micromobility has exacerbated what is sometimes referred to as “mode rage” (drawn from the concept of “road rage”), in which individuals feel hostility for other modes of transportation, even those they may utilize at other times.

Recommendations

A comprehensive approach to managing micromobility in New York City requires a combination of supply-side, corporate accountability, enforcement, and infrastructure interventions. The following recommendations cover actions at the local, state, and federal levels to ensure e-bikes and mopeds become a safe, legal, and predictable feature of the city's transportation landscape. These recommendations are designed to rein in the unpredictability and sense of chaos associated with micromobility in New York City to create safer, more livable streets for everyone.

1. **Cut off the supply of unsafe, illegal devices in New York City and beyond.** Preventing consumers from purchasing and using e-bikes and mopeds illegally requires upstream interventions and collaboration between local, state, and federal government agencies.
    a. **Expand capacity at DCWP and FDNY to levy fines, enforce additional penalties, and shut down illegal retailers.** The city agencies tasked with regulating e-bike shops have struggled to curb both brick-and-mortar and online retailers selling uncertified equipment and devices. Attorneys employed by DCWP are responsible for issuing cease-and-desist orders and fines to online retailers violating Local Laws 49 and 50. This is a labor-intensive process as large online retailers like Amazon often ignore or delay responding to enforcement efforts. The City should provide additional funding to DCWP to hire more attorneys and inspectors to issue and enforce violations against retailers.
    b. **Enhance DMV and state-level efforts to enforce new laws and penalties against moped retailers.** Most moped dealerships in New York City are unlicensed because their products do not have VINs, making them illegal. Many moped sellers also brand their products as e-bikes, misleading customers about the legal requirements to purchase and ride one. The DMV must coordinate with FDNY, DCWP, and NYPD to enforce fines, shut down stores operating illegally, and enforce additional penalties against unlicensed moped dealerships. Enhanced enforcement by the DMV against unlicensed retailers is essential to supplement city-level efforts to investigate and shut down these businesses and cut off the influx of illegal vehicles on city streets. New state-level legislation requiring moped registration at the point-of-sale will go into effect in January 2025 and will rely heavily on DMV action. Ensuring the DMV has the resources needed to enforce these laws effectively will be critical to stemming the supply of illegal vehicles on City streets. The state legislature should also pass Senate Bill 7860 to double fines against retailers selling illegal mopeds from $1,000 to $2,000.
    c. **Support federal-level action to cut off the import, manufacture, and sale of unsafe and illegal e-bikes.** E-bike components and batteries that fail to meet basic safety standards are widely available in the US. These e-bikes are more likely to exceed safe speeds and rely on highly flammable batteries. Many of these items are imported from foreign countries and sold to US-based buyers at

lower prices than higher-quality, lab-certified products. Stricter federal oversight can stem the flow of illegal and dangerous devices onto city streets. Specific measures include:

i. **Pass the Setting Consumer Standards for Lithium-Ion Batteries Act (H.R. 1797):** This bill would require the U.S. Consumer Product Safety Commission to set standards for lithium-ion batteries and require any e-bike batteries sold in the US be lab-certified. This legislation would prevent the practice of selling or purchasing substandard batteries in neighboring states for use in New York City.

ii. **Update the Consumer Product Safety Commission's (CPSC) e-bike safety standards:** The CPSC should adopt the three-class system used in New York and other states to define and regulate e-bikes. Under this system, manufacturers and retailers must clearly communicate to consumers which class their products fall under so buyers can make an informed choice and ensure the devices they buy are street legal. The CPSC should also direct manufacturers to recall high-speed devices that do not fall into any of the three e-bike classes and prevent their sale in the US.

iii. **Pass the Import Security and Fairness Act (H.R. 4148/S. 2004):** This legislation, currently pending in Congress, would lower the maximum value of goods that can be imported duty-free from Russia or China to the US. This would ensure untested mobility devices and lithium-ion batteries would face a higher degree of scrutiny from US customs officials and prevent unsafe items from entering the country.

2. **Create a City-administered licensing program that regulates app-based delivery companies and holds them accountable for the and labor and street safety impacts of their business model.** Improving street safety outcomes requires holding app-based delivery companies accountable. The street and traffic safety impacts of the industry are closely related to companies' reliance on algorithms designed to maximize the number of deliveries in short windows of time. A city-enacted licensing program can establish minimum labor, safety, and equipment standards with which companies must comply to legally operate within New York City. A licensing scheme should supplement minimum pay protections and the existing program capping delivery and transaction fees[38], and feature the following requirements:

   a. **Data Sharing:** Companies must share real-time, anonymized data with DOT about popular routes, pick-up and drop-off locations, times of day, and driver speeds. Delivery apps generate and hold a large volume of data that could inform targeted infrastructure investments to improve street safety. Data sharing must be a requirement for delivery companies that wish to operate in the city. This data should also be publicly available on Open Data.

b. **Safety and Equipment Training**: Companies should require workers to complete a city-administered traffic safety course prior to making deliveries through their platform. The course should cover technology basics, rules of the road, and laws and requirements specific to both e-bikes and mopeds. City agencies, or qualified community organizations, should conduct these courses on a regular basis and in multiple languages, reflecting the linguistic diversity of delivery workers. A combination of licensing fees and financial penalties paid by app companies, revenue from traffic tickets paid by delivery workers should fund this training program.

c. **Regulating Algorithms:** The City should regulate the algorithms used by app-companies to limit the pace of work for people making deliveries, prevent trip "stacking" in which workers are required to complete an unreasonable number of deliveries within a set timeframe, and prevent app companies from routing delivery workers on bridges and streets with speed limits over 30 mph. The City should design regulations to prohibit the kinds of trips that incentivize speeding and reckless driving and impose strong penalties to hold app-companies accountable if such trips still take place. Regulations should prohibit passing along fines to workers or subtracting the cost of any fines from a worker's paycheck. Penalties collected should supplement funding for battery and equipment swaps, e-bike charging infrastructure, safety and equipment trainings, and financial relief options for delivery workers.

d. **Safe Operation Accountability Protocol:** The City, the app-based delivery companies, and worker representative organizations should negotiate terms for a safe operation accountability protocol designed to improve safety outcomes. These parties should tailor the program to delivery workers who accumulate excessive fines for traffic violations such as speeding, running a red light, and riding on sidewalks. Delivery workers in the program who complete reckless driver accountability courses and demonstrate improved driving records (e.g. a number of consecutive months without additional violations issued) should be provided with financial relief and penalty reductions. Delivery workers who persistently fail to improve driver behavior should be subject to a fair and progressive schedule of consequences including temporary suspension and for the most reckless drivers, deactivation. The City, app-companies, and worker representatives should negotiate appropriate terms.

e. **Accountability for Illegal Vehicles**: To ensure that app-companies support workers in using street-legal vehicles and are held accountable for the proliferation of illegal mopeds, app-companies should receive a sizeable fee/penalty (e.g. $10,000) for any moped that is seized during the course of a delivery made on behalf of the app. The City should strictly prohibit companies from passing the fines along to workers.

f. **Pay Transparency:** App companies must provide clear, upfront information about how they calculate total pay, tips, and on-call and active time to workers.
g. **Deactivation Protections:** Delivery workers are consistently at-risk of deactivation and lockouts by app companies for declining orders or failing to complete a certain number of orders within a fixed timeframe. A licensing program for app companies must contain provisions to protect workers from arbitrary deactivations. Without the immense pressure of making deliveries swiftly to avoid deactivation, workers will be far more likely to drive responsibly.
h. **Deliverista Hubs:** Revenue from an app licensing program should support the creation of Deliverista hubs in neighborhoods that experience high volumes of deliveries. These hubs should provide workers refuge from inclement weather, access to mobile device charging stations, safe facilities for bike battery charging, as well as essential resources related to workers' protections and bike repairs.
i. **Violation Penalties**: The City should subject app companies that violate deactivation protections, algorithm regulations, and labor standards to strict fines and penalties. Fine revenue should support programs to fund battery swap programs, e-bike charging infrastructure, and safety training for delivery workers. Workers should also have the private right of action in the event of unauthorized deactivation or wage theft.

3. **Require restaurants to certify that the delivery workers they directly employ are using safe, street-legal equipment, and hold those restaurants accountable when workers are found to be using illegal equipment.** While app-based delivery companies are responsible for the dramatic increase of delivery workers in New York City, there remains a large population of delivery workers who retain direct employment with local restaurants. In 2013, NYC DOT enforced a new law directing restaurants to provide delivery cyclists they employed with safety equipment including helmets, headlights and taillights, reflective vests, bells, and effective brakes.[39] Restaurants that failed to do so could face fines of up to $250 for each violation. This law already requires delivery workers to carry cards that display their employer's name, address, and contact information while on the job, to facilitate enforcement. The City should update these requirements to ensure delivery workers employed directly by individual restaurants are using safe, street legal devices to make deliveries. Restaurants should be required to certify that all delivery workers directly employed or contracted by them are using street-legal vehicles to make deliveries on their behalf, and receive penalties and fines when workers are found to be using illegal vehicles. The restaurants should be liable for paying fines and penalties issued to delivery workers while they were in the course of making deliveries on the restaurant's behalf, via the employer and address found on the delivery worker's employment cards.

4. **Curb reckless driving and enhance accountability for riders who violate traffic laws.** Ensuring New Yorkers feel safe and comfortable on city streets amidst all modes of travel requires a shift in both culture and behavior. It is essential that people using faster and heavier modes of travel, including mopeds, e-bikes, and automobiles, know the rules of the road and follow them. Enforcement needs to be consistent and predictable, rather than random and overly punitive. Traffic enforcement for e-bikes and mopeds should target behaviors most likely to harm other road users or evade accountability. The City should also experiment with educational programs as a means of changing rider behavior. Specific actions include:
    a. **Foster a culture of accountability around street safety at the NYPD to create more predictable, safer streets:** Enforcement, along with education and engineering, is a key pillar of Vision Zero. The City's original 2014 Vision Zero action plan directed the NYPD to conduct more vigorous street enforcement against dangerous moving violations.[40] However, efforts to step up police enforcement against reckless driving have faltered over the past ten years. The number of traffic citations issued by the NYPD declined by 37% between 2018 and 2023, even as fatalities jumped by 25% over the same period.[41] Advocates have long pointed out the failure to enforce laws prohibiting blocking or parking in bike lanes. Despite posing risks to cyclists' safety, vehicles double-parked in bike lanes rarely receive fines. Fewer than 2% of 311 reports of vehicles parked illegally in bike lanes result in a ticket from the NYPD.[42] As a key partner in achieving Vision Zero, the NYPD Highways Division and Traffic Enforcement District must be adequately resourced and prioritized within the department to bring about a culture shift to ensure all road users know the law and follow it, including moped and e-bike riders. This must include enforcement against vehicle parking in bike lanes, which drives e-bikes onto sidewalks and into crosswalks and driving lanes, creating unpredictable and unsafe conditions for pedestrians and drivers alike.
    b. **Target enforcement to focus on the most high-risk behaviors associated with mopeds.** With fewer illegal and unregistered vehicles on the street as the result of the supply-side interventions laid out above, NYPD capacity would be freed to up to focus enforcement actions specifically to target the following high-risk behaviors:
        i. Reckless driving, especially on sidewalks and in bike lanes.
        ii. Forging licenses or vehicle registrations.
        iii. Obscuring license plates or using a fraudulent plate.

        The Department of Sanitation (DSNY) and NYPD should also expand the new joint Ghost Car Task Force to include the seizure of mopeds with forged, obscured, and fraudulent license plates on City streets. [43]
    c. **Establish a reckless driving education program for moped riders repeatedly cited for violating traffic laws.** A program modeled on the Dangerous Vehicle

Abatement Program (DVAP) tailored to motorized two-wheelers can hold the most dangerous riders accountable in a manner that centers restorative justice and prevents recidivism. The DOT-administered pilot sunset in October 2023, eliminating the only program imposing consequences for reckless driving beyond static fines.[44] Consequences for violations should prioritize a restorative, education-forward approach tailored to motorized two-wheelers; where dangerous riders fail to comply with the education components of their course, the City should seize their vehicle. Funding for this program could be supplemented by auctioning off seized, unclaimed street-legal vehicles of reckless drivers.

d. **Earmark revenue from traffic violations involving e-bikes, e-scooters, and mopeds to fund micromobility safety programs** including NYC DOT's battery swap program and the E-Bike Battery Charging Pilot. This fund could also finance new initiatives to help delivery workers purchase UL-certified e-bikes and batteries via low-APR loans and discount programs.

5. **Invest in high-quality infrastructure and street design solutions to support the safe integration of micromobility into New York City streets.** Thoughtfully implemented infrastructure and transportation design can simultaneously improve safety while addressing quality of life issues around e-bikes, mopeds, and micromobility. These include:
    a. **Street design measures**
        i. **Wider protected bike lanes:** Bike lanes need to be wider to accommodate micromobility devices of varying speeds, especially throughout major corridors with high volumes of cyclists and micromobility users. Typical lanes are five feet wide and do not give riders adequate space to ride side-by-side. Wider lanes of 10 to 12 feet give riders space to ride side-by-side and safely pass one another, as shown in Images 1 and 2. Such lanes are standard internationally, including Dronnig Louises Bro (Image 3) and Norrebrogod in Copenhagen and on Amsterdam's PlusNet network. NYC DOT has already expanded some bike lanes to 10 feet, most notably on 10th Avenue in Manhattan.
        ii. **Smart mobility lanes:** Modeled on bicycle streets common throughout Germany and Holland, the City should explore implementation of streets designed for e-micromobility at slow speeds.[45] Smart mobility lanes (SMLs) are a concept proposed by the design firm Gehl to describe neighborhood streets with low traffic volumes designed primarily for cyclists and pedestrians while also accommodating all types of micromobility, including e-bikes. They are similar to "limited local access" open streets found in New York City, but would not allow for private vehicles. Streets exclusively for micromobility are a new concept and

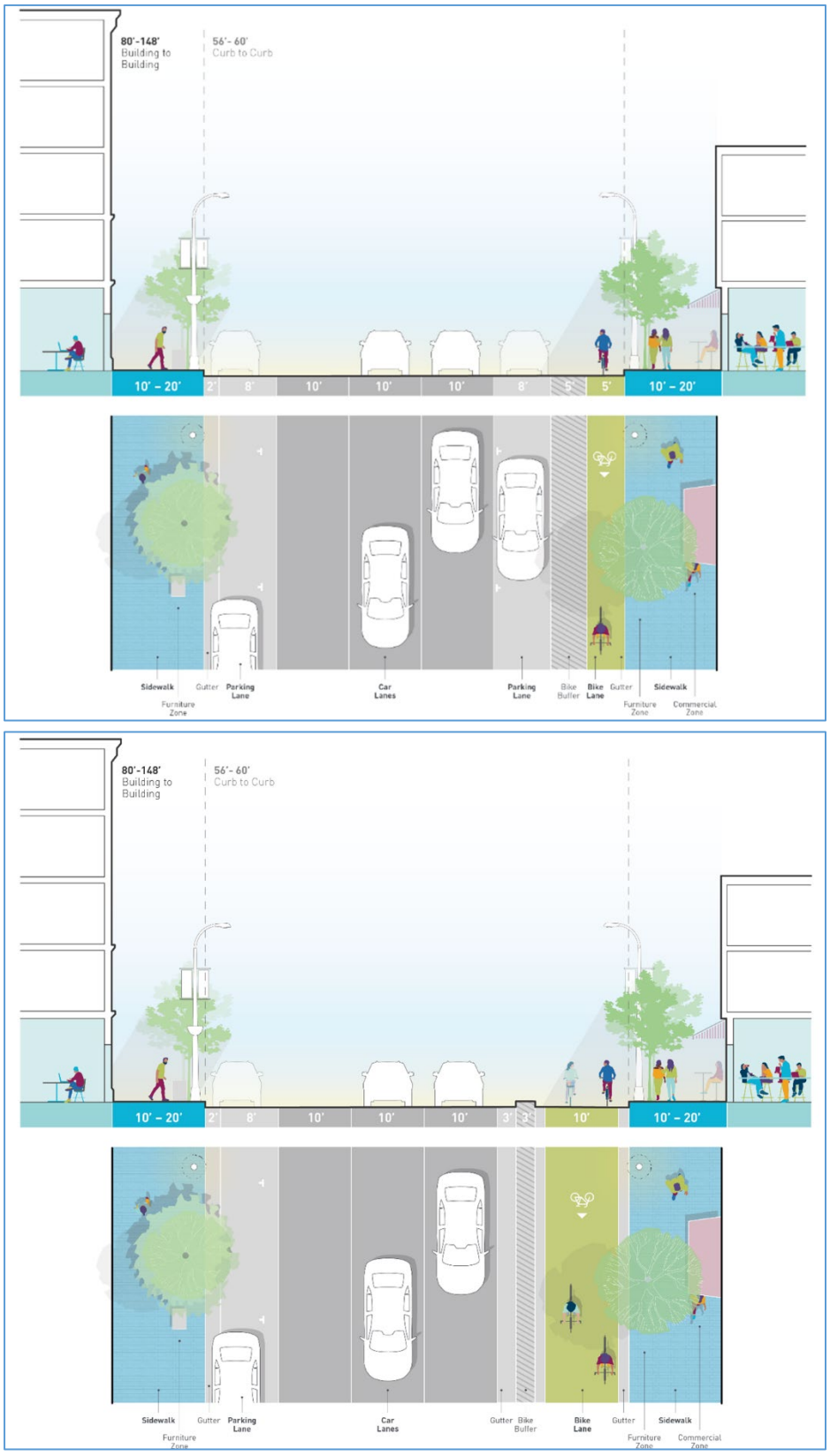
New York City could be the first city to implement one. DOT should decide where to pilot these lanes based on data provided by app-based delivery companies on popular routes and trip volumes.

iii. **Traffic calming:** Traditional traffic calming tools including rumble strips, texturing, cobblestones, chicanes, bollards, and zig-zags can reduce speeds and improve safety (Image 4). To reduce the speeds of electric micromobility devices in pedestrian spaces, intersections, and other strategic locations, DOT should implement these traffic calming tools to change rider behavior and create more predictability for all street users.

b. **Curb management measures**:

i. **Rest hubs, parklets, and e-bike parking:** A lack of dedicated space for e-bike riders and delivery workers to park their devices and wait for orders leads to overcrowding and obstruction of sidewalks and pedestrian spaces. The City should explore repurposing street space previously dedicated to outdoor dining sheds to create parklets that offer e-bike parking and short-term rest areas for delivery workers in a way that keeps sidewalks free and clear for pedestrians.

ii. **Neighborhood loading zones (NLZ):** Following the boom in e-commerce and deliveries to private residences, space for delivery vehicles to load and unload goods are a necessity on residential streets. As of August 2024, NLZs make up approximately 20% of the total number of commercial loading zones.[46] Further investment and implementation of such spaces can help reduce double parking and sidewalk riding at the end of delivery trips in New York City.



Source: Gehl

These images depict an example of using and existing curbside lane to expand a bike lane from 5 ft to 12 ft on an NYC avenue.

Source: Gehl

Dronning Louises Bro, one of the busiest bridges for bikes and e-mobility Copenhagen. Private vehicle use is restricted on this corridor, allowing for widening of the cycle lane.

Source: Suantara Darma/Shutterstock

6. **Ensure and expand the use of safe, affordable e-bikes and batteries.** The City and State must scale up the existing limited programs directed at providing e-bike riders with street-legal equipment to improve safety outcomes. Wider participation in these programs will ensure electric micromobility is safe and affordable for New Yorkers.
    a. **Increase funding for a battery swap program** established in fall 2023 by Local Law 131 that would allow individuals to receive low-cost, high-quality batteries in exchange for surrendering illegal lithium-ion batteries.[47] The City should expand this program using fees paid directly by delivery app companies.
    b. **The New York State legislature should pass S.314/A.275**, which would direct the New York State Energy and Development Authority to establish a ride clean rebate program for e-bikes and e-scooters.[48] The law, sponsored by Senator Julia Salazar, would make e-bikes, and e-scooters that are compliant with all State regulations eligible for a 50% rebate up to $1,100.

7. **Expand safe, convenient e-bike charging facilities to incentivize widespread adoption of UL-certified equipment.** The lack of safe, convenient e-bike battery charging locations in New York City has incentivized charging devices in residential buildings, leading to fires caused by faulty lithium-ion batteries. Curbing e-bike battery fires requires enacting and investing in the following programs:
    a. **Expand NYC DOT's E-Bike Battery Charging Pilot,** which provides spaces for delivery workers to safely charge their devices and swap batteries. The pilot currently enrolls about 100 delivery workers.[49] It is necessary to scale this program up to serve a larger portion of the 80% of delivery workers riding e-bikes in NYC.
    b. **Expand the Safe Charging Accelerator program to cover all residential properties.** Starting next year, individual property owners and businesses can apply for permits to install chargers on streets and sidewalks outside of their buildings. Residential building owners can apply for permits but only if their properties have commercial storefronts. DOT should further mitigate the risk of indoor battery fires by allowing all residential buildings to participate in the program. Rules governing the program should also require the installation of charging stations in the roadway, rather than the sidewalk, to preserve pedestrian space.
    c. **Prioritize the installation of public e-bike chargers in outer borough neighborhoods where large numbers of delivery workers reside**. The current pilot installed chargers at only three locations, all of which are in Manhattan. A newly introduced bill, Intro 1084, would require DOT to install 175 e-bike charging hubs in commercial areas throughout commercial areas in the five boroughs over the next five years.[50] While this is a helpful measure, more charging infrastructure is essential in areas where delivery workers reside so that

they may charge their batteries overnight. DOT should invest in additional charging infrastructure in residential areas with high concentrations of delivery workers to support a shift back from mopeds to e-bikes, in addition to expediting charger installation permits in these areas.

8. **Create a program to guide delivery workers and low-income community members through the process of obtaining a driver's license and registering mopeds.** New York State's Green Light Law, passed in 2019, allows all New Yorkers over the age of 16 to apply for and receive a standard driver's license regardless of legal status. Navigating DMV bureaucracy can still be challenging for delivery workers and undocumented New Yorkers, especially those for whom English is a second language. To ease this process, the state DMV, in partnership with the City, should develop a program to provide delivery workers, low income New Yorkers, and undocumented New Yorkers with comprehensive resources, personalized support, and clear guidance on how to obtain a valid driver's license and register their vehicles. The DMV and City should distribute these resources at Deliverista Hubs and during any safety or training programs offered to workers.

9. **Collect and publicly report accurate, detailed data about crashes, injuries, and fatalities involving e-bikes, stand-up scooters, mopeds, and other devices.** Currently available sources of crash data do not provide a clear picture of the safety impacts of micromobility. While data on crash fatalities held internally by DOT establishes the heightened risks of these devices to riders following their legalization, this data is not publicly available. DOT and NYPD should work together to collect and standardize detailed crash data on fatalities as well as injuries stemming from incidents involving e-bike, scooter, and moped riders. This data must be made public and categorized based on vehicle type in order to ascertain clearer trends about street safety and inform infrastructure and enforcement interventions.

Conclusion

The growing presence of micromobility devices on city streets represents a major trend in New York City's transportation landscape. E-bikes, scooters, and mopeds offer tens of thousands on New Yorkers an affordable and convenient means of transportation, but the proliferation of these vehicles poses new safety and quality of life concerns. Managing these impacts is a multi-faceted challenge for government agencies, touching upon supply-side, labor, traffic enforcement, and infrastructure issues for which there is no single solution.

The comprehensive approach outlined here offers serious steps forward for managing micromobility. Such an approach should balance the climate and convenience advantages these devices offer with the safety and livability problems they raise — for their riders and everyone else on the road.

Success depends on spurring a much-needed shift in the culture of New York City streets, where people know the rules and follow them. This shift is achievable while still supporting advances in cycling and people-oriented infrastructure. Striking this balance is essential to deliver safer, more livable streets for all New Yorkers.

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Endnotes

[1] The legal definition of "micromobility" in New York City encompasses e-bikes and e-scooters, but not mopeds, which are considered limited-use motorcycles. The term "motorized two-wheelers" encompasses all three of these devices, as well as traditional motorcycles. This report focuses on the recent proliferation of e-bikes and mopeds and uses the term "micromobility" to refer to both. The Equipment Overview section provides more detail on terminology

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