

Zoning for E-mobility

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Why is Zoning for E-Mobility Important?

- Transportation is responsible for 29% of total greenhouse gas emissions (EPA)
- Carbon monoxide, nitrogen oxides, and hydrocarbons are released when fuel burns in an internal combustion engine. Engine emission pollutants cause damage to lung tissue and can lead to and aggravate respiratory diseases, such as asthma. Motor vehicle pollution also contributes to the formation of acid rain. (DEC)
- E-bikes, e-scooters, and other micromobility vehicle services are one transportation solution, eliminating additional traffic on streets and contribute to the reduction of greenhouse gas emissions
- Starting in 2035, New York requires all new cars to be zero emission

AND THE LAST TASK IN
THE EXAM IS TO PARK
IN THE PLUG.



Gatis
Sluka
SLUKA2017

Some EV (very) Basics

- Two types of EVs: battery electric vehicles (BEVs) and plug-in hybrid electric vehicles (PHEVs). BEVs use an electric motor that is powered solely by a battery. PHEVs contain both electric motors and gasoline engines. They use the electric motor, at times selectively, until the battery is depleted, and then the vehicle switches to the gasoline engine
- While most charging can be done at home or at work, public charging plays a vital role in driving EV adoption. Charging an EV is a different experience than fueling a car at a gas station. Rather than waiting until the fuel gauge is near empty, EV drivers often take advantage of opportunities to “top off.” While it takes longer to charge your car with electricity, it can be accomplished while you are doing something else. Thus, public charging can provide a boost to local businesses because EV drivers often seek out chargers they can use while enjoying a cup of coffee, dining or shopping nearby.

Source: Northeast States for Coordinated Air Use Management

The Comprehensive Plan

- As always, efforts should start with the Comprehensive Plan. The Plan should identify both general and specific goals
- Comprehensive Plan can set the tone for all future electrification projects by encouraging chargers in homes, promoting charging equipment in parking lots
- Plan can identify cost-effective sites that increase value to EV drivers:
 - - Dwell times between 2 to 4 hours
 - - 240V power near parking spaces
 - - Easily accessible and open 24 hours
 - - Larger parking lots with excess spaces
 - - “Green” image value to host/community
 - - Easy to find along major roadways
 - - Lighting at night
 - - Protected from harsh environmental conditions (NYSERDA)

City of New Rochelle Plan

- 6.31: Build a Green Parking Facility at the Maple Avenue Lot and provide car share parking, electric vehicle and downtown bus recharging.
- Key Concept: Encourage Sustainable Transportation
- Explore strategic infrastructure investments to support new technologies for sustainable transportation, such as electric vehicle charging stations, hydrogen powered buses and other alternative-fuel vehicles.
- 8.35: Expand supply of electronic vehicle charging stations and alternative fueling stations
 - To support and encourage use of low emission vehicles, the City should expand its supply of electric vehicle charging stations in municipal parking lots and encourage gas additional gas stations within the city to provide alternative fueling options.

Code Elements - Definitions

- A number of different definitions of EVs are accepted.
- Battery Electric Vehicle “any vehicle that operates exclusively on electrical energy from an off-board source that is stored in the vehicle’s batteries, and produces zero tailpipe emissions or pollution when stationary or operating.”
- More common is the inclusive “Electric Vehicle” definition - any vehicle that operates, either partially or exclusively, on electrical energy from the grid, or an off-board source, that is stored on-board for motive purpose. “Electric vehicle” includes:
 - (a) A battery electric vehicle; or
 - (b) A plug-in hybrid electric vehicle

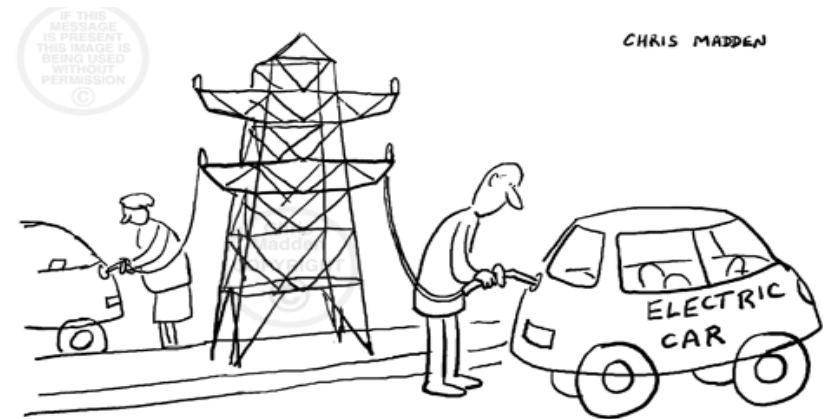
ELECTRONIC VEHICLE CHARGING STATION - An electric vehicle charging station, also called EV charging station, electric recharging point, charging point and EVSE, is an element in an infrastructure that supplies electric energy for the recharging of plug-in electric vehicles, including all-electric cars, neighborhood electric vehicles. All such stations will include designated and exclusive parking for vehicles charging.

Code Elements – Charging Equipment

- “Level 1 is considered slow charging and operates on a fifteen to twenty amp breaker on a one hundred twenty volt AC circuit.
- Level 2 is considered medium charging and operated on a forty to one hundred amp breaker on a two hundred eight or two hundred forty volt AC circuit.
- Level 3 is considered fast or rapid charging and operated on a sixty amp or higher breaker on a four hundred eighty volt or higher three phase circuit with special grounding equipment. Level 3 stations can also be referred to as rapid charging stations that are typically characterized by industrial grade electrical outlets that allow for faster recharging of electric vehicles.” (Chelan WA)

Charging Equipment Locations

- Some codes allow equipment everywhere, others limit Level 3 locations
- Permitted locations.
- (1) Level 1 and Level 2 charging stations are permitted in every zoning district, when accessory to the primary permitted use. Level 2 charging stations shall be subject to building permit approval.
- (2) Level 3, or DC fast charge, charging stations are permitted by right in the following zoning districts when accessory to the permitted use. Installation thereof shall be subject to building permit approval.
 - (a) Commercial-Light Industrial District (C-1).
 - (b) Commercial District (C).
 - (c) Industrial District (I).
- (3) Level 3, or DC fast charge, charging stations are permitted by special permit in the following zoning districts when accessory to the permitted use:
 - (a) Agricultural-Residential District (A-R).
 - (b) Riverfront District (R-F).
 - (c) Special Development District (S-D) (Town of Brutus)



Atlanta, Georgia Code

- “Permitted accessory uses and structures Uses and structures which are customarily accessory and clearly incidental to permitted principal uses and structures shall be permitted in this district. Devices for the generation of energy, such as solar panels, wind generators and similar devices, as well as electric vehicle charging stations equipped with Level 1, Level 2, and/or DC Fast Charge EVSE are allowed.”
- Electric vehicle charging stations equipped with Level 1 or Level 2 are allowed as a permitted accessory use and structure in all zoning districts, and charging stations equipped with DC Fast Charging are allowed as a permitted accessory use and structure in the following zoning districts: Commercial; Industrial; SPI -11, -15, -16, -18, -20; PD-MU, -OC, and – BP; Martin Luther King, Jr. Landmark; Neighborhood Commercial; Live Work; and Mixed Residential Commercial.

EVSE Provisions Town of Brutus Code

- Design standards and other criteria for electric vehicle supply equipment.
- (2) Electric vehicle charging station, public use.
- (a) Electric vehicle parking and charging stations shall be equal to parking space size and performance standards as provided in § 125-32 of this chapter. The installation of electric vehicle supply equipment shall not reduce the electric vehicle parking space length to below off-street parking space size and standards required under § 125-32.
- (b) Installation of EVSE shall meet National Electrical Code Article 625.
- (c) Charging station outlets and connectors shall be no less than 36 inches and no higher than 48 inches from the surface where mounted.
- (d) Adequate electric vehicle charging station protection, such as concrete-filled steel bollards, shall be installed. Curbing may be used in lieu of bollards if the charging station is set back a minimum of 24 inches from the face of the curb.
- (e) Adequate site lighting should be provided unless charging is for daytime purposes only.
- (f) If time limits or vehicle removal provisions are to be applied, regulatory signage including parking restrictions, hours and days of operation, towing, and contact information shall be installed immediately adjacent to, and visible from, the electric vehicle charging station.
- (g) When EVSE is placed in a sidewalk or adjacent to a walkway, it shall not interfere with the minimum pedestrian clearance widths as defined in Chapter 11 of the New York State Building Code. Accessibility. Cords, cables, and connector equipment shall not extend across the path of travel within a sidewalk or walkway.

Encouraging EVs

- The International Code Council recommends adopting or amending codes to require new builds to have 240V plugs for Level 2 chargers. It appears that most EV charging happens at home, yet most homes don't already have a Level 2 EV charger installed.
- Can a New York municipality require new builds to contain charging infrastructure? Be equipped with chargers?
 - No clear authority to do so
 - State law terminates sales of non-Evs in 2035, implicitly supports authority to require chargers in homes

Encouraging EVs - Permit Streamlining

- Reducing permitting time and costs incentives EV charging installation
- Town of Otto Zoning Code:

§ 6.6 Electric Vehicle Supply Equipment (EVSE)

The permitting process for EVSE will be streamlined by:

1. Providing a single permit for EVSE's
2. Shall have a two day turn around time for permits
3. Shall eliminate reviews that do little to validate the safe and efficient operation of a proposed EVSE system. Only one initial inspection shall be required for this facility.

Parking: There will be designated parking for vehicles charging at the EVSE. Cars that are not charging will be banned from these spaces.

Encouraging EVs - Multifamily

- Forbes reports that studies show 85% of EV charging happens at home, but multifamily sites – where approximately 80 million Americans currently live – don't usually have this access.
- “Multiple-Family Residential Land Uses: all new, expanded and reconstructed parking areas shall provide the electrical capacity necessary to accommodate the future hardwire installation of Level 2 EVCSs for a minimum of 10% of required parking spaces.”
- “1. Multiple-family residential land uses shall have 10% of required parking as Level 1 stations for resident parking, and one Level 2 station for guest parking. At least one handicapped accessible parking space shall have access to an EVCS.” (St, Louis, MN)

Encouraging EVs – Commercial/Residential

- Mandating EVSE is fairly common approach.
- “The minimum number of electric vehicle charging stations required is 1 electric vehicle charging station per 50 parking spaces.” (Montgomery County, MD)
- “For new occupancies subject to this section: at least 1 parking space for each 25 residential units shall feature energized outlets.” (Howard County, MD)
- “Any new development that requires 25 or more parking spaces, as calculated by Section 40.04 of these regulations, shall have a minimum of 1 charging space or 3% of the total number of spaces allocated to Electric Vehicles (EVs) (whichever is greater) and must have a Level 2 or 3 charging station/connection per EV parking space.” (Middletown, CT)

Encouraging EVs – Incentive Zoning

- Incentive zoning is the granting of a bonus (such as a larger building or more density in a subdivision) in return for a benefit to the municipality the developer would not otherwise have to provide.
- The goal would be to provide public charging stations in return for a bonus. This is especially useful where public access is limited (a gated community). The charging stations do not have to be at the site – example, obtain charging stations in a public park.

Regulating E-Scooters/E-Bikes



Legalizing E-Bikes/E-Scooters

- New state laws went into effect on August 2, 2020 that authorize the use of E-Bikes and E-Scooters in New York, providing a boost for micromobility options.
- New laws grant municipalities regulatory powers, including the ability to ban or limit the use of Ebikes and E-Scooter
- Municipalities can regulate micromobility companies
- Municipal powers also include setting a lower maximum speeds and banning e-bikes and e-scooters completely.

Case Study: Micromobility in San Diego

- City of San Diego issued a Bicycle Master Plan
 - a Request for Sponsorship through the City's Corporate Partnership Program in search of a partner to develop, install, market and maintain a privately funded bikesharing program in the City
- In 2013, the City of San Diego entered into a ten-year agreement with a private company; DecoBike was designated and referred to as the "Official Bike Sharing Provider of the City of San Diego"

Case Study: San Diego

- What are DecoBikes?
 - E-bikes stationed in large solar-powered corrals or docks
- DecoBike provided approximately \$8 million in infrastructure investment for the City in return for the ability to sell advertising on the bikes and kiosks.
- Decobike enjoyed exclusivity in San Diego and in their first year DecoBike installed 97 stations around the City.



Joshua Emerson Smith, *DecoBike rolls out of San Diego as dockless scooters proliferate*, San Diego Union Tribune (2019)
<https://www.sandiegouniontribune.com/news/environment/story/2019-04-08/decobike-rolls-out-of-the-san-diego-city-as-dockless-alternatives-proliferate>

Case Study: San Diego

- In early 2018, the micromobility floodgates opened in San Diego for other companies.
 - The Office of the City Attorney of San Diego issued a memo which confirmed that the contract between DecoBike and the City did not prohibit other bike sharing/micromobility companies from entering the San Diego market.



BikeSD
https://bikesd.org/wp-content/uploads/2018/11/IMG_3944-1.jpg



Ashley Mackin-Solomon, *'Enough is enough'* — Council member Bry calls for electric scooter moratorium in San Diego, La Jolla Light (2019)
<https://www.lajollalight.com/news/story/2019-07-31/bry-calls-for-electric-scooter-moratorium>

This attracted a host of dockless micromobility companies into the region since these vehicles require less space to park unlike e-bikes, like Decobikes, that require docking stations.

Case Study: San Diego

- Carrot before the stick approach...
 - Initially, the City did not impose regulations on the micromobility share companies
 - The City was not prepared for the increase of micromobility vehicles
- Plans for an additional 77 miles of bikeways underway throughout the City, but the City did not make sufficient progress before the flood of micromobility vehicles entered the market.
 - From the beginning of the Regional Bike Plan Early Action Program in 2013 to 2021, only 12 miles of bikeways are complete, 13 miles are under construction, and 31.5 miles of bikeways are nearing construction.

Case Study: San Diego

- Micromobility vehicles created public safety concerns around the City
- Improper usage of the vehicles led to speeding and accidents in high density pedestrian traffic areas
 - In 2018, there were 44 collisions that involved micromobility vehicles, 13 resulted in serious injuries
 - E-scooters – helmets are optional for adults 18 and older; experiencing more severe accidents
 - Sidewalk and public right-of-way obstructions
 - Lawsuits against the City from disability advocates over vehicles blocking wheelchair access and injuries resulting from people tripping over vehicles in public right-of-ways
 - Scooters found tossed in dumpsters, trees, and fountains



Erin Griffith, *Welcome to San Diego . Don't Mind the Scooters*, New York Times (2019) <https://www.nytimes.com/2019/09/04/technology/san-diego-electric-scooters.html>



Ashley Mackin-Solomon, *Electric vehicles in La Jolla staged against city rules trigger complaints*, La Jolla Light (2020) <https://www.lajollalight.com/news/story/2020-07-31/electric-vehicles-in-la-jolla-staged-against-city-rules-trigger-complaints>

Case Study: San Diego

- In July 2019, City regulations and permitting process went into effect for micromobility vehicles; this created incentives to hold companies accountable for their actions and weed out bad actors¹
- Permits (issued by City Manager)
 - Limited amount of permits
 - Only issued twice a year (January and July)
 - Permits only valid for six months; expire the following July or January, depending on when the permit is issued
 - Permits may be renewed at the City Manager's discretion and if operator is compliant with local laws and agreement terms
 - Operator required to submit a performance bond or similar security
 - Labeling requirements on micromobility vehicles
 - Operator agrees to indemnify, defend, and hold the City harmless from claims and damages arising out of or related to operator's activities under the permit or operation of its business in the city

¹ Amended San Diego Municipal Code, Chapter 8, article 3, adding Division 3 "Share Mobility Devices"

Case Study: San Diego

■ Fees

- Non-refundable fee for each micromobility device that will be in company's fleet used on City property
- Estimated at \$5,000, plus \$150 per device; each company sets its own limits on their fleet size, upon City Manager's approval
- Incentive – reduction of the per-device fee if company adopts a program acceptable to City Manager that increases ridership opportunities to low income individuals

Case Study: San Diego

- The new regulations included restrictions on zones where micromobility vehicles could operate or park based on high pedestrian and vehicle traffic impact areas.



- Outright prohibition of operating micromobility vehicles
- Preventing parking and locking of micromobility vehicles
- Limiting the speed of micromobility vehicles using geofencing technology

Case Study: San Diego

City Municipal Code Section 84.18

- Prohibits the use of motorized transportation devices on Boardwalks (specifically, on the public walkways in Mission Beach, Coronado, Pacific Beach, and La Jolla)
- “Motorized transportation device” includes:
 - shared mobility devices, electric bicycles, motorized bicycles, and motorized scooters as defined in section 83.0302...
- Section 84.18 lays out the locations where motorized transportation devices are prohibited:
 - “(1) beginning at the South Mission Beach Jetty northward to the terminus of the public walkway at Ocean Boulevard at Law Street in Pacific Beach”

Case Study: San Diego

City Municipal Code Section 83.0310

(a) Shared mobility devices shall not be parked, displayed, offered, or made available for rent.

(2) **within 40 feet of another shared mobility device** on a City sidewalk or other City property located in the **beach impact area in the Parking Impact Overlay Zone** as defined in Chapter 13, Article 2, Division 8 of this Code, except in groups of up to four where the shared mobility devices are spaced no more than one foot apart.

(3) **on a City sidewalk located in the Downtown Community Plan area** as defined in Chapter 15, Article 6, Division 3 of this Code.

(4) on City sidewalks or other City property on the block adjacent to a location designated by the City for shared mobility devices

(5) in Disabled Persons Parking Zones

(6) within 500 feet of a hospital

(7) within 500 feet of a school that offers instruction on those courses of study required by the California Education Code...

(8) within six feet in any direction of any sign marking a designated bus stop or trolley stop...or any transit shelter, bench, or information kiosk associated with the bus stop or trolley stop.

Case Study: San Diego

City Municipal Code Section 83.0310

(a) Through geofencing or similar technology, an operator shall reduce the speed of any motorized scooters and motorized bicycles in the operator's fleet to **eight miles per hour** or less at the following locations:

- (1) on the public walkways within Balboa Park;
 - (2) on the public walkways within Liberty Station NTC Park;
and
 - (3) on the public walkways within Spanish Landing Park
and Trail.
- The City imposed further speed limit restrictions (maximum of 3 mph) in areas such as: Martin Luther King Promenade, North and South Embarcadero pedestrian walk, and sections of Mission Bay Park

Case Study: San Diego

- What is geofencing?
 - The creation of a virtual geographic boundary, defined by GPS, RFID, or other technology that enables an operator to regulate speed, issue notifications, take other actions, when a shared mobility device in its fleet enters or leaves an area - San Diego Municipal Code §83.0302
- As a condition of the permit, operators are required to use geofencing in high traffic identified areas for limiting speeds, preventing locking and parking of vehicles, or ending the ride.

Takeaways from this case study

- Local municipalities should take a balanced approach when it comes to regulating micromobility vehicles which should also include a robust permitting process
- Ensure regulations are in place BEFORE companies enter the market
- Consider the impacts that micromobility vehicles will have in various zones (such as Parking Impact Overlay zones) and restrict accordingly
- Consider additional tools to implement to ensure public safety for all riders and pedestrians on the streets (ex: complete streets)
- Sufficient regulation to minimize accidents and prevent obstructions on public right-of-ways but not too much to constrict the market or stifle innovation

Shared Ride Services Best Practices

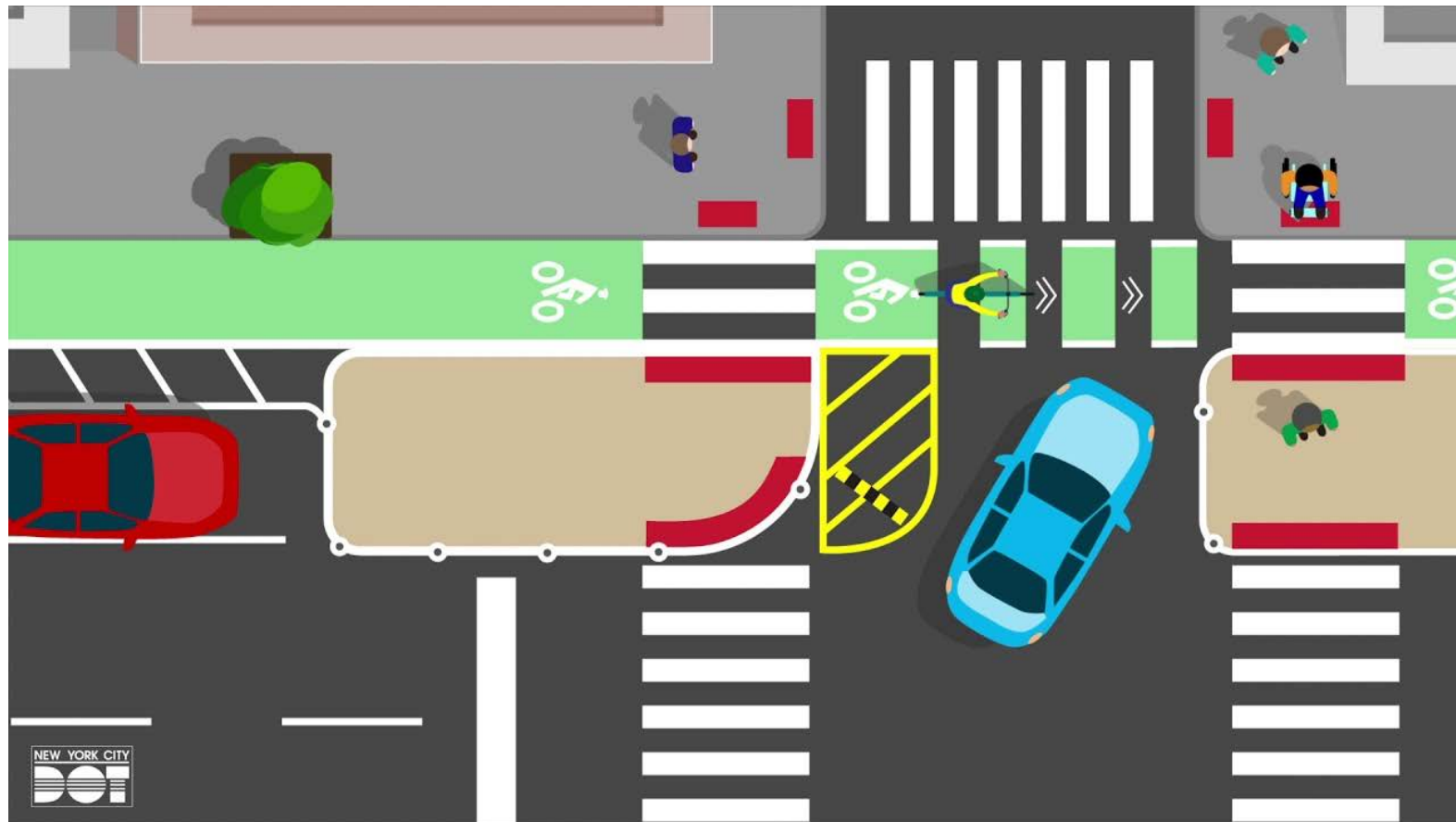
- Shared micromobility services should be only allowed to operate in the public right-of-way with legal permission (e.g. license, permit, contract) from the local government.
- Company must designate who will be responsible for fielding complaints, addressing technical difficulties, coordinating the rebalancing and removal of scooters parked illegally and providing public education. (ex: “Get It Done” App)
- The city should reserve the right to:
 - Terminate permits at any time, for due cause, including causes not specified in the regulatory agreement, and require the operator to remove their entire fleet of vehicles from city streets.
 - Limit the number of companies operating (e.g. cap the number of permits or licenses issued, and/or issue exclusive contracts, permits, or licenses).
 - Limit the number of vehicles that any individual company can deploy, on a per-permit basis.
 - Prohibit specific companies from operating in the public right-of-way based on conduct or prior conduct (e.g. if a company deploys equipment prior to applying for a permit, license, or contract, or fails to comply with permit, contract, or license terms).

Shared Ride Services Best Practices

- Cities should limit the duration of licenses and permits to a fixed time period (e.g. 6-12 months) and require all companies to re-apply for each renewal.
- Contracts developed as the result of competitive bidding processes may have a longer duration.
- Contracts should reserve the right to update permit terms over time.
- Cities should require that operators provide written notice, at least 14 days before ceasing operations, if they are no longer willing or able to provide service in the city.

Solutions for implementing e-mobility safely in cities

Complete Streets



What are complete streets?

- Streets designed to enable safe access to all users - pedestrians, bicyclists (including E-bikes and E-scooters), motorists, and transit riders
- The design of complete streets will vary based on the community context...
 - Sidewalks
 - Wide-paved shoulders
 - Bump outs (curb extensions)
 - Special transit lanes
 - Lane striping
- Save money on future transportation retrofits with infrastructure design in mind to enhance pedestrian safety, reduce congestion, provide more efficient travel within a community, and spur economic development (i.e., compact mixed-use with retail, commercial, and residential spaces)

Complete Streets cont...

- In 2011, Governor Cuomo signed the Complete Streets Act (Chapter 398, Laws of New York)
 - requires state, county and local agencies to consider the convenience and mobility of all users when developing transportation projects that receive state and federal funding
- NYSDOT and local agencies are responsible for implementing this law but this only applies to projects *undertaken by NYSDOT*, or local projects that receive both federal and state funding subject to NYSDOT oversight
- It is up to local municipalities to adopt the Complete Streets practices for locally funded projects
- In New York, there are currently over 100 local municipalities and 15 counties that have passed Complete Street resolutions and/or adopted such policies.¹

¹ <https://www.dot.ny.gov/programs/completestreets/Counties%20and%20Municipalities%20with%20Resolutions>

Complete Streets - City of Buffalo

- The City incorporated complete streets into planning and is defined within its Zoning Code as:
 - Complete Streets: facilities that are designed and operated to enable safe access for all users. Persons with disabilities, pedestrians, bicyclists, motorists and transit riders are able to safely move along and across a complete street. – City of Buffalo Zoning Code § 413-68
- The City delegated authority to the Commissioner of Public Works, Parks, and Streets to include pedestrian and bicycle facilities for all new street construction, street reconstruction, street maintenance, public works and park projects undertaken by the City of Buffalo.
- Placed the City of Buffalo Bicycle and Pedestrian Advisory Board in a consulting capacity for implementation of complete streets.

City of Buffalo Complete Streets results

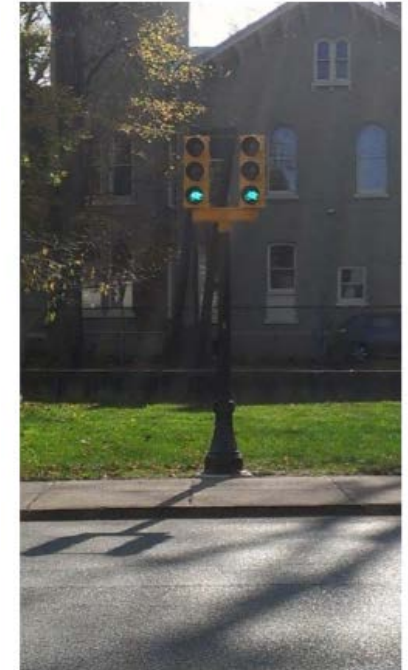


Contra-Flow Bicycle Lane installed on Linwood Avenue

https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-11-08_BuffaloComplete%20Streets_Final%20Report.pdf



Elmwood Ave Cycle Track



Dedicated bicycle signal at North and Linwood Avenue

<https://www.dot.ny.gov/divisions/engineering/technical-services/trans-r-and-d-repository/C-13-51.pdf>