Expanding Affordable E-Mobility Options: Low-Speed Vehicles

April 2025

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U.S. Department of Transportation
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14. ABSTRACT

Low-Speed Vehicles (LSVs), also known as Neighborhood Electric Vehicles (NEVs), are one option that can help expand available transportation choices in the U.S. As small electric motor vehicles with a maximum speed of 25 mph, LSVs can provide benefits to both individuals and communities, including more vehicle choices at lower price points, mobility and accessibility, increased curb use efficiency, and reduced emissions. LSV safety in a variety of operating environments is a topic that this paper begins to address but recognizes that more research is needed. Local governments and regional planners can play a major role in developing local LSV capacity and enabling LSV use, through tools and strategies that include: street infrastructure, Level 1 and 2 charging, curb management, collaboration with delivery companies on loading zones, microhubs, and parking; and municipal policy incorporating LSVs into fleets and personal or shared e-mobility options. State and federal action may also play a role in enabling LSVs for zero-emission local travel. State and Federal agencies could, for example, conduct research on emerging vehicle types, use cases, and associated policy issues as additional research needs for LSVs are identified.

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List of Abbreviations

Abbreviation	Term
AGM	Absorbed glass mat
COG	Council of governments
DC	Direct current
EV	Electric Vehicle
FHWA	Federal Highway Administration
FMVSS	Federal Motor Vehicle Safety Standards
GHG	Greenhouse gas
LSV	Low-Speed Vehicle
LTN	Low-speed travel network
mph	Miles per hour
NACTO	National Association of City Transportation Officials
NEV	Neighborhood Electric Vehicle
NHTSA	National Highway Traffic Safety Administration
SUV	Sport utility vehicle
UTV	Utility vehicle
ZEDZ	Zero-emission delivery zone

Executive Summary

Low-Speed Vehicles (LSVs), also known as Neighborhood Electric Vehicles (NEVs), are one option that can help expand available transportation choices in the U.S. LSVs, small electric motor vehicles with a maximum speed of 25 mph, can provide benefits to both individuals and communities, including more vehicle choices at lower price points, mobility and accessibility for people who cannot drive a full-sized automobile, increased curb use efficiency, and reduced greenhouse gas (GHG) emissions and air quality impacts.[1]

LSVs, a transportation mode distinct from faster passenger vehicles, are available for a variety of use cases, including personal travel, shared mobility (e.g., circulator and on-demand shuttles), freight and cargo, and municipal vehicles. LSV safety in a variety of environments – such as interactions between LSVs and people walking or biking, as well as LSVs sharing roads with larger and faster vehicles – is a topic that this paper begins to address. However, more research is needed to ensure that LSVs, as a viable transportation option, can ensure a safe experience for all road users. This paper notes setting lower community roadway speeds, at 25 mph or less, as one dimension of LSVs that has the potential to contribute to roadway safety.

Local governments and regional planners can play a major role in developing local LSV capacity and enabling LSV use. Tools and strategies available at the local level include:

- **Infrastructure:** Design streets and complete networks to safely accommodate a range of vehicle types and minimize conflicts between LSVs and other modes.
- **Charging:** Reduce barriers to installing, incentivizing, or providing more Level 1 and 2 chargers.
- **Curb Management and Parking:** Manage parking and curb space to accommodate and encourage smaller vehicle types, including LSVs. Collaborate with delivery companies on loading zones, microhubs, and parking.
- **Municipal policy:** Incorporate LSVs into municipal fleets and consider policies to enable the adoption of personal LSVs and shared e-mobility options such as local circulators.

State and Federal action may also play a role in enabling LSVs for zero-emission local travel. State and Federal agencies could consider guidance to accommodate a variety of vehicle types and conduct research on emerging vehicle types, use cases, and associated policy issues as additional research needs for LSVs are identified.

[1] https://www.fhwa.dot.gov/publications/research/safety/17098/003.cfm

1. Introduction

Access to a wide range of affordable, convenient, and well-suited transportation options to perform everyday local trips impacts the quality of life of people in large cities and small towns alike. Unlocking the choice for more people to use low speed vehicles (LSVs) for local travel could help expand those transportation options.

1.1 More tools for local travel

While the overwhelming majority (86 percent) of daily trips in the U.S. are taken in automobiles (cars, vans, SUVs, and pickup trucks),[2] a substantial number of those trips are relatively short. More than half of daily vehicle trips in the U.S. are five miles or less, and more than a third are three miles or less (Figure 1).[3] Additionally, most automobiles can carry up to five people, yet the average occupancy of vehicle trips is 1.5 persons.[4]

These statistics point to a "missing middle" of transportation that can meet the needs of many **local, daily trips** in the U.S.[5] While transportation options exist in some U.S. communities, including walking, biking, and public transit, many residents in other communities face practical barriers to completing local trips without an automobile. Barriers may range from infrastructure to land use patterns to lack of public transit.

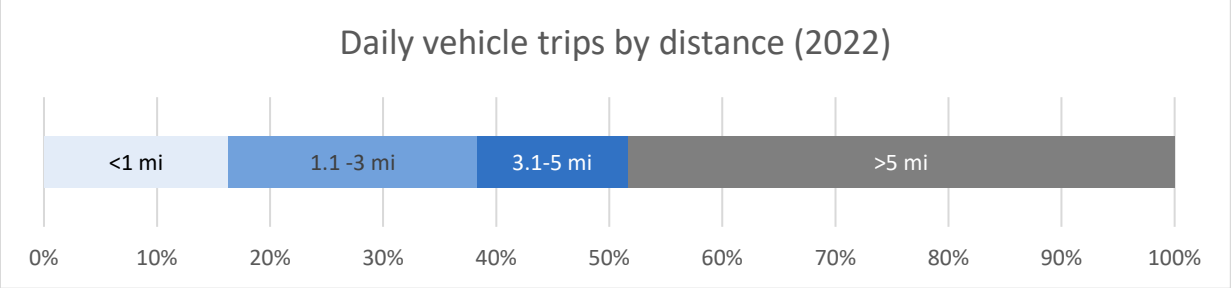

Figure 1. Daily vehicle trips by distance (2022)

This document focuses on one vehicle type that could help fill this gap and **add another choice** for everyday trips. **Low-Speed Vehicles (LSVs),** also known as **Neighborhood Electric Vehicles (NEVs)**,[6] are a

[2] National Household Travel Survey (NHTS) 2022: https://nhts.ornl.gov/person-trips
[3] NHTS 2022: https://nhts.ornl.gov/vehicle-trips
[4] https://www.energy.gov/eere/vehicles/articles/fotw-1333-march-11-2024-2022-average-number-occupants-trip-household
[5] There are a wide range of small-format e-mobility types, including micromobility (e-bikes, e-scooters, etc.), electric mopeds and motorcycles; however, this white paper focuses on LSVs, a vehicle format that may not be familiar to many policymakers outside of a few communities where they are commonly used.
[6] See the text box below labeled "LSV or NEV?" for a full discussion of the definitions of these two terms.

distinct class of motor vehicles federally defined as four-wheeled vehicles that cannot exceed speeds of 25 mph and cannot weigh more than 3000 lb. [7] LSVs have the potential to be an affordable, efficient option for last-mile delivery fulfillment, first-mile transit connections, and municipal fleets. Adding LSVs to the transportation toolbox could help expand transportation choices and complement other travel modes, including walking, biking, rolling, taking transit or ridehail, and driving.

Figure 2. An LSV in use by park rangers at Mammoth Cave National Park in Kentucky. LSVs are a distinct vehicle class from golf carts and are designed for on-road use. (Image source)

LSVs are regulated under Federal Motor Vehicle Safety Standards (FMVSS) No. 500 and are already available in the United States.[8] Since LSVs can be used legally on local roads in many communities without new Federal or State policies, these communities may consider opportunities for potential LSV adoption immediately. For decades, LSVs have been used in a limited number of communities in the Sun Belt, but they are gaining prominence as more States develop rules governing their use on public roads.

LSV or NEV?

The terms "low-speed vehicle (LSV)" and "neighborhood electric vehicle (NEV)" are often used interchangeably but have a few key distinctions. As regulated by the National Highway Traffic Safety Administration (NHTSA), LSVs are defined in 49 CFR 571.3 and 571.500. While NEV is not a vehicle category at the federal level, NHTSA noted in a 2012 Report to Congress that the definitions of NEV and LSV given in the final rule establishing FMVSS No. 500 makes it clear that NEVs are a type of LSV and thus regulated by FMVSS No. 500.[9]

Most states (37) use the term "LSV" in their regulations of road use by small vehicles with a top speed of 25 mph, while 9 states use "NEV" for low-speed electric vehicles. Many of the states that use the term NEV specifically note that these vehicles must meet FMVSS 500 (See Appendix C), with the

[7] 49 CFR 571.3 defines Low-speed vehicles as: "a motor vehicle, (1) That is 4-wheeled, (2) Whose speed attainable in 1.6 km (1 mile) is more than 32 kilometers per hour (20 miles per hour) and not more than 40 kilometers per hour (25 miles per hour) on a paved level surface, and (3) Whose GVWR is less than 1,361 kilograms (3,000 pounds)." https://www.ecfr.gov/current/title-49/subtitle-B/chapter-V/part-571/subpart-A/section-571.3

[8] Under FMVSS No. 500, LSVs are generally not required to comply with other FMVSS that establish requirements for occupant protection and crash avoidance performance.

[9] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf

primary distinction behind the use of NEV in these states being that the vehicles are required to be electrically powered.[10]

While some gas- or diesel-powered vehicles could be considered LSVs but not NEVs, in practice the vast majority of LSVs available on the market are battery electric vehicles (99.8% of LSVs in use in 2008 were electric according to U.S. DOE),[11] making the terms largely synonymous.

Figure 3. Left – LSVs with pickup bed for employee use at Lawrence Berkeley National Lab in Berkeley, CA. Right – Utility LSVs at Emory University in Decatur, GA (U.S. DOT Volpe Center)

Beyond providing alternatives for personal, local trips, LSVs can expand vehicle options available to businesses and municipalities. LSVs come in a variety of formats, including passenger configurations and utility vehicle formats, such as truck-like configurations with either pickup beds or box vans (Figure 3). These small-format utility vehicles, popular in university and other campus environments,[12] could also be a context-appropriate fit for a variety of uses in municipalities, park systems, and commercial delivery fulfillment, particularly in communities with limited curb access. Municipalities and commercial interests may consider incorporating LSVs into their vehicle fleets for scenarios in which affordable, small-format vehicles could more flexibly serve needs currently met by full-sized automobiles, as shown in Table 1.

[10] The vast majority of states define LSV or NEV based on some combination of factors from the federal definition of LSV in 49 CFR 571.3, including: four wheeled, top speed of 25 mph, and GVWR <3000 lb. A few states use substantially different definitions for either LSV or NEV with elements that do not align with the federal definition, including "3 or 4 wheels" (Minnesota – NEV; Ohio – LSV) or "maximum speed of 35 miles per hour" (Texas – LSV), but would encompass all LSVs. One state (New Mexico) uses the term "neighborhood electric car" and references 49 CFR 571.500 in the definition; while two states (Colorado, Montana) use the term "low-speed electric vehicle" (LSEV), with definitions that vary substantially from the federal definition of LSV but would cover LSVs. See Appendix C for a full breakdown.

[11] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf

[12] E.g., Kennedy Space Center: https://www.fmlink.com/articles/kennedy-space-center-polaris-gem-electric-vehicles/

Table 1. Examples of corporate and municipal LSV use by use case category.

Patrol Vehicle	 Law enforcement (Brea, CA)	 Public safety (University of Maryland, Baltimore[13])	 Ranger fleet vehicle (Mammoth Cave National Park, KY[14])
Maintenance and Operations	 Groundskeeping (University of Georgia)	 Parks operations (Banff, Canada) [15]	 Maintenance vehicle (Vanderbilt University, TN)
Shared Mobility	 **Local circulator**[16] for first/last-mile connections (Boca Raton, FL)		
Last-mile freight	 Postal Delivery Canada Post (Ottawa, Canada)	 Postal delivery PostNord (Ystad, Sweden) [17]	 Postal Delivery Correos (Spain)[18]

[13] https://elm.umaryland.edu/elm-stories/2023/Electric-Vehicles-On-Patrol.php
[14] https://www.facebook.com/MammothCaveNPS/posts/throughout-the-park-you-may-see-rangers-driving-small-electric-vehicles-called-g/5296423723709468/
[15] https://www.banff.ca/CivicAlerts.aspx?AID=1708
[16] City of Boca Raton: https://myboca.us/2460/BocaConnect---Circuit-Shuttle
[17] Ystad, Sweden 2021. Photo by John Leffmann: https://commons.wikimedia.org/wiki/File:Postnord_-_%28bil%29_-Ystad-2021.jpg
[18] https://forococheselectricos.com/2013/11/fagor-ederland-compra-comarth-vehiculos-electricos.html

Golf carts versus LSVs

While golf carts and LSVs can be of similar size and may travel at similar speeds, they are distinct vehicle types. Golf carts are considered off-road utility vehicles, while LSVs are a type of on-road motor vehicle. Of the two, only LSVs are regulated by NHTSA under FMVSS No. 500, which sets requirements, such as, vehicle weight, speed, and safety equipment[19] that golf carts generally do not meet. Unlike golf carts, LSVs can be legally operated on certain public roads in all U.S. States (see LSV road use rules across the U.S.). These distinctions are further discussed in Appendix A - Taxonomy of LSVs and related vehicle types.

Figure 4 Golf cart (left) vs. LSV (right). (Image source Wikimedia: Golf cart, LSV)

Required equipment to meet the federal LSV safety standard for on-road use, which are absent on the golf cart (left) but present on the LSV (right), include (non-exhaustive list): rear-view mirrors, head and tail lamps, seatbelts, and a windshield. Note that while the presence of these items is required under FMVSS 500,[20] nearly all of the equipment on LSVs is not required to meet the minimum level of performance required by the FMVSS for these items that are required on regular passenger vehicles.

This paper describes strategies and tools to help municipalities enable LSV adoption for personal use, municipal vehicles or service fleets, and delivery fulfillment. Notably, many of the strategies that apply to personal LSV use are also applicable to other use cases, like freight.

This white paper is first and foremost intended as a resource for local officials and regional planners to understand LSV capacity and consider the potential role of broader LSV use in their communities.

[19] https://www.ecfr.gov/current/title-49/subtitle-B/chapter-V/part-571/subpart-B/section-571.500
[20] https://www.nhtsa.gov/sites/nhtsa.gov/files/tp-500-02.pdf

1.2 How LSVs can benefit communities

Expanding opportunities for LSVs can offer improved mobility and can complement existing clean transportation investments in the U.S. While automobiles can be appropriate for many trip types, a reliance on them for nearly all trips and contexts introduces challenges for communities, including safety, affordability, environmental, and operational issues. When LSVs can serve more daily trips, they may help address some of the transportation challenges that communities face today, as summarized in Table 2.

Table 2. Community transportation challenges and how LSVs may help address them.

Topic	Surface Transportation Challenges in Communities	How LSVs Could Help Address these Challenges
Safety	• **People walking, biking, and rolling face a safety crisis**. More than one in five road deaths in 2022 were pedestrians or bicyclists.[21] [22] • **Vehicle height is increasing, contributing to increased risks** for people outside of the vehicle. A 10 cm height increase in a vehicle's front end has been linked to 22 percent increase in pedestrian crash fatality risk.[23]	• Traffic calming interventions to create a community-wide, LSV-friendly **low-speed (<25 mph) road network** may improve safety for everyone, including pedestrians. • Crashes between lower speed, lower-profile vehicles like LSVs and pedestrians **may pose reduced fatality risk to the pedestrian as** compared to crashes with faster, taller vehicles.[24]

[21] https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813581; https://crashstats.nhtsa.dot.gov/Api/Public/ViewPublication/813560

[22] FHWA Strategic Plan FY2022-2026. https://highways.dot.gov/sites/fhwa.dot.gov/files/2023-05/FHWA_Strategic_Plan_05.25.23.pdf

[23] J. Tyndall, "The effect of front-end vehicle height on pedestrian death risk," Economics of Transportation, vol. 37, 2024.

[24] https://highways.dot.gov/safety/pedestrian-bicyclist/safety-tools/synthesis-methods-estimating-pedestrian-and-bicyclist; https://www.iihs.org/news/detail/vehicles-with-higher-more-vertical-front-ends-pose-greater-risk-to-pedestrians

Topic	Surface Transportation Challenges in Communities	How LSVs Could Help Address these Challenges
Affordability and Access	• The cost of automobile ownership is a **financial burden** for many households and can prevent low-income individuals from attaining the same level of mobility as higher-income individuals.[25] • A growing portion of the population will **age out of driving** as baby boomers start reaching age 80 in 2026.[26]	• LSVs provide **more vehicle options at lower price points,** potentially allowing people to use income on other needs. • More vehicle options offer **mobility and accessibility** for people who cannot drive a full-sized personal vehicle.
Curb and Land Use Efficiency	• Vehicles have become larger, leading to more **space demands for parking**.[27] • Shifting consumption patterns have necessitated more curb space for **food and parcel delivery vehicles**.	• LSV delivery vehicles can **increase curb use efficiency**, as they have **smaller physical footprints** than automobiles and can help lessen demands on curb and street space needs.

[25] U.S. Department of Transportation, Bureau of Transportation Statistics. "Household Spending on Transportation: Average Household Spending". https://data.bts.gov/stories/s/Transportation-Economic-Trends-Transportation-Spen/ida7-k95k/

[26] https://www.census.gov/library/stories/2019/12/by-2030-all-baby-boomers-will-be-age-65-or-older.html

[27] "Vehicle front-end geometry and in-depth pedestrian injury outcomes," Traffic Injury Prevention, vol. 25, no. 4, pp. 631-639, 2024.

Topic	Surface Transportation Challenges in Communities	How LSVs Could Help Address these Challenges
Environment	• The transportation sector is the largest source of GHG emissions in the U.S., representing nearly one-third.[28] The **majority of these GHG emissions is from personal automobiles**.[29] • Personal vehicles emit a wide range of other **air pollutants** linked to health and environmental harms.[30] [31] • Municipalities face challenges to **rapidly electrify their fleets to meet GHG reduction goals**. To rapidly decarbonize the transportation sector, vehicle electrification will need to be paired with strategies to reduce vehicle miles traveled, including investments in public transit and active transportation, as well as land use strategies to enable shorter trips and more travel choices.[32]	• Fewer trips made by automobile can help **reduce pollution emissions.** • Electric LSVs **do not have tailpipe emissions,** and smaller EVs (like LSVs) **use less energy per mile driven** than larger EVs,[33] meaning that less electricity supply is needed to power them. This **could help reduce demand on local electric grids**. • LSVs can be an **affordable entry point for municipalities** to invest in electrifying their fleets and begin to decarbonize the transportation sector.

[28] "Sources of Greenhouse Gas Emissions 2022", US EPA, 2023. https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions
[29] "Emissions of Carbon Dioxide in the Transportation Sector", CBO, 2022 https://www.cbo.gov/publication/58861
[30] https://www.fhwa.dot.gov/environment/air_quality/
[31] https://www.sciencedirect.com/science/article/pii/S1361920913001107
[32] https://www.transportation.gov/sites/dot.gov/files/2024-07/DOT%20Report%20to%20Congress%20Decarbonizing%20US%20Transportation%20072924%20final.pdf
[33] Weiss, Martin, et al. "Energy Efficiency Trade-Offs in Small to Large Electric Vehicles." *Environmental Sciences Europe*, vol. 32, no. 1, Dec. 2020, p. 46, https://doi.org/10.1186/s12302-020-00307-8.

2. The LSV landscape in the U.S.

LSVs have been around for decades in the U.S. They have been used as a personal transportation option as well as in freight and municipal service fleet applications. Non-LSV, small-format cars and trucks that can be driven at higher speeds as well as 2- and 3-wheel EVs, which are not regulated as LSVs, are acknowledged in Appendix A.

2.1 Personal use

LSVs have a long history of use in some communities across the U.S., particularly in the Sun Belt and coastal areas as well as on some island communities.[34] Some of these communities include Peachtree City (GA),[35] The Villages (FL),[36] Sun City (AZ), and Lincoln (CA).[37] Some of these are "golf cart communities," designed with specific path systems for golf cart and LSV use. In addition to LSVs, many of these communities feature heavy use of golf carts for transportation, which may be allowed on public roads under special municipal or State laws.[38] LSVs have been growing in popularity for local personal travel in a variety of communities across the U.S., from Charleston, SC[39] to the New Jersey shore[40] to Southern California.[41] Growing interest in LSVs has led more States to formalize LSV road use rules in recent years.[42]

2.2 Freight and municipal fleets

Beyond personal vehicle use, LSVs for urban freight and municipal fleets can address issues of sustainability and affordability as well as curb use and land efficiency. Shifting delivery trends influenced by increased e-commerce options and related changes in consumer behavior are impacting the volume of deliveries and their locations in urban areas. Same-day package deliveries direct to consumers' doors are resulting in higher package volumes in residential neighborhoods, shifting deliveries away from

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[34] E.g.: https://sullivansisland.sc.gov/residents/golf-cart-low-speed-vehicles
[35] https://library.municode.com/ga/peachtree_city/codes/code_of_ordinances?nodeId=PTIICOOR_CH78TR_ARTIIIMOCA_S78-94REPAUSUT
[36] https://thevillagesflorida.com/golf-cart-requirements/
[37] https://www.lincolnca.gov/en/living-here/golf-cart-and-nev-routes.aspx
[38] E.g., South Carolina: https://casetext.com/statute/code-of-laws-of-south-carolina-1976/title-56-motor-vehicles/chapter-2-specialized-vehicles/article-1-low-speed-vehicles/section-56-2-105-golf-cart-permit-and-the-operation-of-a-golf-cart
[39] https://charlestoncitypaper.com/2024/08/23/learn-the-rules-how-to-stay-safe-when-taking-your-golf-cart-on-the-road/
[40] https://www.inquirer.com/business/new-jersey-beach-golf-carts-20240728.html
[41] https://southbaycities.org/programs/local-travel-network/
[42] E.g., Connecticut formalized rules around LSV road use in 2024: https://www.cga.ct.gov/2024/act/pa/pdf/2024PA-00020-R00SB-00183-PA.pdf

commercial and industrial neighborhoods where cities have previously anticipated and planned for deliveries with supporting infrastructure (e.g., loading zones, warehouse locations for last-mile deliveries) and into residential areas.[43] At the same time, competing curb needs have been evolving in recent years with varying uses from rideshare pick-up/drop-off to outdoor seating for small businesses.

Within this changing context, small-format delivery vehicles like LSVs have the potential to help meet last-mile delivery needs while addressing curb use challenges and shifting consumer preferences. With their substantially smaller footprints than other last-mile delivery vehicles, like delivery vans and box trucks (Table 3), LSVs could help reduce geometric conflict between delivery vehicles, other modes, and other curb uses.[44] This may benefit residential areas where street infrastructure is less well-equipped to handle increasing delivery volumes[45] as well as busy commercial districts featuring multiple modes and curb uses. Implementing LSVs (Table 3) could lead to faster deliveries in dense neighborhoods, more efficient use of curb loading and unloading space, and reduced traffic congestion and reductions in emissions.[46] Shifting a portion of last-mile delivery in such areas from large trucks to smaller-format delivery vehicles could also help reduce fatality risk in crashes with vulnerable road users, such as pedestrians and bicyclists.[47] While large trucks comprise 5 percent of registered vehicles, they accounted for approximately 7 percent of pedestrian fatalities and 10 percent of bicyclist fatalities in 2019.[48] In 2021, these fatalities rose to 631, the highest since 1979.[49]

LSVs have been piloted for last-mile delivery uses in several countries. Canada Post introduced LSVs for postal delivery in Ottawa in 2022.[50] Across Europe, postal services including PostNord (Sweden and Denmark),[51] La Poste (France),[52] and Correos (Spain)[53] have introduced electric LSV-equivalent vehicles into their fleets (Table 1).

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[43] Biking-the-Goods-Urban-Freight-Lab-White-Paper.pdf (urbanfreightlab.com)

[44] Note that while LSVs may contribute to reduced user conflict with other modes in delivery scenarios, occupant protection safety for the occupants of LSVs requires further study to ensure that safety needs for all modes, including the LSV occupants, are met.

[45] https://www.smartcitiesdive.com/news/curbside-ecosystem-e-commerce-congestion-ups/517347/

[46] Biking-the-Goods-Urban-Freight-Lab-White-Paper.pdf (urbanfreightlab.com)

[47] https://www.nyc.gov/html/dot/html/pr2024/e-cargo-bike-on-city-streets.shtml; https://nacto.org/wp-content/uploads/2018/12/2018USDOTVolpe_Downsizing_FINAL_updated12-21-18.pdf

[48] FMCSA: Pocket Guide to Large Truck and Bus Statistics; NHTSA Traffic Safety Facts 2019

[49] https://www.fmcsa.dot.gov/sites/fmcsa.dot.gov/files/2023-11/21T14.xlsx

[50] https://www.canadapost-postescanada.ca/cpc/en/our-company/financial-and-sustainability-reports/2022-annual-report/social-and-environmental.page

[51] https://www.clubcar.com/en-us/resources/brochures-and-videos/club-car-urban-supports-sustainable-logistics-cold-climate; https://etron.se/postnord-valjer-e-tron-ab-som-leverantor-i-stor-upphandling-av-eldrivna-postfordon/

[52] https://www.ingenieros.es/noticias/ver/nuevos-vehiculos-electricos-para-correos-de-francia/1766; https://www.lanouvellerepublique.fr/indre-et-loire/commune/la-riche/la-poste-un-quad-a-la-place-du-deux-roues

[53] https://murciaeconomia.com/archive/13931/un-coche-electrico-de-la-murciana-comarth-protagoniza-un-sello-europeo

There may be similar demand for small-format delivery vehicles in communities across the U.S. In several urban areas, including New York City[54] and Portland,[55] there has been growth in last-mile delivery fulfillment by large-format delivery e-cargo bikes. This suggests that delivery LSVs, which feature similar small footprints and low speeds, could similarly be a tool to expand delivery options and meet delivery demand.

Table 3: LSV last-mile delivery e-mobility vehicles. The vehicle footprint is illustratively compared to a van (not LSV).

Image			
Vehicle	Club Car Urban LSV Standard Van Box[56]	Gem eL XD Delivery[57]	**Comparison:** Mercedes-Benz Sprinter 2500[58] Delivery van (not LSV)
Price	$28,341	$23,056	$63,286
Cargo volume	74 cubic feet	86 cubic feet[59]	319 cubic feet Note: about half is usually unavailable for parcels due to center walking aisle
Footprint	11.9 ft x 5.8 ft	12.2 ft x 4.6 ft[60]	19.5 ft x 6.7 ft
In a 22' x 8' parallel parking spot[61]			

Expanding municipal fleets to include LSVs can be a practical and affordable strategy for municipalities. Utility LSVs, such as those shown in Table 4, can support municipal vehicle use cases, like parks department and maintenance vehicles. These vehicles are well-suited to fulfill similar roles as utility vehicles like pickup trucks but provide additional flexibility due to their small footprint and lower cost.

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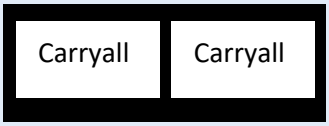
[54] https://www.nyc.gov/html/dot/html/pr2024/e-cargo-bike-on-city-streets.shtml
[55] https://oregonbusiness.com/19307-the-last-mile-home/
[56] https://www.clubcar.com/en/build/vehicle-configuration?model=Urban_LSV&powertrain=FLA&type=Commercial
[57] https://www.gemofcharleston.com/el-xd/
[58] https://www.bostonsprinter.com/new/Mercedes-Benz/2024-Mercedes-Benz-Sprinter+2500-858e5cb8ac1813fca99463d1e2b1646d.htm
[59] https://www.cartmart.com/content/polaris-commercial/gem; https://www.burnslift.com/wp-content/uploads/2022/08/gem-accessory-catalog-2.pdf
[60] https://www.gemcar.com/gem-el-xd/?cmplz-force-reload=1736523084939
[61] MUTCD 2023 (11th edition) fig. 3B-23 (p. 582) https://mutcd.fhwa.dot.gov/pdfs/11th_Edition/part3.pdf

Utility LSVs are already common across college campuses where pickup-bed and box-style LSVs are used by operations and maintenance departments for hauling equipment.[62]

Table 4. Two utility LSVs configured with pickup beds. The spatial footprint is compared to a full-sized EV pickup truck

Vehicle	 Club Car Carryall 510 LSV (LSV)[63]	 Westward Industries MaxEV[64] (LSV)	 **Comparison**: 2024 Ford F-150 Lighting XLT[65] (not LSV)
Price (new)	$20,000	$19,950	$62,995
Cargo bed	4 ft x 3.7 ft	5 ft x 4.2 ft	5.6 ft x 4.2 ft
Curb weight	1656 lb[66]	1630 lb	6,000-9,000 lb
Footprint	9.8 ft x 5.2 ft	12.7 ft x 5 ft	19.4 ft x 6.7 ft
In a 22’ x 8’ parallel parking spot			

LSVs can be configured in a variety of other formats for specialized purposes and can be used in a range of capacities that are currently met with full-sized vehicles. Emory University’s use of LSVs to provide campus dining options to community members while a cafeteria is closed for renovations, and a University of California-Davis student group’s use of an LSV as a mobile food pantry for students (Figure 5) further point to the potential of LSVs beyond the personal travel, freight, and municipal use cases.

[62] https://news.uga.edu/facilities-management-division-introduces-new-electric-fleet/
[63] https://www.clubcar.com/en-us/commercial/street-legal-vehicles/carryall-510-lsv
[64] https://westwardindustries.com/wp-content/uploads/2024/04/MAX-EV-2-Door-Spec-Sheet-1.pdf; https://westwardindustries.com/max-ev-4-lsv-wheel/
[65] https://www.ford.com/trucks/f150/f150-lightning/models/f150-xlt/
[66] https://www.clubcar.com/en-us/build/vehicle-configuration?model=Carryall_510_LSV&type=Commercial

Figure 5. Top, Pickup-configured utility LSVs at Vanderbilt University in Nashville, TN (U.S. DOT Volpe Center). Left, low-speed vehicles on Emory University (Decatur, GA) campus configured as food trucks. Right, a LSV on UC Davis (CA) campus configured as a mobile food pantry (Images: U.S. DOT Volpe Center and UC Davis)

2.3 Road use rules across the U.S.

While federal vehicle standards for LSVs are set by NHTSA (see Appendix A for regulatory distinctions between LSVs, other small motor vehicles, and golf carts), rules regarding operation on public roads are set by each State. While State-level rules regarding LSV operations differ from State to State, LSVs can be permitted to be operated on at least some public roads in all States.[67] Figure 6 provides an overview of State-level laws about the maximum speed limits of roads on which LSV operation is permitted. In 35 States, this limit is 35 mph. Other States (7) have set lower maximum speed limits, while a couple states permit LSVs on higher-speed roads (2). Most States permit LSVs to cross higher-speed roads at intersections, although the maximum speed limit of intersecting roads varies by State.

While LSVs may be permitted to operate on roadways with speed limits greater than 25 mph in some States, this is faster than LSVs can operate. Traveling on roads with speed limits greater than 25 mph may expose LSV occupants to safety risks, as they will experience significant speed differentials with other vehicles. Additionally, LSVs are generally not required to comply with FMVSS for crash protection

[67] In some states, these vehicles are referred to in statutes as "Neighborhood Electric Vehicles" (NEVs) or "Low-Speed Electric Vehicles" (LSEVs).

that other motor vehicles must comply with. Further research is needed to understand the safety implications of LSV operation on such roadways and their interactions with faster moving automobiles.

In many States, local municipalities may set additional restrictions on LSV road use within municipal boundaries. These restrictions are related to safe operations and sometimes include banning the use of LSVs altogether. Some States permit municipalities to allow LSV use on higher-speed roads within the local jurisdiction, and a few States require local municipalities to "opt in" to permit LSV use in their jurisdiction. While two States do not explicitly address LSV road use, they prohibit motor vehicles from operating on roads where they impede the reasonable flow of traffic.

Appendix C provides a table of State-by-State LSV road-use rules, including information about permitting local modifications and links to the Figure 6 State laws and sources.

Beyond the speed limit of roads where LSV operation is permitted, many States also have other restrictions or requirements for operating LSVs on public roads, including:

- LSVs are required to be titled and registered with the DMV. In some States, they may be issued a license plate.[68]
- Operators are required to have a valid driver's license.
- Operators are required to carry insurance.[69]

[68] As one example of a State which requires license plates for LSVs, as well as title, registration, driver's license, and insurance, see Va. Code § 46.2-908.3.
[69] As one example, see Delaware Code Title 21 § 2113A for an example of a State that requires title and registration, driver's license, and insurance: https://delcode.delaware.gov/title21/c021/sc01/index.html

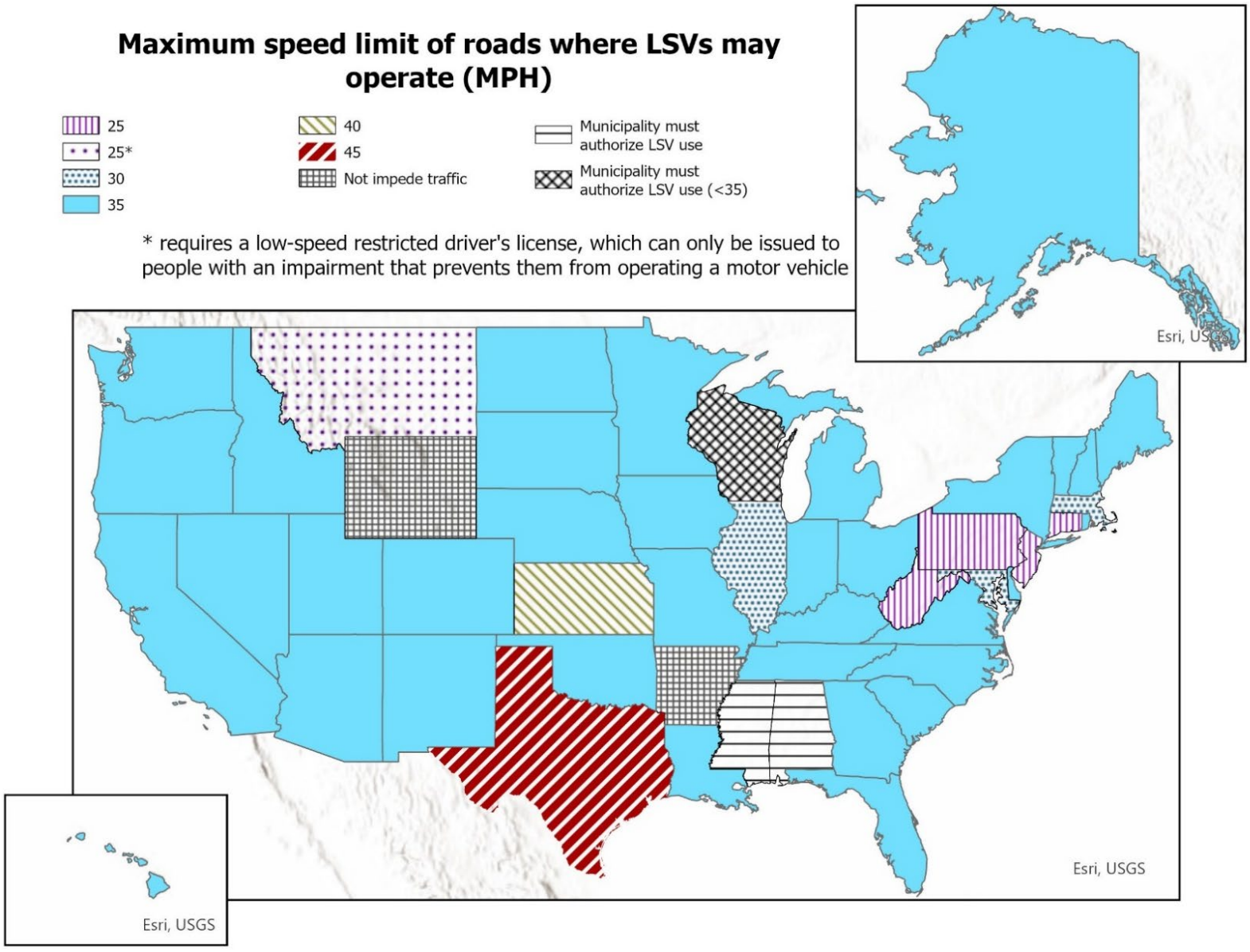


Figure 6. Map of the maximum speed limits of roads where LSVs may be operated.

2.3.1 Road speed context

Even where it is legal for LSVs to be used on roads with 35 mph speed limits, it does not mean that these higher speed roads are a safe or comfortable environment for LSV drivers.[70]

A 2012 NHTSA report to Congress on LSVs stated that low-speed roads with dedicated environments for LSVs without interactions with automobiles and light trucks are the appropriate operating environment for LSV usage and is what NHTSA intended when it established FMVSS No. 500. The report concluded that operating LSVs on roads with speed limits above 25 mph represents a foreseeable safety risk to LSV occupants, noting that safety features such as air bags, required for passenger vehicles and light trucks but not for LSVs, are more critical for saving occupants' lives in high-speed crashes. The lack of these safety systems on LSVs presents risks for their usage in environments where they may encounter larger and heavier vehicles. The report reiterated that LSVs' current safety performance was based on an expectation that LSVs would be used on roads with speed limits no greater than 25 mph. It concluded that for LSVs to safely use roads with speed limits up to 40 mph, they would need to meet a substantially larger set of safety standards.[71]

There is currently limited to no research on the safety performance of LSVs in crashes with people outside the vehicle, including people walking, biking, or rolling. However, given that speed is a primary factor in pedestrian crash fatality risk,[72] and that increases in vehicle height have been identified as a factor in rising fatalities for people walking, biking, and rolling over the past 30 years,[73, 74, 75] LSVs may present a lower safety risk to pedestrians in the event of a crash when compared to a heavier and taller vehicle. However, LSVs are not required to be equipped with automatic emergency braking systems, which will be required on all passenger vehicle and light trucks (but not LSVs) manufactured after September 1, 2030, by the recently established FMVSS No. 127. The requirements of this safety standard require full crash avoidance with pedestrians in different test scenarios. Further research on safety outcomes in crashes between LSVs and people walking or cycling could help fill this knowledge gap on the potential safety effects of increased LSV use in communities.

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[70] Because LSVs are not required to comply with occupant protection performance requirements applicable to rigorous crash tests, unlike passenger vehicles and light trucks, there is limited test data and information about their crashworthiness for occupants in collisions at different speeds. However, the Insurance Institute for Highway Safety (IIHS) conducted a 31-mph side impact crash test of a Gem LSV and a Smart Fortwo, finding that the crash dummy in the LSV experienced forces indicating fatality or serious injury.[70] This limited testing presents serious concerns about LSV occupant safety at speeds above 25 mph in mixed environments with passenger vehicles and light trucks. https://www.iihs.org/news/detail/low-speed-vehicles-and-minitrucks-shouldnt-share-busy-public-roads-with-regular-traffic

[71] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf

[72] https://www.transportation.gov/NRSS/SaferSpeeds

[73] https://www.tandfonline.com/doi/full/10.1080/15389588.2024.2332513

[74] https://www.iihs.org/news/detail/vehicles-with-higher-more-vertical-front-ends-pose-greater-risk-to-pedestrians

[75] https://www.iihs.org/news/detail/vehicle-height-compounds-dangers-of-speed-for-pedestrians

3. Strategies for Enabling LSV Use and Adoption

Local governments and regional planners can play a major role in developing local LSV capacity and encouraging LSV use. This section reviews strategies that municipalities could consider to enable LSV use and adoption.

3.1 Infrastructure

LSVs can largely make use of existing road networks in low-speed contexts. Reducing speed limits and prevailing traffic speeds through Complete Streets network strategies[76] is a primary strategy to safely accommodate LSVs in existing street networks. Reducing prevailing traffic speeds reduces the risk of fatalities and serious injuries for all modes, but particularly for pedestrians, as shown in Figure 7.

Reducing vehicle speeds align with the U.S. DOT National Roadway Safety Strategy and the Safer Speeds[77] principle in the Safe System Approach.[78] Creating appropriate speed limits for all road users is one of the FHWA's Proven Safety Countermeasures,[79] and reducing vehicle speeds is part of the comprehensive Complete Streets roadway safety design strategies that many States and municipalities are adopting.[80]

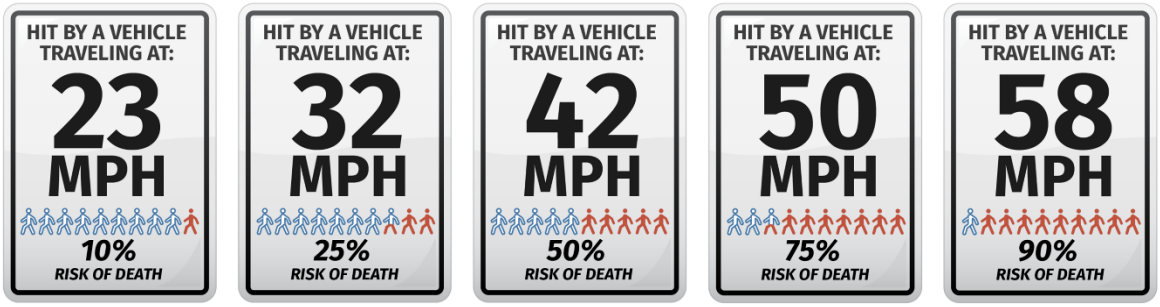

Figure 7. The risk of a pedestrian being killed when struck by a vehicle increases at a non-linear rate as vehicle speed increases. (Image: U.S. DOT National Roadway Safety Strategy)

In a 2012 report, NHTSA noted that U.S. DOT does not encourage LSV use on mixed-traffic roads at speeds above the maximum LSV speed (25 mph), since vehicle safety requirements are designed around the assumption that these vehicles would be used on low-speed streets with traffic speeds of 25 mph or

[76] https://highways.dot.gov/safety/proven-safety-countermeasures/appropriate-speed-limits-all-road-users
[77] https://www.transportation.gov/NRSS/SaferSpeeds
[78] https://www.transportation.gov/NRSS/SafeSystem
[79] https://highways.dot.gov/safety/proven-safety-countermeasures
[80] https://highways.dot.gov/safety/proven-safety-countermeasures/appropriate-speed-limits-all-road-users

lower.[81] NHTSA also noted that several California communities with widespread LSV use have reported that while LSVs are permitted on streets with 35 mph speed limits, only a small portion of users frequently traveled on or felt comfortable using 35 mph facilities.[82] This suggests that roads with traffic speeds above 25 mph are not comfortable for many LSV drivers. Therefore, reducing traffic speeds could be a key strategy for increasing LSV adoption. Communities with longstanding histories of LSV use include retirement communities,[83] planned communities with dedicated LSV-only infrastructure,[84] and campus environments.[85] These types of controlled, low-speed environments are well-suited to LSV use and are consistent with the context in which NHTSA established the vehicle category definition.[86]

Road diets – a term describing a roadway reconfiguration, sometimes reducing the number of travel lanes, lane widths, or incorporating infrastructure supporting other modes (e.g., bike lanes) – are an FHWA Proven Safety Countermeasure that can improve safety and mobility options through traffic calming.[87] Road diets and other measures to lower top vehicle speeds can facilitate safer LSV use and broadly increase safety for vulnerable road users. Resources that municipalities can refer to for guidance on implementing infrastructure-based traffic calming[88] solutions include the FHWA Toolbox of Individual Traffic Calming Measures and NACTO's Urban Street Design Guide Speed Reduction Mechanisms.

To enable LSV adoption, **municipalities can also consider connectivity at the network level**, rather than focusing solely on individual corridors. Municipalities may choose to conduct analyses of the suitability of existing road networks for LSVs. A network level approach can help municipalities identify network gaps and better understand the opportunities for LSV use by residents. These network analyses can consider both integrating LSVs on existing roadways with other modes as well as opportunities for an LSV-only network.

Gaps currently exist in many communities' low-speed street networks that could otherwise be well-suited for local travel by LSVs. As an example, Figure 8 compares the urban core and outlying suburban street networks of Columbus, OH. In Ohio, LSVs are prohibited on roads with speed limits over 35 mph.[89] The second panel of Figure 8 shows that removing the higher-speed roads where LSVs are prohibited from the network isolates suburban neighborhoods between which residents cannot legally drive LSVs. While the urban core remains well connected by roads with 35 mph speed limits, LSV drivers on these roads are likely to experience at least a 10-mph speed differential, which may be uncomfortable and unsafe. By limiting roads to the "comfortable network" of 25 mph and lower speed limits (third panel of

[81] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf
[82] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf
[83] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf
[84] For example: https://www.lincolnca.gov/en/living-here/golf-cart-and-nev-routes.aspx
[85] For example: https://newsreleases.sandia.gov/sandia-national-laboratories-photovoltaic-vehicle-receives-greengov-presidential-award/
[86] https://www.federalregister.gov/documents/2006/04/19/06-3590/federal-motor-vehicle-safety-standards-low-speed-vehicles; https://www.nhtsa.gov/interpretations/07-005545as
[87] https://highways.dot.gov/safety/proven-safety-countermeasures/road-diets-roadway-reconfiguration
[88] https://highways.dot.gov/safety/speed-management/traffic-calming-eprimer
[89] https://codes.ohio.gov/ohio-revised-code/section-4511.214

Figure 8), the suburban context becomes highly fragmented, and sections of the urban core network become disconnected islands. Design changes to reduce speeds to 25 mph or less on additional roads, particularly on critical links in the road network, can help bridge these islands and make LSVs feasible for more local trips throughout an entire city, town, or region.

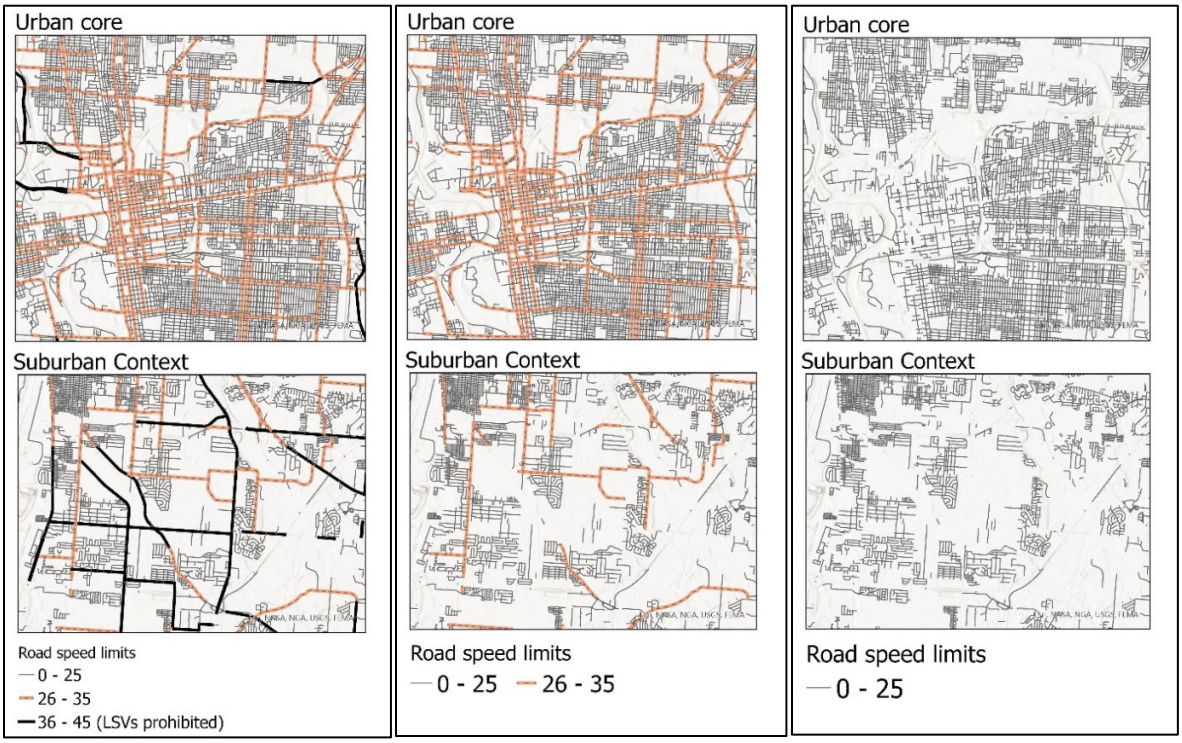

Figure 8. Columbus, OH urban and suburban <45 mph (left), <35 mph (center), <25 mph (right) street network.

Some municipalities and regions have engaged in network-level planning for low-speed networks for LSVs. The South Bay Cities COG Local Travel Network (LTN) is one example of a region considering network-level connectivity for LSVs, largely using existing street networks. In contrast, the Peachtree City, GA Multi-Use Path Master Plan is an example of local network-level planning for LSVs using an off-street path system. Some of the approximately 100 miles of path system run parallel to roads, while others run mid-block or between cul-de-sacs to make trips by LSV more direct and convenient than is possible by automobile (Figure 9). Fayette County, in which Peachtree City is located, "is working diligently to expand its network of paths with the intention of linking the path systems of all of [its] cities."[90] Peachtree City's municipal code only permits use of LSVs on the multi-use path system if the vehicles are operated in a mode that does not allow them to exceed 20 mph.[91]

[90] https://www.fayettesheriff.org/245/Golf-Cart-Ordinance
[91] Chapter 78, Article III Section 78-94: https://library.municode.com/ga/peachtree_city/codes/code_of_ordinances?nodeId=PTIICOOR_CH78TR_ARTIIIMOCA_S78-94REPAUSUT

User conflicts and perceptions of unsafe conditions can arise when transportation modes moving at different speeds share the same facilities. Conflicts can already be seen on busy multi-use paths where pedestrians, bicyclists, and e-micromobility users share space but travel at different speeds. In communities like the South Bay Cities and Peachtree City, LSV-focused plans combine LSV paths or travel lanes with bicycle or pedestrian facilities, which adds LSVs with the potential to travel at speeds up to 25 mph to this mix of users. This has the potential to increase user conflicts and degrade the perception of safety among people walking, bicycling and rolling, especially on already busy multi-use paths and protected bike lanes.

The implications of facilities shared by LSVs and other users are not yet well-studied nor understood. Future research is needed to better understand the interactions and potential modal conflicts in communities where LSVs and golf carts currently share facilities with bicycles, pedestrians, or other active transportation users. Increased understanding would help support approaches to prevent or address such conflicts – for example, determining needed levels of modal separation for safety and comfort – and support informed development and adoption of low-speed networks across the country.

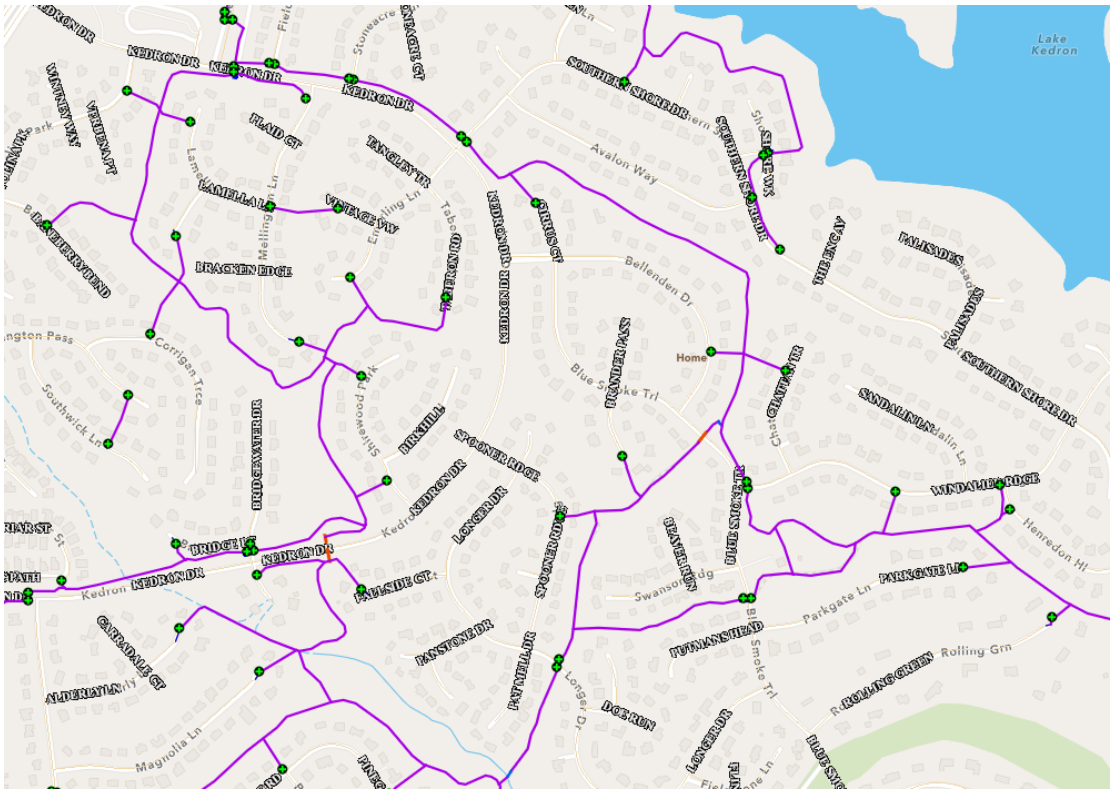

Figure 9. Peachtree City's off-street path network (in purple) provides direct midblock and cul-de-sac connections by golf cart or LSV.[92]

[92] https://ptcgis.maps.arcgis.com/apps/webappviewer/index.html?id=4e97e56946884309b5d6d04d2d569867

In summary, local governments can consider the following opportunities to plan for safer LSV infrastructure:

- Identify opportunities for **traffic calming** to reduce speeds to under 25 mph.
- Leverage a **Complete Streets design approach**. Municipalities can systematize the implementation of design changes, such as **road diets**, to promote lower vehicle speeds by incorporating infrastructure changes aligned with Complete Streets principles into their road resurfacing program or other policies.
- Study and plan for **LSV network connectivity** needs and gaps, including an analysis of the existing road network.

3.2 Charging

LSVs can be charged using a standard 120V wall outlet (Level 1 charging) and are not compatible with DC Fast Charging. Some LSV models can be adapted for 240V (Level 2) charging, but this is not standard across all vehicles and companies. An LSV typically takes 6 - 8 hours to charge from empty using Level 1 charging (see Table 5).

Table 5 - Example charging specifications for LSV and full-sized EV

Vehicle	Gem E2[93] 	Tesla Model 3[94] (EV car) 
Curb weight	1200 lb.	3891 lb.
Battery capacity	AGM: 5 kWh Li-ion: 16 kWh	57.5 kWh
Range	AGM battery: 28-35 mi 16 kWh Li-ion battery: 88-125 mi	319 mi
Price	$15,240 +	$42,000
Charging times – Level 1 (120 V)	AGM battery: 7 hours 16 kWh Li-ion battery: 4 hours	Up to 4 days
Charging times – Level 2 (240 V)	--	8-12 hours (11.5 kW/48A - 7.6 kw/32A)

[93] https://www.gemcar.com/battery-charger/; https://tularepolaris.com/Specialty-Vehicles-GEM-e2-2024-Tulare-CA-fb929dcb-351e-4ddd-a1c4-b05200437fee

[94] https://www.tesla.com/model3

The range provided by a single charge varies widely depending on battery type, but a typical LSV may have a range of around 40 miles. While some models offer lithium-ion battery options for extended range, flooded and absorbed glass mat (AGM) lead-acid batteries are standard for many LSV models given their intended use for short-range local travel.[95] Like EVs, most personally owned LSVs can be charged at home or at work. Use cases where public LSV charging could be beneficial include shared fleets and delivery vehicles. To provide LSV charging, local governments can:

- **Identify and incentivize opportunities to integrate 120 V outlets into Level 2 and/or DC fast charging public charging sites.** Compared to the cost of installing or upgrading an EV charging station, adding an outlet to accommodate LSV charging can involve minimal cost and allows more vehicle types to benefit from these charging stations. LSV users typically need to bring their own charging cord to use these outlets, as there is a lack of cord standardization.
- **Identify location criteria for where public Level 1 charging is needed to support LSV adoption.** Widespread adoption of LSVs, in place of traditional EVs, may result in a reduced need for neighborhood Level 2 chargers in some communities by making Level 1 charging practical for opportunity and destination charging.

3.3 Curb Management and Parking

One benefit of LSVs can be that less space is needed to park them (Table 3 and Table 4). As new and varied types of LSVs emerge, including those for curb-side deliveries, municipalities may wish to consider new ways of managing parking and curb space. To accommodate LSV parking and access to the curb, local governments can:

- **Collect data on existing curbside conditions and curb use.** Municipalities can engage violators of existing curb regulations to better understand how to structure access to the curb for a variety of vehicle types and uses.
- **Reconsider loading zone locations and allowable vehicles.** For example, municipalities can dedicate small vehicle loading zones specifically for LSVs where State and local laws allow for their operation. Truck commercial loading and LSV loading zones can be co-located to allow for trans-loading goods from trucks to LSVs for last-mile deliveries (see discussion of microhubs below).
- **Streamline zoning and permits for microhubs and pilot microhubs through public-private partnerships.** A microhub is a last-mile delivery solution that enables small-format vehicles like LSVs, e-cargo bikes, or electric vans to complete deliveries. Microhubs operate like fulfillment centers where packages are delivered and then distributed by small-format vehicles, like LSVs, to their final destinations. Whereas traditional fulfillment centers are located outside of urban cores, microhubs are located within neighborhoods.

[95] Discussion with CartMart representative, November 13, 2024

- **Consider zero-emission delivery zones.** Some communities have implemented green loading zones or zero-emission delivery zones (ZEDZs), which would incentivize LSVs as a tool for last-mile freight. See Appendix B for more information on Portland's ZEDZ example.
- **Consider marking spaces for LSV parking.** Due to their smaller size, LSVs may be a good fit for tight spaces where traditional automobiles cannot fit. Municipalities may consider repurposing curb or garage spaces that are too small for an automobile for one or more LSVs (Figure 10). In areas with significant LSV use, consider marking spaces with LSV-specific dimensions.[96]

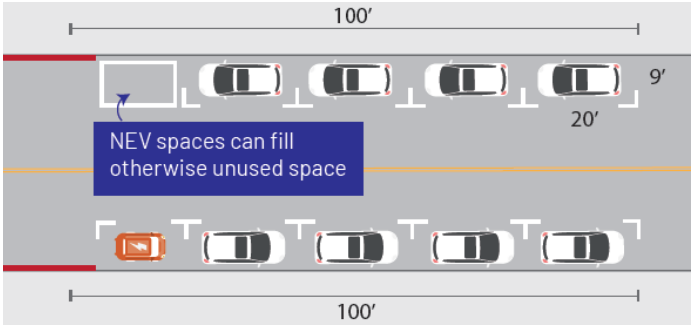

Figure 10. An LSV (low-speed vehicle) or NEV (neighborhood electric vehicle) parking space is shorter in length than a typical parallel parking space along the curb, allowing it to fit along the curb in spaces where a regular space cannot. (source: SBCCOG)

[96] https://cdn.southbaycities.org/wp-content/uploads/2024/02/01172332/02.2024-SBCCOG-LTN-Playbook-complete.pdf

4. Conclusion

Unlocking LSVs for local travel can complement parallel investment in EVs and associated infrastructure, ultimately providing people with more flexibility and more transportation choices. LSVs can expand mobility choices for short daily trips, last-mile delivery, and utility vehicle needs for municipalities and other similar contexts. By expanding available choices, LSVs can potentially help address transportation challenges that many communities currently face, including vehicle affordability, environmental impacts of vehicle use, and curb use conflicts, contributing to community residents' quality of life.

By focusing on local infrastructure changes that support a network of low-speed roads with traffic speeds under 25 mph, communities seeking to accommodate LSV use at the infrastructure level can help realize the potential of slower speed road networks that permit more flexible electric mobility options. Within a low-speed environment, further research would support understanding the full safety implications of LSV interactions with people biking and walking, as well as of LSV occupant safety in interactions with faster passenger vehicles on roadways with speed limits greater than 25 mph.

The strategies in this document are intended to aid local governments in addressing these challenges and enabling more widespread adoption of LSVs for well-suited local travel, municipal, and last-mile delivery applications. Municipalities can consider infrastructure, charging, curb management and parking, and local policies that would make LSV use more accessible and more comfortable. Creating the conditions that would make LSV use safe and feasible for more people can unlock more transportation choices and give people more mobility options tailored for the short, everyday trips that shape daily lives.

Appendix A – Taxonomy of LSVs and related vehicle types

LSVs are a category of motor vehicle that may be unfamiliar to local leaders outside of the communities where they are already used. This section explains how LSVs fit into a broader category of motor vehicles, and how LSVs differ from other motor vehicle types like motorcycles, full-sized automobiles, and non-motor vehicles like golf carts.

LSVs/NEVs vs. golf carts vs. passenger cars

Although they are both low-speed, four-wheeled vehicles featuring similar designs, LSVs, which are referred to under some State laws as Neighborhood-Electric Vehicles (NEVs), are legally distinct from golf carts and other off-road utility vehicles (UTVs) at the federal level. NHTSA does not classify golf carts and UTVs as motor vehicles,[97] but LSVs are considered motor vehicles[98] and may operate on some public roads in all States (see section Road use rules across the U.S.). Though some States and jurisdictions have special rules allowing golf carts on certain roads in some communities,[99] this is not universal across most States.

As motor vehicles, LSVs are required to have specific equipment for on-road use, including headlamps, taillamps, stop lamps and rear turn signals, rear-view mirrors, seatbelts, windshields, and other required features specified in 49 CFR § 571.500.[100] However, such equipment and devices are generally not required to comply with performance requirements established by FMVSS meaning they do not provide the same level of safety provided on traditional passenger vehicles. Some companies that produce golf carts and utility vehicles offer LSV versions of their off-road vehicles that are street legal by complying to these equipment requirements.

Though some golf carts and UTVs have electric motors, these vehicles are not considered "neighborhood electric vehicles" for regulatory purposes. A NEV is defined in most State law and in interpretation by NHTSA[101] as a type of LSV that is electric powered. Almost all State definitions of NEVs explicitly require NEVs to comply to the federal definition and to vehicle safety standards for LSVs (see Appendix C – LSV Road Use Laws by State). Since nearly all LSVs in the U.S. are electric vehicles

[97] https://www.nhtsa.gov/interpretations/zozloski1635
[98] https://www.ecfr.gov/current/title-49/subtitle-B/chapter-V/part-571/subpart-A/section-571.3
[99] For example, South Carolina: https://casetext.com/statute/code-of-laws-of-south-carolina-1976/title-56-motor-vehicles/chapter-2-specialized-vehicles/article-1-low-speed-vehicles/section-56-2-105-golf-cart-permit-and-the-operation-of-a-golf-cart
[100] https://www.ecfr.gov/current/title-49/subtitle-B/chapter-V/part-571/subpart-B/section-571.500
[101] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf

(99.8 percent of LSVs in use in 2008 were electric according to the U.S. DOE), the terms LSV and NEV can be seen as essentially synonymous.[102]

While LSVs are motor vehicles and fall under NHTSA's purview, LSVs have a separate set of criteria and safety requirements within the FMVSS than apply to passenger vehicles. LSVs are not subject to the occupant crashworthiness standards nor the crash avoidance performance standards that apply to cars, SUVs, and trucks. This is because of LSVs' low maximum speed (25 mph) capability and because the intent at the time was that LSVs would be limited to dedicated use environments and not in mixed use environments with traditional vehicles with travel speeds above 25 mph.[103]

There are several types of enclosed, three-wheeled electric vehicles in use across the U.S. for municipal use cases such as parking enforcement. While these vehicles can offer similar space-efficiency benefits as LSVs due to their small footprints, these three-wheeled motor vehicles are regulated as motorcycles by NHTSA, rather than as LSVs. Table 6 explains the distinguishing characteristics of different types of small-format motor vehicles under federal rules.

Some States refer to a separate category of "medium-speed vehicles", which are generally defined as vehicles with a maximum speed of 35 mph or 45 mph.[104] Under federal regulations, these vehicles would be considered full passenger vehicles and subject to the same safety standards as full-sized, full-speed cars, SUVs, and trucks.[105] While NHTSA has received petitions for the creation of a medium-speed vehicle class at the federal level that would be subject to a more stringent set of FMVSS than LSVs but substantially less than full-sized vehicles, the agency has denied these petitions, citing that such a class of vehicles would result in significantly greater risk of death or serious injuries.[106]

While this white paper focuses on LSVs, the taxonomy table below includes other small-format EVs such as motor scooters and motorcycles to illustrate how these small-format vehicles differ (Table 6).

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[102] https://www.nhtsa.gov/sites/nhtsa.gov/files/neighborhood_electric_vehicles.201206.pdf
[103] https://www.nhtsa.gov/interpretations/07-005545as
[104] For example, Colorado (45 mph max): https://casetext.com/statute/colorado-revised-statutes/title-42-vehicles-and-traffic/regulation-of-vehicles-and-traffic/article-4-regulation-of-vehicles-and-traffic/part-1-traffic-regulation-generally/section-42-4-1096-class-b-low-speed-electric-vehicles-effective-date-rules
Minnesota (35 mph max): https://www.revisor.mn.gov/statutes/cite/169.011
[105] https://www.nhtsa.gov/interpretations/07-005545as
[106] NHTSA, Denial of petition for rulemaking, Docket No. NHTSA–2008–0154, Federal Register Vol. 73, No 188, September 26 2008. https://www.govinfo.gov/content/pkg/FR-2008-09-26/pdf/E8-22736.pdf

Table 6. Taxonomy: Small-format Motor Vehicles

Vehicle Type	# wheels	NHTSA Criteria: **"motor vehicles"** (Title 49 § 571.3)[107]
Motor scooter/ moped (some)[108]  (Image: Wikimedia)	2 or 3	Broadly: "**Motorcycle**" • Powered • Seat or saddle • No more than 3 wheels "**Motor driven cycle**" (type of motorcycle) • Top speed ≥ 20 mph • 5-brake horsepower or less (Exempted from certain motorcycle FMVSS requirements)
Motorcycle  (Image: Wikimedia)	2 or 3	"**Motorcycle**" • Powered • Seat or saddle • No more than 3 wheels Motorcycle that is not a "motor driven cycle": • Top speed ≥ 20 mph or greater • 5-brake horsepower or more
Low-speed vehicle  (Image: Wikimedia)	4	"**Low-speed vehicle**"[109] • 4 wheels • Top speed > 20 mph and ≤ 25 mph • GVWR <3000 lb Title 49 § 571.3

Historical and global precedents

Historically, demand for low-cost entry models have created a market for small economy cars – e.g., the VW Beetle, Citroën 2CV, Fiat 500, and Ford Anglia. In the U.S., small economy cars held market share in the early-1950s with cars like the Nash Rambler and Hudson Jet and later in the 1970s with cars like the AMC Gremlin. These small, affordable, highway-legal models served an important role in providing low-cost access to personal mobility, but such small vehicles have all but disappeared from U.S. showrooms. Small cars, like the EU A-segment passenger cars and Japanese kei cars, continue to be widely used globally.

[107] https://www.ecfr.gov/current/title-49/subtitle-B/chapter-V/part-571/subpart-A/section-571.3
[108] https://www.nhtsa.gov/importing-vehicle/importation-and-certification-faqs-0
[109] https://www.ecfr.gov/current/title-49/subtitle-B/chapter-V/part-571/subpart-A/section-571.3

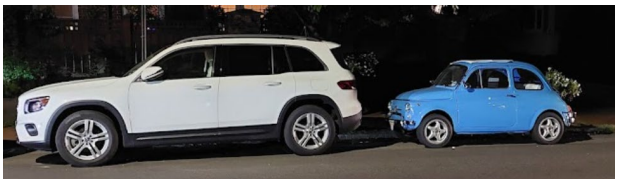


Figure 11. 1970s Fiat 500 (right) next to a 2020s SUV (left), illustrating different impacts on curb demand in Cambridge, MA. (U.S. DOT Volpe Center)

In recent decades, small-format EVs have gained market share throughout the world. In Japan, electric kei cars – a class of small, highway-legal city cars – have been available since 2009. As of March 2018, 95 percent of India's EV sales were 2- and 3-wheel vehicles (i.e., electric motor scooters and electric rickshaws).[110] In Europe, quadricycles – vehicles roughly equivalent to LSVs – are divided into two classes, mainly based on curb weight.

Kei vehicles and demand signals for smaller-format e-mobility options

Different vehicle formats serve different applications, and unmet demand for smaller, more affordable highway-capable vehicles in the U.S. may be indicated by rising import volumes of kei cars and trucks. Kei vehicles are a category of small, highway-legal automobiles in Japan. Both the length and price of a kei truck are approximately half that of a full-size pickup truck, yet they have similar or larger cargo beds, making these small vehicles practical for a variety of utility uses.

Imports of 25+ year-old kei trucks from Japan have risen year-over-year in the U.S. in recent years, quadrupling from around 1,800 in 2018 to more than 7,500 in 2023.[111]

Figure 12. Electric kei van example. (Mitsubishi Minicab EV)

[110] https://web.archive.org/web/20190423080235/https://enincon.com/wp-content/uploads/2019/03/Flyer-2W-3W-Market.pdf
[111] https://www.nbcnews.com/business/autos/kei-trucks-are-gaining-popularity-us-small-size-low-prices-rcna156653

Most States currently have no specific laws about kei vehicles, and State DMV administrators can choose whether to allow registration.[112] The following is a comparison for illustration.

Price:

- Imported Kei trucks: $500-$10,000[113]
- 2025 Ford F-150 XL SuperCab: $41,560[114]

Vehicle footprint:

- 2009 Honda Acty: 11.2 ft x 4.8 ft[115] (~54 sq. ft)
- 2025 Ford F-150 XL SuperCab: 19.3 ft x 6.7 ft (128.7 sq. ft)

Cargo bed size and capacity:

- 2009 Honda Acty: 6.3 ft x 4.6 ft (29.4 sq. ft), max payload: 772 lb.[116]
- 2025 Ford F-150 XL SuperCab: 6.5 ft x 4.2 ft (27 sq. ft), max payload: 1670 lb.

Battery size, range, and charge time:

- Kei van (112 mile range): **20 kWh, 7.5 hours at 3 kW**[117]
- 2025 Ford F-150 Lightning (230-mile standard range): **107 kWh, 13 hours at 7.7 kW**[118]

[112] https://www.nbcnews.com/business/autos/kei-trucks-are-gaining-popularity-us-small-size-low-prices-rcna156653
[113] https://www.cnn.com/2024/07/14/business/kei-trucks-japan-tiny-movement/index.html
[114] Ford F-150 XL price and specs: https://www.ford.com/trucks/f150/models/f150-xl/
[115] https://www.honda.co.jp/auto-archive/actytruck/2009/dimensions/
[116] https://www.honda.co.jp/auto-archive/actytruck/2009/loadingplatform/
[117] Example: Mitsubishi Minicab EV: https://www.mitsubishi-motors.com/en/newsroom/newsrelease/2023/20231124_3.html
[118] https://media.ford.com/content/dam/fordmedia/North%20America/US/product/2022/f-150-lightning/pdf/F-150_Lightning_Tech_Specs.pdf

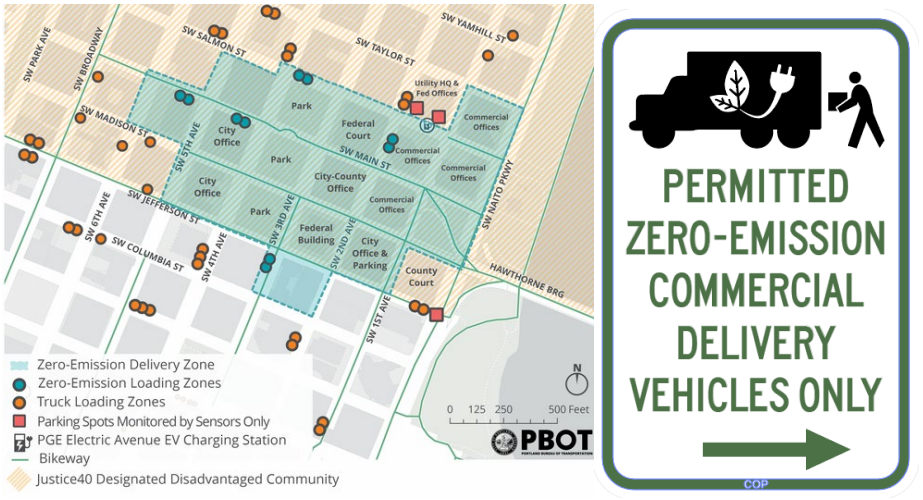
Appendix B – Resource List of LSV local use cases and infrastructure and curb-management planning

Infrastructure Planning: Low-speed Network

Location	Description
South Bay Cities COG, CA	"Low-speed travel network" for NEV/LSV, bicycle, micromobility; **On-street** facilities
Peachtree, GA	100+ mile shared-use path system; **Off-street** facilities; heavy golf cart usage and specific design guidelines
Corpus Christie, TX	Padre/ Mustang Island multimodal (**on-street**) network plan: walk, bike, golf cart/LSV, boat
Houston, TX	Brays Bayou Greenway: Pedestrian/bike greenway with separated golf-cart lane; **Off-street** facility

Infrastructure Planning: Curb Management

Location	Description
Boston, MA	City of Boston Curb Use Guide and Action Plan (2024); includes curb use prioritization matrix for different street types
Bellevue, WA	City of Bellevue: Curb Management Plan
Portland, OR	Zero-emissions delivery zone pilot- funded through U.S. DOT Strengthening Mobility and Revolutionizing Transportation (SMART) Grant. During the six-month pilot, commercial loading zones (CLZs) in 16 downtown blocks have been converted to "zero emission loading zones" where only zero-emission vehicles (ZEVs), such as electric trucks, vans, or e-cargo bikes, are permitted to park. The city created a ZEV permitting process for delivery vehicles, while existing city parking enforcement activities ensure ZEDZ compliance. Portland analyzed existing CLZ use in the pilot area at the start of the project, **finding that 75% of vehicles in CLZs were non-compliant.** Non-compliant uses such as passenger vehicle parking, pick-up and drop-off, and third-party app food delivery often forced delivery operators to waste time circling the block. Communication about non-compliant use of loading zones and the value of a well-regulated curb has helped the project gain support from delivery companies, which recognize potential benefits in time and fuel savings despite initial pushback.

	The project also involves engagement and data integration with a Portland-based e-cargo bike logistics company, B-Line Urban Delivery for zero-emission last-mile delivery. The project **leveraged B-line's existing microhub**, where goods are transferred from trucks to e-cargo bikes for delivery to the downtown core. While this pilot did not involve LSV delivery vehicles, the success of the e-cargo bike pilot aspect also suggests that small-format vehicles with similar cargo capacities like LSVs, could be a successful solution for last-mile delivery in a similar urban context.  **Figure 13. Portland, Oregon Zero-Emission Delivery Zone project area (image source)**
New York City	Piloting a three-year microhub pilot in 20 locations across the city for trans-loading from trucks to e-cargo bikes, handcarts, and smaller electric vans.[119]
(Multiple)	Open Mobility Foundation SMART Curb Collaborative: 10 US cities using Curb Data Specification, a set of open-source APIs, to represent curb use digitally and interact with users. The participating cities, including Portland, OR (example featured below), are implementing curb management projects through SMART grants from the U.S. DOT.
FHWA	FHWA outlines a process for creating a data-driven curbside management policy in the Curbside Inventory Report.

[119] https://www.nyc.gov/html/dot/html/pr2024/nyc-dot-proposing-rules-local-delivery-hub-pilot.shtml

Selected LSV Deployment and Planning Examples

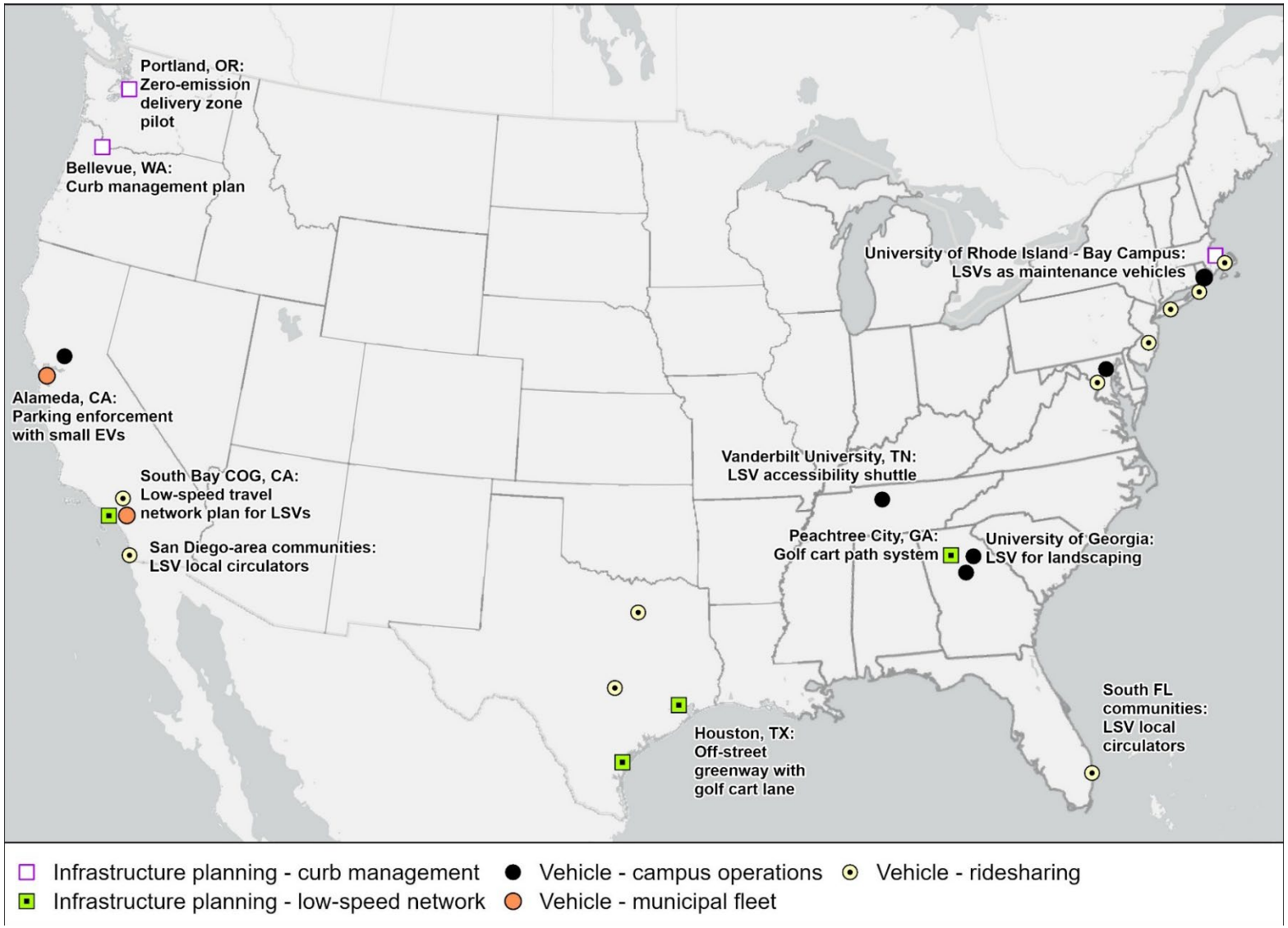


Figure 14: Map of local examples of LSV-related deployment and planning from communities around the country

Vehicle Use Case: Municipal Fleet

Location	Description
Brea, CA	Low-speed vehicle for police
Alameda, CA	Three-wheeled electric vehicle (similar footprint as LSV) outfitted for parking enforcement replacing conventional electric vehicles. Narrow vehicles will impede traffic less than previously used full-sized EVs in commercial districts.

Vehicle Use Case: Campus Operations

Location	Description
UC Davis (Davis, CA)	Mobile food pantry in a specialized box-style utility LSV
University of Georgia (Athens, GA)	Pickup and box-style utility LSVs used by grounds, building service, operations and maintenance departments to haul tools and landscaping equipment
Emory University (Atlanta, GA)	Cafeteria vendors operating out of LSV food trucks during cafeteria renovation
University of Maryland, Baltimore (MD)	LSVs for campus police patrol
Vanderbilt University (Nashville, TN)	LSV/golf cart accessible transportation service for community members with medical or accessibility needs

Vehicle Use Case: LSV Local Circulator

Location	Description
South Florida: • Boca Raton, FL • Boynton Beach, FL • Fort Lauderdale, FL • The Gardens Mall, FL • Hollywood East, FL • Lake Worth Beach, FL • Lauderdale-By-The-Sea and Galt Mile, FL • West Palm Beach and Palm Beach, FL • Wilton Manors, FL **Southern California:** • Avalon, Catalina Island, CA • Belmont Shore, CA • Huntington Beach, CA • Leimert Park, CA • Downtown Long Beach, CA • Santa Monica, CA • Seal Beach, CA • Coronado, CA • National City, CA • Oceanside, CA • Pacific Beach, CA • San Diego, CA • Palm Desert, CA **Long Island:** • East Hampton, NY (seasonal) • Montauk, NY (seasonal) • Southampton, NY **Other:** • Washington, DC • Plymouth, MA • Trenton, NJ • New Rochelle, NY • Austin, TX • West Dallas, TX	A number of communities around the US have introduced LSVs as a form of last-mile rideshare or electric shuttle through local circulator vehicles. These can be booked or flagged for shared last-mile transportation to destinations such as intercity train stations, downtown districts, and popular tourist attractions.  **Figure 15. LSV circulator in Boca Raton[120] for first/last-mile connections to train station, downtown**

[120] City of Boca Raton: https://myboca.us/2460/BocaConnect---Circuit-Shuttle

Appendix C – LSV Road Use Laws by State

State laws governing maximum speed limits of public roads on which LSVs can operate (as of August 2024). Local modifications column notes if local governments are permitted to restrict LSV road access to lower maximum speed limits than statewide rules or allow LSV road use on higher-speed rules than statewide rules.

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
Alabama	LSV	• 4 wheels • Max speed >20 <25 mph • GVWR <3000 lb • Complies with 49 CFR 571.500	local option	"Class two" Municipalities can authorize	Municipality can authorize	**Definition:** "low-speed vehicle" Ala. Code § 11-73-6 **Road use:** "Low-speed vehicle operation on streets" Ala. Code § 11-73
Alaska	LSV	• 4 wheels • Max speed >20 <25 mph • Complies with federal weight, safety standards	general	Restrict/ allow – 45 mph max	35	**Definition:** "low-speed vehicle" Alaska Stat. § 28.90.990 **Road use:** "Operation of Low-speed vehicles": Alaska Stat. § 28.35.261
Arizona	NEV	• Emissions free • 4 wheels • Complies with definitions and standards in 49 CFR 571.3(b) and 571.500	general		35	**Definition:** "Neighborhood electric vehicle": Arizona Revised Statutes 28-101.53 **Road use:** Arizona Revised Statutes 28-966
Arkansas	LSV	• 4 wheels • Max speed >20 <25 mph • GVWR <3000 lb	n/a		"impede traffic"	**Definition:** "low speed vehicle" AR Code § 23-112-103.18 **Road use:** Minimum speed regulation (not LSV specific): AR Code § 27-51-208-a "No person shall drive a motor vehicle at such a slow speed as to impede the normal and reasonable movement of traffic except when reduced speed is necessary for safe operation or in compliance with the law."

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
California	LSV or NEV	• 4 wheels • Max speed >20 <25 mph • GVWR <3000 lb • "A 'low-speed vehicle' is also known as a 'neighborhood electric vehicle.'"	general	Restrict	35	**Definition:** "low-speed vehicle": CA Veh Code § 385.5 (a) **Road use:** CA Veh Code § 21260 (speed limits) § 21266 (local restrictions)
Colorado	"Low-speed electric vehicle" (LSEV)	• Electric powered • 3+ wheels • No handlebar • VIN number	general	Restrict/ allow – 40 mph max	35	**Definition:** ""Low-speed electric vehicle"" Colo. Rev. Stat. § 42-1-102 48.6 ** "Class B" LSEVs defined as 25-45 mph maximum speed is defined, but will not issue registrations for Class B vehicles until NHTSA adopts a standard for LSVs travelling at these speeds (Colo. Rev. Stat. § 42-4-109.6) **Road use:** "Low-speed electric vehicles" Colo. Rev. Stat. § 42-4-109.5
Connecticut	LSV	• "same meaning as provided in 49 CFR 571.3"	general	Restrict	25	**Definition** (Effective October 1 2024): ""Low-speed vehicle"" Conn. Gen. Stat. § 14-1.52 **Road type:** "Operation of low-speed vehicles on highways": Conn.Gen.Stat. § 14-NEW - [Newly enacted section not yet numbered] Legislative research report on LSV rules across states(2023): https://www.cga.ct.gov/2023/rpt/pdf/2023-R-0242.pdf
Delaware	LSV	• 4 wheels • Max speed >20 <25 mph • GVWR <3000 lb • Complies with 49 CFR 571.500 • Not truck	general		35	**Definition and operation:** "Low-speed vehicles" Del. Code tit. 21 § § 2113A

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
Florida	LSV, including NEVs	• 4 wheels • Max speed >20 <25 mph • Complies with 49 CFR 571.500 • "including, but not limited to, neighborhood electric vehicles"	general	Restrict	35	**Definition:** "Low-speed vehicle" Fla. Stat. § 320.01.41 **Road use:** "Operation of a low-speed vehicle…on certain roadways" Fla. Stat. § 316.2122
Georgia	LSV	• 4 wheels • Max speed >20 <25 mph • Complies with 49 CFR 571.500	general		35	**Definition:** "Low-speed vehicle" GA Code § 40-1-1 25.1 **Road use:** "Operating low-speed and multipurpose off-highway vehicles on highways" Ga. Code § 40-6-362
Hawaii	NEV	• Emissions free • Max speed >20 <25 mph • 4 wheels • GVWR <3000 lb • Complies with 49 CFR 571.500	general		35	**Definition:** "neighborhood electric vehicle" Haw. Rev. Stat. § 291C-1 **Road use:** "Neighborhood electric vehicles; speed; restrictions" HI Rev Stat § 291C-134
Idaho	NEV	• Electrically propelled; emissions free • 4 wheels • Conforms to LSV requirements and definitions in 49 CFR 571	general		35	**Definition:** "Neighborhood electric vehicle" Idaho Code § 49-123 **Road use:** "Restricted use of neighborhood electric vehicles on highways" Idaho Code § 49-663
Illinois	LSV	• 4 wheels • Max speed >20 <25 mph • Complies with 49 CFR 571.500	general	Restrict/allow-35 mph max	30	**Definition:** "low-speed vehicle" 625 ILCS 5/1-140.7 **Road use:** "Operation of low-speed vehicles on streets" 625 ILCS 5/11-1426.2
Indiana	LSV	• 4 wheels • 25 mph max speed • Complies with 49 CFR 571.500 • Not privately assembled	general		35	**Definition:** "Low speed vehicle" Ind. Code § 9-13-2-94.5 **Road use:** "Low speed vehicles; violation" " Ind. Code § 9-21-5-8.5

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
Iowa	LSV	• Vehicle manufactured in compliance with 49 CFR 571.500	general		35	**Definition:** "Low-speed vehicle" Iowa Code § 321.1 **Road use:** "Operation of low-speed vehicles" Iowa Code § 321.381A
Kansas	LSV	• 4 wheels • Max speed >20 <25 mph • Complies with 49 CFR 571.500	general		40	**Definition:** "Low-speed vehicle" Kan. Stat. § 8-1488 **Road use:** "Unlawful operation of low-speed vehicle" Kan. Stat. § 8-15,101
Kentucky	LSV	• Electric or combustion propelled • 4 wheels • 25 mph max speed	general		35	**Definition:** "Low-speed vehicle" Ky. Rev. Stat. § 186.010 **Road use:** "Operation of a low-speed vehicle on highway" Ky. Rev. Stat. § 189.282
Louisiana	LSV	• 4 wheels • Electric power • 25 mph max speed	general	Restrict	35	**Definition:** "low-speed vehicle" La. Stat. tit. 32 § 1 **Road use:** "Low-speed vehicles…" La. Stat. tit. 32 § 300.1
Maine	LSV	• 4 wheels • Max speed >20 <25 mph • 3,000 unloaded weight • Complies with 49 CFR 571.500	general	Restrict	35	**Definition:** "Low-speed vehicle" Me. Stat. tit. 29-A § 101 **Road use:** "Operation of low-speed vehicles" Me. Stat. tit. 29-A §2089
Maryland	LSV	• 4 wheels • 20-25 mph min/max speed	general	Restrict	30	**Definition:** "Low speed vehicle" Md. Code, Transp. § 11-130.1 **Road use:** "Limitations on driving low speed vehicles" Md. Code, Transp. § 21-1125

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
Massachusetts	LSV	• Conforms to definition in 49 CFR § 571.3 • Complies with 49 C.F.R. § 571.500	general	Restrict	30	**Definition:** "Low-speed motor vehicle" or "low-speed vehicle" Mass. Gen. Laws ch. 90 § 1 **Road use:** "Operation of low-speed motor vehicles on public ways" Mass. Gen. Laws ch. 90 § 1F **RMV information page:** https://www.mass.gov/info-details/low-speed-vehicles
Michigan	LSV	• Conforms to definition in 49 CFR § 571.3 • Complies with 49 C.F.R. § 571.500	general		35	**Definition:** "Low-speed vehicle" Mi. Comp. Laws § 257.25b **Road use:** Mi. Comp. Laws § 257.660
Minnesota	NEV	• Electric powered • 3-4 wheels • Max speed >20 <25 mph	general		35	**Definition:** "Neighborhood electric vehicle" Minn. Stat. § 169.011 **Road use:** "Neighborhood and medium-speed electric vehicles" Minn. Stat. § 169.224
Mississippi	LSV	• 4 wheels • Electric or gasoline-powered • Max speed >20 <25 mph • Complies with 49 C.F.R. § 571.500	local option	Municipalities may authorize for roads in city limits	Municipality can authorize	**Definition:** "Low-speed vehicle" Miss. Code § 63-32-1 **Road use:** "Authorization to operate golf carts and low-speed vehicles on public roads within municipality under certain circumstances" Miss. Code § 63-32-3
Missouri	LSV	• Conforms to definition in 49 CFR § 571.3 • Complies with 49 CFR § 571.500	general	Restrict	35	**Definition:** "low-speed vehicle" Mo. Rev. Stat. § 304.029 **Road use:** Operation of low-speed vehicles on highway Mo. Rev. Stat. § 304.029

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
Montana	LSEV	• 4 wheels • Max speed >20 <40 mph • Electric powered • Wheelbase >40 inches; wheel diameter >10 inches • Complies with 49 CFR § 565	general		25, only by people with impairments which prevent them from operating a regular vehicle	**Definition:** "Low-speed electric vehicle" Mont. Code § 61-1-101 **Road use:** "Low-speed electric vehicle – golf cart operated by person with restricted driver's license – operating requirements" Mont. Code § 61-8-378 Can only be operated by holder of low-speed restricted drivers license, issued to: "a person who is physically or otherwise impaired in a manner and degree that prevent the person from safely operating a motor vehicle across the range of speeds permitted or required on a public highway." Mont. Code § 61-8-378
Nebraska	LSV	• 4 wheels • Max speed >20 <25 mph • <3000 lb GVWR • Complies with 49 CFR § 571.571 OR • 3 wheels • 25 mph max speed • <3000 lb GVWR • Has windshield	general	Restrict	35	**Definition:** "Low-speed Vehicle" Ne. Rev. Stat. §§ 60-119.01 **Road use:** "Low-speed Vehicle; restrictions on use" Ne. Rev. Stat. §§ 60-6,380
Nevada	LSV	• 4 wheels • Max speed >20 <25 mph • <3000 lb GVWR • Complies with 49 CFR § 571.500	general		35	**Definition:** "Low-speed vehicle" Nev. Rev. Stat. § 484B.637 **Road use:** Nev. Rev. Stat. § 484B.637
New Hampshire	NEV	• 4 wheels • Max speed >20 <25 mph • Complies with 49 CFR § 571.500	general		35	**Definition:** "Neighborhood electric vehicle" N.H. Rev. Stat. § 259:66-b **Road use:** "Neighborhood Electric Vehicles" N.H. Rev. Stat. § 265:158

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
New Jersey	LSV	• As defined in 49 CFR § 571.3(b) • 4 wheels • Max speed >20 <25 mph • Not gasoline or diesel-powered • Complies with 49 C.F.R. § 571.500	general	Restrict/allow-35 mph max	25	**Definition:** "Low-speed vehicle" N.J. Stat. § 39:1-1 **Road use:** "Operation of low-speed vehicle on public roads; conditions" N.J. Stat. § 39:4-31.1 **NJ.gov information page:** https://www.nj.gov/mvc/vehicletopics/lowspeed.htm
New Mexico	"neighborhood electric car"	• 4 wheels • Max speed >20 <25 mph • Not gasoline or diesel-powered • Complies with 49 C.F.R. § 571.500	general	Restrict	35	**Definition:** "neighborhood electric car" N.M. Stat. § 66-1-4.12 **Road type:** N.M. Stat. § 66-3-1103
New York	LSV	• Max speed >20 <25 mph • <3000 lb GVWR • Complies with 49 C.F.R. § 571.500	general	Restrict	35	**Definition:** "low speed vehicle" N.Y. Veh. & Traf. Law § 121-F **Road use:** "Limitations on registrations" N.Y. Veh. & Traf. Law § 2262
North Carolina	LSV	• 4-wheeled • Electric or gas powered • Max speed >20 <25 mph	general		35	**Definition:** "Low-speed vehicle" N.C. Gen. Stat. § 20-4.01 **Road use:** "Operation of a low-speed vehicle, mini-truck, or modified utility vehicle on certain roadways" N.C. Gen. Stat. § 20-121.1
North Dakota	LSV	• 4-wheeled • Max speed >20 <25 mph • <3000 lb GVWR	general	Restrict	35	**Definition:** "Low-speed vehicle" N.D. Cent. Code § 39-29.1-01 **Road use:** "Low-speed vehicles" N.D. Cent. Code § 39-29.1

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
Ohio	LSV	• 3- or 4-wheeled • Max speed >20 <25 mph • <3000 lb GVWR	general	Restrict	35	**Definition:** "Low-speed vehicle" Oh. Rev. Code § 4501.01 **Road use:** "Operation of low-speed, under-speed, or utility vehicle, or a mini-truck" Oh. Rev. Code § 4511.214
Oklahoma	LSEV	• 4-wheeled • Electric powered • Max speed >20 <25 mph • <3000 lb GVWR • Complies with 49 C.F.R. § 571.500	general	Restrict	35	**Definition:** "Low-speed electrical vehicle" Okla. Stat. tit. 47 § 1-134.1 **Road use:** "Low-speed electrical vehicles - Restrictions on operation" Okla. Stat. tit. 47 § 11-805.1
Oregon	LSV	• 4-wheeled • Max speed >20 <25 mph	general	Allow	35	**Definition:** "Low-speed vehicle" ORS § 801.331 **Road use:** "Unlawfully operating low-speed vehicle on highway; penalty" ORS § 811.512
Pennsylvania	NEV	• 4-wheeled • Electric powered • Max speed >20 <25 mph • Complies with 49 C.F.R. § 571.500	general	Restrict/allow – 35 mph max	25	**Definition:** "Neighborhood electric vehicle" 75 Pa. C.S. § 102 **Road use:** "Operation on certain highways or roadways" 75 Pa. C.S. § 3593
Rhode Island	LSV or "Low-speed motor vehicle"	• Conforms to definition in 49 CFR § 571.3 • Complies with 49 CFR § 571.500 • Electric powered	general	Restrict	35	**Definition:** "Low-speed motor vehicle" or "low-speed vehicle" R.I. Gen. Laws § 31-1-3 **Road use:** "low-speed vehicle" R.I. Gen. Laws § 31-19.6-1

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
South Carolina	LSV	• 4- wheeled • Max speed >20 <25 mph • <3000 lb GVWR	general	Restrict	35	**Definition:** "Low speed vehicle" S.C. Code § 56-1-10 **Road use:** "Conditions for operation on street or highway" S.C. Code § 56-2-100
South Dakota	LSV	• 4- wheeled • Max speed >20 <25 mph	general	Restrict	35	**Definition:** "Low-speed vehicle" S.D. Codified Laws § 32-3-1 **Road use:** "Low-speed vehicles" S.D. Codified Laws § 32-25-27
Tennessee	LSV "including NEV"	• 4- wheeled • Electric or gas powered • Excluding golf cart • Max speed >20 <25 mph • Comply with 49 CFR § 571.500	general	Restrict	35	**Definition:** "Low speed vehicle" Tenn. Code § 55-1-122 **Road use:** "Operation of low speed and medium speed vehicles" Tenn. Code § 55-8-191
Texas	NEV	• Max speed 35 mph • Comply with 49 CFR § 571.500	general	Restrict	45	**Definition:** "neighborhood electric vehicle" Tex. Transp. Code § 551.301 **Road use:** "Operation on roadways" Tex. Transp. Code § 551.303
Utah	LSV	• 4- wheeled • Max speed <25 mph • No more than 6 passengers • Not golf cart	general	Highway Authority may restrict	35	**Definition:** "Low-speed vehicle" Utah Code § 41-6a-102 **Road use:** "Low-speed vehicle" Utah Code § 41-6a-1508
Vermont	NEV	• Electric powered; emissions free • No more than 4 passengers • Max speed <25 mph • 4- wheeled • <3000 lb GVWR • Comply with 49 CFR § 571.500	general	Restrict	35	**Definition:** "Neighborhood electric vehicle" Vt. Stat. tit. 23 § 4 **Road use:** "Operation of neighborhood electric vehicles" Vt. Stat. tit. 23 § 1043

State	Terminology (LSV/NEV)	Definition	Authorization	Local modifications to road max. speed limit?	Road speed limit (MPH)	Source
Virginia	LSV	• 4 wheels • Electric or gas-powered • Not used exclusively for agriculture or golf cart • Max speed >20 <25 mph • Comply with 49 CFR § 571.500	general	Restrict	35	**Definition:** "Low-speed vehicle" Va. Code § 46.2-100 **Road use:** Va. Code § 46.2-908.3
Washington	NEV	• Electric powered; emissions free • 4- wheeled • Max speed >20 <25 mph • Comply with 49 CFR § 571.500	general	Restrict/allow	35	**Definition:** "Neighborhood electric vehicle" Wash. Rev. Code § 46.04.357 **Road use:** "Neighborhood electric vehicles" Wash. Rev. Code § 46.61.725
Washington D.C.	LSV	• 4-wheeled • Max speed >20 <25 mph • <3000 lb GVWR	general		Unclear	https://dmv.dc.gov/sites/default/files/dc/sites/dmv/publication/attachments/Non-Traditional%20Motor%20Vehicle%20Chart%20%283.24.21%29.pdf
West Virginia	LSV	• 4-wheeled • Max speed >20 <25 mph	general		25	**Definition:** "Low-speed vehicle" W. Va. Code § 17A-1-1 **Road use:** "Every motor vehicle, etc., subject to registration and certificate of title provisions; exceptions" W. Va. Code § 17A-3-2
Wisconsin	LSV	• Conforms to definition in 49 CFR § 571.3 • Complies with 49 C.F.R. § 571.500 • Not golf cart	local option	local municipalities can choose to allow or prohibit	Local municipalities can authorize (>35)	**Definition:** "Low-speed vehicle" Wis. Stat. § 340.01 **Road use:** "Authority to allow or prohibit the operation of low-speed vehicles" Wis. Stat. § 349.26
Wyoming	LSV	• Does not explicitly discuss low-speed vehicles	****		impede traffic	**Road use:** "No person shall drive a motor vehicle at such a slow speed as to impede the normal and reasonable movement of traffic except when reduced speed is necessary for safe operation or in compliance with law." Wyo. Stat. § 31-5-304

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