
Louisiana Transportation Research Center

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Golf Carts on Public Roads–Literature Review of Legislation and State of the Practice in the United States

by

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This technical assistance report investigated the laws governing golf carts in the United States. Specifically, the report focused on reviewing literature to document the existing state laws and regulations for golf cart operation on public roads, including Louisiana-specific local laws, and the traffic safety impact of operating golf carts on public roads. Some operators have modified the conventional golf cart, originally manufactured to have speeds of no more than 15 mph, to achieve higher speeds and to be used in making short trips on public roads. These speed-modified golf carts, with top speeds between 20 and 25 mph, are included in NHTSA's classification of low-speed vehicles. Findings from the study revealed that in general, golf carts are prohibited to operate on state and federal highways but about 37 states allow them to operate on their low-speed roadways. Some of these states have passed legislation authorizing their local governments to regulate the use of golf carts on public streets within their local jurisdictions. Restrictions include permitting crossings only at specific intersections and specifying speed limits ranging from 25 mph to 35 mph for roadways on which these speed-modified golf carts can be operated on. Golf carts are not designed to meet the crash-test requirements of passenger cars; therefore, they offer limited protection to their occupants in crashes. Golf cart operations on public roads in the United States have resulted in both serious injuries and fatalities. In fact, 130 fatalities have been recorded by FARS during 2013 – 2018.

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This technical assistance report investigated the laws governing golf carts in the United States. Specifically, the report focused on reviewing literature to document the existing state laws and regulations for golf cart operation on public roads, including Louisiana-specific local laws, and the traffic safety impact of operating golf carts on public roads. Some operators have modified the conventional golf cart, originally manufactured to have speeds of no more than 15 mph, to achieve higher speeds and to be used in making short trips on public roads. These speed-modified golf carts, with top speeds between 20 and 25 mph, are included in NHTSA's classification of low-speed vehicles.

Findings from the study revealed that in general, golf carts are prohibited to operate on state and federal highways but about 37 states allow them to operate on their low-speed roadways. Some of these states have passed legislation authorizing their local governments to regulate the use of golf carts on public streets within their local jurisdictions. Restrictions include permitting crossings only at specific intersections and specifying speed limits ranging from 25 mph to 35 mph for roadways on which these speed-modified golf carts can be operated on.

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Introduction

Golf carts are electric- or gas-powered vehicles usually used on and around golf courses. However, in recent years, golf carts have become very popular and their use on public roads has become common. These vehicles, originally manufactured for use on the golf course, are now being operated in well-planned and gated environments as well as on some public and local roadways to conveniently cover short distances for shopping, social, and recreational activities. Golf carts have low cost operations, are energy-efficient, environmentally friendly, and provide a quiet means of transportation to cover shorter trips in a neighborhood despite their low speeds.

Recently, manufacturers of golf carts have modified these vehicles by increasing their maximum speeds from 15 mph to 25 mph, and even to 35 mph in some cases. The National Highway Traffic Safety Administration (NHTSA) includes speed-modified golf carts with top speeds of 20 mph or 25 mph in its low-speed vehicle (LSV) classification group, thereby subjecting them to Federal Motor Vehicle Safety Standard requirements for safety equipment [1], [2]. Due to the increase in operation of golf carts and similar four-wheeled vehicles on public roads, many states have enacted laws and regulations permitting the operation of these vehicles on their streets; however, the requirements differ from state to state [3]. In Louisiana, golf carts are not allowed to operate on state or federal highways. However, municipalities or local governing bodies may allow the operation of golf carts on municipal, city, village, town, or parish roads [4].

Although there are several benefits in allowing golf carts to operate on public roads, the increasing number of these vehicles in mixed-vehicle traffic on public roads has raised concerns about traffic and occupant safety. The safety limitations of these vehicles, such as lack of protection and inadequate safety equipment, are likely to expose drivers and passengers to higher crash risks than passenger cars, especially on streets with a speed limit higher than 25 mph. The Insurance Institute for Highway Safety's crash tests showed that the mix of LSVs and regular traffic is a dangerous combination, because LSVs with some safety features are no match for even the smallest cars that meet crashworthiness standards on the roads [5]. It therefore comes as no surprise that the growing use of golf carts on public roads has already resulted in fatalities and serious injuries nationwide [6], [7], [8].

Due to the issues and concerns raised above, the Louisiana Department of Transportation and Development (DOTD) Highway Safety Section requested that the Louisiana

Transportation Research Center (LTRC) collect information on the state of practice regarding laws for operating golf carts on public roads in the United States. Specifically, this report provides a review of the various definitions of golf carts used by federal and state agencies, states' laws and regulations for operating these golf carts on public roads, Louisiana specific laws, and safety impacts of operating golf carts on public roads.

Literature Review

Many states have passed laws authorizing operation of golf carts and other similar vehicles on public roads, subject to speed and operational limitations, but the requirements differ from state to state. The study was conducted to determine and document the existing laws or regulations in each state for operating golf carts on public roads. Specifically, the literature review in this report is organized into the following topics: (1) definition of golf carts and LSVs by federal agencies; (2) state laws and regulations for operating golf carts on public roads; (3) a Louisiana-specific synthesis of laws related to golf cart on public roads, and (4) the safety impact of operating golf carts on public roads.

Laws and Regulations for Operating Golf Carts on Public Roads

Federal Definition of Golf Carts and LSVs

The terms “golf cart” and “golf car” are used interchangeably in the literature. NHTSA and manufacturers of these vehicles use the term “golf car” while the general public and most states use the term “golf cart.” Since the majority of the state legislations use the term “golf cart,” this report will use the term golf cart with no quotation marks.

The NHTSA’s final rule, Federal Motor Vehicle Safety Standards 49 CFR Part 571, included the following definitions for golf carts and LSVs [1], [2]:

“Conventional golf cart” means either a fleet golf car or a personal golf car.

“Fleet golf car” means a golf car used solely to carry one or more people and golf equipment to play golf.

“Personal golf car” means a golf car used to carry one or more people and may carry golf equipment to play golf. These are sold to individual people who may use them to travel on public roads to and from golf courses and to play golf, to travel on public roads on purposes unrelated to golf, or for all of these purposes.

“Speed-modified golf car” means a conventional golf car that was modified, after its original manufacture, so as to increase its speed. While some speed-modified golf cars have a top speed of 20 to 25 mph, others have a higher top speed. That modification may

currently be accompanied by the addition of safety equipment required for the on-road use of the golf cart.

“Low-speed vehicle” means a vehicle, (a) that is 4-wheeled, (b) whose speed attainable in 1.6 km (1 mile) is more than 32 kilometers per hour (20 mph) and not more than 40 kilometers per hour (25 mph) on a paved level surface, and (c) whose Gross Vehicle Weight Rating (GVWR) is less than 1,361 kilograms (3,000 pounds).

The low-speed vehicle group includes neighborhood electric vehicles and speed-modified golf cars, whose top speeds are in the range of 20 to 25 mph. LSVs are required by the Federal Motor Vehicle Safety Standards to be equipped with headlamps, stop lamps, turn signal lamps, tail lamps, reflex reflectors, parking brakes, rearview mirrors, windshields, seat belts, and vehicle identification numbers [1]. On the other hand, golf carts with top speeds of 20 mph or less are subject only to state or local safety equipment requirements [1].

States Laws and Regulations for Operating Golf Carts on Public Roads

This study explored each state legislature’s website to document the existing golf cart laws in the United States. The information found is presented in the alphabetical order of states that have existing laws as of January 2020. The review focused on finding information on golf cart definitions, maximum speed limits, safety equipment requirements, posted speed limit of the roads, and what type of roads golf carts are allowed to operate on. The only states where no laws or regulations pertaining to the operation of golf carts on public roadways were Delaware, Massachusetts, New Hampshire, Vermont, New York, Rhode Island, Idaho, Wyoming, Maryland, West Virginia, Hawaii, New Jersey, and Utah.

Alabama

The code of Alabama section 40-2A defines a golf cart as *an off-road recreational vehicle primarily designed and manufactured for use on a golf course for sporting or recreational purposes* [9]. Golf carts are allowed to operate only on public roads designated by the local governing bodies and with speed limits not more than 25 mph. Operators are required to register and have their golf carts insured before operating on public roads. Golf carts must be equipped with headlights, tail lights, blinkers, and seatbelts [10], [11].

Alaska

No definition was found for golf carts but Alaska allows golf carts to be operated on highways as designated by the local governing body. Golf carts must comply with the requirements applicable to snowmobiles or off-highway vehicles. Operators of these vehicles must possess a valid driver license and must get their vehicles insured. Drivers must be at least 16 years of age before operating on public roads. Golf carts must be equipped with a protective shield, reflectors, brakes and lights [12], [13].

Arizona

Arizona law 28-777 defines golf cart as *a motor vehicle that has no less than three wheels in contact with the ground, that has an unladen weight of less than one thousand eight hundred pounds, that is designed to be and is operated at not more than 25mph and that is designed to carry not more than four persons including the driver* [14]. Golf carts are allowed to operate only on roads with speed limits less than 35 mph. They are required to be registered by their owners and must meet the standard requirements of the Arizona Department of Motor Vehicles. All golf carts operated on public roads must be insured [15].

Arkansas

No definition for golf carts was found. Act 170 (HB1274) mentions that it shall be within the municipal affairs and authority of any municipality in the state of Arkansas to authorize the operation of golf carts on city streets that are not federal or state highways or county roads. However, golf carts are not required to be registered or licensed to be operated on public streets [16].

California

California vehicle code section 345 defines a golf cart as *a motor vehicle having no less than three wheels in contact with the ground, having an unladen weight less than 1,300 pounds, which is designed to be and is operated at not more than 15 mph and designed to carry golf equipment and not more than two persons, including the driver* [17]. Golf carts in California are not required to be registered if driven on a highway within one mile of a golf course. They are allowed to operate on roads, designated by the local authorities, with speed limits of 25 mph or less. Operators of golf carts must be at least 16 years and above. Under the California Highway Patrol, if driven on the roads, golf carts must meet certain equipment requirements and standards, such as at least a headlamp, tail lamp, stop

lamp, a rear reflector, front/rear turn signals, front/side reflectors, a mirror, a horn, fenders, a safety-glazed windshield, safety belts, and windshield wipers [18].

Colorado

The Colorado revised statutes 42-1-102 define golf car as *a self-propelled vehicle not designed primarily for operation on roadways and that has: (a) A design speed of less than twenty miles per hour; (b) At least three wheels in contact with the ground; (c) An empty weight of not more than one thousand three hundred pounds; and (d) A carrying capacity of not more than four persons* [19]. Golf carts are not allowed on state highways. However, local authorities may authorize and regulate the operation of golf carts on public roads by resolution or ordinance of the governing body. The drivers must not be under 16 years of age and unlicensed drivers cannot carry a passenger who is younger than 21. Golf carts may cross a state highway at-grade to continue travelling on a non-state highway [20]. Colorado classifies a golf cart as a low-speed electric vehicle (LSEV). These vehicles are only allowed on roads with posted speed limits of not more than 35 mph but can cross at-grade of a road with speed limits of more than 35 mph [21].

Connecticut

No definition was found for the golf cart in Connecticut. The operation of golf carts on public roads are authorized by the city or town. Golf carts are allowed to operate on city or town roads with posted speed limits of not more than 25 mph. Operators must ensure they possess a valid driver's license and insurance. Golf carts can only be operated during daytime hours. Golf carts are required to be equipped with a horn and a flag that provides assistance to other motor vehicles for its operation [22].

Florida

Golf carts are defined in section 320.01(22) of the Florida statutes as *a motor vehicle that is designed and manufactured for operation on a golf course for sporting or recreational purposes and that is not capable of exceeding speeds of 20 mph*. Golf carts are prohibited from operating on public roads, with several exceptions as follows. They are allowed to operate only on county roads or municipality streets, with a posted speed limit of 30 mph or less [23]. The responsible municipality or local government must ensure that appropriate signs are posted on these roads for such operation. Persons under the age of 14 years are not allowed to operate these vehicles on public roads. Golf carts can also operate only during daytime hours. They are, however, not required to be registered and

insured. They are required to also be equipped with efficient brakes, reliable steering apparatus, safe tires, a rearview mirror, headlights, brake lights turn signal windshield, and red reflectorized warning devices in both front and rear [24].

Georgia

The Georgia Code defines golf carts in section 40-1-1(17.2) as *any motorized vehicle designed for the purpose and exclusive use of conveying one or more persons and equipment to play the game of golf in an area designated as a golf course*. Golf carts usually have an average speed of less than 15 mph on a straight course made of a concrete or asphalt surface [25]. They are allowed to operate on roads with speed limits not more than 35 mph and can cross any road or street at properly marked crossings as permitted by the municipalities. Golf carts are permitted to operate during daytime hours. They are also required to be equipped with headlights, brake lights, turn signals, a windshield braking system, a reverse warning device, tail lamps, a horn, and hip restraint. Drivers 15 years and above who have valid license can operate a golf cart alone [26].

Illinois

Illinois vehicle code section 1-123.9 defines golf cart as *a vehicle specifically designed and intended for the purposes of transporting one or more persons and their golf clubs or maintenance equipment while engaged in the playing of golf, supervising the play of golf, or maintaining the condition of the grounds on a public or private golf course* [27]. Golf carts are identified as non-highway vehicles and are therefore only allowed to operate on city streets with speed limits not more than 35 mph, as authorized by the municipalities or local governing bodies. Golf carts can cross streets or roads with a posted speed limits above 35 mph as long as they are not federal or state highways. Operators must possess a valid driver's license. Golf carts are required to be equipped with brakes, a steering apparatus, tires, a rearview mirror, red reflectorized warning devices in the front and rear, a slow-moving emblem on the rear, and must have a headlight and tail lamps lighted to make them eligible to operate on public roads [28].

Indiana

The Indiana code 9-13-2 section 69.7 defines golf cart as *a four (4) wheeled motor vehicle originally and specifically designed and intended to transport one (1) or more individuals and golf clubs for the purpose of playing the game of golf on a golf course* [29]. Golf carts are only allowed to operate on city, town, or county roads as permitted by

the ordinances adopted by the local governing bodies. Golf carts are not required to be registered before they can operate on public roads but operators must have valid driver's license [30]. Golf carts may be allowed to cross a state highway at right angles if the operation can be done safely [31].

Iowa

No definition of golf carts was found for Iowa. Iowa code 321.247 states the requirements for golf cart operation on city streets upon approval of their governing bodies. Drivers are required to have a valid driver's license. Golf carts cannot be driven on city roads that act as a primary road link to the city but shall be allowed to cross them. They can only operate during daytime hours and are not required to be registered to operate on public roads. Golf carts shall be equipped with a "slow-moving vehicle" sign and a bicycle safety flag, adequate brakes when operating on city streets, and must meet any other safety requirements [32].

Kansas

Kansas statutes section 8-1495 defines golf cart as *a motor vehicle that has no less than three wheels in contact with the ground, an unladen weight of not more than 1,800 pounds, is designed to be and is operated at not more than 25 mph and is designed to carry no more than four persons including the driver* [33]. Golf carts cannot be operated on any interstate highway, federal highway, or state highway. However, they can be driven on city roads if authorized by such city, with posted speed limits of no more than 30 mph. They may cross public roadways that have speed limits higher than 30 mph [34]. They can operate during both daytime hours and at night provided they are equipped with a slow-moving vehicle emblem and lights [35].

Kentucky

The Kentucky revised statute Title XVI motor vehicle 189.286 defines golf cart as *any self-propelled vehicle that is designed for the transportation of players or maintaining equipment on a golf course, while engaged in the playing of golf, supervising the play of golf, or maintaining the condition of the grounds on a golf course and has a minimum of four (4) wheels* [36]. Golf carts are designed to operate with a speed of no more than 35 mph and can only operate during daytime hours on public roadways with maximum speed limits of 35 mph. These roadways should be designated by the local government. Golf carts are not required to be registered or have a title or emission compliance

certificate. However, operators of these vehicles must possess a valid driver's license to be able to drive on public roads. Golf carts are required to meet the federal motor vehicles safety standards for low-speed vehicles [37].

Maine

Section 1. 29-A subsection 2093 of the Maine legislature defines golf cart as *a motor vehicle that is originally designed and manufactured for operation on a golf course for sporting or recreational purposes and that is not capable of exceeding speeds of 20 mph*. Golf carts are allowed to operate on roads or streets with posted speed limits not more than 35 mph and individuals operating the golf carts must possess a valid driver's license [38]. They should be operated on roads clearly designated by the municipalities or the local governing bodies with visible posted signs along such roadways. No safety equipment requirements for golf carts were found for the state of Maine [39].

Michigan

The Michigan vehicle code Section 257.657a defines golf cart as *a vehicle designed for transportation while playing the game of golf*. Golf carts that are modified extensively can be registered as LSVs [40]. Golf carts are allowed to operate on village, city, and township streets with speed limits not exceeding 15 mph and on state trunk line with speed limits no more than 30 mph during daytimes only. These vehicles are also not required to be registered in the state of Michigan. Operators of golf carts must be at least 16 years of age and must possess a valid driver's license. Modified golf carts must meet the vehicle safety requirements of an LSV. Therefore, they are required to be equipped with headlamps, at least one tail lamp, at least one stop lamp or mechanical signal device, one reflector on each side, one exterior and interior mirror, brakes, a parking brake, a horn, a windshield, safety belts crash helmets, and the manufacturer's identification number [41].

Minnesota

There is no specific definition for golf carts in the statutes for the state of Minnesota. However, they are known to generally as *seat two to four people and can be powered by an electric or gasoline engine ranging from under 4 to over 20 horsepower*. The vehicle weight is commonly around 500 to 800 lb. but can be over 2,000 lb. and have a top speed of no more than 20 mph. If golf carts are modified to achieve 25 mph, they may be considered neighborhood electric vehicles or medium-speed electric vehicles. They are

not allowed on public roads. However, Minnesota laws allow local government to authorize, with a special permit, golf carts use on streets and highways under their jurisdiction. Operators of golf carts may cross any street or highway that intersects with the designated roadway. Also, operators of these vehicles are not required to have a driver's license as long as they have the special permit that is limited to areas where it was issued. Golf carts are required to operate during daytime hours, be equipped with headlights, tail lights, brake lights, a rear mirror, and have a triangular slow-moving vehicle emblem [42], [43].

Mississippi

Mississippi has no law pertaining to use of golf carts on public roads. However, local municipalities may allow them on roads within their jurisdiction. Golf cart means *a motor vehicle that is designated and manufactured for operation on a golf course for sporting or recreational purposes and that is not capable of exceeding speeds of 20 mph and is equipped with the safety equipment as required under 49 CFR Section 20 571.500*. Operators can only operate during daytime hours and must possess a valid driver license. They must also ensure that their vehicles are registered. Golf carts are required to be equipped with headlights, brake lights, turn signals, and windshield [44], [45].

Missouri

In Chapter 304.034 of the Missouri Revisor of Statutes, golf cart means *a motor vehicle that is designed and manufactured for operation on a golf course for sporting or recreational purposes and that is not capable of exceeding speeds of 20 mph*. Municipalities may allow golf carts to operate on city or municipal roads with speed limits of no more than 35 mph and only cross state or federal highways that intersect at these streets with speed limits not more than 45 mph. They are not required to be registered before operation on public roads. However, the carts must be equipped with adequate brakes [46].

Montana

Section 61-1-101-25a of the Montana Code defines golf cart as *a motor vehicle that is designed for use on a golf course to carry a person or persons and golf equipment and that has an average speed of less than 15 mph*. Golf carts are only allowed to operate on public roads of cities or counties, and by ordinances put in place by local governing body. Golf carts are not required to be registered, insured, or have a title. Operators must

possess a valid driver license. Golf carts are required to be equipped with at least one and not more than two headlamps, at least one tail lamp, at least a reflector, stop lamps, a horn, and a mirror that reflects to the driver a view of the highway [47].

Nebraska

Statute 60-116.01 of the Nebraska Statutes defines a golf cart as *a vehicle that has at least four wheels, has a maximum level ground speed of less than 20 mph, has a maximum payload capacity of one thousand two hundred pounds, has a maximum gross vehicle weight of 2500 pounds, has a maximum passenger capacity of not more than four persons, and is designed and manufactured for operation on a golf course for sporting and recreational purposes*. Golf carts cannot be operated at a speed higher than 20 mph. They are allowed to operate on city, village, or county roads close to a golf course as authorized by the local governing body and only during daytime hours on streets with speed limits of no more than 35 mph. Golf carts can cross a portion of state or federal highways that intersect with local roads. Operators are required to possess a valid driver's license and a liability insurance before driving on public roads. No safety equipment requirement was found for the golf carts for the state of Nebraska [48], [49].

Nevada

No definition for golf carts was found for the state of Nevada. Golf carts may be operated in residential developments of counties that only approve of their operations. A permit and insurance are required only in certain counties. Operators are required to possess a valid driver's license. Golf carts are required to be equipped with headlamps, tail lamps, reflectors, stop lamps, mirror, brakes, and a slow-moving vehicle emblem or placard in order to obtain permit for operation in a county with population of 700,000 or more [50].

New Mexico

The state of New Mexico has authorized municipalities to permit and regulate operation of golf carts on municipal streets [51]. Golf cart is defined by City of Elephant Butte ordinance number 158 as *a vehicle that is manufactured primarily for the operation on golf courses and that has four wheels, a steering wheel, bench seats or individual seats for each passenger, and that has a maximum speed of 20 to 25 mph*. Golf carts are allowed to operate on city roads, as authorized by the local governing body, and may cross other streets or highways at intersections. The maximum posted speed limits of these roads were not indicated. Operators must possess a valid driver's license and must

meet the financial responsibility requirements. Golf carts are required to be equipped with brakes, reliable steering, safe tire, rear-view mirror, slow-moving vehicle emblem, audible device, headlights, tail lights, brake lights, and turn lights [52].

North Carolina

Section G.S. 20-4.01 defines golf cart as *a vehicle designed and manufactured for operation on a golf course for sporting or recreational purposes and that is not capable of exceeding speeds of 20 mph*. Golf carts are only allowed to operate on county or city streets with posted speed limits not more than 35 mph but are allowed to cross road portions with speed limits greater than 35 mph. Operators must be at least 16 years of age and have a valid driver's license. Golf carts are required to be registered and have liability insurance. They are also required to be equipped with a vehicle identification or serial number, rear view mirror, rear triangle reflector, two operating headlights, and two operating tail lights to operate on public roads [53].

North Dakota

No specific definition of golf carts was found for North Dakota. However, golf carts are allowed to operate during daytime hours on city roads as authorized by the local governing body. The code does not clearly specify the maximum speed limits for these roads. Golf carts do not require titling, registration, and equipment provision, and are only allowed to cross highways perpendicularly [54].

Ohio

No definition for golf carts was found, but Ohio's revised code 4511.215 allows a local authority to authorize, by ordinance or resolution, the operation of golf carts (under-speed vehicles) on a public street or highway under its jurisdiction [55]. Golf carts are allowed to operate on a secondary street with posted speed limits of no more than 35 mph, as permitted by the local governing body. Operators must be at least 16 years of age with a valid driver's license. Golf carts need to be registered and must pass the required vehicle inspection in order to operate on public roads. They are also required to be equipped with adequate brakes and braking system, brake lights, head lights, tail lights, signal lights working steering mechanism, a windshield, a rear-view mirror, and appropriate tires [56].

Oklahoma

Oklahoma does not allow golf carts to operate on state-owned highways. However, cities and municipalities have the right to allow golf cart usage on their city streets and county roadways with speed limits less than 25 mph, along with appropriate signage. Also, they are not prohibited from crossing state highways perpendicularly. No safety equipment requirement was found for golf carts for the state of Oklahoma [57], [58].

Oregon

Oregon vehicle code 801.295 defines golf cart as *a motor vehicle that has no less than three wheels in contact with the ground, has an unloaded weight less than 1,300 pounds, is designed to be and is operated at not more than 15 mph, and is designed to carry golf equipment and no more than two persons, including the driver* [59]. Golf carts may be operated on highways that are adjacent to a golf course, if authorized by a road authority. They may also be operated between the golf course and the place where they are located or parked. Golf carts do not require registration [60].

Pennsylvania

Pennsylvania vehicle code, Act 57, section 102 defines golf cart as *a self-propelled motor vehicle designed and manufactured for the transportation of persons or equipment for sporting, maintenance or recreational purposes that is not capable of exceeding a speed of 20 mph*. Even though they are not allowed on highways, golf carts may cross highways perpendicularly at locations designated by the department of state or local authorities. Operators must be at least 18 years of age to drive alone in a golf cart. Golf carts are exempted from being registered before operating on public roads [61].

South Carolina

No definition was found for golf carts in South Carolina. They are allowed to operate during daytime within 4 miles of the address on the registration certificate, and on secondary roads with speed limits of no more than 35 mph. They can cross a highway or street at an intersection with posted speed limit of more than 35 mph. A political subdivision may create separate golf cart paths or reduce the area from 4 miles to 2 miles, in areas within its jurisdiction. Golf cart operators must be at least 16 years of age and hold a valid driver's license and must ensure that their vehicles are registered and insured [62].

South Dakota

Section 32-14-13 defines golf cart as *a four wheeled vehicle originally and specifically designed and intended to transport one or more individuals and golf clubs for the purpose of playing the game of golf on a golf course*. Golf carts are only allowed by the municipal local governing body to operate on town or municipal roads, but they can cross the highways perpendicularly at specified locations. The maximum posted speed limits of the town or municipal roads were not found for South Dakota. Operators must ensure that they hold a valid driver's license and proof of insurance. Golf carts must be equipped with a slow-moving vehicle emblem or a white or amber warning light [63].

Tennessee

Traditional golf carts are not allowed to drive on public roads in Tennessee. The Tennessee Code Annotated Section 55-1-123 defines a conventional golf cart as *a motor vehicle that is designed and manufactured for operation on a golf course for sporting or recreational purposes and that is not capable of exceeding speeds of twenty miles per hour (20 mph)* [64]. If golf carts are modified to meet all low- and medium-speed vehicle requirements, they can be registered and used on public roadways as permitted by the county. A low-speed vehicle is defined by the Tennessee code annotated section 55-1-122 *as any four-wheeled electric or gasoline vehicle, excluding golf carts, whose top speed is greater than 20 mph, but not greater 25 mph, including neighborhood electric vehicles*. Modified golf carts are allowed to operate on streets with speed limits of 35 mph or less and are permitted to cross streets that exceed 35 mph. The department of transportation, county, or municipalities may prohibit operation of LSVs on jurisdiction roads if it is not safe. Operators must have a valid class D driver's license, proof of valid insurance, and vehicle identification number. Modified golf carts are required to be equipped with headlamps, stop lamps, front and rear turn signals, tail lamps, reflectors, a parking brake, exterior mirror, windshield, and seat belts [65].

Texas

The Texas Transportation code, section 551.401 defines a golf cart as *a motor vehicle designed by the manufacturer primarily for use on a golf course*. Golf carts are not required to be registered. However, they have to display a license plate to operate on a highway. Golf carts can only operate during daytime in certain areas, such as a master planned community and a public or private beach, and on highways with speed limits no more than 35 mph. In addition, they must operate not more than two miles from a golf

course. Golf carts are not prohibited to cross at intersections including a highway that has a posted speed limit of more than 35 mph. Nonetheless, municipalities and certain counties may prohibit the operation of golf carts on highways or may allow operation on all or part of highway under their jurisdictions with speed limits less than 35 mph. Golf carts are required to be equipped with headlamps, tail lamps, reflectors, parking brake, and mirrors [66].

Virginia

The code of Virginia 46.2-100 defines golf cart as *a self-propelled vehicle that is designed to transport persons playing golf and their equipment on a golf course*. Golf carts can only operate during daylight hours unless equipped with lights on designated public highways with maximum speed limits of not more than 25 mph. However, they are allowed to cross highways with a maximum speed of 35 mph at certain intersections. Operators must possess a valid driver's license before they can operate on public roads. Golf carts must display a slow-moving vehicle emblem whenever they are operating on public highways [67].

Washington

Section 3, chapter 46.04 of the Washington state laws defines golf carts as *a gas-powered or electric-powered four-wheeled vehicle originally designed and manufactured for operation on a golf course for sporting purposes and has a speed attainable in one mile of not more than 20 mph*. Golf carts are allowed to operate in zones created by the county or city and on some public roads with speed limits of no more than 25 mph [68]. Individuals eligible to drive a golf cart must be at least 16 years of age and must possess a valid driver's license. Golf carts must be equipped with reflectors, seat belt, and rearview mirrors when operated upon streets and highways [69]

Wisconsin

In Section 23.33fm of the Wisconsin state legislature, golf cart means *a vehicle whose speed attainable in one mile does not exceed 20 mph on a paved, level surface, and that is designed and intended to convey one or more persons and equipment to play the game of golf in an area designated as a golf course*. Any city, village, or town may regulate the operation of golf carts on highways under its jurisdictions by ordinance. The distance should be less than one mile and have a travel route sign. Municipalities, by ordinance, may allow golf carts to operate on municipal roadways with speed limits of 25 mph or

less and to cross highways with speed limits of no more than 35 mph at certain points. Golf carts operators must be at 16 years and above. The golf carts are required to be equipped with reflective devices [70].

Louisiana-Specific Laws Related to Golf Carts

Section RS 32:299.4A of the Louisiana law defines golf cart as an *electric four-wheeled vehicle originally intended for use off-road on golf courses and other green spaces whose maximum speed is 25 mph*. Golf carts may be operated on parish roads or municipal streets designated by a municipality or parish, and these roads must have the appropriate signage, posted by the governmental entity, indicating that the operation is authorized. The average speed limits of these roads were not stated in the legislation. Operators are required to have a valid driver's license and must ensure that the golf carts are registered and insured before they can operate on public roads. Golf carts may cross a part of a state highway where a golf course is constructed on both sides of the state highway only if DOTD has issued a permit. Golf carts are required to be equipped with efficient brakes, reliable steering apparatus, safe tires, rear view mirror, red reflective warning devices in both the front and rear of the vehicle, front and rear turn signal lamps, tail lamps, brake lamps, headlamps, and a vehicle identification number or serial number [4].

Further information was gathered from parishes, cities, and towns' websites and local news' websites to identify local regulations for use of golf carts on public roads in Louisiana. Information found was for two parishes, two cities, and four towns in Louisiana, as presented in the sections below.

St. Charles Parish

The section 15-26 of code of ordinance for St. Charles parish defines golf cart as an *electric four-wheeled vehicle originally intended for use off-road on golf courses and other green spaces whose maximum speed is 25 mph*. A golf cart shall not operate upon any state highway but may operate on a parish road or street with speed limits of 25 mph or less. They must be operated in accordance with all state traffic regulations and must carry only the number of passengers for which it is designed to carry. Operators of golf carts must have a valid driver's license and must have the golf carts registered and insured with the Louisiana Office of Motor Vehicles. Golf carts must be equipped with efficient brakes, reliable steering apparatus, safe tires, rear view mirror, red reflective warning devices in both the front and the rear of the vehicle, front and rear turn signal

lamps, tail lamps, brakes, lamps headlamps and vehicle identification number or serial number [71].

St. John the Baptist Parish

Golf carts are defined similarly to the state's definition as *an electric four-wheeled vehicle originally intended for use off-road on golf courses and other green spaces whose maximum speed is 25 mph*. Section 40-8 of the St. John the Baptist ordinance allows golf cart operation only on parish roads assigned for golf cart use within the parish and for crossing of certain designated highways. The code of ordinance does not indicate the speed limits of these roads. Golf carts are not permitted to operate on 23 streets in Laplace, seven streets in Reserve, and two streets in Garyville within the parish. Operators are also required to follow all state traffic regulations and have a valid driver's license. The golf carts have to be registered and insured with the St. John the Baptist Parish Sheriff's Office. They are also required be equipped with efficient brakes, reliable steering apparatus, safe tires, rear view mirror, red reflective warning devices in both the front and the rear of the vehicle, front and rear turn signal lamps, tail lamps, brakes, lamps, headlamps, and a vehicle identification number or serial number [72].

City of DeQuincy

Section 13-9 of the DeQuincy code of ordinance defines golf carts as *an electric motorized pleasure vehicle that do not exceed 25mph on a straight and level surface*. Golf carts are only allowed to operate on designated streets, roads, pathways, or highways within the city of DeQuincy. They may only operate or cross state highways LA12, LA389, and LA27 at designated crossing points marked for these vehicles within the city. They are not allowed to drive down state highways or in their rights-of-way. DeQuincy city code of ordinance does not indicate the speed limits of these streets or highways for golf carts. Operators must ensure that they obey all parish municipal and state traffic laws for the golf cart. They must also have a valid driver's license and must have liability insurance and registration for golf carts in order to operate on public roads. Golf carts are required to be equipped with a rear vision mirror capable of providing the operator with a hundred feet clear sight picture, headlights, tail lights, and brake lights [73].

City of Youngsville

Youngsville's Code of General Ordinance, Sec 22-58 defines golf carts as *an electric motorized pleasure vehicle capable of traveling a maximum speed of not more than 25 mph on a straight and level surface*. Golf carts can only operate on public streets, roads, and pathways within jurisdiction of the city during daylight hours. They are restricted from travel upon the 19 state highways mentioned in the ordinance or in their right-of-way. Golf cart operators must obtain liability insurance and must possess a valid driver's license in order to operate on public roads. Drivers and operators must adhere to all municipal, parish, and state traffic laws governing the use of golf carts in the city. Golf carts are required to be equipped with mirrors, front and rear turn signals, head lights brake lights, and must display a valid permit of operation on the left side of the windshield [74].

Grand Isle

No definition of golf carts was found for the town of Grand Isle. Louisiana Revised Statutes 32.127 states that golf carts are allowed to cross Louisiana Highway 1 with designated paths or crossing for such vehicle within the town limits of the Grand Isle between sunrise and sunset. Golf cart operators must have a valid driver's license when crossing Louisiana Highway 1 in the town of Grand Isle. Crossing signs may be posted by the DOTD [75].

Jena

Golf carts are defined by the state definition for golf carts: *a battery operated, or electricity powered vehicle designed and manufactured for sporting or recreational purposes*. Golf carts are allowed on streets and highways with posted speed limits of 35 mph or less within the town. Operators must ensure that they adhere to all traffic laws, possess a valid driver's license and must have their vehicles registered and insured by the Jena Police Department. Golf carts must be equipped with rear vision mirrors, front and rear turn signals, headlights, brakes lights, and seat belts [76].

Kinder

Section 14-50 of Article IV *Golf Carts and Slow Moving Vehicles* defines golf cart as *an electric motorized pleasure vehicle capable of traveling a maximum speed of not more than 25 mph on a straight and level surface*. Golf carts may cross or drive on state

highways LA165, LA190, and LA383 only at the following crossings: LA190 at 13th Street and at Railroad Street, LA383 at 13th Street and at Railroad Street, and LA165 at 2nd Avenue as designated and marked by DOTD. Golf carts are not allowed to travel upon state highways or in their rights-of-ways. Operators must possess a valid driver's license and must have their vehicles registered and insured. They are allowed to operate during daytime hours but are prohibited to operate at night or during inclement weather. Golf carts must also be equipped with headlights, turn lights, brake lights, and mirrors [77].

Town of Welsh

Section 20-33 of the Welsh code of ordinance defines golf carts as *an electric motorized pleasure vehicle that do not exceed 25 mph on a straight and level surface*. Golf carts are allowed to operate on public roadways within the jurisdiction of the town and allowed to cross state highways LA90 at South Polk Street, LA99 between East Nichols and West Nichols, and LA99 between North Street and Beaufort Street. Golf carts can only operate during daytime hours. Operators must possess a valid driver's license and must have their vehicles insured to obtain permit to operate golf carts. These vehicles must be equipped with a rear vision mirror on the exterior of the driver's side, a mirror on the passenger side or an interior mirror, front and rear turn signals, headlights, and brake lights [78].

Safety Impacts of Operating Golf Carts on Public Roads

Golf carts do not have a designated right-of-way on public streets unless incorporated in well-planned communities. When operating on public roads, golf carts are sharing the roadways with high-volume traffic with varying speeds. Therefore, occupants of these vehicles are exposed to high injury risk in the event of a crash due to the speed differentials and lack of protective equipment. Golf carts are not required by the federal regulations to meet crash-test requirements or be equipped with safety features, since they are not designated to be used on high-speed public roads. They are only subject to state and local government's requirements for safety features. However, if the golf carts are modified to reach higher speed limits, they are included under LSVs and are required to be equipped with some safety equipment such as headlamps, tail lights, brake lights, seat belts, turn signal lamps, and rearview mirrors [1].

The existing literature on crashes involving golf carts on public road is very limited. One study was found that looked specifically at police reported traffic crashes involving golf carts and all-terrain vehicles (ATVs). Two other studies looked at golf cart-related injuries

and one at effectiveness of seat belt and golf carts' performance characteristics. The results of these papers are summarized below.

Russo and Smaglik analyzed Arizona crash data from 2010 to 2015 to understand the factors affecting the injury severity of ATVs and golf carts [7]. The study found that during this 6-year period, 1,769 persons driving or riding ATVs or golf carts were involved in 575 golf cart police reported crashes. Of these crashes, 21 were fatalities, 67 incapacitating injuries, 157 non-incapacitating injuries, 74 possible injuries, and 252 no injuries. When the crashes were collectively analyzed for ATVs and golf carts, researchers found that almost 68% of persons involved in the crashes were severely injured or killed. About 58% of the total persons were involved in single-vehicle crash, and 80% involved in crashes that occurred on tangents as opposed to 20% that occurred on curves. Almost 63% of the total persons were involved in crashes on roadways with speed limits of no more than of 35 mph. The study also looked at occupant ejection and vehicle rollover and found that 337 persons were ejected and 630 vehicles rolled over. The results of this study provide important findings on the characteristics of golf cart and ATV crashes, which can be used to develop effective countermeasures.

Watson et. al. evaluated the golf cart-related injuries treated in the United States emergency departments [6]. The study analyzed a long period (1990-2006) and found that the most common cause of injury when operating the golf cart was falling or jumping from the golf cart and this had twice as likely chance of head or neck injuries. About 70.3% of injuries occurred at sport or recreational facilities with only 15.2% occurring on public streets. The study recommended taking safety precautions when using golf carts and limiting transportation of children in the golf carts.

Passaro et. al. investigated golf cart-related injuries in the North Carolina community of Bald Head Island [79]. The study found that out of 22 people involved in golf cart injuries, seven were children (aged 2-10). It was also found that 13 people fell off moving golf carts and 19 of the 22 injured people received immediate medical care at the hospital. At least six of the 15 injured adults had alcohol involved. The findings suggest using appropriate occupant restraints when the golf carts are used as transportation vehicles.

A study conducted by Long et al. on the seat belt effectiveness and performance characteristics of the golf carts and LSVs found that even at a low speed of 11 mph, golf carts are capable of ejecting an unrestrained occupant when negotiating a curve [80]. Occupants who drove or rode in these vehicles without seatbelts were more prone to

ejection, especially in J-turn maneuvers, since there was no hip restraint. This study found that seat belts in golf carts significantly improve occupant safety when golf carts are operated on roadways.

In summary, even though very limited, these studies have demonstrated that operating golf carts on public roads has resulted in serious injuries and fatalities, revealed the risks associated with driving golf carts or low-speed vehicles on public roads, and the highlighted need for safety equipment on these vehicles.

Objective and Scope

The objective of this study was to conduct a literature review to ascertain the state of the practice in golf cart operation on public roads in the United States. Specifically, this report documented existing laws and regulations governing the operation of golf carts on public roads, a Louisiana-specific synthesis of local regulations, and traffic safety impacts of operating golf carts on public roads.

Methodology

The information for this report was obtained mainly from federal and state websites, Google Scholar, the Transportation Research International Documentation (TRID) database, news, and periodical websites. These resources were queried using keywords such as *definition of golf carts, low-speed vehicles, golf cart laws, golf cart injuries, type of roads, maximum road speed limits, average speed of the golf carts, safety equipment of the golf carts, and requirements of the golf carts.*

Discussion of Results

The research team conducted a comprehensive literature search at the national level to document each state’s law(s) for regulating golf cart usage on public roads. In addition, the research explored studies on golf carts crashes and related injuries to determine the traffic safety impact of operating golf carts on public streets.

Among the 50 states reviewed, 37 states have existing laws permitting golf carts on public roads. These states authorized their local governments to regulate the use of golf carts on public streets inside their jurisdictions. Generally, states do not permit golf cart operation on state or federal highways; however, they allow crossing of state or federal highways, especially at specific perpendicular intersections, or at designated intersections. Table 1 represents a summary of these states, along with golf carts’ maximum operating speed limit, maximum posted speed limit of the road, and the type of roads they are allowed to drive on. Table 1 also presents the requirements for golf cart driver age and state-specific requirements for golf carts to operate on public roads. If no information concerning these categories was found in the documents reviewed for each state, it was noted as “No Information” or “N/I” in the table.

Table 1: States permitting golf carts operation on public roads

State	Golf cart maximum speed limit (mph)	Maximum posted speed limit of the road (mph)	Type of roads on which operation is permitted	Driver’s age (years)	Requirements
Alabama	N/I	25	Municipal/ county/town roads	N/I	Insurance, registration, safety equipment
Alaska	N/I	N/I	Designated highways	16	Insurance, valid driver’s license, safety equipment
Arizona	25	35	N/I	N/I	Proof of liability insurance, registration

State	Golf cart maximum speed limit (mph)	Maximum posted speed limit of the road (mph)	Type of roads on which operation is permitted	Driver's age (years)	Requirements
Arkansas	N/I	N/I	Specific city streets	N/I	N/I
California	15	25	Roads designated by local authorities	16	Safety equipment
Colorado	20	35	Local roads designated by local authorities	16	LSEV safety requirements
Connecticut	N/I	25	City/town roads	N/I	Valid driver's license, insurance
Florida	20	30	Designated county or municipal roads	14	Appropriate road signs, safety equipment
Georgia	15	35	N/I	15	Valid driver's license, safety equipment
Illinois	N/I	35	City roads	N/I	Valid driver's license, safety equipment
Indiana	N/I	N/I	City/town/county roads	N/I	Valid driver's license
Iowa	N/I	N/I	City streets	N/I	Valid driver's license, safety equipment

State	Golf cart maximum speed limit (mph)	Maximum posted speed limit of the road (mph)	Type of roads on which operation is permitted	Driver's age (years)	Requirements
Kansas	25	30	City roads	N/I	Slow-moving vehicle emblem
Kentucky	35	35	City streets designated by local government	N/I	Valid driver's license, LSVs safety requirements
Louisiana	25	N/I	Designated parish roads or municipal streets	N/I	Valid driver's license, proof of liability insurance, registration, safety equipment, appropriate signage posted on roads
Maine	20	35	Local roads designated by local authorities	N/I	Appropriate road signs, valid driver's license
Michigan	N/I	15/30	City/Village/ town roads and state trunk lines	16	Valid driver's license, safety equipment, manufacturer's identification number
Minnesota	20	N/I	City/ county roads	N/I	Permit by county or municipal, safety equipment
Mississippi	20	N/I	Local roads designated by local authorities	N/I	Valid driver's license, registration, safety equipment
Missouri	20	35	Municipality streets	N/I	Adequate brakes

State	Golf cart maximum speed limit (mph)	Maximum posted speed limit of the road (mph)	Type of roads on which operation is permitted	Driver's age (years)	Requirements
Montana	15	N/I	County/City roads	N/I	Valid driver's license, safety equipment
Nebraska	20	35	Local roads	N/I	Valid 's license, liability insurance
Nevada	N/I	N/I	County roads	N/I	Insurance and permit only for some counties, valid driver's license, safety equipment
New Mexico	25	N/I	City roads	N/I	Valid driver's license, proof of financial responsibility, safety equipment
North Carolina	20	35	County/city roads	16	Valid driver's license, vehicle identification number, valid issued registration, liability insurance, safety equipment
North Dakota	N/I	N/I	City roads	N/I	No registration, titling, or safety equipment required
Ohio	N/I	35	Secondary streets permitted by local authorities	16	Valid driver's license, valid issued registration, vehicle inspection, safety equipment
Oklahoma	N/I	25	County and city roads	N/I	N/I
Oregon	15	N/I	Highways adjacent to golf course	N/I	No registration required

State	Golf cart maximum speed limit (mph)	Maximum posted speed limit of the road (mph)	Type of roads on which operation is permitted	Driver's age (years)	Requirements
Pennsylvania	20	N/I	Only cross highways designated by local authorities	18	No registration required
South Carolina	N/I	35	Secondary roads within 4 miles or less of home address	16	Valid driver's license, proof of liability insurance, certificate of registration
South Dakota	N/I	N/I	Town or municipal roads	N/I	Valid driver's license, insurance, slow-moving vehicle emblem
Tennessee	20/25	35	County roads only for modified golf carts (25 mph speed limit)	N/I	Valid class D driver's license, proof of valid insurance, vehicle identification number, registration, and safety equipment
Texas	N/I	35	Certain highways designated by municipalities or counties	N/I	Safety equipment, display of license plate
Virginia	N/I	25	Designated highway	N/I	Valid driver's license, slow-moving emblem
Washington	20	25	County/city roads	16	Valid driver's license, safety equipment

State	Golf cart maximum speed limit (mph)	Maximum posted speed limit of the road (mph)	Type of roads on which operation is permitted	Driver's age (years)	Requirements
Wisconsin	20	25	Marked city, village, or town roads	16	Reflective devices

It can be observed from Table 1 that the maximum speed limit for golf carts varies from state to state, with values from 15 to 35 mph. However, several states have not specified their maximum allowable speed limits. Also for the states that specified these values, it is evident that several of them have a 5 to 20 mph speed differential between the maximum allowable speed limit for golf carts and the maximum posted speed limit of the street on which the golf carts operate. Literature showed that a speed differential of 10 to 20 mph, that occurs when a vehicle moves slower or faster than the traffic stream, increases the collision rate [80], [81]. Tables 1 and 2 show that for the states that recorded higher number of fatalities, golf carts with a maximum speed of either 20 or 25 mph are allowed to drive on designated streets with maximum speed limit of either 30 or 35 mph, which creates a potential speed differential of 10 mph between golf carts and other vehicles. Georgia has a speed differential of 20 mph, Colorado, Maine, Missouri, Nebraska, and North Carolina's is 15 mph, and California, Arizona, Tennessee, and Florida's is 10 mph. Only Kentucky has the same speed limit of 35 mph for golf carts and streets. Almost all the states required operators to possess a valid driver's license before operating on any designated road. Looking at the type of roads on which golf cart operation is permitted, most of the roadways are municipal, city, county, town, or designated by the local governing bodies, with speed limits varying from 15 to 35 mph.

In Louisiana, golf carts are not allowed to operate on state or federal highways, but are allowed to cross some highways at designated points. According to the Louisiana state definition for golf cart, the maximum operating speed is 25 mph. Golf carts may only operate on parish roads or streets as designated by the parishes or municipalities in Louisiana.

The literature review in this study showed that golf cart-related injuries and fatalities do occur on public roads in the United States [6], [7]. The findings and recommendations of these studies showed that safety equipment is essential for golf carts that operate on

public roads. Furthermore, the Fatality Analysis Reporting System (FARS) provided by NHTSA has records of fatalities involving golf cart vehicles. Table 2 shows the number of golf cart vehicles involved in fatal crashes by year and respective state for the period 2013 to 2018 [8].

Table 2: Fatality data for golf carts in the United States

State	2013	2014	2015	2016	2017	2018	Total
Alabama	0	1	0	0	1	0	2
Arizona	8	5	1	6	2	0	22
Arkansas	0	0	1	0	0	0	1
California	0	1	1	1	2	2	7
Florida	4	3	8	6	2	7	30
Georgia	3	1	1	2	2	0	9
Illinois	0	1	1	1	1	1	5
Indiana	0	1	1	0	0	0	2
Iowa	0	0	1	0	0	2	3
Kansas	0	0	1	1	0	1	3
Kentucky	0	0	2	1	0	0	3
Louisiana	1	0	0	0	0	0	1
Michigan	1	1	0	3	0	0	5
Minnesota	0	1	1	0	0	0	2
Mississippi	1	0	0	0	0	0	1
Missouri	0	1	0	0	1	2	4
Nebraska	0	1	0	0	0	0	1
New Jersey	0	1	1	0	0	0	2

State	2013	2014	2015	2016	2017	2018	Total
North Carolina	0	0	0	2	0	1	3
Ohio	0	3	0	0	0	0	3
Oklahoma	2	0	0	0	0	0	2
Pennsylvania	0	0	0	1	0	0	1
South Carolina	1	0	0	3	1	0	5
Tennessee	0	0	0	1	0	0	1
Texas	1	0	0	3	4	2	10
Washington	0	0	0	0	1	0	1
Wisconsin	0	0	0	1	0	0	1
Total	22	21	20	32	17	18	130

Source: FARS Data

Over this six-year period, 130 golf carts were involved in fatalities. Florida and Arizona recorded the highest number of golf cart fatalities, 30 and 22 respectively, with fatalities occurring almost every year. Texas recorded ten fatalities and Georgia recorded nine fatalities, followed by California with seven. Illinois, Michigan, and South Carolina recorded five fatalities, respectively.

Conclusions

This technical assistance report investigated the laws governing golf carts in the United States. The study documented definitions of golf cart by federal and state agencies, state laws for golf carts operation on public roads, a Louisiana-specific synthesis of golf cart laws and regulations, and safety impacts of operating golf carts on public roads.

Conventional golf carts were originally manufactured to have a top speed limit of 15 mph and to carry one or more people and golf equipment to play golf. However, in recent years, some have been modified to achieve higher speed limits to be used for short trips outside golf courses. Speed-modified golf carts, included by NHTSA in the low-speed vehicle (LSV) category, can have a top speed of 20 or 25 mph. Speed-modified golf carts whose top speed is between 20 and 25 mph are subject to Federal Motor Vehicles Safety Standard 49 CFR 571.500 requirements for LSV, which mention that each LSV shall be equipped with headlamps, front and rear turn signal lamps, tail lamps, stop lamps, reflex reflectors, a parking brake, rearview mirrors, windshield, type 1 or type 2 seat belts, and a vehicle identification number. On the other hand, golf carts that have a maximum speed limit of 20 mph are subject only to state or local safety equipment requirements.

Although NHTSA standard 49 CFR Part 571 provides definitions for golf carts and LSVs, whose top speed is less than 25 mph, states and local agencies have their own definitions for golf carts and can stipulate their own maximum speed limits for these vehicles, as well as the maximum posted speed limit of the roadways on which these golf carts operate. Findings from this study revealed that 37 states have laws permitting golf carts operation on public roads. These states authorized their local governments to regulate the use of golf carts on public streets inside their jurisdictions. Crossing of state or federal highways is allowed at specific perpendicular intersections or at designated intersections.

Among the 21 states that provided a definition for golf carts and stated the maximum golf cart speed limits, four states specified a speed limit of 15 mph, eleven states listed 20 mph, five other states listed 25 mph, and only one state (Kentucky) listed 35 mph. Similarly, the maximum roadway posted speed limit (on which golf carts can be operated on) for these states varied from 25 mph (seven states), through 30 mph (three states), to 35 mph (13 states). A potential speed differential between the roadway posted speed limit and golf cart maximum operating speed limit was noted for 13 states. For example among the states that provided both information, three states have a potential speed differential

of 5 mph, four states have 10 mph, five states have 15 mph, and one state has 20 mph. Regarding the golf cart requirements, 21 states ensured that the golf carts were equipped with minimum safety equipment requirements to operate on public roads.

In Louisiana, golf cart operation on state or federal highways is not allowed. However, the local governing bodies of municipalities, parishes, cities, or towns may allow the operation of golf cart on designated roads or streets within their jurisdictions as permitted by their ordinance. The responsible governmental entity shall post appropriate signage indicating that operation of golf carts on that designated street is authorized. Golf carts may cross certain portions of some designated state highways if a permit has been obtained from DOTD. It is also required that golf carts operating on public roads shall have registration, liability insurance, and meet the federal standard safety equipment requirements. The study found that only St. Charles Parish and St. John the Baptist Parish in Louisiana have ordinances for regulating golf cart operation on their parish roads. Researchers also found information for two cities and four towns in Louisiana that have enacted ordinances relating to golf cart operation on public roads.

Golf carts are not designed to meet the crash-test requirements of passenger cars and therefore are not designed to protect their occupants in crashes. The risk of fatality or serious injury, during a collision, heightens with increasing speeds. Literature regarding crashes involving golf carts is very limited. However, a few studies showed that operations of golf carts on public roads have resulted in related injuries and fatalities nationwide. A study, that analyzed Arizona's crash data from 2010 through 2015, showed that a total of 571 golf cart vehicles were involved in police reported crashes, with 21 of them being fatalities and 67 serious injuries. Furthermore, in the last six years (2013 to 2018), FARS has recorded 130 fatalities involving golf carts.

Based on the literature findings, in order to protect all road users, states considering operation of golf carts on their roadways should minimize high speed differentials between the maximum allowable speeds of the golf carts and the posted speed limits of the roadways they will be operated on. Furthermore, factors such as traffic volume, number of heavy vehicles in the traffic, crossing highways with higher speed limits, and golf cart safety equipment should be taken into consideration when enacting regulations for using golf carts on designated public roads.

Acronyms, Abbreviations, and Symbols

ATV	All-terrain vehicle
CFR	Code of Federal Regulations
DOTD	Department of Transportation and Development
FARS	Fatality Analysis Reporting System
GVWR	Gross Vehicle Weight Rating
LSV	Low Speed Vehicle
LSEV	Low Speed Electric Vehicle
LTRC	Louisiana Transportation Research Center
mph	miles per hour
N/I	No information
NHTSA	National Highway and Traffic Safety Administration
RS	Revised Statute
TRID	Transportation Research International Documentation

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