

Vulnerable Users (VU) in Massachusetts

May 21, 2025



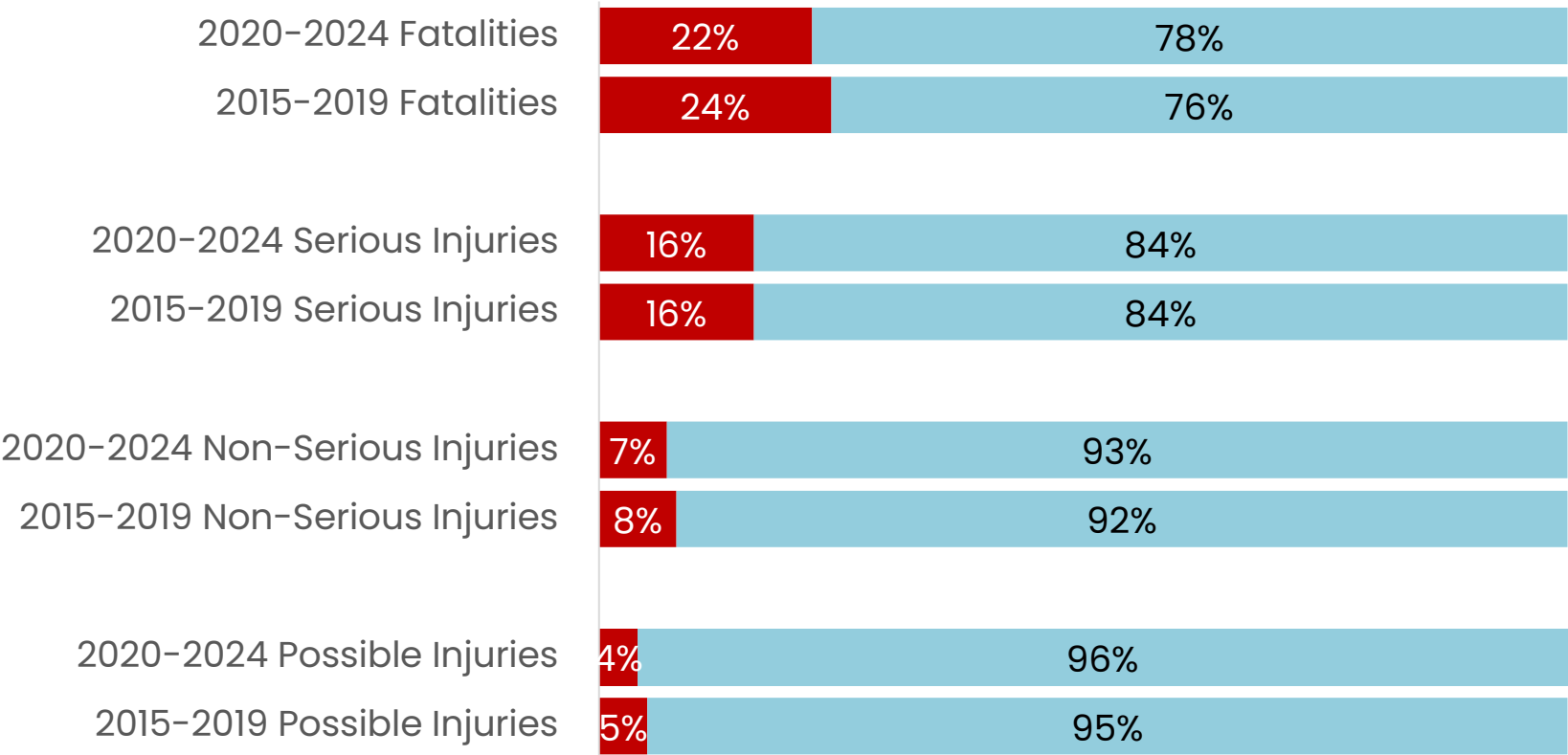
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Vulnerable User Crash Data and Injury Severity

Severity of Crashes disproportionately affects Vulnerable Users

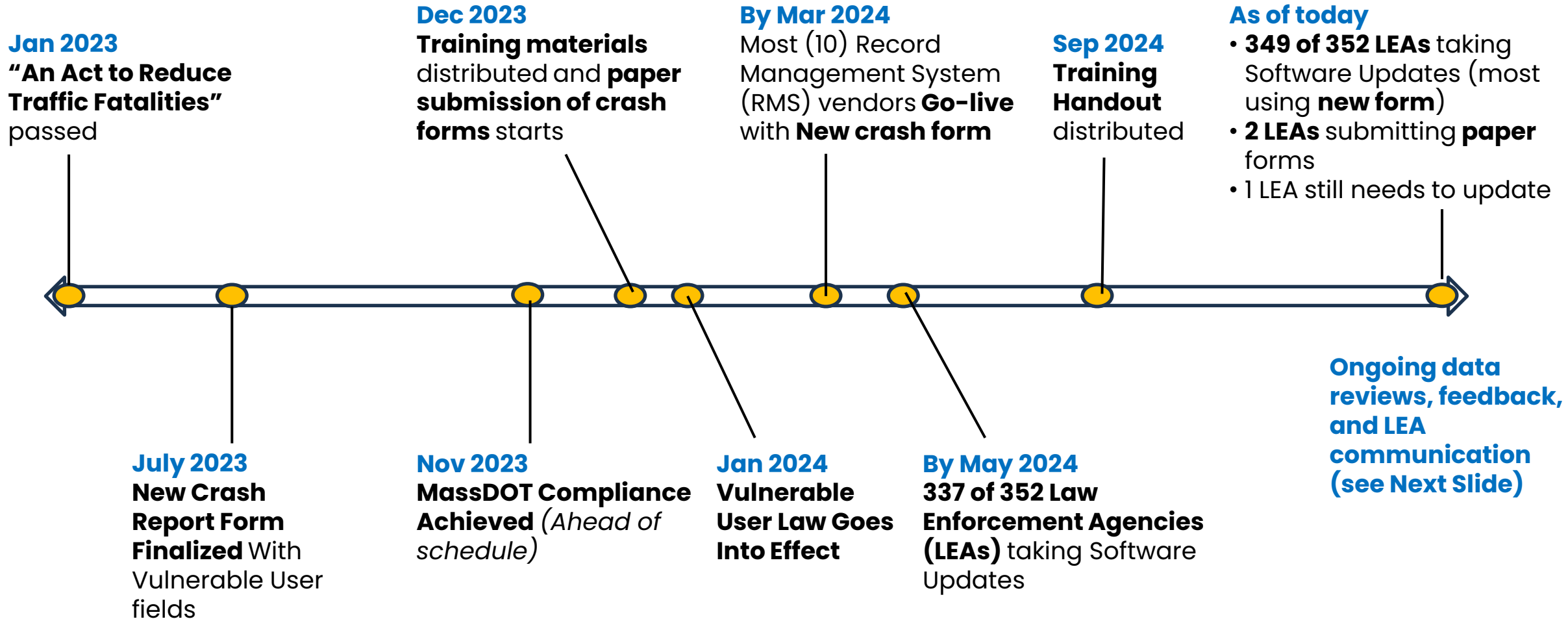
Percentage of Vulnerable Users by Injury Severity



■ Vulnerable user ■ Non-Vulnerable user

Timeline and Milestones on the Road to Compliance

4



Collaboration with Stakeholders

Registry of Motor Vehicles (RMV) Crash Data Review and Activities

5

ONGOING REVIEW

Daily review of Vulnerable User data entered to identify & fix discrepancies

Ongoing review of reports: non-submit, completeness, rejections, warnings, timeliness, Law Enforcement Agency (LEA) emails to identify priority LEA targets for outreach

ONGOING COMMUNICATION

Outreach to LEAs (25-30 per week) and RMS vendors as needed to resolve questions, review reports, get feedback and discuss S/W fixes

FOUNDATIONAL ACTIVITIES

Provide input to curriculum for new cadet and established officer training (16 Academies)

Attend Chief Association (10 associations) meetings to provide input and get feedback

Summary of 2024 Data

Vulnerable Users in 2024 Crash Data

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Vulnerable User type	Total People in 2024 Crashes
Pedestrian	2,020
Bicyclist	1,523
Motorized Scooter rider	284
Unknown (includes Not-Reported)	83
Other	69
Motorized Bicyclist	62
Electric Personal Assistive Mobility Device User	37
Non-Motorized scooter Rider	29
Train/Trolley Passenger	23
Skateboarder	21
TOTAL	4,224

Other Vulnerable User Categories (not shown in table)

- Horse Rider, Horse-drawn Carriage Driver, Farm Equipment Operator: **0 Crashes**
- Non-Motorized Wheelchair user (5), Other Micromobility Device User (5), Utility Worker – Outside of vehicle (5), In-line skater (3), Roller Skater (2): **1-5 people in crashes**
- Hand Cyclist (18), Roadway Worker – Outside of vehicle (17), Emergency Responder – Outside of vehicle (11), Tricyclist (7): **6-19 people in crashes**

Crash Data Review Learnings

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Of the Vulnerable User crash reports submitted till Dec 2024, approximately **16%** had an issue identified upon **manual** review. Some of the key issues are summarized below:

Type of Issue	Incidence	Examples (not comprehensive)
Potentially incorrect Vulnerable User classification	31%	Identified based on examining narrative. E.g. E-bikes classified as motorized bicycle, motorized bicycle (Mopeds) being entered as motorized scooter
No Vulnerable User involved	21%	Identified based on examining narrative. E.g. Pedestrian was not struck, entered motor vehicle passengers, animals, inanimate objects as Vulnerable Users
Invalid codes	15%	Entered invalid codes e.g for injury status or suspected drug/alcohol etc
Non qualify	18%	Crash in parking lot or private property

LEA feedback:

- Too many Vulnerable User categories on the crash form
- Some of the Vulnerable User categories can be confusing
- Do not always understand the importance of collecting this information

Vulnerable User Moving Forward

Next Steps

8

- **UMass Engagement:** In Fall 2024, MassDOT engaged UMass to develop recommendations for Vulnerable User definitions and types and clarify allowable uses and restrictions to optimize safety for all users.
- **Legislative Commission:** A special commission on micromobility was established by the 2024 Legislature to explore regulatory frameworks for micromobility vehicles (e.g., e-scooters, e-bikes), with goals including:
 - Review of current state/local regulations
 - Recommendations for use on bike paths, sidewalks, and shared-use paths
 - Support for innovation and shared micromobility options in municipalities
- The Special Commission on Micromobility held its first meeting on April 9th and their report is due end of 2025.
- **Results from UMass study** should be available in Summer 2025 and will be provided to the Special Commission on Micromobility and the MassDOT Board of Directors.

Thank You



Appendix

UMass Project

Vulnerable User General Laws State of Practice

11

Project Scope:

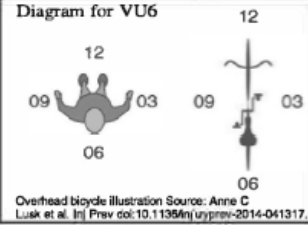
Develop recommendations for potential changes to VU definitions and types within the Massachusetts General Laws (MGLs) and Code of Massachusetts Regulations (CMRs) and/or the Massachusetts Crash Report as well as how they relate to the Code of Federal Regulations (CFRs) and clarify allowable uses/restrictions on the roadway to optimize the safety of all users.

Tasks	Mo 1	Mo 2	Mo 3	Mo 4	Mo 5	Mo 6	Mo 7	Mo 8	Mo 9
Kick-off meeting with MassDOT									
Review Massachusetts VU definitions and types in MGL and RMV police crash report.									
Conduct key informant interviews to further understand the current challenges.									
Research VU definitions and crash report VRU types in other states and national best practices.									
Develop draft proposed changes.									
Conduct focus groups and/or key informant interviews.									
Develop final recommendations.									

Vulnerable User Crash Data Form

12

Please complete a section for each vulnerable user involved in the crash.

Vulnerable User		Type <input type="text" value="VT11"/>	Action <input type="text" value="VT12"/>	Location <input type="text" value="VT13"/>																
VU: _____ <div style="display: flex; justify-content: space-between; width: 100%;"> Last First Middle </div> Address _____ City _____ State _____ Zip _____ License # _____ St _____ DOB/Age _____ Traffic Control Device <input type="text" value="VT14"/> Origin/Destination <input type="text" value="VU5"/> Contact Point: <input type="text" value="VU6"/>		Primary Injury Area: <input type="text" value="VU7"/> <div style="display: flex; justify-content: space-between;"> <div> Event Sequence <input type="text" value="VU8"/> <input type="text" value="VT18"/> <input type="text" value="VT19"/> <input type="text" value="VU8"/> Contributing Code <input type="text" value="VU9"/> <input type="text" value="VU9"/> Distracted by <input type="text" value="VT110"/> <input type="text" value="VT110"/> </div> <div> Test Status: <input type="text" value="VU11"/> Type of Test: <input type="text" value="VT112"/> BAC Test Result: <input type="text" value="VU13"/> Susp. Alcohol: <input type="text" value="VU14"/> Susp. Drug: <input type="text" value="VT115"/> </div> </div>																		
<div style="display: flex; align-items: center;"> <div style="flex: 1;">  <p>Diagram for VU6</p> <p>Overhead bicycle illustration Source: Anne C. Luak et al. Int J Prev doi:10.1135/ijupr-2014-041317.</p> </div> <div style="flex: 1;"> <table border="1" style="width: 100%;"> <tr> <td>Sex</td> <td>VU16 Seat Pos.</td> <td>VU17 Safety Equipment</td> <td>VU18 Eject Code</td> <td>VU19 Trap Code</td> <td>VU20 Injury Status</td> <td>VU21 Transp. Code</td> <td>Medical Facility</td> </tr> <tr> <td>Vulnerable User</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> </div> </div>		Sex	VU16 Seat Pos.	VU17 Safety Equipment	VU18 Eject Code	VU19 Trap Code	VU20 Injury Status	VU21 Transp. Code	Medical Facility	Vulnerable User										
Sex	VU16 Seat Pos.	VU17 Safety Equipment	VU18 Eject Code	VU19 Trap Code	VU20 Injury Status	VU21 Transp. Code	Medical Facility													
Vulnerable User																				

- Some fields previously existed but additional data attributes were added (example: vulnerable user type)
- Some fields added to mimic those of the driver (example: event sequence)
- Some fields are new (example: origin/destination)

Examples of Vulnerable Users

January 2024



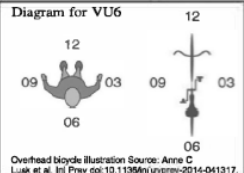
Massachusetts law defines 'vulnerable users' as:

- Pedestrians
- Roadside workers
- Bicyclists
- People riding horses or horse drawn carriage
- People using:
 - Wheelchairs
 - Personal mobility devices
 - Motorized bicycles
 - Motorized scooters
 - Non-motorized scooters
 - Skateboards
 - Roller skates



The Police Crash Report has been revised to include vulnerable users. Included in the presentation are definitions and examples of the vulnerable user types that may be used when completing the police crash report.

Please complete a section for each vulnerable user involved in the crash.

Vulnerable User		Type <input type="text" value="VT11"/>	Action <input type="text" value="VT12"/>	Location <input type="text" value="VT13"/>
<p>VU: Last First Middle Primary Injury Area: <input type="text" value="VU7"/></p> <p>Address _____</p> <p>City _____ State _____ Zip _____</p> <p>License # _____ St _____ DOB/Age _____</p> <p>Traffic Control Device <input type="text" value="VT14"/></p> <p>Origin/Destination <input type="text" value="VU5"/></p> <p>Contact Point: <input type="text" value="VU6"/></p> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>Event Sequence <input type="text" value="VU8"/> <input type="text" value="VT18"/> <input type="text" value="VT19"/> <input type="text" value="VU8"/></p> <p>Contributing Code <input type="text" value="VU9"/> <input type="text" value="VU9"/></p> <p>Distracted by <input type="text" value="VT110"/> <input type="text" value="VT110"/></p> </div> <div style="margin-left: 10px;"> <p>Test Status: <input type="text" value="VU11"/></p> <p>Type of Test: <input type="text" value="VT112"/></p> <p>BAC Test Result: <input type="text" value="VU13"/></p> <p>Susp. Alcohol: <input type="text" value="VU14"/></p> <p>Susp. Drug: <input type="text" value="VT115"/></p> </div> </div>				
	Sex	VU16 Seat Pos.	VU17 Safety Equipment	VU18 Eject Code
		VU19 Trap Code	VU20 Injury Status	VU21 Transp. Code
Vulnerable User				Medical Facility

VU1 - Vulnerable User Type


- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver
- 16 Farm Equipment operator
- 17 Other Micromobility Device User
- 18 Utility Worker - Outside of vehicle
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown

1 – Pedestrian (Definition)

Any person who is not an occupant. Inclusions:

- Person on foot
- Person standing, walking, running, jogging, hiking, sitting, or lying within the trafficway or on private property, etc.
- A person assisted with a cane or walker
- Person pushing a baby carriage/stroller or carrying a baby.
- Baby being carried.
- A person ejected from a transport vehicle who has come to rest in the trafficway during a prior unstabilized situation and struck in a second or subsequent unstabilized situation.

VU1 - Vulnerable User Type

- 1 Pedestrian 
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1 – Pedestrian (Examples)



2 – Bicyclist (Definition)


Any occupant of a two-wheeled road vehicle propelled by pedaling and **may include an electric motor** of 750 watts or less. It includes bicycles solely propelled by human power and those that can be propelled by human power and/or an electric motor. This includes all people (operator and passengers) on bicycles and a person being pulled by a bicycle (e.g., in a wagon or bike trailer).

Per M.G.L. c. 90, § 1, an e-bicycle can have one of two classes:

"Class 1 electric bicycle", an electric bicycle or tricycle equipped with a motor that provides assistance only when the rider is pedaling and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.

"Class 2 electric bicycle", an electric bicycle or tricycle equipped with a motor that may be used exclusively to propel the bicycle and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist 
- 3 Skateboarder
- 4 Train/Trolley Passenger
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2 – Bicyclist (Examples)



Popular brands include:


- Trek
- Specialized
- Cannondale
- Santa Cruz
- Scott
- Schwinn



3 – Skateboarder (Definition)

A person riding on a board mounted on wheels whether manual or e-powered.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder 
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
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3 – Skateboarder (Examples)



Popular brands include:


- Baker
- Girl
- Element
- Zero



4 – Train/Trolley Passenger (Definition)

A passenger of a land vehicle that is designed primarily for, or in use for, moving people or property from one place to another on rails and not in use on a trafficway other than a railway.

VU1 - Vulnerable User Type


- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger 
- 5 Roller Skater
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4 – Train/Trolley Passenger (Examples)



A person riding on roller skates that have a wheel on each “corner” of the skate.

VU1 - Vulnerable User Type

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5 - Roller Skater (Examples)



Popular brands include:


- Impala
- Moxi
- Roller Derby



6 – In-line Skater (Definition)

A person riding on in-line skates consisting of a single line of wheels along the bottom.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
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6 – In-line Skater (Examples)



Popular brands include:


- K2
- Bauer
- CCM
- Impala



7 – Non-motorized Scooter Rider (Definition)

A footboard mounted on two wheels with a long steering handle propelled manually by resting one foot on the footboard and pushing the other against the ground.

VU1 - Vulnerable User Type

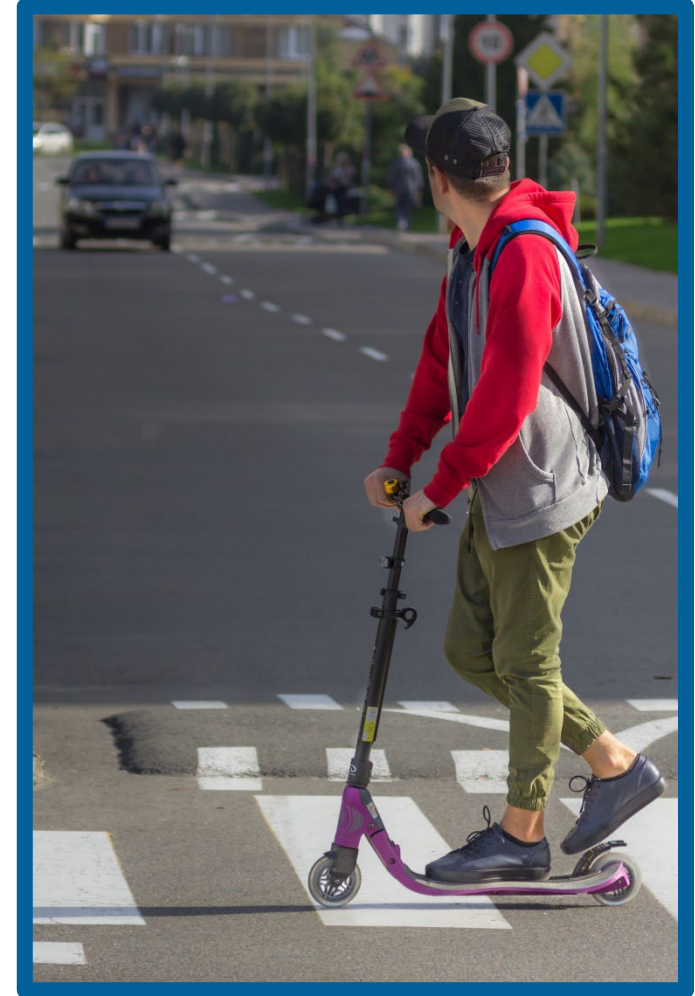
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- 99 Unknown

7 – Non-motorized Scooter Rider (Examples)



Popular brands include:


- Razor
- Mongoose
- Cityglide



8 – Non-motorized Wheelchair User (Definition)

A person riding on a manually propelled wheelchair. (For **motorized wheelchair** see ***Electronic Personal Assistive Mobility Device.***)

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
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8 – Non-motorized Wheelchair User (Examples)



Popular manufacturers include:


- Invacare
- TiLite
- Permobil



9 – Motorized Bicyclist (Definition)

According to MGL c. 90, s. 1: "*Motorized bicycle*", a pedal bicycle which has a helper motor, or a non-pedal bicycle which has a **motor**, with a cylinder capacity not exceeding fifty cubic centimeters, an automatic transmission, and which is capable of a maximum speed of no more than thirty miles per hour; provided, that the **definition of "motorized bicycle" shall not include an electric bicycle**. A "**motorized bicycle**" is typically referred to as a **moped**.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
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9 – Motorized Bicyclist (Examples)




Popular brands of motorized bicycles include:

- Tomos
- TaoTao
- Yamaha
- Zhen



A person riding a type of human-powered land vehicle powered by the arms rather than the legs, as on a bicycle. Most handcycles are tricycle in form, with two coasting rear wheels and one steerable powered front wheel. Despite usually having three wheels, they are also known as ***hand bikes***.

VU1 - Vulnerable User Type

- 1 Pedestrian
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- 18 Utility Worker - Outside of vehicle
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- 20 Emergency Responder - Outside of vehicle
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- 99 Unknown

10 – Hand Cyclist (Examples)



Popular manufacturers include:

- Invacare
- AmTryke



11 – Tricyclist (Definition)


Any occupant of a three-wheels road vehicle propelled by pedaling **and may include an electric motor** of 750 watts or less. It includes tricycles solely propelled by human power and those that can be propelled by human power and/or a motor. This includes all people (operator and passengers) on tricycle and a person being pulled by a tricycle (e.g., in a wagon or bike trailer).

Per M.G.L. c. 90,§ 1, an e-bicycle can have one of two classes:

"Class 1 electric bicycle", an electric bicycle or tricycle equipped with a motor that provides assistance only when the rider is pedaling and that ceases to provide assistance when the bicycle reaches the speed of 20 miles per hour.

"Class 2 electric bicycle", an electric bicycle or tricycle equipped with a motor that may be used exclusively to propel the bicycle and that is not capable of providing assistance when the bicycle reaches the speed of 20 miles per hour.

VU1 - Vulnerable User Type

- 1 Pedestrian
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- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown

11 – Tricyclist (Examples)



Popular brands include:


- Schwinn
- Radio Flyer
- Liberty Trike



12 – Motorized Scooter Rider (Definition)

A person riding a motorized scooter consisting of any two wheeled tandem or three wheeled device that has handlebars, designed to be stood or sat upon by the operator, powered by an electric or gas-powered motor that is capable of propelling the device with or without human propulsion. The definition of "motorized scooter" shall NOT include a motorcycle or motorized bicycle, a moped or a three wheeled motorized wheelchair.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
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12 – Motorized Scooter Rider (Examples)



Popular brands include:

- Niu
- Roadrunner



An individual who is riding on a self-balancing, two non-tandem wheeled device or 4-tandem wheeled device designed to transport only one person, with an electric propulsion system whose maximum speed on a paved level surface is 12.5 miles per hour or less.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
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- 20 Emergency Responder - Outside of vehicle
- 97 Other
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13 – Electric Personal Assistive Mobility Device User (Examples)




Popular manufacturers include:

- Segway
- BEST Power Wheelchair

An individual riding on a horse for use of transportation.

VU1 - Vulnerable User Type


- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
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- 99 Unknown

14 – Horse Rider (Examples)



A person driving any wheeled device similar to, but not limited to, wagons, carriages, carts, or similar devices in, upon, or by which any living person may be transported; designed to be drawn by one or more horse(s), hold passengers, and be driven for hire.

VU1 - Vulnerable User Type


- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver 
- 16 Farm Equipment operator
- 17 Other Micromobility Device User
- 18 Utility Worker - Outside of vehicle
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown

15 – Horse-Drawn Carriage Driver (Examples)



Any person operating a farm tractor or irrigation equipment having a per unit purchase price of at least one thousand dollars (\$1,000.00). Farm Equipment also includes, regardless of purchase price, attachments and baling wire, binders' twine and surface wrap used primarily and directly in any farm operation; aircraft designed or adapted to undertake agricultural applications; dairy equipment.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver
- 16 Farm Equipment operator 
- 17 Other Micromobility Device User
- 18 Utility Worker - Outside of vehicle
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown

16 – Farm Equipment Operator (Examples)




Popular brands include:

- MTZ
- John Deere
- New Holland



Any person operating a small, low-speed, electric-powered transportation device, lightweight, wheeled electric-powered conveyances.

VU1 - Vulnerable User Type


- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver
- 16 Farm Equipment operator
- 17 Other Micromobility Device User 
- 18 Utility Worker - Outside of vehicle
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown

17 – Other Micromobility Device User (Examples)



A person outside of a vehicle whose job it is to perform general maintenance, repair, and construction work assignments in support of public works projects; and to operate light and moderately heavy maintenance and construction equipment.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver
- 16 Farm Equipment operator
- 17 Other Micromobility Device User
- 18 Utility Worker - Outside of vehicle 
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown

18 – Utility Worker – Outside of Vehicle (Examples)



19 – Roadway Worker – Outside of Vehicle (Definition)

Any employee of a railroad, or of a contractor to a railroad, whose duties include inspection, construction, maintenance or repair of railroad track, bridges, roadway, signal and communication systems, electric traction systems, roadway facilities or roadway maintenance machinery on or near track or with the potential of fouling a track, and flagmen and watchmen/lookouts.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver
- 16 Farm Equipment operator
- 17 Other Micromobility Device User
- 18 Utility Worker - Outside of vehicle
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown

19 – Roadway Worker – Outside of Vehicle (Examples)



A person whose job it is a paramedic, police officer, or firefighter who is among those responsible for going immediately to the scene of an accident or emergency to provide assistance.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver
- 16 Farm Equipment operator
- 17 Other Micromobility Device User
- 18 Utility Worker - Outside of vehicle
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other
- 99 Unknown




20 – Emergency Responder – Outside of Vehicle (Examples)



A person who does not meet the definition of the other vulnerable user categories such as an individual working at a toll booth or a person who is inside of a store.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
- 8 Non-Motorized Wheelchair User
- 9 Motorized Bicyclist
- 10 Hand Cyclist
- 11 Tricyclist
- 12 Motorized Scooter Rider
- 13 Electric Personal Assistive Mobility Device User
- 14 Horse Rider
- 15 Horse-drawn Carriage Driver
- 16 Farm Equipment operator
- 17 Other Micromobility Device User
- 18 Utility Worker - Outside of vehicle
- 19 Roadway Worker - Outside of vehicle
- 20 Emergency Responder - Outside of vehicle
- 97 Other 
- 99 Unknown

97 – Other (Examples)



Used when it cannot be determined which attribute describes the non-motorist at the time they became involved in the crash. This would occur in situations where the details to make the determination are missing in the case materials or are reported as unknown. An example would be if it is unknown if the person was on foot or on a skateboard at the time they were struck.

VU1 - Vulnerable User Type

- 1 Pedestrian
- 2 Bicyclist
- 3 Skateboarder
- 4 Train/Trolley Passenger
- 5 Roller Skater
- 6 In-Line Skater
- 7 Non-Motorized Scooter Rider
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- 19 Roadway Worker - Outside of vehicle
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- 99 Unknown 