



# POLICY AND PROCEDURES FOR PDD OPERATIONS

Draft Document

Pennsylvania Department of Transportation

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## 1 Introduction

On November 1, 2020, Act 106 of 2020 was enacted and permitted the operation of Personal Delivery Devices (PDD) in pedestrian areas, on select shoulders or berms of roadways, and on select roadways. Prior to operating, an applicant must receive a PDD Authorization from the Pennsylvania Department of Transportation (PennDOT). Per Act 106, PennDOT is charged with establishing policies and guidelines to administer the authorization of PDDs. Per Act 106, PDD are classified as pedestrians.

The policy does not apply to PDDs operated on private property.

## 2 Responsibilities and Powers

Act 106 Title 75, Chapter 85, Subpart C establishes the following responsibilities and powers.

### PennDOT

- Issue, approve, renew, revoke, suspend, condition or deny issuance or renewal of PDD authorizations.
- Authorize transition from Phase 1 to Phase 2 operations prior to 180 days.
- Establish policies and guidelines to administer PDD authorizations and ensure ongoing compliance.
- By order of the secretary, prohibit the use of a PDD on any roadway, or shoulder or berm of a roadway, under the jurisdiction of the department where the secretary determines that the operation of the PDD could constitute a hazard.
- By order of the secretary, authorize the use of PDDs on roadways, shoulders or berms with posted speed limits greater than 25 mph but no greater than 35 mph.
- Display the following information on the PennDOT website:
  - A list of authorized entities that includes the authorized operational phase of each authorized entity.
  - Any order issued by the secretary regarding PDDs.
  - Policies or guidelines issued by the department consistent regarding PDDs.
- Notify applicable authorized entities when PennDOT determines conditions constitute a weather emergency or hazardous event.

### Applicant/Authorized Entity

- Apply for or renew a PDD authorization. An authorized entity shall have the right to appeal PDD authorization suspensions or revocations.
- Notify the governing body of the municipality of the authorized entity's intent to operate PDD within the municipality no less than 30 days prior to the date on which the authorized entity commences PDD operations within the municipality.
- Self-report to the Department and the law enforcement agency of the municipality governing the right-of-way containing the pedestrian area or roadway, or shoulder or berm of the roadway, an accident involving any of the authorized entity's PDDs that resulted in bodily injury, death or damage to property within 24 hours of the accident.

- Develop and maintain a list of unique identification numbers assigned to each of the PDDs, which shall be updated prior to an authorized entity operating a PDD not listed in the application.
- Provide any information or records on an ongoing basis that may be required by the department and is reasonably necessary for the administration and enforcement as identified in this policy.
- Only operate a PDD according to the operational phase for which the authorized entity has been authorized by the department.
- Only operate a PDD according to the operational plan authorized by the department.
- Maintain an insurance policy that includes general liability coverage of not less than \$100,000 per incident for damages arising from the operation of the PDD.
- Ensure a PDD will yield the right-of-way, or safely navigate around, to all pedestrians and pedalcyclists in a pedestrian area.

### **Municipalities**

- Create an ordinance or resolution as required to do the following:
  - Permit the use of a PDD on a roadway or shoulder or berm of a roadway, under the jurisdiction of the municipality where the posted speed limit is greater than 25 miles per hour but not greater than 35 miles per hour
  - Prohibit the use of a PDD on any roadway, or shoulder or berm of a roadway, or pedestrian area under the jurisdiction of the municipality where the municipality, after consultation with the authorized entity, determines that the operation of the PDD would constitute a hazard.
  - Enforce any law, rule or regulation as it relates to the operation of the PDD in this Commonwealth.
- Notify applicable authorized entities when PennDOT determines conditions constitute a weather emergency or hazardous event.

Municipalities are prohibited, except as identified above, from regulating the operation of a PDD operated in a pedestrian area, roadway, or shoulder or berm of a roadway, under the jurisdiction of the municipality.

### **Law Enforcement**

- Enforce compliance in accordance to Title 75 Chapter 85 Subchapter C § 8521 (Criminal penalties).

## 3 Authorization

### 3.1 Application

Prior to submitting an application to PennDOT, the applicant shall contact the municipality they intend to operate within. PennDOT may engage others as necessary in the review. After consulting with the municipality, the applicant shall submit an application available on the [www.penndot.gov/pdd](http://www.penndot.gov/pdd) webpage.

#### 3.1.1 Application Elements

1. Applicant Information
  - a. Entity's name

- b. Address
- c. Mailing address (if different)
- d. Principal Point of Contact
  - i. Name
  - ii. Title
  - iii. Telephone Number
  - iv. Email Address
- e. Proof of insurance
- 2. Information on the municipality the applicant contacted including:
  - a. Name of Municipality
  - b. Name of Municipality representative
  - c. Date of contact
  - d. Method of contact
  - e. Concerns raised by the municipality, if any
- 3. PDD Information
  - a. Year, Make, and Model
  - b. Engine Type
  - c. Average Travel Distance of a fully loaded PDD on a single charge/Full tank of fuel
  - d. Dimensions (L, W, H)
  - e. Weight without cargo
  - f. Maximum weight with cargo
  - g. Unique Identification Number(s)
  - h. Picture of the PDD
  - i. Indented operating phase
  - j. Maximum range of the PDD
- 4. PDD Operator Information
  - a. Name (Last, First, MI)
  - b. Acknowledgment of having a valid driver license
  - c. Training completion date
  - d. Type of Operator (field, remote, or both)
- 5. Operational Design Domain
  - a. A general overview of the intended ODD including:
    - i. Physical Infrastructure (e.g., roadway types)
    - ii. Operational Constraints (e.g., speed limit or traffic conditions)
    - iii. Objects (e.g., roadway users and non-roadway users obstacles/objects)
    - iv. Connectivity (e.g., remote fleet management system).
    - v. Environmental Conditions (e.g., weather, particulate matter, and illumination)
    - vi. Zones (e.g., geo-fencing)
- 6. Operation Information
  - a. Route Information
    - i. Route (start and end point by intersection)
      - 1. State if the PDD will be operating in a pedestrian area, on the shoulder of a roadway.
      - 2. State if the PDD may operate on a roadway.

- ii. Municipality
    - iii. Acknowledgement that the routes are within the PDD's ODD
    - iv. Acknowledgement that a field visit was performed and proposed routes are within the ODD.
    - v. Acknowledgement if there is a bridge along the route
  - b. Operating Speed
    - i. Maximum operating speed
    - ii. Intended operating speed (pedestrian area)
    - iii. Intended operating speed (roadway/shoulder of a roadway)
  - c. Description of the cargo the PDD intends to transport
  - d. Intended hours of operation
  - e. A description of where the PDD will be stored between deliveries
7. Emergency Responder Information
- a. A description on how to stop or disable a PDD.
  - b. A description of post-crash considerations.
  - c. Any additional considerations, if applicable.
8. Acknowledgements
- a. The applicant has taken reasonable steps (e.g., controlled testing in simulation, closed track or on-road) to ensure the PDD is capable of operation within the parameters of the Operational Design Domain (ODD).
  - b. That the PDD will yield the right-of-way, or safely navigate around, to all pedestrians and pedalcyclists in a pedestrian area.
  - c. That PDD is capable of operating in compliance with all applicable laws and regulations
  - d. The PDD can obey traffic control devices within its ODD.
  - e. During Phase 1, the PDD operator will always stay within 30 feet and line of sight of the PDD.
  - f. The PDD operator has the skills, knowledge, and ability to take over control of the PDD.
  - g. The PDD can safely alert the PDD operator, when applicable, that the PDD operator must take control back of the PDD.
  - h. The PDD has a mechanism to engage and disengage the automation that is easily accessible to the PDD operator, and a means for an Emergency Service Responder, to stop or disable the PDD, if necessary.
  - i. That the PDD is equipped with a means to store operational data before a collision occurs. The data shall be made available to PennDOT and applicable law enforcement agencies upon request in the event a crash occurs.
  - j. That the applicant has considered and implemented reasonable measures, which may include industry standards, best practices, company policies, or other methods, to mitigate cybersecurity risk.
  - k. That quality controls are deployed and monitored to ensure the acknowledgements checked above are implemented, adhered to and measured to ensure safe operation.
  - l. The PDD will comply with all PennDOT policies and guidelines related to the authorization and operation of PDDs.
  - m. The applicant maintains an insurance policy that includes general liability coverage of not less than \$100,000 per incident for damages arising from the operation of the PDD.

## 9. Safety Questions

- a. A description of how a PDD determines when it is safe to transition between a pedestrian area, shoulder of a roadway, and roadway.
- b. A description of how the applicant ensures remote operations has no impact on the safe operations of the PDD.
- c. A description of all accommodations made for pedestrians with disabilities.
- d. A description of the actions that a PDD and/or PDD operator will take if they are unable to yield the right-of-way or navigate around a pedestrian or pedalcyclist.
- e. A description of the proposed schedule for safety and maintenance inspections of PDDs.
- f. A description of the training procedures for PDD operators.
- g. Details, and copies if available,, of the educational campaign to be employed by the applicant to educate and bring awareness of PDDs to municipalities, motorists and the general public.
- h. A description of steps taken to ensure the autonomous operations align with industry standards and best practices (e.g., compliance with UL 4600 or ISO26262).
- i. A description of accident procedures in the event of an accident involving injury to a person or damage to property or an accident causing damage to the PDD.

### 3.2 Review

Upon receipt of the application, PennDOT's Office of Transformational Technology will initiate the review process with applicable areas of PennDOT including PennDOT's Policy Office, Office of Chief Counsel, Driver and Vehicle Services Deputate, Highway Administration Deputate, Bicycle and Pedestrian Coordinator, and the local Engineering District. PennDOT will also engage the applicable municipalities and any other stakeholders deemed necessary.

Throughout the review process, PennDOT reserves the right to ask for clarification and additional information where needed to properly evaluate the application. PennDOT will have the sole authority to issue, approve, renew, revoke, suspend, condition or deny issuance or renewal a PDD authorization.

PennDOT will notify the applicant in writing of the status of their application within 30 days of submission. If approved, authorization shall be valid for one (1) year.

### 3.3 Operating Phases

Phase 1 - The operation of a PDD through a driving system that allows remote or autonomous operation by an authorized entity where the device is controlled remotely and a PDD operator is within 30 feet of the PDD and within the line of sight of the PDD. Upon the initial issuance of a PDD authorization, an authorized entity shall be limited to Phase 1 operation to demonstrate safe operation of PDDs by the authorized entity and its PDD operators.

Phase 2 - The operation of a PDD through a driving system that allows remote or autonomous operation by an authorized entity where the device is monitored remotely by a PDD operator and the driving system is capable of being controlled and overridden remotely by the PDD operator.



### 3.3.1 Transition from Phase 1 to Phase 2 (at 180 days)

PennDOT may not limit an authorized entity to Phase 1 operation for less than 90 days<sup>1</sup> and not more than 180 days from the date the PDD authorization was issued, or less than 90 days and not more than 180 days from the date the authorized entity's Phase 2 operation was revoked by the department, whichever is applicable, unless agreed to by the authorized entity.

The authorized entity shall notify PennDOT and the applicable municipalities 30 days prior to the transition from Phase 1 to Phase 2. The notice should include:

- Certification that the PDDs is capable of safely operating in Phase 2 and that the PDD make, model, and software is the same or similar to the PDD that was used in Phase 1.
- Number of accidents or violations in the last 180 days. The authorized entity should not transition to Phase 2 until it can successfully operate a consecutive 180 days without an accident or violation.
- Certification that any applicable municipality supports the transition to Phase 2.
- Description of how, if at all, the operations of the PDD will differ in Phase 2 compared to Phase 1. The ODD and general operations of the PDD should not differ from Phase 1 to Phase 2.
- Total miles traveled during Phase 1 operations in the last 180 days.
- Total number of deliveries during Phase 1 operations in the last 180 days.
- Total number of occurrences when the PDD operator had to override autonomous operations during Phase 1 operations in the last 180 days.
- Any additional information that demonstrates the PDD's ability to safely operate in Phase 2.

### 3.3.2 Early Transition from Phase 1 to Phase 2

If the authorized entity wishes to transition to Phase 2 prior to 180 days, the authorized entity shall notify PennDOT and the applicable municipalities 45 days prior to the desired date for the transition from Phase 1 to Phase 2. The notice shall include:

- Certification that the PDDs is capable of safely operating in Phase 2 and that the PDD make, model, and software is the same or similar to the PDD that was used in Phase 1.
- Number of accidents or violations in the last 180 days. The authorized entity shall not transition to Phase 2 if the PDD was at fault for any accident or committed a violation.
- Certification that any applicable municipality supports the transition to Phase 2.
- Description of how, if at all, the operations of the PDD will differ in Phase 2 compared to Phase 1. The ODD and general operations of the PDD should not differ from Phase 1 to Phase 2.
- Total miles traveled in the last 180 days.
- Total number of deliveries in the last 180 days.
- Total number of occurrences when the PDD operator had to override autonomous operations in the last 180 days.
- Any additional information that demonstrates the PDD's ability to safely operate in Phase 2.

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<sup>1</sup>PennDOT may exempt an authorized entity from Phase 1 operations upon initial issuance of a PDD authorization if the authorized entity can certify, to the department's satisfaction, safe PDD operations in the Commonwealth or other jurisdictions.

### 3.4 Modification

After receiving PDD authorization, the authorized entity shall notify PennDOT if there are material changes in the submission or if there are material modifications to the ODD such that the submission no longer accurately or adequately describes the scope of operations.

### 3.5 Renewal

An application for the renewal of a PDD authorization shall be submitted at least 45 days prior to the expiration of the PDD authorization and include an update of the information contained in the initial application. In addition, the applicant shall provide:

- The total number of trips each personal delivery device performed within the previous 12 months; and
- A list of accidents resulting in personal injury or property damage and any violations of this subchapter issued to the authorized entity for a personal delivery device operated by the authorized entity within Pennsylvania in the previous 12 months.

### 3.6 Suspension and Revocation

#### 3.6.1 Suspension of Authorization

PennDOT may suspend PDD authorization if operations are deemed unsafe or if the authorized entity violates aspects of the PDD authorization.

#### 3.6.2 Revocation of Authorization

Following notice and an opportunity for an administrative hearing, PennDOT may revoke a PDD authorization where a knowing and willful violation of Title 75, Chapter 85, Subpart C occurred that resulted in death, serious bodily injury or property damage or when the authorized entity has demonstrated an inability to operate safely in accordance with Title 75, Chapter 85, Subpart C.

#### 3.6.3 Appeal

An authorized entity shall have the right to appeal PDD authorization suspensions or revocations in accordance with 2 Pa.C.S. Chs. 5 Subch. A (relating to practice and procedure of Commonwealth agencies) and 7 Subch. A (relating to judicial review of Commonwealth agency action).

#### 3.6.4 Prohibition

PennDOT may not suspend or revoke the PDD authorization of an authorized entity that self-reports an accident involving an authorized entity's PDD where the accident was not the fault of the authorized entity or the authorized entity's PDD operator.

#### 3.6.5 Reinstatement of Authorization

Upon the suspension or revocation of authorization, the authorized entity shall be entitled to request reinstatement. PennDOT may consider any actions taken by the authorized entity to correct deficiencies, if any, that caused the suspension or revocation or evidence that the PDD or the PDD operator was not at fault in the incident that led to the suspension or revocation of authorization.

### 3.7 Ongoing Compliance

To ensure ongoing compliance, the authorized entity shall provide a quarterly performance report. The report shall contain the following information regarding the quarter:

- Roadway segments where operations occurred
- Total miles traveled
- Total number of deliveries
- Approximate average speed when operating on in a pedestrian area
- Approximate average speed when operating on a roadway or shoulder of a roadway
- Total number of occurrences when the PDD operator had to override autonomous operations
- Total number of violations
- Total number of accidents
- Peak number of devices simultaneously operating (by municipality)

The report shall be submitted to PennDOT as prescribed on the [www.penndot.gov/pdd](http://www.penndot.gov/pdd) webpage.

### 3.8 Enforcement/Criminal Penalties

Per Title 75, Chapter 85, Subpart C Section 8521, the following criminal penalties are applicable.

- a. Penalty - An authorized entity that violates a provision of Title 75, Chapter 85, Subpart C shall be guilty of a summary offense and shall, upon conviction, be sentenced to pay a fine of not less than \$25 and no more than \$1,000.
- b. Unauthorized operation - A person that violates section 8512 (relating to general prohibition) shall be guilty of a summary offense and shall, upon conviction, be sentenced to pay a fine of not less than \$500.
- c. Suspended or revoked authorization - A person that knowingly violates section 8512 (relating to general prohibition) and whose authorization was suspended or revoked by the department shall be guilty of a summary offense and shall, upon conviction, be sentenced to pay a fine of not less than \$1,000.

### 3.9 Right-to-Know Law

Per Title 75, Chapter 85, Subpart C Section 8515:

- a. Applicability - Except as provided in subsection (b), the following shall not be subject to the act of February 14, 2008 (P.L.6, No.3), known as the Right-to-Know Law:
  - 1) Information contained in an application for a PDD authorization or renewal application submitted to the department by an applicant under this section or section 8514 (relating to application).
  - 2) Additional information requested by the department and submitted by an applicant as part of the review of the applicant's application for a PDD authorization or renewal application under this section or section 8514.
  - 3) Information and records submitted by an authorized entity to the department under this section or section 8514.
- b. Applicability exception - Subsection (a) shall not apply to the following:
  - 1) Information or records submitted to the department under section 8514(b)(2)(i), (ii) or (iv), (4), (8) or (9)(ii).
  - 2) Information or records required to be posted on the department's publicly accessible Internet website under section 8513(b)(3)(ii) (relating to powers of department).

## 4 Operating Requirements, Recommendations, and Constraints

### 4.1 Equipment

#### 4.1.1 Requirements

1. The PDD shall be equipped with a driving system that allows remote or autonomous operation, or both.
2. The PDD shall have a maximum width of 32 inches.
3. The PDD shall have a maximum length of 42 inches.
4. The PDD shall have a maximum height of 72 inches.
5. The PDD shall have a maximum weight 550 pounds (not including cargo or goods).
6. The PDD shall be equipped with a braking system that brings the PDD to a complete stop from an initial speed of 25 miles an hour or less<sup>2</sup>.
7. The PDD shall be equipped with a lamp that emits a beam of white light intended to illuminate a PDD's path and is visible from a distance of at least 500 feet to the front and a lamp emitting a red flashing light, light emitting diode or device visible from a distance of 500 feet to the rear. An authorized entity may supplement the required front lamp with a white flashing lamp, light-emitting diode or similar device to enhance its visibility to other traffic.
8. The PDD shall be equipped with software, equipment or technologies that allows a police officer or other emergency responder to stop or disable the PDD.
9. The PDD shall be equipped with retroreflective material on the left and right side of the PDD if operating between dusk and dawn<sup>3</sup>.
10. The PDD shall be capable of indicating to motorists when transitioning from a shoulder of a roadway to a roadway.
11. The PDD shall be capable of reverting to a minimum risk condition if an error occurs.

#### 4.1.2 Recommendations

1. The PDD should emit warning sounds designated to alert pedestrians to the presence of the PDD.

### 4.2 Fleet size

#### 4.2.1 Constraints

1. The maximum fleet size allowed per authorized entity will be based on the size of the population of the municipality. A municipality with a population up to 50,000 shall have a maximum of five (5) active PDDs per authorized entity. An additional PDD shall be allowed for every additional 10,000 residents.
  - a. Additional PDDs shall be allowed if the authorized entity can document a use case, demonstrate the additional fleet will not create any mobility or safety impacts, and receives the concurrence of the municipality for additional PDDs.

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<sup>2</sup> Based on the weight of the PDD and the weight of the intended cargo.

<sup>3</sup> The retroreflective material shall meet the requirements specified in Federal Motor Vehicle Safety Standards - § 571.108 (Standard No. 108; Lamps, reflective devices, and associated equipment).

## 4.3 PDD Operator

### 4.3.1 Requirements

1. PDD operators shall possess a valid driver's license from a licensing authority in the United States.
2. A PDD operator shall have the ability to remotely control, monitor or otherwise operate the PDD.
3. A PDD operator shall be within 30 feet and line of sight of the PDD during Phase 1.
4. PDD operators shall have successfully completed training prescribed in the PDD application. The training shall include, at a minimum:
  - a. Confirmation of basic operating skills including, but not limited to,
    - i. Basic PDD operation
    - ii. Visual search
    - iii. Night operations, if applicable
    - iv. Hazard perception
    - v. Responses to PDD malfunctions
    - vi. Responses to sudden emergencies
    - vii. Responses to distractions
    - viii. Responses to aggressive road users
    - ix. Responses to adverse weather conditions
    - x. Post-crash procedures
    - xi. Interactions with road users (e.g., strollers, wheelchairs, children, bicycles, outdoor dining)
  - b. Basic knowledge of PDD controls, instruments, and safety components
  - c. Basic trip procedures, including, but not limited to:
    - i. Pre-trip inspection of the PDD
    - ii. Trip planning
    - iii. Post-trip procedure
  - d. Divided visual and mental attention tasks for the PDD Operator
  - e. A description of how refresher training is conducted

### 4.3.2 Constraints

1. A PDD operator shall be responsible for monitoring one (1) PDD during Phase 1 (i.e. 1:1 ratio).
2. A PDD operator shall be responsible for monitoring no more than ten (10) PDDs during Phase 2 for the first year (i.e. 10:1 ratio).
  - a. After the first year, the authorized entity may request to expand the ratio by demonstrating that the PDD operator is capable of monitoring additional PDDs without reducing safety and intervention time.
3. A PDD operator shall be responsible for only monitoring a PDD in a geographic region they are familiar with.<sup>4</sup>

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<sup>4</sup> In the event a PDD operator must remotely control the PDD, they should be familiar with the surrounding environment and what to expect from local road users. Driver/pedestrian behavior and geographic environment may be different in Pennsylvania than other states.

## 4.4 Operations

### 4.4.1 Requirements

1. The PDD shall only operate according to the operational phase for which the authorized entity has been authorized by PennDOT.
  2. The PDD shall be prohibited from operating outside of the submitted ODD.
  3. The PDD shall utilize the shoulder or berm of a roadway as far as practicable from the edge of the roadway whenever a shoulder or berm is available, and its use is practicable.
  4. The PDD shall utilize a pedestrian area when a shoulder or berm of a roadway is not available or its use is not practicable.
  5. The PDD shall operate as near as practicable to the outside edge of the roadway when neither a pedestrian area nor a shoulder or berm of a roadway is available<sup>5</sup>.
  6. The PDD shall cross roadways in accordance with Title 75 Chapter 35 Subchapter C § 3542 and § 3543.
  7. The PDD shall obey all traffic control devices and directions from police officers.
  8. The PDD shall not be parked and/or docked within a pedestrian area or on a shoulder of roadway in between deliveries.
  9. If the PDD becomes inoperable, the authorized entity shall retrieve the PDD within a timely manner and ensure safety around the device until it can be removed.
  10. Prior to first operating, an authorized entity shall physically inspect the intended route to ensure the PDD can safely operate.
  11. The PDD shall not operate a pedestrian area, shoulder of a roadway, or roadway that PennDOT or the municipality has prohibited<sup>6</sup>.
- Roadways and Shoulders of a Roadway
12. The PDD shall follow all applicable local ordinances and regulations related to pedestrians and abide by Title 75 Chapter 35 Subchapter C (Rights and Duties of Pedestrians).
  13. The PDD shall only operate on roadways posted 25 miles per hour or less.<sup>7</sup>
  14. The PDD shall not exceed 25 miles per hour when operating on a roadway or shoulder of a roadway.
  15. The PDD shall travel in the same direction as vehicles and on the right side of the roadway when operating on roadway or shoulder a roadway.
  16. The PDD shall travel along the shoulder as far away from the travel lane as practicable.
  17. When transitioning from the shoulder of a roadway to the roadway, the PDD shall make an indication to surrounding motorists.
  18. When operating on a roadway, the PDD shall make an indication to following motorists when braking.
  19. PDD operator shall use reasonable efforts so as not to impede the normal and reasonable movement of traffic.

#### Sidewalks

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<sup>5</sup> The PDD shall immediately return to a pedestrian area or shoulder of a roadway when available and safe to do so.

<sup>6</sup> In accordance with Title 75 Chapter 85 Subsection C § 8516 and § 8517. Prohibited areas are identified in PennDOT's website.

<sup>7</sup> PDDs may operate on roadways posted between 25 and 35 miles per hour per Title 75 Chapter 85 Subsection C § 8516 and § 8517.

20. The PDD shall yield the right-of-way, or safely navigate around, to all pedestrians and pedalcyclists in a pedestrian area<sup>8 9 10</sup>.
21. The PDD shall yield right-of-way, or safely navigate around, all animals within a pedestrian area (e.g., pets or service animals).
22. The PDD shall not exceed 12 miles per hour while operating in a pedestrian area.
23. The PDD shall not block curb cuts or impede access to driveways.
24. The PDD shall leave the sidewalk perpendicular to the shoulder of the roadway when transitioning to the shoulder.
25. The PDD shall not operate in a pedestrian area less than 48 inches wide.

#### 4.4.2 Recommendations

1. The PDD should not dwell in a pedestrian area for more than 5 minutes while waiting to start or complete a delivery.
2. The PDD should only operate when performing deliveries or conducting essential functions such as mapping or calibrating.
3. When encountering another PDD, the larger PDD should yield to the smaller PDD.
4. Any images collected by the PDD during operations should be used for operational purposes only.
5. The PDD should avoid operations during peak hours and on roadways with higher annual average daily traffic.

#### 4.4.3 Constraints

1. The PDD shall be prohibited from operating on a roadway or shoulder of a roadway if the height of the PDD, excluding attachments such as flags or antennae, is less than 42 inches.
2. The PDD shall be prohibited from operating on a shoulder of a roadway that is less than sum of the width of the vehicle with an additional 1 foot of clearance.
3. The PDD shall operate at a relative walking speed when in proximity of pedestrians and pedalcyclists.
4. The PDD shall operate at a relative walking speed in high pedestrian zone<sup>11</sup>. Shall maintain a map of all applicable roadway segments on the [www.penndot.gov/pdd](http://www.penndot.gov/pdd) webpage.
5. The PDD shall maintain a speed differential no greater than 5 mph from the posted speed limit when operating on a roadway.
6. The PDD shall be prohibited from operating on a roadway or shoulder of a roadway with high pedestrian crash rate<sup>12</sup>. PennDOT shall maintain a map of all applicable roadway segments on the [www.penndot.gov/pdd](http://www.penndot.gov/pdd) webpage.
7. The PDD shall be prohibited from operating in/on:

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<sup>8</sup> Per the Americans with Disability Act and PennDOT Publication 13M(DM-2), the minimum clear width for a single wheelchair is 36 inches and according to FHWA, 2.5 feet is the minimum width for a single pedestrian. The authorized entity shall consider this information when determining routes.

<sup>9</sup> If a PDD is unable to yield the right-of-way or safely navigate around, the operator shall resume control of the PDD within 60 seconds of notification.

<sup>10</sup> The PDD shall never put a pedestrian in a position of danger due to the inability of the PDD to yield or navigate around.

<sup>11</sup> A high pedestrian zone is defined a Downtown Center zone, Commercial Neighborhood zone, and a residential zone above 60 dwelling units per acre. PennDOT will maintain a map on the [www.penndot.gov/pdd](http://www.penndot.gov/pdd) webpage.

<sup>12</sup> Pedestrian crash corridors are based on 5 years of crash data over specific roadway segments

- a. Work zones<sup>13</sup>
- b. Active school zones
- c. Trails and other shared use paths that prohibit motor vehicles<sup>14</sup>
- d. Unpaved surfaces in the public right-of-way including dirt, gravel, or grass<sup>15</sup>.
- e. Bike-only lanes
- f. Roadways adjacent to designated or metered on-street parking

## 4.5 Weather Emergency and Other Hazardous Events

### 4.5.1 Restrictions

1. The authorized entity shall temporarily cease/restrict the operation of PDDs due to a weather emergency or other hazardous event identified by PennDOT or a municipality<sup>16</sup>.  
The authorized entity shall not resume operations until the extreme weather or hazardous event has been clear<sup>17</sup>.

## 4.6 Cargo

### 4.6.1 Requirements

1. The PDD shall not transport hazardous materials regulated under 49 U.S.C. § 5103 (relating to general regulatory authority) and required to be placarded under 49 CFR Pt. 172 Subpart F (relating to placarding).
2. The PDD shall not transport age restricted items that require age verification including, but not limited to alcohol, tobacco products, and weapons.
3. The PDD shall not transport live animals.
4. All cargo shall be enclosed within the PDD.
5. The authorized entity shall ensure that the weight of the cargo does not cause structural damage to any roadway, shoulder of a roadway, or pedestrian area where the PDD will operate<sup>18</sup>.

## 4.7 Public Education/Community Engagement

### 4.7.1 Requirements

1. When developing an educational campaign, the applicable municipalities and PennDOT shall be consulted to ensure the content, material, and approach meets the needs of local stakeholders and community.
2. The authorized entity shall grant permission for PennDOT and applicable local stakeholders, including municipalities, to utilize all developed materials in their own education campaigns and training.

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<sup>13</sup> Unless there are pedestrian protections in place. If sidewalks are closed for construction, the PDD shall utilize the pedestrian detour or other streets.

<sup>14</sup> Trails and shared use paths utilize federal funds that prohibit the use of PDDs.

<sup>15</sup> Unpaved surfaces in public right-of-way are not maintained and may cause PDDs to become immobile.

<sup>16</sup> To the extent possible, PennDOT and local municipalities will attempt to provide three (3) days' notice of upcoming events that could be deemed hazardous.

<sup>17</sup> As defined by PennDOT or the applicable municipality.

<sup>18</sup> Per PennDOT DM-4 (Structure) 3.6.1.6, "A pedestrian load of 0.075 ksf shall be applied to all sidewalks wider than 2.0 ft. and considered simultaneously with the vehicle design live load."



3. The educational campaign shall be factually correct and not conflict with Act 106 or information published by PennDOT.
4. The educational campaign shall be focused on the authorized entity's PDD.
5. The educational campaign shall be tailored to the specific municipality where the PDD will operate and provide necessary safety and operational information (i.e. not just generic, national marketing material).<sup>19</sup>
6. Accessibility shall be accounted for when developing the educational campaign.
7. PennDOT and any applicable municipalities shall have the ability to review the educational campaign and request changes.

#### 4.7.2 Recommendation

1. The authorized entity should coordinate and establish a relationship with local stakeholders including, but not limited to, municipalities, metropolitan planning organizations, emergency service responders, and advocacy organizations.
2. The authorized entity should coordinate with municipalities to identify potential data needs including operational data (e.g., Average number of daily deliveries by zip code of destination, Average wait time for same day deliveries, Average cost of a delivery) and sensor data (e.g., help identify missing signs or debris on a roadway).
3. The authorized entity should operate a service center that can provide real-time support in multiple languages to any person interacting with a PDD by phone, online, or in-person. The service should also be capable of accepting calls/re-routed information from existing city service centers, such as a 311 or equivalent service.

## 4.8 Accident Procedures

### 4.8.1 Requirements

1. The authorized entity shall self-report to PennDOT<sup>20</sup> and the law enforcement agency<sup>21</sup> of the municipality governing the right-of-way containing the pedestrian area or roadway, or shoulder or berm of the roadway, an accident involving any of the authorized entity's personal delivery devices that resulted in bodily injury, death or damage to property within a reasonably practicable timeframe, but in no case to exceed 24 hours from the time of the accident.
2. The authorized entity shall provide information regarding accident procedures including:
  - a. The duties of the authorized entity and its PDD operators with respect to removing the PDD or accident debris from roadways, or shoulders or berms of a roadway, and pedestrian areas of the personal delivery device so as not to impede traffic or pedestrians in the event that the personal delivery device is rendered inoperable or damaged to the extent it cannot be safely operated.<sup>22</sup>
  - b. The process where the applicant will exchange, if necessary, insurance information to all parties involved in the accident within 24 hours of the accident.

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<sup>19</sup> Coordination with the applicable municipalities is necessary to ensure the appropriate content is included in the educational campaign.

<sup>20</sup> The PennDOT contact information and required accident reporting information will be accessible on the [www.penndot.gov/pdd](http://www.penndot.gov/pdd) webpage.

<sup>21</sup> Prior to operations, the authorized entity shall receive the appropriate contact information from local law enforcement and required accident information.

<sup>22</sup> Debris cleanup should be performed in accordance to all applicable laws and regulations.

- c. The safety inspection and maintenance protocols for personal delivery devices damaged in an accident.
3. A PDD shall not resume operations after an accident until a safety inspection is performed and the authorized entity can certify the PDD is capable of safely operating.
4. The PDD shall be equipped with a means to store operational data before an accident occurs.<sup>23</sup> The data shall be made available to PennDOT and applicable law enforcement agencies upon request in the event a reportable accident occurs<sup>24</sup>.
5. The authorized entity shall cooperate with law enforcement and PennDOT on any accident investigation.
6. The authorized entity shall comply with all applicable law and regulations related to accident reporting.
7. The authorized entity and/or PDD operator shall take all appropriate steps to ensure safety following an accident.

## 4.9 Safety and Maintenance for PDDs

### 4.9.1 Requirements

1. The authorized entity shall perform routine maintenance on their PDD fleet.
2. The authorized entity shall perform an inspection prior to commencing daily operations.
3. The authorized entity shall perform a comprehensive inspection on a periodic basis to ensure the PDD is capable of safely operating within the intended ODD and meeting all applicable requirements.
4. If mechanical or software failure occurs, the authorized entity shall identify the cause of the failure and inspect all similar PDDs.<sup>25</sup>
5. The authorized entity shall take reasonable steps (e.g., controlled testing in simulation, closed track or on - road) to ensure the PDD is capable of operation within the parameters of the Operational Design Domain (ODD).

## 5 Identifying Markings

The authorized entity shall ensure the following information is permanently placed on the front and right side of the PDD<sup>26</sup>:

- The name of the authorized entity.
- The unique identification number assigned to the PDD.
- Telephone number of the authorized entity to report a violation, an accident, or an insurance claim.

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<sup>23</sup>At a minimum, the PDD should have the capability to store what the PDD observed and how the PDD reacted to the information.

<sup>24</sup> Such request shall specify the type of data that is being requested, shall be narrowly construed to include only relevant information, and shall be provided within a reasonable time in a reasonable format.

<sup>25</sup> Regardless if the failure occurs in a PDD in Pennsylvania or another location.

<sup>26</sup> If it is infeasible to place the identifying marking on one or more of the specified locations, the authorized entity shall notify PennDOT and work to find a comparable solution.

The text shall be in a font compliant with the Americans with Disabilities Act (ADA) and have a minimum character height of 5/8" (16 mm). All text shall meet ADA requirements for sign visual characters (ADA 2010 Standards, Section 703.5).

To avoid duplicate identification numbers across multiple authorized entities, the unique identification number shall use the following naming scheme:

- XXX - #### - ZZZZZ
  - XXX –3 letter code will be the first 3 letters of the authorized entity’s name
  - #### – 4-digit sequential serial number assigned by the authorized entity
  - ZZZZZ – optional information the authorized entity wishes to assign

The authorized entity should include the required information in braille when feasible.

## 6 Policy Disclaimer

This policy is a living document and may be updated to reflect technological changes and national best practices.

Authorized entities will be notified of any policy changes via email and shall confirm receipt.

## 7 Glossary of Terms

**“Accident.”** For purposes of required reporting for PDD operation, an accident involving either injury to or death of any person; or damage to any vehicle or property involved.

**“Active PDD.”** A PDD operating in a pedestrian area, on a shoulder or berm of a roadway, or on a roadway.

**“Applicant.”** A person or an educational institution applying for PDD Authorization.

**“Authorized Entity.”** A person or an educational institution holding a PDD authorization.

**“Autonomous Operations.”** The hardware and software that is collectively capable of performing the entire dynamic driving task on a sustained basis for a PDD.

**“Dynamic Driving Task.”** The operational (steering, braking, accelerating, monitoring the device and trafficway) and tactical (responding to events, determining when to change lanes, turn, use signals, etc.) aspects of driving, but not the strategic (determining destinations and waypoints) aspect of the driving task.

**“Hazardous Event.”** A nonrecurring event that results in an environmental condition that may impact the safe operations of a PDD.

**“Intervention Time.”** The time it takes for PDD operator to take control of a PDD from being made aware of a need to intervene.

**“Minimum Risk Condition.”** A condition to which a user or an autonomous system may bring a device after performing the Dynamic Driving Task fallback in order to reduce the risk of a crash when a given trip cannot or should not be completed.

**“Municipality.”** A city, borough, incorporated town, township, or similar unit of government.

**“Operational Design Domain (ODD).”** The PDD Entity’s definition of the conditions in which the autonomous operations, or the differing automated components thereof, is intended to operate with respect to roadway types, geographical location, speed, range, lighting conditions for operation (day and/or night), weather conditions, and other operational domain constraints, including a description of how the automation provides for object and event detection and response under of normal driving scenarios, expected hazards (e.g., vehicles, pedestrians), and unspecified events (e.g., emergency vehicles, temporary construction zones) that could occur within the operational domain.

**“Operational Phase.”** Phase 1 or phase 2.

**“PDD Authorization.”** An authorization issued by the department under section 8515 (relating to authorization issuance and renewal) permitting the operation of a personal delivery device in accordance with this subchapter.

**“PDD Operator.”** An employee of an authorized entity permitted by the authorized entity to remotely control, monitor or otherwise operate a personal delivery device on behalf of the authorized entity as provided under this subchapter. The term does not include an individual who requests a delivery or service provided by the personal delivery device or dispatches the personal delivery device.

**“Pedestrian”** A natural person afoot. Any of the following: (1) An individual afoot. (2) An individual with a mobility-related disability on a self-propelled wheelchair or an electrical mobility device operated by and designated for the exclusive use of an individual with a mobility-related disability. (3) A personal delivery device.

**"Pedestrian Area."** A sidewalk, crosswalk, safety zone, pedestrian tunnel, overhead pedestrian crossing or similar area for pedestrians.

**"Person."** A natural person, firm, co-partnership, association, or corporation.

**“Personal Delivery Device (PDD)”** A ground delivery device that is manufactured for transporting cargo or goods; is operated by a driving system that allows remote or autonomous operation, or both; and weighs 550 pounds or less without cargo or goods.

**"Phase 1."** The operation of a personal delivery device through a driving system that allows remote or autonomous operation by an authorized entity where the device is controlled remotely and a PDD operator is within 30 feet of the PDD and within the line of sight of the PDD.

**"Phase 2."** The operation of a personal delivery device through a driving system that allows remote or autonomous operation by an authorized entity where the device is monitored remotely by a PDD operator and the driving system is capable of being controlled and overridden remotely by the PDD operator.

**"Range."** The horizontal distance to which a PDD can travel.

**"Roadway."** That portion of a highway improved, designed or ordinarily used for vehicular travel, exclusive of the sidewalk, berm or shoulder even though such sidewalk, berm or shoulder is used by pedalcycles. In the event a highway includes two or more separate roadways the term "roadway" refers to each roadway separately but not to all such roadways collectively.

**“Weather Emergency.”** A weather event that results in a warning or advisory from the National Weather Service.

**“Work Zone.”** The area of a trafficway where construction, maintenance or utility work activities are being conducted which is properly signed as a work zone in accordance with PennDOT regulations, policies and publications.