Vigilant LPR Speed Trailer Upfit Kit Installation & Aiming Guide

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Read Me First

Notations Used in This Manual

Throughout the text in this publication, you notice the use of **Warning**, **Caution**, and **Notice**. These notations are used to emphasize that safety hazards exist, and the care that must be taken or observed.

WARNING: An operational procedure, practice, or condition, and so on, which may result in injury or death if not carefully observed.

CAUTION: An operational procedure, practice, or condition, and so on, which may result in damage to the equipment if not carefully observed.

NOTE: An operational procedure, practice, or condition, and so on, which is essential to emphasize.

Special Notations

The following special notations are used throughout the text to highlight certain information or items:

Table 1: Special Notations

Example	Description
Menu key or **Camera** button	Bold words indicate a name of a key, button, or soft menu item.
The display shows `Settings Applied`.	Typewriter words indicate the MMI strings or messages displayed.
`<required ID>`	The courier, bold, italic, and angle brackets indicate user input.
Setup→Settings→All Settings	Bold words with the arrow in between indicate the navigation structure in the menu items.

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Document History

Version	Description	Date
MN008436A01-AA	Initial Release	July 2021

Chapter 1

Hardware Overview

This section lists all of the requirements and equipments needed to configure the ALPR Speed Trailer Upfit Kit.

1.1
Upfit Components

Table 2: List of ReaperHD with VLP Processor Equipment

Equipment	Photo
PoE Switch	

Equipment	Photo
GPS/4G Antenna Dongle	
Low Voltage Disconnect with Ring Terminals	

Equipment	Photo
Wiring Harness	
12 V DC Tablet Computer Power Supply	
Tablet Computer Docking Cradle	

Equipment	Photo
Tablet Computer with Ethernet Cable	
Docking Cradle RAM Mount	*Image is not available*
Camera RAM Mount	*Image is not available*
25 mm ReaperHD with Camera Cable	*Image is not available*
25 mm ReaperHD with Camera Cable	*Image is not available*

1.2
Existing Trailer Requirements

The upfit kit requires the existing features for proper installation into a speed trailer.

The existing trailer features are as follows:

*   12 V power system
*   Internal mounting space for Tablet Computer, PoE Switch, and Low Voltage Disconnect
*   Suitable mounting location for ALPR cameras

Required Tools

In addition to a suitable trailer, the following additional tools and hardware are required:

*   Phillips Head Screwdriver
*   Power Drill (for drilling mounting holes if necessary)
*   Wire Snips and Wire Stripper (optional)
*   Pliers and Crimping Tool (optional)
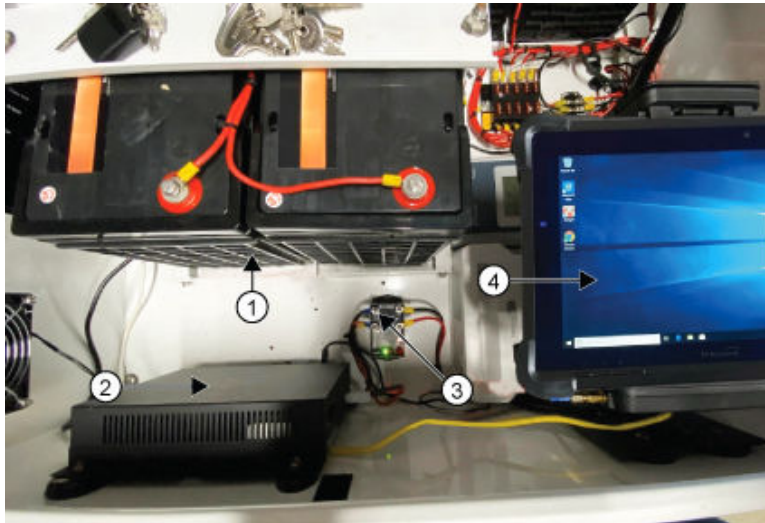*   Wrench or Ratchet Set
*   Allen Wrench Set

Required Harware

Additional wiring for the to connect the 12V power supply from the batteries to the Low Voltage Disconnect may be required.

Installation

Specific mounting requirements for each component may change depending on the configuration or construction material of the trailer that the kit is being installed into.

Figure 1: Wiring Diagram

Table 3: Wiring Diagram Callouts

Number	Description
1	Batteries
2	POE
3	Low Voltage Disconnect
4	10.1" Rugged Tablet

If it is not possible or desired to drill mounting holes in the trailer equipment enclosure a heavy-duty double sided mounting tape can be used instead for the internal components, but not the camera mounts.

IMPORTANT: Mount the Upfit Kit components securely to prevent damage to them while the trailer is in transit.

Power for the Tablet Computer and ReaperHD PoE Switch comes from the low voltage disconnect, which in turn ties into the existing 12V power system of the trailer either through a bus bar, fuse box, or directly on to the battery terminals.
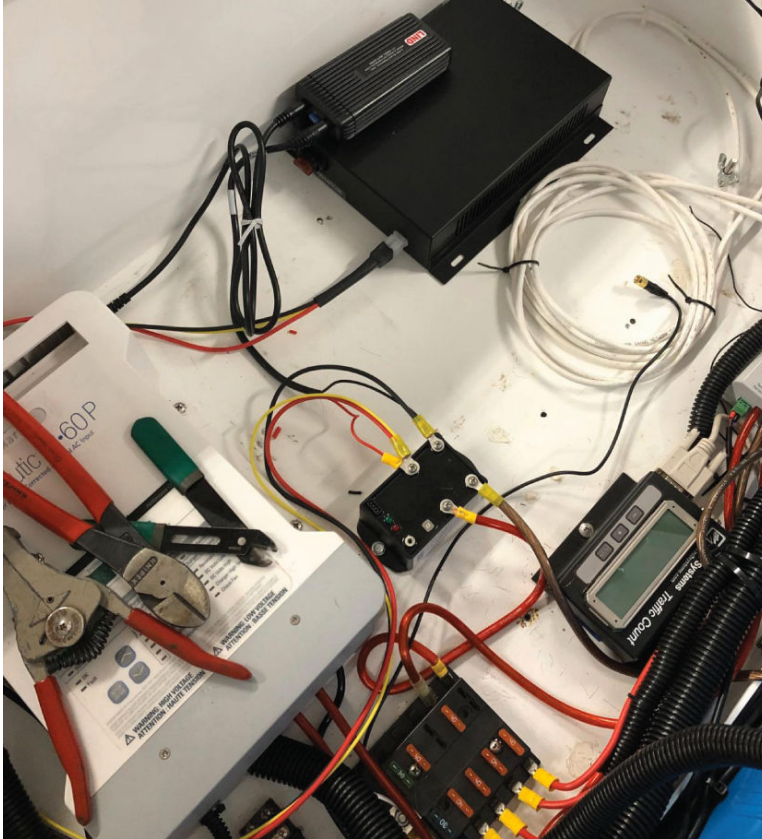
CAUTION: Always disconnect power first from the batteries to the rest of the trailer's power system before performing any servicing of the components inside.

When retrofitting a trailer with an existing ABOX-3210 vehicle computer, first disconnect, unmount and remove the unit from the trailer.

2.1
Power Wiring Overview

The selectable Low Voltage Disconnect ties the upfit kit components into the trailer batteries of the 12 V power system. It cuts off at ~11 V (lowest setting) and automatically turns back on at ~12.8 V to protect the batteries from damage.

> 📝 **NOTE:** Notice the Low Voltage Disconnect in the center of the image and its orientation.

The two thickest red and brown wires connected to the terminals on the right connect to a 12 V power source's positive and negative wires, respectively. In this case, the positive red wire is coming from a fuse box that receives power from the battery bank. The negative brown wire returns directly to the negative terminal on one of the batteries.

The three medium thickness red, yellow, and black wires connected to the terminals on the left are from the Wiring Harness and provide power for the PoE Switch.

The two least thick red and black wires connected to the terminals on the left are from the 12 V Tablet PSU and provide power to the Tablet Computer.

2.2
Mounting the ReaperHD Cameras

Prerequisites:
Mount the 16 mm ReaperHD camera, the 25 mm ReaperHD camera, and run the included Camera Cables.

If the upfit kit is being installed into a trailer without a camera enclosure, a suitable external mounting location must be identified that will allow the cameras to be oriented horizontally. A cable run with

entry into the trailer's equipment enclosure may need to be installed if the trailer is not equipped with a camera enclosure.

> **NOTE:** A secured camera enclosure and conduit for the camera cabling are strongly recommended for security, but not required as ReaperHD cameras and the included cabling are rated for outdoor use.

Procedure:

1 Feed the RJ-45 connector end of a Camera Cable through the bottom of the camera enclosure and into the inside of the trailer equipment enclosure.

2 Thread washers onto the four bolts included with the Camera RAM Mount.

3 Insert the bolts into the four holes in the plate of the Camera RAM Mount.

4 Secure the Camera RAM Mount bolts with four nuts with the ball side of the mounting plate towards the front of the camera enclosure.

5 Plug the Camera Cable into the port on the back of the camera and secure the fastening ring.

6 Attach the clamp on the back of a ReaperHD camera to the ball of the Camera RAM Mount.

7 To secure the camera in place, tighten the four screws with an Allen Wrench.

8 Repeat from step 1 for the other mount and camera.

2.3
Mounting the GPS/4G Antenna

Prerequisites: The GPS/4G Antenna dongle provides the Tablet Computer GPS location information and an Internet connection. The dongle should be placed on the exterior of the trailer with a clear view to the sky wherever possible.

Procedure:

1 Find a suitable location on the trailer to place the GPS/4G Antenna dongle.

2 Use the included screws to attach the dongle mount to the exterior of the trailer.

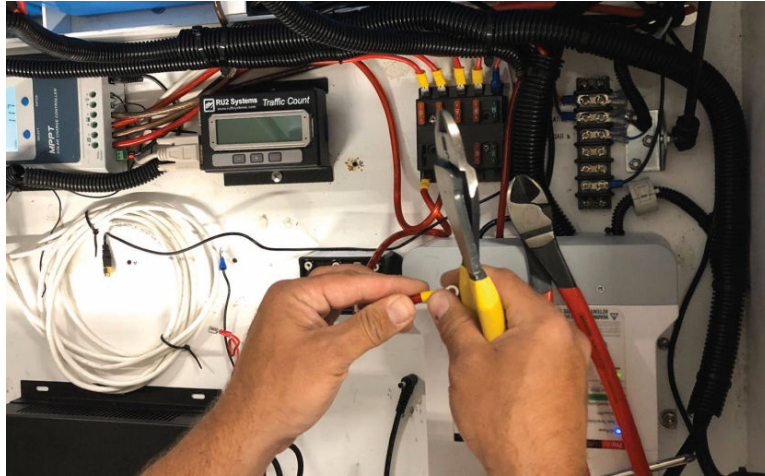3 Attach the dongle to the mount and run the cable into the Trailer equipment enclosure.

2.4
Installing the Low Voltage Disconnect

Prerequisites: Mount the Low Voltage Disconnect in a centralized location in the equipment enclosure such that all of the components and the battery wires can reach it.
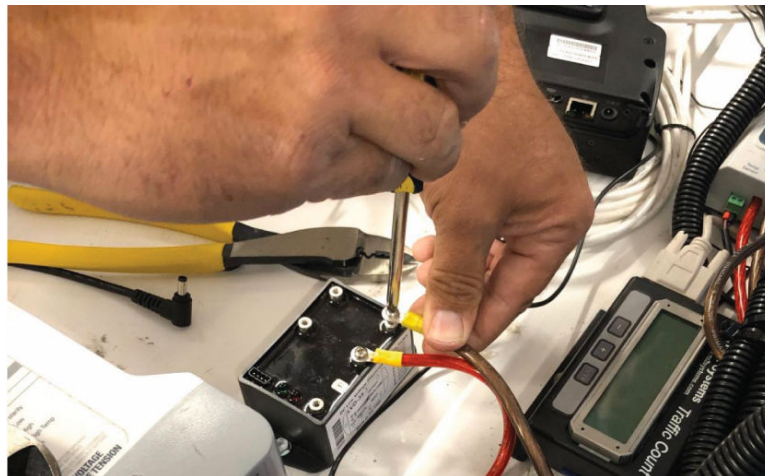

Procedure:

1 To disconnect the batteries of the trailer from the rest of the power system, pull the fuse from the fuse box where the positive battery wire connects to it.

2 Mount the Low Voltage Disconnect to the equipment enclosure.

3 Crimp two Ring Terminals included with the Low Voltage Disconnect to the positive and negative wires leading to and from the batteries.
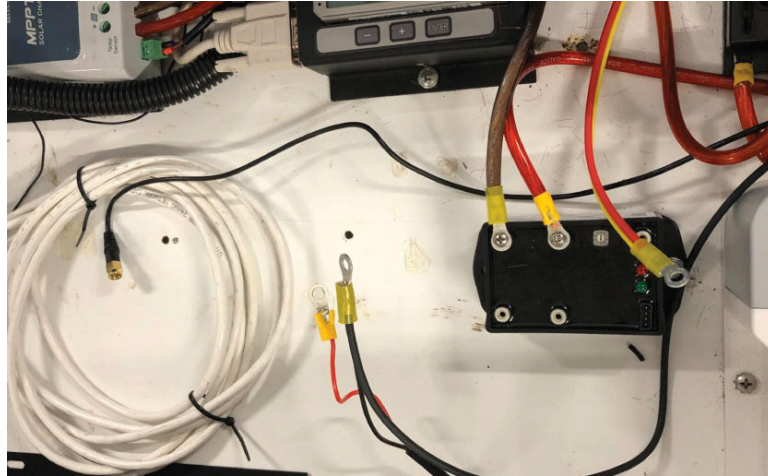
> **NOTE:** When the Low Voltage Disconnect is oriented with the three-terminal side facing north the northwest terminal is negative and the one directly east of it is positive.

4 Use a Phillips Head Screwdriver and the included screws to connect the positive and negative wires to their respective terminals on the three-terminal side of the Low Voltage Disconnect.
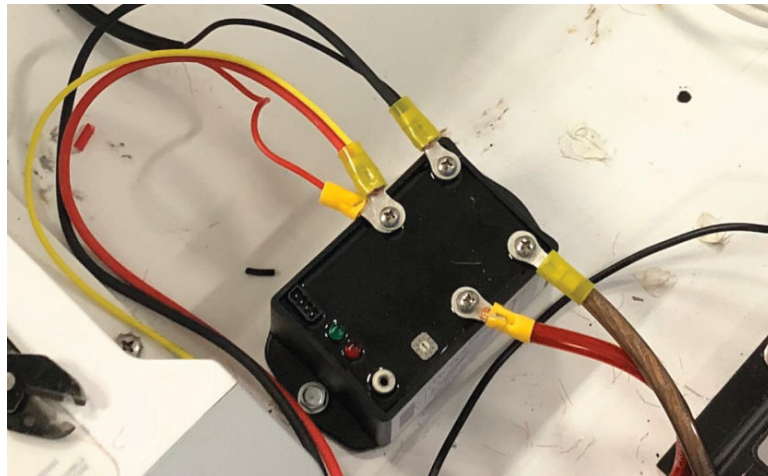

5 Crimp the other two Ring Terminals included with the Low Voltage Disconnect onto the two non-terminated wires of the 12 V DC Tablet Computer Power Supply.

> **NOTE:** When the Low Voltage Disconnect is oriented with the two-terminal side facing south the southwest terminal is negative and the one directly east of it is positive.

6 Connect the Ring Terminals of the black wires from the Wiring Harness and the 12 V DC Tablet Computer Power Supply to the southwest terminal.

7 Connect the Ring Terminals of the red and yellow wires from the Wiring Harness and the red wire of the 12 V DC Tablet Computer Power Supply to the other terminal on the two-terminal side.

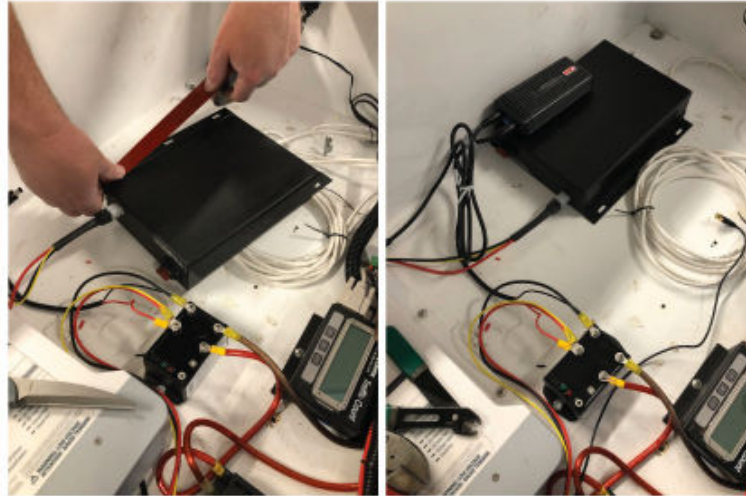> **NOTE:** The Wiring Harness comes with pre-installed ring terminals.

2.5
Installing the PoE Switch

When and where to use: The PoE Switch provides power and a network connection to the ReaperHD cameras.

Procedure:

1 Mount the PoE Switch to the equipment enclosure of the trailer.

2 Plug the end of the Wiring Harness with the power connector into the back of the PoE Switch.

3   Plug the two Camera Cables into any ports on the PoE Switch.

4   Plug the Ethernet Cable for the Tablet Computer into a free port.

2.6
Mounting the Tablet Computer

When and where to use: The Tablet Computer runs the Vigilant CarDetectorMobile software for LPR processing and PlateSearch connectivity. The Docking Cradle RAM Mount assembly comes with magnets to attach it to the trailer equipment enclosure. If the enclosure is not constructed of a ferromagnetic metal, the magnets can be removed and the RAM Mount bolted directly to the enclosure.

Procedure:

1   Attach the magnetic portion of the Docking Cradle RAM Mount to a suitable location inside the enclosure.

> **NOTE:** An interior side of the equipment enclosure is usually the best place to mount the Tablet Computer.

2   Attach the plate of the Docking Cradle RAM Mount to the rear of the Docking Cradle with the four included bolts.

3   Attach the double-socketed arm portion of the Docking Cradle RAM Mount to the ball on the magnet portion.

4 Seat the ball of the Tablet Computer Docking Cradle into the other socket of the arm. Adjust and tighten the clamps on the arm to hold the docking cradle in place.

5 Plug the Ethernet Cable from the PoE Switch into the Ethernet port on the docking cradle.

6 Attach the GPS dongle into the GPS port on the docking cradle.

7 Plug the power cable from the 12 V DC Tablet Computer Power Supply into the power port on the docking cradle.

8 Insert the security key of the docking cradle into the lock and turn to unlock and open the docking cradle.

9 Seat the Tablet Computer into the docking cradle and push down on the top of the docking cradle to clamp the tablet into place.

10 Relock the cradle.

2.7
Testing the System

Prerequisites: Double check that all of the connections have been made and all tools have been removed from the equipment enclosure before reconnecting power from the batteries to the power system of the trailer.

Procedure:

1 Reconnect the batteries to the power system of the trailer and check the following component:

   • The Tablet Computer is powered on.

   • Check the IR emitters on the ReaperHD cameras.

   • Check the ports on the PoE Switch for activity lights.

2 If all components are powered, launch the **Mobile LPR Camera** application on the Tablet Computer.

   NOTE: For information on configuring the Tablet Computer and the Mobile LPR Camera, see *the Mobile Tablet Configuration Guide, MN007817A01*.

2.8
Aiming the Cameras

When and where to use: The LPR cameras need to be aimed each time the trailer is moved.

Procedure:

1 Aim the smaller mm ReaperHD camera at the closer lane and the 25mm ReaperHD at the far

lane. **2** To accurately aim the cameras within their monitored lanes, use the Camera Aiming Tool
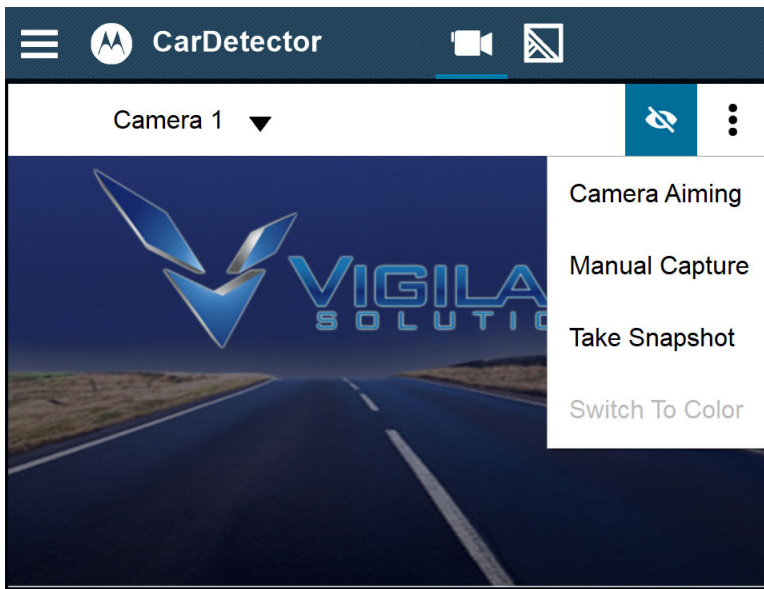**M**obile LPR Camera application.

> **NOTE:** For more information on using the **Mobile LPR Camera** application, see *Mobile LPR Camera System Installation Guide, MN007802A01.*

3 Loosen the camera knobs enough to move the cameras and use the aiming tool to center the plate in the green aiming box.

4.3.8
Camera Navigation

Figure 46: Camera Navigation Window

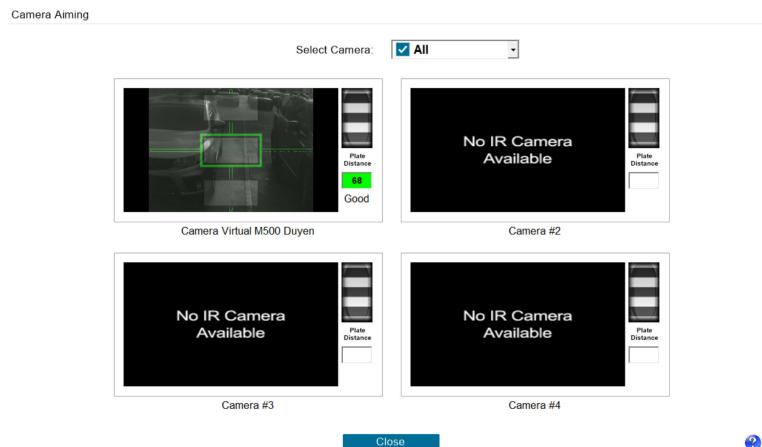⚠️ **WARNING:** Live video rendering should only be used while aiming cameras. This helps to preserve computer resources.

4.3.8.1
Using the Camera Aiming Tool

All cameras will render simultaneously and allow the user to correctly aim each camera.

Procedure:

1   From the **Camera Navigation Menu** click the **Camera Aiming** list item.

2   Select the camera to aim from the **Select Camera** drop-down menu.

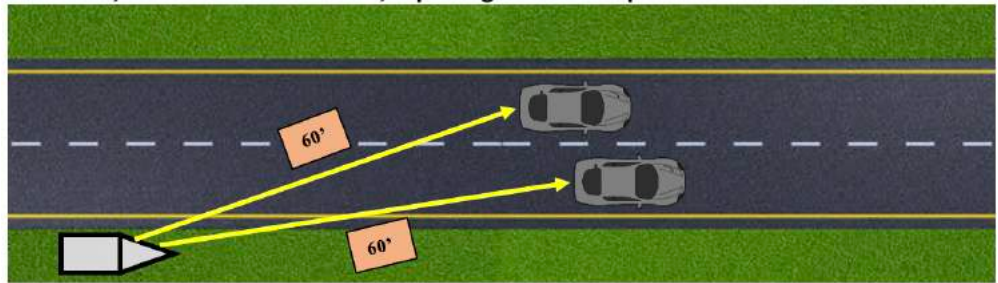**Figure 47: Camera Aiming Tool**

TRAILER DEPLOYMENT:

1. Position the trailer on a straight road, allowing a minimum of 60 feet between the trailer and any curves in the road. Cameras should point at the rear license plates of vehicles 60' away.
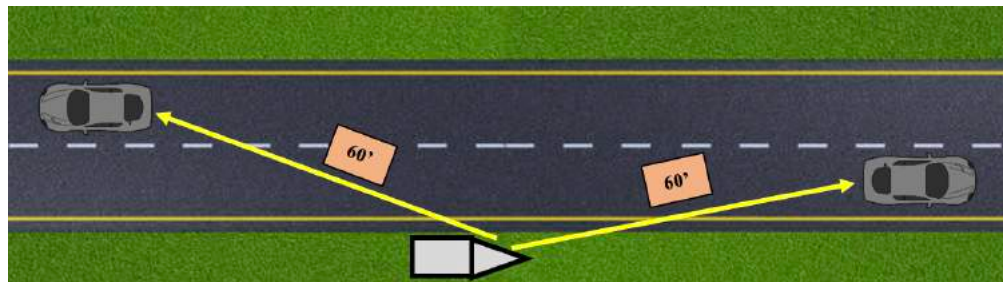
EXAMPLE DEPLOYMENT METHODS:

1. Two lanes, same direction of traffic, capturing rear license plates:

2. Two lanes, opposite direction of traffic, capturing rear license plates:

3. Center median, two lanes, opposite direction of traffic, capturing rear license plates: