Traffic Counter installation guidelines
Prepared by Dave Magill

Site selection
Three criteria: accurate data, protecting equipment, and safety during installation and retrieval. If the site won't reasonably deliver on all three, take notes and move on to another site.

- Accuracy:
  Must be on road segment requested by PennDOT.
  If site isn't close to segment offset specified, will it yield the same stats?
  The test for this is: the precise offset *and* this site are on the *same* side of any statistically significant traffic volume 'generators'.
  Is the site far enough from signals/major intersections to prevent backed up traffic from stopping on the tubes?
  Site should not be on/beside tight curve.
- Protecting equipment:
  Is there secure public property (utility pole/guardrail/sign) that counter can be chained to (if class count with two counters, will need signs reachable on both sides of road)
  Slope/drainage: counter units won't be submerged in heavy rain?
  Fairly even road surface so tubes won't come loose
- Installation/retrieval safety:
  Don't try to install in a location lacking an escape route you would use without hesitation eg: not on a high bridge, or on a narrow shoulder beside a wall
- Don't install too close to a blind spot (hill/curve) or a compelling driver distraction
- Don't install close to multiple/busy intersections that you can't easily monitor for approaching cars.
- If several cars parked on street, consider securing counter near hydrant to prevent parked car complicating later removal; this strategy is most useful for volume/single counter installs

Some general principles when working in traffic without flaggers:

- Wear reflective vest etc. as prescribed by PennDOT
- For anything other than a deserted road with clear views both ways, spend a moment before setting up to anticipate problems. Consider intersections, driveways, cars/trucks turning/passing, blind spots, mail/garbage trucks
- Don't do any work on the road until you've defined your work zone with cones
- People don't want to hit you, but assume they will not slow down and are distracted by kids and phones
- Don't figure things out while crossing the roadway -- the only decision you should be making in traffic is whether a vehicle is getting too close -- do your thinking on the grass
- Face the traffic
- Know where your partner is, and be able to communicate

- When installing in steady traffic, you'll rely on gaps created by traffic signals. Be patient, and make it clear when you are staying off the road so traffic doesn't back up.
- Particularly when working in heat, save the simplest, low traffic installations for later in the day, keep water in the van, and monitor your energy, alertness and your partner

Parking work van

If no street parking or safe/wide shoulder, next choices are:

- church/school/shared business parking lot (leave flashers on)
- Single business parking lot
  Leave flashers on, wear id, find someone who isn't busy, ask permission to park for 20 minutes
- Edge of farm/large property (if you see anyone, ask permission)
- If residential curbed street, see if anyone around who might be okay with use of their driveway, wear id, have partner and equipment visible at van, generally no problem but if sensing unease move on

Cone placement

- Default placement is evenly spaced, on both shoulders approaching work zone, with cones guiding traffic away from the crew. Larger gaps for high speed roads.
- Modify default placement to address sightlines:
  If installation is not far from hill/curve, place a cone on far side of blind spot
- Don't block intersections, driveways -- prevent cone related work interruptions.

Install prep

- Confirm van stocked with road tape etc. as needed
- Have enough short & long nails + nylon webbing on person--consider tool belt for this + hammer
- If uncertain that tube is long enough (eg. previously cut), wait for clear roadway and count steps from counter location to far side of traffic lanes, lay out tube off road, confirm length

Programming counter

Volume count tube install (one/two lane road)

- Carry coiled tube (with hardware on one end) to roadside opposite counter, nail hardware into shoulder/parking lane a couple feet away from traffic lane--farther as needed for safety depending on traffic speed/volume--place to allow removal if cars parked later
- On roadside, uncoil and check sufficient tube length to cross road without snags

- Target for the other end of road tube is directly across road, on shoulder near counter, which is clear of parking spaces if possible
- Cross when clear and immediately take up slack and step on tube
- Check for traffic, wait as needed until again clear, stand stable, pull tube to add tension, step back onto tube -- for each 10' of roadway try to pull tube an additional foot
- Keeping foot on tube, wrap in nylon webbing and hammer nail to road through webbing, nailhead just grazing/flush to tube to secure
- Repeat with a second strip of webbing, short nail is adequate for this backup attachment
- Attach open end of tube to 'A' port of traffic counter and confirm vehicles being counted If road quiet, you can simulate a car with two quick stomps on the tube
- Use strips of road tape to keep tube stable: generally a strip of road tape for each tire track and additional as needed for small gaps under tube at dips/ripples in roadway. Peel off tape backing off-road, keep watching for traffic when applying each strip
- Use tape/nylon webbing/stakes as needed to keep road tube in neat path from roadside to coiled surplus beside counter, can tie coil with rubber strap
- Close counter lid, chain/lock to pole
- Return tools to van, check for trash, get cones, cross site off your map and move on

Class count tube install (two lane road)

- Have two counters configured for class count at secure points (public poles/guardrails etc) on opposite sides of roadway
- Use tubes with knot in middle and no hardware, functionally equivalent to two separate volume tubes
- You'll be installing two tubes, 8ft apart, consider this (and driveways etc) when locating first tube
- Tube will be installed with knot at road centerline or equivalent--measure this distance in steps and then (off the road) uncoil sufficient tubing on both sides of knot to lay tubing on road quickly without snags
- You and partner will be nailing first attachment to roadway simultaneously with tube under tension; for safety confirm hammer and sufficient nails on person
- One person stays at their attachment point, other crosses road with tubing, then both add tension--keeping knot at centerline-- then step on tubing to hold while nailing
- Keeping foot on tube, wrap in nylon webbing and hammer nail to road through webbing, nailhead just grazing/flush to tube to secure
- Use a short nail for a nearby backup attachment
- When tube secure, listen to end of tube confirm air puff/pop when cars cross
- With first tube confirmed good, measure an 8ft gap from attachment point for second tube, mark with chalk, repeat on other side of road
- Repeat attachment procedure for second tube using chalk marks as guide
- Once second tube nailed in, you'll be attaching tubes to (configured) counter ports to confirm proper counting before taping down tubes

- On both sides of road, tube that cars contact first goes into ‘A’ port, second tube into ‘B’ port
- Once counters confirmed working proceed as per volume count (copied below)
- Use strips of road tape to keep tube stable: generally a strip of road tape for each tire track and additional as needed for small gaps under tube at dips/ripples in roadway. Peel off tape backing off-road, keep watching for traffic when applying each strip
- Use tape/nylon webbing/stakes as needed to keep road tube in neat path from roadside to coiled surplus beside counter, can tie coil with rubber strap
- Close counter lid, chain/lock to pole
- Return tools to van, check for trash, get cones, cross site off your map and move on