

TMT Traffic Data Workflow

Traffic Survey Group – Tube Based Volume Count Specification

Work Activity: Collection of volume counts using the Peek ADR1000 counter and road tubes for requests received through the Traffic Survey Project Count Program.

Safety Equipment

Personal Protective Equipment:

- Safety Glasses or Goggles (Required)
- Steel Toe Work Shoes (Required)
- Day/Night Safety Vest (Required)
- Work Gloves (Optional)
- Knee Pads (Optional)
- Head Lamp (Optional)

Vehicle Safety Equipment:

- Yellow/White Rotating Warning Lights (Required)
- Yellow/White LED Flashing Corner Lights (Optional)
- Work Spotlight (Required for night work)
- Equipment Partition (Required)
- Fire Extinguisher (Required)
- First Aid Kit (Required)

Scheduling Work

Field Supervisors will verify data collection schedules that require specific conditions related to school, businesses, or events. Schedule project counts so that special instructions specified in a project request are met. If standard 48 hour counts are requested, counters will be installed on Mondays and Tuesdays. If weather delays work or holidays occur early in the week, counters may be installed on Wednesday but must be completed by midday. Counts must not be collected over holidays unless specifically requested. Counts to be collected over the weekend should be installed late in the week and checked on Friday before ending the work week.

Project work must be coordinated with other work activities. Schedule your vehicle class work around project work to fill out the work week. Work itineraries must be submitted to the Field Supervisor the previous week. Technicians must follow work itineraries. Any changes in itinerary must be approved by the Field Supervisor. All overnight travel must be preapproved by the Field Operations Engineer. All travel will be made in compliance with Traffic Survey travel policies. Any condition that may cause delay in project work requires notification of the Field Supervisor immediately. Field Supervisors must contact the Field Operations Engineer immediately. Project count stations on high volume facilities may require scheduling work at night. Field supervisors determine final scheduling with Field Operations Engineer approval.

TMT Traffic Data Workflow

Traffic Survey Group – Tube Based Volume Count Specification

Site Selection

All counter installations must comply with Traffic Survey safety policies. Technicians are prohibited from installing road tubes on interstate mainline travel lanes. Under no circumstances are technicians to work within the limits of a work zone. Technicians must perform the risk assessment process for each counter installation. Refer to the Portable Count Safety Specification.

Technicians will travel to a station location specified in the project request. Perform a risk assessment on the segment the station is located. Select a location that provides safe working conditions and conditions for collection of good quality counts. Criteria required for these conditions are:

- Installations must be a minimum of 200 ft from intersections
- Installations must be a minimum of 500 ft from ramp junctions
- Avoid placing counters near busy driveways
- Short high volume multilane segments will require staggering directional counter installations away from signals to avoid queuing traffic
- Installations must not be placed on bridges
- Installations must not be placed within railroad right of ways
- A maximum of 3 through lanes may be collected on a single tube sensor
- Tubes may be run across all lanes with a knot used to limit lanes detected
- Center turn lanes must be collected with one of the directional installations
- Select locations where there is little traffic using a center turn lane

If there is no location where a counter may be installed safely, or the requested count location is not consistent with what is in the field, contact your supervisor immediately. Field Supervisors must contact the Field Operations Engineer immediately.

Vehicle Operation

Technicians must comply with motor vehicle laws of North Carolina. Defensive driving techniques must be used when operating a State vehicle. Anytime a counter is being installed you are working in your own work zone. Traffic data collection activities fall under Mobile Operations in the MUTCD. This requires the use of rotating flashing yellow and white lights during all work activities on the highway. These lights must be in good working condition for you to work. Inspect them daily. If they are not operating properly, contact your supervisor immediately to arrange repairs.

Always review maps to determine the route to be taken to the next station while stopped. Do not attempt to read the map while driving. Follow the Vehicle Operation SOP for Portable Count Data Collection when installing or retrieving counters.

TMT Traffic Data Workflow

Traffic Survey Group – Tube Based Volume Count Specification

Counter Installation Specifications

Always be observant of activities in the area that may affect travel patterns at time of installation. Note any activities on your field notes. If major activities occur that have a significant impact on travel patterns (detours, events), contact your supervisor immediately. Field Supervisors must notify the Field Operations immediately. Major activities may require postponement of data collection. The Field Operations Engineer will coordinate with the customer to make this determination. Once a suitable location has been selected, counters must be installed properly to collect the data as requested.

Acceptable counter configurations are:

- Single Counter/Single Tube – non-directional on undivided highway
- Single Counter/Two Tubes –
 - a) Long tube/short tube directional on undivided highway
 - b) Median installation with single tube in each direction on divided highway
- Two Counter/Single Tube Each –
 - a) Divided highway with counter installation in each direction
 - b) Undivided multilane with center turn lane – 5 Lane cross section with 2 lane/3 lane setup or 7 Lane cross section with 3 lane/4 lane setup

A single tube with a knot may be used to replace two single tube installations if the counters can be secured opposite each other. On unusual cross sections with multiple medians, more than two counters may be used. Record a sketch on the field sheet identifying lane and direction layout and counter/tube configurations. Specific installation requirements are:

- Record SiteID, StationID, location information, technician, and date on field sheet
- Select appropriate length tube and inspect tubing prior to installation
- Must have a minimum of 10 ft of tubing between nearest travel lane and counter
- Secure tubing to the far side of the highway first
- Place the tubing across the travel lanes to be counted
- Use a tube tester to check operation of the tube sensor, replace tube if it fails test
- Secure tube to near side of the highway and stretch so that it has some tension
- Initialize counter and check battery charge, if charge is low, replace counter
- Program SiteID, StationID and count interval into counter
- Input counter settings based on sensors used and configuration
- Attach tube sensor to air switch
- Monitor operation of counter/tube setup for proper detection of axles
- Verify counter programming
- Secure counter to a fixed object
- Coil excess tubing at the counter
- Place tape at appropriate locations to secure tube
- Place locator flags along the tube in the grass if it is tall and may be mowed

TMT Traffic Data Workflow

Traffic Survey Group – Tube Based Volume Count Specification

Counter must be secured to an appropriate fixed object. Do not secure counter to ornamental shrubs or trees. Do not secure them to mailboxes or fire hydrants. Use signposts, poles and guardrails. Avoid securing to items where tubing will cross a sidewalk. Use chains when needed. Always secure in a location where the counter will not be immersed in water if a heavy rain occurs.

Taping is not required on very low volume roads. Medium to high volume roads must be taped. Use duct tape for most locations. Minimum taping for two lane roads is on each shoulder and on the centerline. Taping on multilane roads is on each shoulder and between each lane. If a road has rutting, tape must be placed in the middle of the ruts also. Use asphalt tape and glue on high volume installations. As a last resort, tubes may be installed across sidewalks. Use many pieces of tape to ensure the tube is securely placed on the sidewalk to prevent a tripping hazard to pedestrians.

Adverse Weather

If a major weather event occurs such as a hurricane or winter storm, technicians must plan to pickup equipment. They must coordinate with their supervisor on how to respond to a weather event. Field Supervisors must obtain approval from the Field Operations Engineer for the final decision on what actions must be taken. Refer to the Traffic Survey Field Weather Policy for additional information.

Counter Retrieval Specifications

Counts with long durations (5 day, 7 day) must be inspected during the count period. Counter/sensor operation must be checked. Installations must be checked before the weekend. If the tube is still operating properly but has become loose, resecure using additional tape. When checking installations or retrieving counters, be observant of activities in the area that may affect travel patterns. Note any activities on your field notes. If major activities occur that have a significant impact on travel patterns, contact your supervisor immediately. Field Supervisors must notify the Field Operations immediately. Major activities may require recounting the station at a later date. The Field Operations Engineer will coordinate with the customer to make this determination. The counter retrieval process is:

- Check the counter/tube sensor setup for proper operation
- Capture data on PC Card and check the # of days collected
- Retrieve counter
- Retrieve tube sensor
- Complete field sheet

Do not clear data from counter until data on the PC Card has been processed.

TMT Traffic Data Workflow

Traffic Survey Group – Tube Based Volume Count Specification

If counter and/or sensor are not operating properly, you can process the data from the counter and review the data. If the failure appears to have occurred past the count duration time period, the data may be acceptable and may be submitted for further review. Make a detailed note in your field notes regarding the issue. The count may need to be recounted after further review. If the count data indicates the failure occurred during the count period, you may reinstall at that time if it still meets the request requirements. If not, the count must be scheduled for the following week. For counts requiring specific days of the week (5 day, 7day), the days with valid counts may be used and the missing days needed must be collected. If more than one counter is used to collect a single station and only one of the installations fails, you must recount the entire station.

Field Data Processing

Technicians must process count data for review. Field data processing requires:

- Capture data from the PC Card onto your laptop
- Process counts using the TDP software
- Input location descriptions and directions in TDP
- Print reports and review data for consistency and check for breaks
- Make 2 copies of files onto separate floppy disks
- Schedule recounts if data shows sensor failures or counter problems
- Submit field sheets, report printouts, and 1 floppy disk to supervisor

Technicians must retain 1 floppy disk for their records for 3 years. If data submitted on floppy becomes corrupted before processed, you will be required to make another copy to submit. Field Supervisors will review the data report prior to submitting to the Field Operations Center.

Final Data Review

Field Supervisors are responsible for ensuring all project counts are completed by field deadlines. Supervisors submit field sheets, report printouts, and floppy disks for all project data. The Project Data Technician processes counts, makes edits to correct errors, and prepares the project data packet for review. The Field Operations Engineer performs final review of all project data. They may contact field staff to check on conditions or to get clarification on information submitted. Final review may result in recounts on occasion but most errors or data problems should be detected by field staff and addressed appropriately prior to data submittal. Once final review is completed, the Project Data Technician makes copies of final reports and delivers the data packet to the customer.