

NCHRP 20-05/Topic 56-05:

Traffic Analysis Practices for Non-Motorized Modes

APPENDIX E: EXAMPLE STATE DOT GUIDANCE

This appendix compiles publicly available state DOT policies, manuals, plans, and tools relevant to the integration of non-motorized modes into traffic analysis and project development. Documents were included when they provided direction on how pedestrians, bicyclists, mobility device users, or micromobility are considered in planning, design, operations, safety screening, exposure analysis, data collection, or project prioritization. Availability and level of detail vary by state, and this appendix is intended as a practical reference rather than a complete inventory.

Table E-1. Publicly Available State DOT Policies, Manuals, and Tools Relevant to Non-Motorized Traffic Analysis

State DOT	Year	Guidance
AK	2025	<i>Alaska Highway Preconstruction Manual, Chapter 12</i> defines the State’s engineering and policy framework for integrating non-motorized transportation into highway projects, requiring accommodation of bicyclists and pedestrians unless formally exempted. The chapter also includes a waiver process for infeasible cases and aligns design guidance with AASHTO and the Alaska Traffic Manual. <i>Link:</i> https://dot.alaska.gov/stwddes/dcsprecon/assets/pdf/preconhwy/chapters/chapter12.pdf
AZ	2018	ADOT’s <i>Bicyclist and Pedestrian Count Strategy Plan</i> lays out a statewide framework for building a consistent, defensible non-motorized count program, focusing on how Arizona should collect, store, and use bicyclist and pedestrian volume data to support safety analysis, project prioritization, and performance measurement. The plan reviews proven count technologies, evaluates ADOT’s current limited capabilities, and identifies 130 priority count locations based on crash history, major bicycle routes, special events, and high-activity corridors. <i>Link:</i> https://activetransportation.az.gov/sites/default/files/documents/files/Bicyclist-and-Pedestrian-Count-Strategy-Plan.pdf

State DOT	Year	Guidance
CA	2025	<i>Caltrans Highway Design Manual</i> establishes statewide design standards for bicycle transportation facilities. The chapter defines bikeway classes, outlines when and where each facility type should be used, and details design requirements for widths, clearances, intersections, drainage, and safety treatments (Source 1). Caltrans Pedestrian Exposure Model Map provides an interactive visualization of estimated annual pedestrian volumes across California, offering a statewide baseline for understanding non-motorized exposure and supporting data-driven safety analysis. The pedestrian volumes shown on the map are modeled estimates derived from a direct demand model and do not represent observed counts. The model is calibrated using short-term counts collected at over 1,200 intersections statewide, incorporating contextual variables such as population, employment density, and street network characteristics surrounding each location (Source 2). 1. Link: https://dot.ca.gov/-/media/dot-media/programs/design/documents/chp1000-a11y.pdf/1000#page=1.00&gsr=0 2. Link: https://misc-external.dot.ca.gov/trafficops/ped/exposure_model_predictions.html
CO	Varies	CDOT's <i>Pedestrian and Bicycle Volume Data Collection Toolkit</i> gives agencies a practical guide to selecting and using non-motorized counting technologies, summarizing the strengths, limitations, and ideal applications of sensors such as infrared, pneumatic tubes, inductive loops, piezoelectric strips, video analytics, and manual counts (Source 1). The Online Transportation Information System (OTIS) is a public data portal that provides access to non-motorized count data, supporting calibration, exposure analysis, and statewide monitoring for pedestrian and bicycle modes (Source 2). 1. Link: https://www.codot.gov/programs/bikeped/documents/2016-10-21-cdot-nonmotorized-monitoring-plan-toolkit_appendix-b_a11y.pdf 2. Link: https://dtdapps.codot.gov/bikeped
DE	2016	The <i>Delaware DOT Bicycle and Pedestrian Count Program Guide</i> outlines the state's framework for systematically collecting and evaluating non-motorized traffic data. The count program dictates the operational setup for short-duration and permanent continuous counts, guiding the selection of strategic locations, like screenlines and intersections, and the deployment of specialized equipment such as pneumatic tubes and Eco-Counters. Link: https://deldot.gov/Publications/plans/bikeandped/pdfs/DelDOT_Count_Program_Guide.pdf
FL	Varies	The Statewide Non-Motorized Traffic Monitoring Program aims to collect statistically valid bicycle and pedestrian volume data across Florida. It utilizes a combination of a permanent continuous count network for year-round baseline data and an extensive short-term deployment initiative (supported by an equipment loaner program) to ensure comprehensive geographic coverage for safety studies, facility planning, and road maintenance (Source 1). To

State DOT	Year	Guidance
		standardize these operations, Chapter 5 of the Traffic Monitoring Handbook provides detailed step-by-step methodologies for site selection, equipment installation, and data factoring (Source 2) The interactive Non-Motorized Traffic Monitoring Program Data Dashboard acts as the public-facing repository for sharing all collected volume statistics. It features various analytical views, including statewide interactive maps, individual site details, hourly count reports, and specific breakdowns for FDOT Districts and regional pathways (Source 3). 1. Link: https://www.fdot.gov/statistics/trafficinfo/florida-non-motorized-traffic-monitoring 2. Link: https://fdotwww.blob.core.windows.net/sitefinity/docs/default-source/statistics/docs/tmhandbook.pdf 3. Link: https://shorturl.at/htO6U
MD	2023	<i>The Bicycle Network Accessibility Analysis</i> evaluates Maryland's active transportation infrastructure by comparing the destinations, jobs, and populations accessible via bicycle to those reachable by automobile. Its approach for non-motorized traffic analysis relies on an LTS scoring system to spatially model network connectivity and route approachability for cyclists of varying skill levels. Link: https://www.mdot.maryland.gov/OPCP/MDOT_Bicycle_Network_Accessibility_Analysis_2023.pdf
MI	2024	<i>The Leveraging Crowd-sourced Data in Planning, Design, Analysis, and Evaluation of Pedestrian and Bicycle Traffic</i> report presents a data-driven framework for estimating active transportation volumes. To overcome the spatial limitations of physical count programs, the study integrates ground-truth baseline data from 43 permanent continuous counters with crowdsourced mobility data, specifically from Strava. Link: https://www.michigan.gov/mdot/-/media/Project/Websites/MDOT/Programs/Research-Administration/Final-Reports/SPR-1741-Report.pdf
MN	2017	<i>The Bicycle and Pedestrian Data Collection Manual</i> provides guidance for collecting non-motorized traffic data, including count types (both continuous and short-duration), sensor selection, site selection, data management, analysis, and AADT extrapolation. Link: https://mdl.mndot.gov/items/201703
NC	2021	The report titled, <i>The Bicycle Volume: Counting Machine Validation & Correction, Estimating & Forecasting, and Analysis of Injury Risk</i>, evaluates the data methodologies used within the state's Non-Motorized Volume Data Program (NC NMVDP). The report details how to apply linear correction factors to adjust raw machine counts and develops advanced multiple linear regression models that fuse these ground-truth counts with crowdsourced Strava data, roadway geometry, and sociodemographic variables to accurately estimate and forecast bicycle volumes across the network. Link: https://connect.ncdot.gov/projects/research/RNAProjDocs/RP2020-43%20-%20Final%20Report.pdf

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OR	2025	<i>Chapter 14 of Multimodal Analysis</i> of the Oregon DOT Analysis Procedures Manual focuses on evaluating the quality and comfort of active transportation networks rather than detailing a physical volume count or equipment deployment program. For non-motorized traffic analysis, the manual establishes perception-based methodologies to calculate PLTS and BLTS alongside MLOS) scores. Link: https://www.oregon.gov/odot/Planning/Documents/APMv2_Ch14.pdf
TN	2023	The TDOT <i>Bicycle & Pedestrian Counting: Best Methodologies Assessment</i> provides a framework for establishing a statewide active transportation monitoring system in Tennessee. For the count program, the report evaluates existing local efforts and conducts an analysis of traditional and emerging data collection technologies, ranging from manual and automated physical sensors to video and smartphone-based methods. Regarding non-motorized traffic analysis, the assessment emphasizes data homogenization and integration, outlining strategic approaches to standardize disparate data sources, develop factor groups, and apply spatial-temporal adjustment factors, while highlighting the critical need for robust calibration and validation protocols when utilizing third-party or crowdsourced datasets. Link: https://rosap.ntl.bts.gov/view/dot/56300/dot_56300_DS1.pdf
TX	2024	Multimodal analysis of the TxDOT <i>Traffic and Safety Analysis Procedures Manual, Chapter 14</i>, establishes Texas's framework for evaluating active transportation networks, focusing primarily on assessing perceived safety, comfort, and convenience rather than detailing a physical count deployment program. For non-motorized traffic analysis, the manual relies on PLTS and BLTS scoring methodologies alongside traditional HCM and microsimulation calculations. Link: https://www.txdot.gov/manuals/des/tsp/chapter-14-multimodal-analysis/14-2-multimodal-analysis.html
UT	Varies	The report titled, <i>Developing a Rubric and Best Practices for Conducting Counts of Non-Motorized Transportation Users</i>, which led to the Utah Bicycle and Pedestrian Counts Guidebook, establishes a structured approach for statewide active transportation monitoring. As part of the count program, the study evaluates the effectiveness of various methodologies across diverse environments, including testing automated technologies such as radar-based sensors and micro-radar systems for local feasibility (Source 1). The interactive Active Transportation Counters Dashboard acts as the public-facing repository for managing and sharing Utah's collected volume statistics. Leveraging continuous data from EcoVisio automated counters dating back to 2013, the platform features dynamic analytical views that allow planners and the public to filter pedestrian, bicycle, and multimodal activity by specific geographic regions, travel modes, and timeframes (such as commuting hours, months, or weekdays) to easily evaluate facility usage and trends (Source 2). 1. Link: https://rosap.ntl.bts.gov/view/dot/35017/dot_35017_DS1.pdf 2. Link: https://gis.udot.utah.gov/AT-Counters

State DOT	Year	Guidance
VT	2017	The Vermont <i>Bicycle and Pedestrian Counting Program Report</i> establishes the framework for the state's active transportation monitoring efforts. For the count program, the study provides strategic guidance on expanding continuous and short-term data collection, evaluating the deployment of automated infrared sensors and video-based manual counts, particularly in rural environments. Regarding non-motorized traffic analysis, the report focuses on standardizing data management by introducing a centralized web portal and database. It details methodologies for applying specific correction factors (such as a 1.16 multiplier to adjust for infrared sensor occlusion) and explores the integration of crowdsourced Strava Metro data to accurately extrapolate short-term observations into reliable, year-round statewide volume estimates. Link: https://rosap.ntl.bts.gov/view/dot/65801/dot_65801_DS1.pdf

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