Making People Count!
An Introduction to NC’s Non-Motorized Volume Data Program

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North Carolina’s Non-Motorized Volume Data Program (NMVDP) is a research project to test a bicycle and pedestrian count protocol and replicate this methodology across the state.

What gets measured, gets done. If you’re not counted, you don’t count!
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Motivations behind NMVDP

Use of AADPT and AADBT estimations

- Project Prioritization and Funding
- Planning Decisions
- Complete Streets Policy Implementation
- Operations and Maintenance

**Need common, consistent system to measure volume to:**

- Understand current trends and model future usage
- Evaluate at different levels (site, corridor, region)
- Share data

Annual Average Daily Traffic (AADT)
Annual Average Daily Pedestrian Traffic (AADPT)
Annual Average Daily Bicycle Traffic (AADBT)
Non-Motorized Volume Counts

- **Manual**: Project/Context Specific
- **Short Duration**: Continuous
- **Continuous**: Trends/Patterns
**Continuous Count Stations** – Permanent counting sites that provide data continuously (24 hours per day, 7 days per week).

Enough data should be collected to allow calculation of accurate adjustment factors (Time of Day, Day of Week, Monthly) to apply to **Short Duration Counts**.
NC’s “State of Practice”

- 17 agencies have or plan to conduct counts
- Most counts are short duration, manual counts
- Collected for specific projects or as part of ‘add-on’ to intersection turning movement study
- CCS installed independently* on trails by park/rec departments: Greensboro, Charlotte, and Chapel Hill

*(Not part of NC NMVDP)
National State of Practice

- FHWA Traffic Monitoring Guide (Ch. 4)
- NCHRP Report 797 & Web Only Doc. 205
- TMG Format for bicycle and pedestrian counts
- Peers:
  - Colorado DOT
  - MnDOT
- Local/Regional Programs
  - Delaware Valley Regional Planning Commission
  - San Diego State University (SANDAG)
Phase I: Pilot Region

[Map showing CCS and SDC Sites]

- CCS Sites (13)
- SDC Sites (22)
NON-MOTORIZED TRAFFIC MONITORING PROGRAM ELEMENTS

- Local Agency Coordination
- Site Selection
- Training
- Sampling Plan
- Data Collection Methods
- Equipment Purchasing and Support
- Equipment Vendor Coordination
- Equipment Installation Oversight
- QA/QC and Data Validation
- Data Cleaning & Correction
- Reporting
- Coordinated Data Collection
Local Agency Coordination

- What’s In It For Agency?
  - Equipment
  - Technical assistance / Training
  - Access to validated, cleaned data

- What’s In It For NCDOT?
  - Critical local knowledge
  - Installation assistance
  - Monitoring/maintenance assistance
  - Established relationships

Continuous Count Station Collecting Data
Martin Luther King Blvd, Chapel Hill, NC
Station Installation Diagram
Martin Luther King Jr Blvd
Chapel Hill, NC
Quality Control of the Data

- Retrieve / compile data
  - Monitor equipment
  - Perform regular checks on the data
- Conduct validation study
  - Precision and accuracy of the count

Continuous Count Station, Brevard Greenway
Brevard, NC
American Tobacco Trail
Durham, NC

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Table 5. Average Bicyclist Count by Day of Week

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Table 6. Bicyclist Patterns by Day of Week and Hour of Day

Seasonal Bicycle Activity
American Tobacco Trail [I-40 Bridge], Durham, NC
12/01/2014 - 11/30/2015

Count of Bicyclists and Pedestrians by Month
American Tobacco Trail [I-40 Bridge], Durham, NC
12/01/2014 - 11/30/2015
**Analyze Data**

- Derive adjustment factors from continuous count data
- Derive expansion factors from sampling plan for each site type
- Develop AADT numbers
  - Apply adjustment factors
  - Apply error correction factors
  - Extrapolate observed counts for short-duration site AADTs
- Explain any statistical uncertainties
More Patterns!
Project Expansion

2014 Phase I Pilot: NCDOT Division 7 and 9
2015 Phase II Project Expansion: NCDOT Divisions 4, 5, 8 and 10
2015 – 2018: Economic Impact of Shared Use Paths Research Project

- Trail user surveys and count sampling
- Opportunity to understand seasonality, expand CCS program
- Provide extrapolation figures for economic, health, and transportation

Locations:

- Brevard Greenway – Brevard, NC
- Crabtree Creek Greenway – Raleigh, NC
- Duck Trail – Duck, NC
- Yadkin River Greenway – North Wilkesboro, NC
- American Tobacco Trail – Downtown Durham, NC

Learn more!

Session 3 on Thursday (1:30-3PM) with Sarah O’Brien (ITRE) and Matt Hayes (Alta)
ANTICIPATED NMVDP CONTINUOUS COUNT STATIONS (LATE 2016)

Pedestrian CCS - 54

- II (37)
- I (12)
- SUP (5)

Bicycle CCS - 50

- II (33)
- I (12)
- SUP (5)
Elements of a Volume Data Program

It’s more than just counting!

1. Geospatial sampling
2. Site selection methods
3. Data collection methods
4. Equipment procurement
5. Equipment installation
6. Equipment validation
7. Development of adjustment factors
8. Technical support
9. Maintenance troubleshooting
10. Coordination with short duration count vendors
11. Coordination of state and local agency partners
12. Standardization of data inputs
13. Quality assurance and quality control checks on data
14. Data management and reporting
15. Data analysis
16. Development of annualized statistics
Training and Resources

- Informational Webinar
  - Introduction to the program

- 1-Day Workshop
  - Audience: bike/ped coordinators, planners, greenway/parks and recreation managers, engineers, transportation professionals
  - Detailed information on programmatic elements

[Link to Training and Resources: itre.ncsu.edu/focus/bike-ped/]

Pilot Project Training, Site Selection Field Visit
Greensboro, NC
Training and Resources

- NMVDP Program Website
  - Phase I – Count Station Overview and Data Summary
  - Phase I - CCS Data Download
  - Detailed Project Report (coming soon!)
  - Site Selection Paper
  - Program Level QAQC Processes
  - CCS Installation Video / Photos

itre.ncsu.edu/focus/bike-ped/
NC Non-Motorized Volume Data Program

About
Establishing a bicycle and pedestrian count program will assist the NCDOT in evaluating facility usage over time, inform the project prioritization process and provide quantifiable evidence to support non-motorized facility inclusion through the Complete Streets process. Improving municipal and regional planning for active travel. In turn, these data can be fed into tools to measure existing trends and model future increases in non-motorized trips at state, corridor, and regional levels.

Phase I Pilot Project
The pilot phase of the NC Non-Motorized Volume Data Program was conducted in the geographic region which comprises NCDOT Divisions 7 and 8 to test a bicycle and pedestrian counts protocol and regionalize the methodology across the state. Continuous Count Stations were used to monitor bicycle and pedestrian travel for Phase I, which occurred in late 2018. Twelve Phase I stations were set up to monitor both bicycle and pedestrian traffic for a total of twenty-four continuous count data streams which were still active. These stations cover a mix of sites across different land uses, travel patterns, and volume groups. Detailed technical information can be found in the Phase I Final Report and Appendices.

The following programmatic elements were piloted (i.e. the Trored region) to select, install and provide quality data for the twelve stations:
- Agency Coordination
- Site - Installation (Site Selection and Requirements)
- Equipment (Set Up, Installation, and Ongoing)
- Equipment Operation
- Data Handling (QA/QC Checks, Cleaning, and Correcting)
- Equipment Maintenance
- Data Reporting

Phase II Expansion
Phase II of the project started in 2015 with expansion to NCDOT Divisions 1, 5, 8, and 10. Over 50 stations, or 110 data streams to monitor bicycle traffic and pedestrian traffic are expected to be live by the end of 2016, making North Carolina’s NMVDP one of the largest non-motorized monitoring programs in the United States.
What You Can Do!

- Consider:
  - Installing a CCS to collect bicycle and/or pedestrian counts
  - Validating equipment and performing QA/QC on data
- Share data using TMG data format
- When collecting SDC Counts:
  - 7 consecutive days, 24/7 is recommended best practice
  - Count when volumes are expected to be high (spring, fall) and avoid bad weather
  - Use digital format, keep good metadata
What will you use the data for?

- Inventory statistics
- Route planning / Connectivity analysis
- Project planning and development
- Inter-agency coordination
- Project selection/prioritization
- Determining unmet need
- School siting
- Access to recreation amenities
- Relate spatial datasets (e.g. crash data)
- Development of goals/benchmarks
- Data gaps/deficiencies
- Compare assets
- Facilities Maintenance
- Research
- Funding
- Promote physical activity
Thank You!

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