

# National Bicycle Network Portal, TMG and TMAS Updates

Office of Highway Policy Information

---

**Shuqing Wang, PE, Ph.D.**

Transportation Specialist

National Traffic Data and Advanced Analytics Program Manager

Travel Monitoring and Surveys Division,

FHWA Office of Highway Policy Information

[Shuqing.Wang@DOT.GOV](mailto:Shuqing.Wang@DOT.GOV)



# Outline

- Background
- Recommended Bicycle Geospatial Data Template
- National Bicycle Network (NBN) Status
- NBN Integration and Publication Process
- Future NBN Works
- TMG Updates
- TMAS Activity
- Resources

# Bicycle Geospatial Data Background

## Office of Highway Policy Information

- In 2019, the Federal Highway Administration initiated the National Bicycle Network (NBN) project with the aim of **developing a database of nationwide bicycle facilities based on GIS Data released by public agencies such as state DOTs, MPOs, local Councils of Government, cities and county public works.**
- To gain quantitative information on bicycle route data regarding location, condition, length and other information to facilitate the investing, planning, design, construction, and operating of such facilities as a safe, efficient, and equitable travel mode.
- This project was designed to support the **establishment of viable bicycle transportation networks** and, ultimately, serve as a resource for integrating facility, count, and crash data [1].

### Developing National Bicycle Facility Inventory Data Final Report

July 2019



U.S. Department of Transportation  
Federal Highway Administration  
Office of Highway Policy

Federal Highway Administration  
Bicycle Facility Inventory Program

July 2019  
FHWA-PL-19-050

1

[1] Federal Highway Administration, *Developing National Bicycle Facility Inventory Data Final Report*. (U.S. Department of Transportation, Washington, D.C., 2019).



# Bicycle Geospatial Data Template

- During this effort, a data template was proposed to unify data attributes for nationwide bicycle routes.

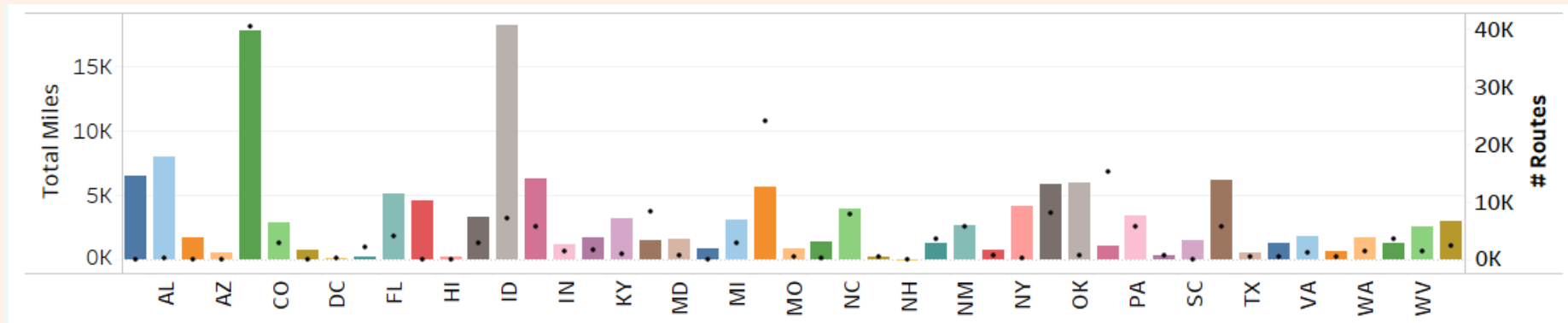
Item	Field Name	Item	Field Name	Item	Field Name	Item	Field Name
1	STATE	8	STREET	15	LENGTHMI	22	DATASOURCE
2	BRID	9	WIDTH	16	ROUTEID	23	SOURCEURL
3	NAME	10	BUFWIDTH	17	FROMMEAS	24	UPDATEDATE
4	CITYNAME	11	BKSEPTP	18	TOMEAS	25	COMMENT
5	BKFACTP	12	BKSHLD RTP	19	AADBT		
6	MATERIAL	13	OWNER	20	AADPT		
7	USBRID	14	INSTALLYR	21	STATUS		

- Polyline M as the geometry type – to embed route measurements

# NBN status

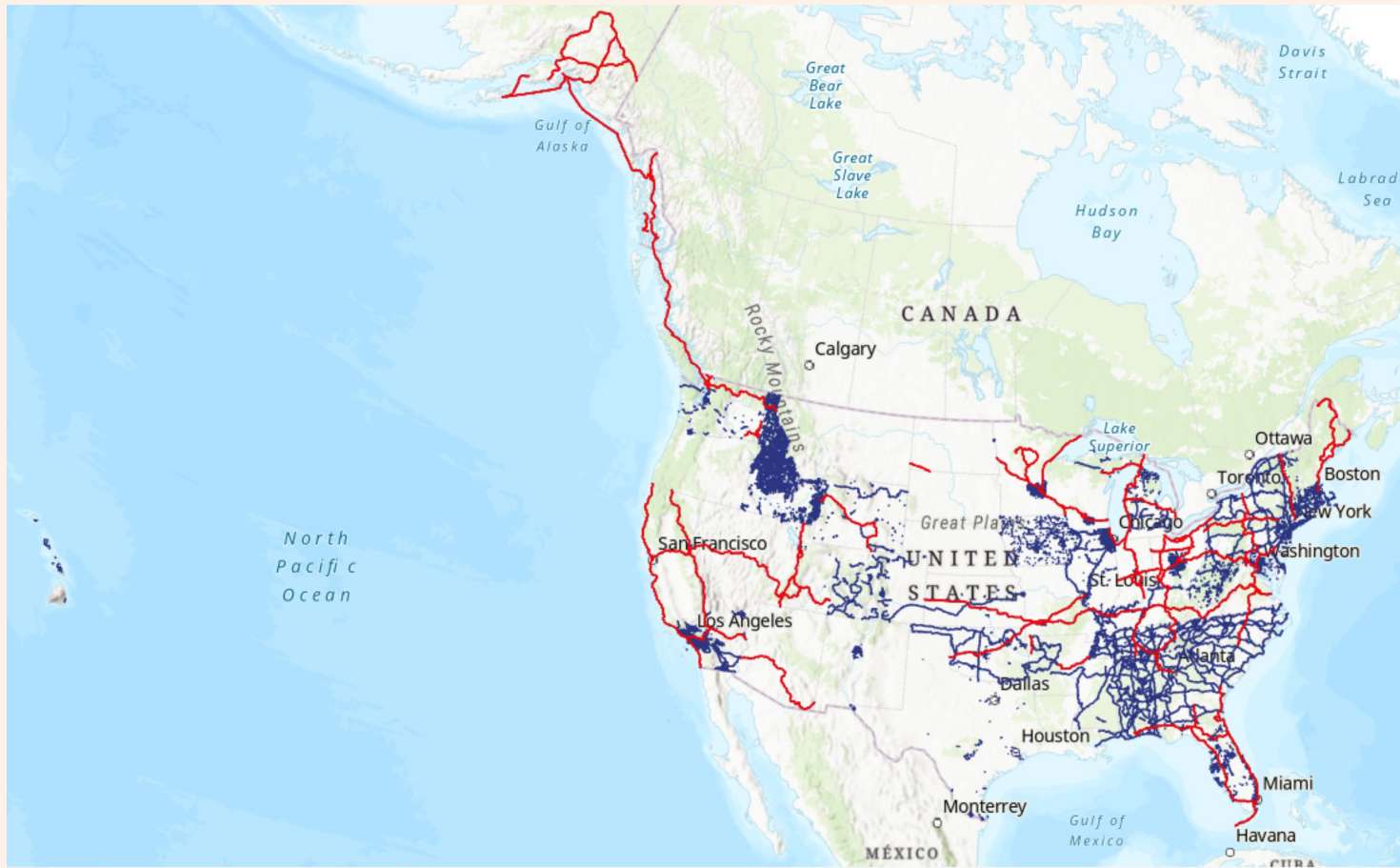
Office of Highway Policy Information

- The data collection was initiated through the Oak Ridge National Laboratory in late 2022.
- So far, 146K miles of route network collected from 47 states.



# NBN status (cont.)

Office of Highway Policy Information

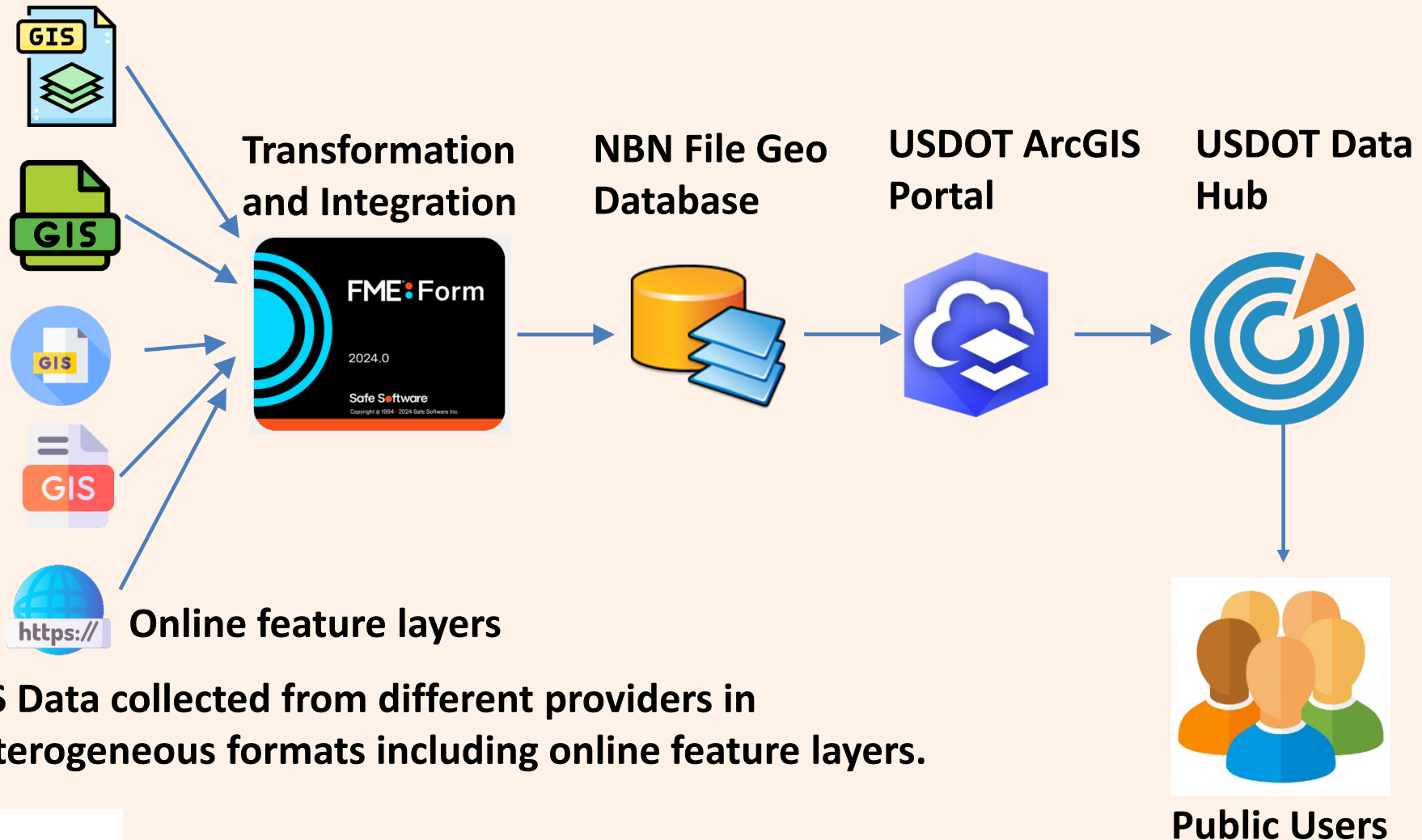


The US Bicycle Route system is shown in Red  
Source: FHWA, USDOT



# NBN Integration and publication process

Office of Highway Policy Information

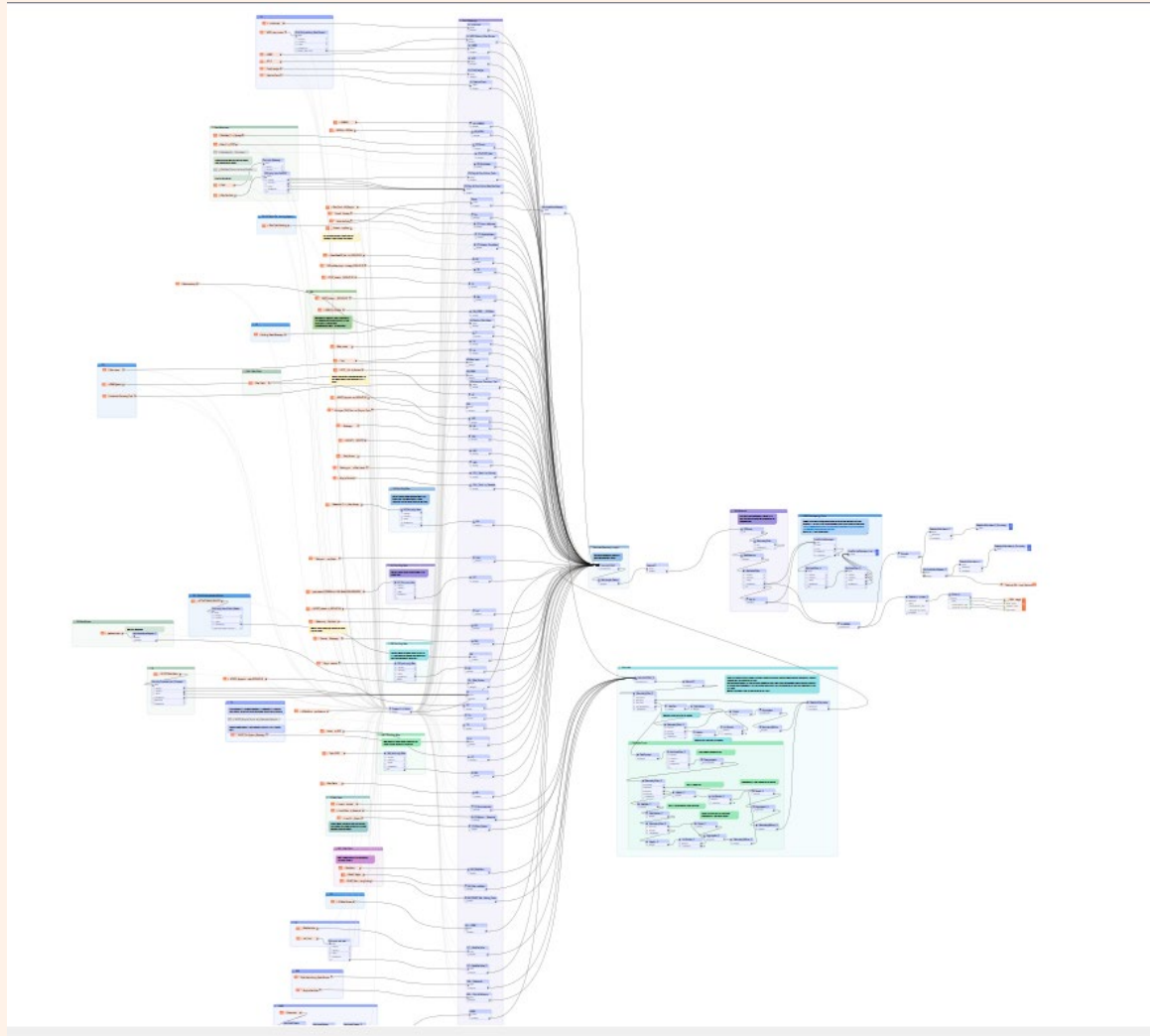


**GIS Data collected from different providers in heterogeneous formats including online feature layers.**

**Public Users**

# NBN Integration and Publication Process

Office of Highway Policy Information



## Integration Process



# NBN Future Work

- Expand the data collection for more coverage.
- Further validate and reconcile collected data.
- Build the NBN portal using USDOT ArcGIS Experience Builder.

# 2022 TMG Micromobility Updates

Office of Highway Policy Information

## Key Updates

- ☐ **Delimited data file format vs. fixed width column style format**
- ☐ **Station data**
  - Total field # reduced from 29 to 15
  - Added Reporting Agency Indicator
  - Only State/Count FIPS/RAI, Station ID and Location are required
  - No need to submit year by year
- ☐ **Count data**
  - Total field # reduced from 312 to 14 with each record for each count interval
  - Added RAI
  - Removed gender and all station-related fields

Federal Highway Administration Traffic Monitoring Guide

## Traffic Monitoring Guide

Version 1.0 - December 2022

Version 1.1 - August 2024, Micromobility Data Format

Update



U.S. Department of Transportation  
**Federal Highway Administration**



# 2022 TMG Micromobility Updates – cont.

## Office of Highway Policy Information

Table 4-35. Summary of the Micromobility Station Record Data Fields

Field	Columns	Width	Description	Type	Importance
1	1	1	Micromobility Station Record Indicator (MSRI)	Alphanumeric	Required
2	2-3	2	State FIPS (SFIPS)	Integer	Required
3	4-6	3	County FIPS (CFIPS)	Integer	Required
4	7-16	10	Reporting Agency Indicator (RAI)	Alphanumeric	Required
5	17-76	60	Station ID (SID)	Alphanumeric	Required
6	77-87	11	Latitude (LAT)	Real	Required

4-75

### Chapter 4. Traffic Monitoring Data Formats

Field	Columns	Width	Description	Type	Importance
7	88-98	11	Longitude (LONG)	Real	Required
8	99-100	2	Function Class and Area Type (FCAT)	Alphanumeric	Optional
9	101	1	Type of Sensor (TS)	Alphanumeric	Optional
10	102	1	Primary Count Purpose (PCP)	Alphanumeric	Optional
11	103-106	4	Year Station Established (YEARE)	Integer	Optional
12	107-110	4	Year Station Discontinued (YEARD)	Integer	Optional
13	111-112	2	Posted Route Sign (PRS)	Alphanumeric	Optional
14	113-120	8	Posted Route Sign Number (PRSN)	Alphanumeric	Optional
15	121-220	100	Other Notes (ON)	Alphanumeric	Optional

Table 4-40. Summary of the Micromobility Count Record Data Fields

Field	Columns	Width	Description	Type	Importance
1	1	1	Micromobility Count Record Indicator (MCRI)	Alphanumeric	Required
2	2-3	2	State FIPS (SFIPS)	Integer	Required
3	4-13	10	Reporting Agency Indicator (RAI)	Alphanumeric	Required
4	14-73	60	Station ID (SID)	Alphanumeric	Required
5	74	1	Type of Count (TC)	Alphanumeric	Required
6	75	1	Helmet Usage (HU)	Alphanumeric	Optional
7	76	1	Age (AGE)	Alphanumeric	Optional
8	77-80	4	Year of Counts (YEAR)	Integer	Required
9	81-82	2	Month of Counts (MONTH)	Alphanumeric	Required
10	83-84	2	Day of Counts (DAY)	Alphanumeric	Required
11	85-88	4	Count Start Time (in military time) (CST)	Integer	Required
12	89-90	2	Count Interval (in minutes) (CI)	Integer	Required

4-81

### Chapter 4. Traffic Monitoring Data Formats

Field	Columns	Width	Description	Type	Importance
13	91-94	4	Count Data Reporting Scheme (CDRS)	Alphanumeric	Required
14	95-99	5	Counts (COUNTS)	Integer	Required

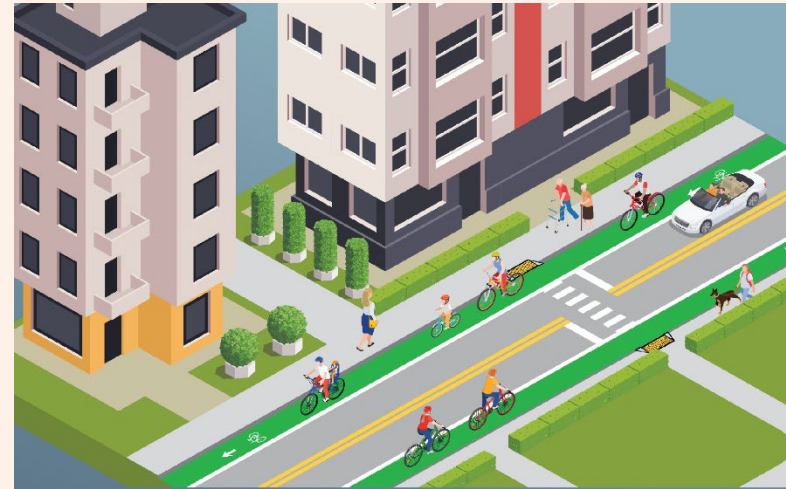


# August 2024 Updates of the 2016 TMG

## Nonmotorized

Office of Highway Policy Information

- Format used prior to the update will continue to be valid.
- Updated data items are now optional rather than required.
- A new tool called **Nonmotorized\_Station\_Record\_Generator** is developed to facilitate the production of Station Record for TMAS.



2016 Traffic Monitoring Guide  
Nonmotorized Data Format  
August 2014 Updates



U.S. Department of Transportation  
Federal Highway Administration  
Office of Highway Policy Information  
1200 New Jersey Ave., SE  
Washington, D.C. 20590  
<https://www.fhwa.dot.gov/policyinformation>  
FHWA-HPL-24-020



# August 2024 Updates of the 2016 TMG

## Nonmotorized – cont.

### Office of Highway Policy Information

1	In compliance with the updated 2016 TMG and the current TMAS 2.8 operations.							
2	Field	Columns	Width	Description	Type	Importance	Enter the information manually (white cells)	Code
3							Enter the value via dropdown (light orange background cells)	Produced
4	1	1	1	Nonmotorized Station Record Identifier (L)	Alphanumeric	Required	L -- (No entry is needed)	L
5	2	2-3	2	State FIPS Code	Integer	Required	24	24
6	3	4-6	3	County FIPS Code	Integer	Required	31	031
7	4	7-12	6	Station ID	Alphanumeric	Required	WBL001	WBL001
8	5	13-14	2	Function Class and Area Type	Alphanumeric	Optional		
9	6	15	1	Trail Direction or Roadway Direction	Integer	Optional	0 East-West or Northwest-Southeast	0
10	7	16	1	Where the Count Occurs	Integer	Optional		
11	8	17	1	Direction of Bicycle/Pedestrian Movement	Integer	Required	2 Bicycles/pedestrians traveling in the opposite facility direction	2
12	9	18	1	Further Travel Location Indicator	Integer	Optional		
13	10	19	1	Intersection	Integer	Optional		
14	11	20	1	Type of Count	Integer	Required	2 Bicycles only	2
15	12	21	1	Method of Counting	Integer	Optional		
16	13	22	1	Type of Sensor	Alphanumeric	Optional		
17	14	23-26	4	Year of Data	Integer	Optional		
18	15	27	1	Factor Group 1	Integer	Optional	Leave this cell blank - no entry is needed	
19	16	28	1	Factor Group 2	Integer	Optional	Leave this cell blank - no entry is needed	
20	17	29	1	Factor Group 3	Integer	Optional	Leave this cell blank - no entry is needed	
21	18	30	1	Factor Group 4	Integer	Optional	Leave this cell blank - no entry is needed	
22	19	31	1	Factor Group 5	Integer	Optional	Leave this cell blank - no entry is needed	
23	20	32	1	Primary Count Purpose	Alphanumeric	Optional		
24	21	33-34	2	Posted Speed Limit	Integer	Optional		
25	22	35-38	4	Year Station Established	Integer	Optional		
26	23	39-42	4	Year Station Discontinued	Integer	Optional		
27	24	43	1	National Highway System	Alphanumeric	Optional		
28	25	44-51	8	Latitude	Decimal	Required	38971599	38971599
29	26	52-60	9	Longitude	Decimal	Required	77101816	077101816
30	27	61-62	2	Posted Route Signing	Integer	Optional		
31	28	63-70	8	Posted Route Sign Number	Integer	Optional		
32	29	71-130	60	LRS Route ID	Alphanumeric	Optional	Leave this cell blank - no entry is needed	
33	30	131-138	8	LRS Location Point	Alphanumeric	Optional	Leave this cell blank - no entry is needed	
34	31	139-188	50	Station Location	Alphanumeric	Optional		
35	32	189-239	51	Other Notes	Alphanumeric	Optional	this is test site located 3.1 miles north of the park entrance	this is test site located 3.1 miles north of the pa
36								
37				Copy Station Record to Clipboard				



# TMAS Activity

- FHWA Travel Monitoring Analysis System (TMAS) 2.8 accepts all **portable or permanent bicycle** and/or **pedestrian count data**.
- TMAS 2.8 accepts the original 2016 TMG Micromobility data.
- TMAS 2.8 also accepts the August 2024 updated 2016 TMG Micromobility data.
- The upcoming TMAS 3.0 will accept the updated 2022 Micromobility data.

# Resources

Please feel free to contact with Shuqing Wang at [shuqing.wang@dot.gov](mailto:shuqing.wang@dot.gov) to submit bike network data.

- National Bicycle Network Portal  
(<https://data.transportation.gov/stories/s/National-Bicycle-Network/88zh-3rgb/>)
- NBN ArcGIS Online Feature Layer  
(<https://usdot.maps.arcgis.com/apps/mapviewer/index.html?webmap=2bfada054f9e416a8e4dc2a7c4364894>)
- NBN USDOT ArcGIS Online Web App  
(<https://experience.arcgis.com/experience/b829bba99f3547f88e679c42a8d7c63b/>)
- 2022 Traffic Monitoring Guide (TMG)  
(<https://www.fhwa.dot.gov/policyinformation/tmguide/>)



# Q/A

Office of Highway Policy Information

**Shuqing Wang, PE, Ph.D.**

Transportation Specialist

National Traffic Data and Advanced Analytics Program Manager

Travel Monitoring and Surveys Division,

FHWA Office of Highway Policy Information

[Shuqing.Wang@DOT.GOV](mailto:Shuqing.Wang@DOT.GOV)