

Appendix Two

Who's on the Trail Methodology Report 2024

Since 2005, Parks & Trails New York, with support from the New York State Canal Corporation, has conducted trail counts at dozens of locations along the Canalway Trail. This report describes the methodology used to conduct the counts and to analyze the data gathered. The methodology report is intended to be a companion to the *Who's on the Trail: Canalway Trail* report issued by Parks & Trails New York in spring 2025.

Electronic Count Protocol

PTNY's electronic count process relies on the PYRO-Box counter manufactured by Eco-Counter, a French company that sells a range of pedestrian and bicycle counting products. PTNY currently uses the PYRO-Box counters, Eco-Counter's most popular counter.

The PYRO-Box counter is a simple gray plastic box that can be installed on a sign or fence post or other vertical surface. The counter uses infrared pyroelectric technology to count the people passing within range of the sensor by detecting body temperature. Counters are installed for a minimum of one month, although PTNY prefers to install counters for one year or longer so as to use actual counts rather than samples of data to estimate full-year counts.

Counter locations are selected by PTNY staff in consultation with NYS Canal Corporation. A site visit is required to ensure that a suitable location can be found for installing the counter, although in some cases this visit occurs at the same time that the counter is installed. Counters are installed by PTNY staff, with notification to the state or municipal entity responsible for maintenance on that stretch of the Canalway Trail. Once installed, counters collect data continuously without manual interference or coordination.

To collect recorded data from the counter, PTNY staff visits the counter and uses Bluetooth technology to connect the counter to a mobile phone application or laptop program and sync the data. Data is uploaded to Eco-Counter's Eco-Visio software, from which staff can download and analyze the data at 15-minute, one hour, one day, or one-month intervals for each counter.



National Bicycle and Pedestrian Documentation Project Methodology

The calculations used to extrapolate partial year count figures into full year use estimates were based on the methodology published by the National Bicycle and Pedestrian Documentation Project (NBPD). More information is available on the NBPD website at <https://www.bikepeddocumentation.org/>.

The NBPD extrapolation figures allow for the conversion of hourly, daily, or monthly count data into daily, weekly, or yearly figures, respectively. The instructions to the NBPD extrapolation spreadsheet, which is publicly available at <http://bikepeddocumentation.org/>, are based on the use of manual counts. The directions recommend that estimates are based on the average of at least two and preferably three two-hour counts during the same period and week or during consecutive weeks. Weekday counts are directed to occur on Tuesdays through Thursday and not on holidays, and weekend counts can be completed on either Saturday or Sunday.

The extrapolation spreadsheet calls for five input variables - count dates, count times, type (multi-use path or street/sidewalk), climate region, and two-hour count volume. Count dates provide the spreadsheet with information on the day of week and month of the count, and count time provides the inputs on what times were observed. The “type” factor allows the extrapolation methodology to be used for multi-use pathways or for users cycling on the street or walking on sidewalks in medium- to high-density areas. All electronic counts, and most of the manual counts, included in this analysis were done on paths and use the “path” extrapolation factors; one of the manual counts was done on a sidewalk and as a result uses the “street/sidewalk” factors. Climate region gives users one of three choices: “Long Winter-Short Summer,” “Moderate Climate,” or “Very Hot Summer-Mild Winter.” All of the counts in New York were categorized in the “Long Winter-Short Summer” climate region. Finally, the input calls for the two-hour count total. Based on these five variables, the NBPD spreadsheet is set up to return the daily, weekly, monthly, and annual count figures based on a two-hour count total.

The NBPD structure is based on three tables. Table One calculates daily use based on hour-long periods as a percentage of total daily use. These figures differ based on path or street/sidewalk, on weekday or weekend, and on whether the counts are done between April and September or between October and March. For each of these circumstances, each hour of time between 6:00 a.m. and 10:00 p.m. is estimated to be a set percentage of total daily use. For example, from 5:00 p.m. to 6:00 p.m. on a path on a June weekday is considered 7% of daily use at that location. An observed two-hour count is first multiplied by 1.05 to account for the fact that 6:00 a.m. to 10:00 p.m. is assumed to be 95% of all trail usage, and then the resulting figure is divided by the two-hour count proportion to come up with a daily estimate.

The second table converts the daily total to a weekly total using a similar estimation factor, where each day of the week is given a percentage of total weekly use. This figure is used to generate the monthly estimate (without using a separate table) by multiplying the weekly estimate by the number of weeks in the month (accounting for partial weeks). While the notes in the table include a correction that holidays should be accounted for weekend usage rates, it does not appear that the formulas account for that correction.

	APR-SEP				OCT-MAR			
	6am - 9pm				6am - 9pm			
	---- Path ----	-Street/Sidewalk-	---- Path ----	-Street/Sidewalk-	---- Path ----	-Street/Sidewalk-	---- Path ----	-Street/Sidewalk-
	wkdy	wkend	wkdy	wkend	wkdy	wkend	wkdy	wkend
600	2%	1%	1%	1%	2%	0%	1%	0%
700	4%	3%	2%	1%	4%	2%	2%	1%
800	7%	6%	4%	3%	6%	6%	3%	2%
900	9%	9%	5%	3%	7%	10%	5%	4%
1000	9%	9%	6%	5%	9%	10%	6%	5%
1100	9%	11%	7%	6%	9%	11%	8%	8%
1200	8%	10%	9%	7%	9%	11%	9%	10%
1300	7%	9%	9%	7%	9%	10%	10%	13%
1400	7%	8%	8%	9%	9%	10%	9%	11%
1500	7%	8%	8%	9%	8%	10%	8%	8%
1600	7%	7%	7%	9%	8%	8%	7%	7%
1700	7%	6%	7%	8%	7%	5%	6%	6%
1800	7%	5%	7%	8%	6%	3%	7%	6%
1900	5%	4%	7%	8%	4%	2%	7%	6%
2000	4%	3%	7%	8%	2%	1%	6%	6%
2100	2%	2%	6%	8%	2%	1%	5%	5%

The final table adjusts the monthly estimate to an annual estimate and is based on the climate regions. For each of the three climate regions, each month of the year is considered to be a set portion of total annual use. The three tables as they appear in NBPD are listed below (with the categories that don't apply to the upstate region removed).

Table 2: Day to Week		Table 3: Region and Month	
DAILY ADJUSTMENT FACTORS		MONTHLY ADJUSTMENT FACTORS	
		CLIMATE REGION	Long Winter Short Summer
SUN	18%	JAN	3%
MON	14%	FEB	3%
TUES	13%	MAR	7%
WED	12%	APR	11%
THURS	12%	MAY	11%
FRI	14%	JUN	12%
SAT	18%	JUL	13%
Note: Holidays use weekend rates		AUG	14%
		SEP	11%
		OCT	6%
		NOV	6%
		DEC	3%

The underlying assumptions used by the NBPD factors is that any given two-hour period of time represents a set percentage of total annual bicycle and pedestrian use at that location. With additional data collected, those assumptions can be calculated more precisely, and be less reliant on formulas to “fill in the gaps” in collected data.

PTNY Extrapolation Methodology

For PTNY’s electronic count sites, the observed usage was extrapolated to calculate a full-year estimate for that site. The raw data was downloaded for the entirety of the time the counters were installed at each location. Data was downloaded at an hour-level granularity to ensure that it was available for hour-by-hour analysis. The data was checked for any anomalies, and any data excluded that may have been downloaded from outside the period of time when the counter was installed.

Once the data was cleaned, the process of extrapolating up to a full year began. Typically, only partial data was available for the day the counters were installed, and for the day that data was downloaded from the counter. When only a portion of the full day’s use was available, PTNY disregarded any data from the hour stretch in which the counter was installed or when data was retrieved, as staff passing in front of the counter would skew the data. Using the remaining hours, and the appropriate NBPD factors for that day, the partial day use was extrapolated to a full day use estimate for that day.

The data was then aggregated by day, using observed data for all days and the calculated estimate for the beginning and end day. With this data, a similar process was undertaken for partial month data. However, it was done slightly differently from the NBPD calculations. NBPD extrapolation calculates an estimated weekly use figure, using the day of the week as a percentage of weekly use, with a note that holidays use weekend rates. This weekly estimate is then multiplied by the number of weeks in the count month (number of days in the month divided by seven). However, this process ignores the different weekdays that may be found in any given month, and the formulas don’t appear to actually account for holiday use. To adjust for those factors, each day of the year was assigned a “daily use” adjustment factor. These factors were the daily adjustment factor for each regular weekday, and the “holiday rate” of 18% for each New York State observed holiday. Using these factors, it was possible to calculate a “daily use” rate for each day as a percentage of total monthly use. This was calculated by summing all of the “daily use” adjustment factors and dividing each day’s factor by the total monthly aggregate use percentage.

Once “daily use” rates were calculated, total estimated monthly use could be determined. This was only done for months for which less than the full month’s use was collected. Total estimated monthly use was calculated by dividing the total observed data for that month by the percentage of total estimated monthly use that those days represent.

The monthly use factors represent the final piece of the calculation used by PTNY to determine annual use. This process followed a similar format to the above calculations, with full month data used where available, and the “calculated” full month data used following the process shown above. The NBPD calculations provide monthly extrapolation factors - based on the climate region (all counts were considered to have taken place in the “Long Winter Short Summer” region). Based on these figures, a similar formula could be calculated to that shown above, dividing the total available data (including full month observed data and calculated partial month data), and dividing that by the percentage of total estimated monthly use that those days represent.

A slightly different procedure was followed for locations where multiple two-hour observational counts volumes were collected. For these locations, each two-hour volume was entered into a sheet that determined each time frame’s estimated proportion of total annual use. As multiple two-hour stretches were added to the sheet, the total observed figure represented a greater proportion of the total estimated annual use. The total observed data was divided by that estimated percentage of annual use figure to determine the total estimated annual use at those locations.

This year’s Who’s on the Trail report does not claim to identify total use for any given year. Rather, Who’s on the Trail calculates an overall “Estimated Annual Use” figure, based on calculating the total annual use using all available data from the period of time counters were installed. This formula works for locations that had counters installed for more than one year as well, determining an estimated “12 month” figure for locations with more than 12 months of data.

Total Trail Visitation Estimate

In anticipation of the completion of the Empire State Trail by the end of 2020, the Hudson River Valley Greenway, with the assistance of Alta Planning & Design, published [Empire State Trail: Trail User Projections](#), which estimated the potential number of annual users on the EST. The report estimates that 8.6 million users would visit the EST annually once completed, based on existing trail counts and the population density surrounding the stretches of trail. The methodology used in this report has been slightly modified and now provides the basis for PTNY to count the total estimated annual use on the ECT and CCT.

For 2024, this report continues to use the methodology used to calculate and report in 2022 and 2023, and the way that estimated use is reported. The report no longer attempts to claim an estimated use figure for a single year specifically, as had been done in 2019, 2020, and 2021. Rather, the report estimates average total annual use based on data collected along the Canalway Trail over the past five years. Prior to 2023, reports provided estimates as precise count numbers, rather than the rough estimates that they represent. Following last year's precedent, this report provides all estimates rounded to the nearest thousand.

Using the updated methodology, PTNY estimates an average of 3,979,000 trail visits per year based on the last five years of data. This includes an estimated 3,840,000 visits per year to the Erie Canalway Trail, and an estimated 139,000 visits per year to the Champlain Canalway Trail. These estimated figures are in line with the estimated use figures reported in previous Who's on the Trail reports.

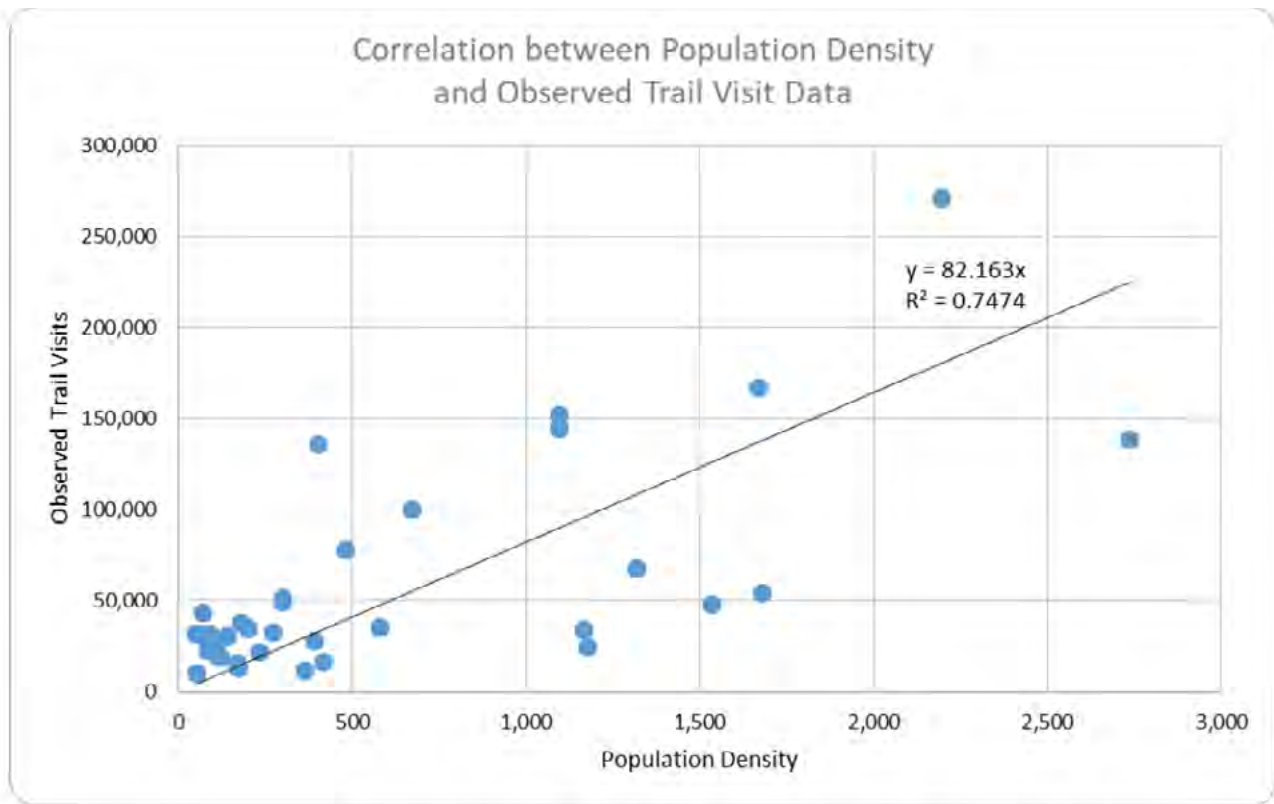
Detailed Methodology

The below methodology was developed by Alta Planning & Design and replicated with their permission for use in calculating total trail use along the Erie and Champlain Canalway Trails.

The core assumption in the methodology is that trail use correlates with population density in surrounding areas. This is supported by research cited in the Empire State Trail report. Population densities around a three-mile radius of each electronic counter location were calculated using the following steps:

- 1. Map the 39 locations along the ECT and CCT where PTNY conducted trail counts between 2020 and 2024.**
- 2. Determine the population density of block groups within a three-mile distance from each count location.** All block groups that fall within a three-mile radius of each existing counter location were selected, and 2020 Decennial Census Total Population data was joined to the block groups (POP). Each block group agglomeration had its area calculated (SQMI).
- 3. Determine population density for each individual counter location.** The sum of the population and (POP_SUM) and sum of the area (SQMI_SUM) for each block group agglomeration was calculated. These values were then used to determine the unique population densities (POP_DEN) associated with each counter location by dividing the sum of the population by the sum of the area ($POP_DEN = [POP_SUM / SQMI_SUM]$).

Each of the 39 trail counts and the corresponding population densities were plotted. The counter data was weighted based on the number of days that each counter was active, so the model considered those locations which had more observed days rather than projected data based on the NBPD formula. The resulting trendline was used to estimate trail users at each sample location on the Canalway Trail system. The trendline calculated using this data is represented by the equation ($y = 82.163 * x$), where x represents the population density for each counter location and y represents estimated annual trail visits. This equation is the most accurate of various trendline options, showing a consistent linear relationship between density and trail visitation. The resultant R² value was 0.7474, a much stronger correlation than that used by Alta or by this report in previous years.



The estimated trail use for the entirety of the ECT and CCT were calculated based on this trendline equation using the following steps:

1. **Map sample count points along the ECT and CCT.** Sample locations were remapped by PTNY based on the methodology used by Alta in its report. A total of 56 sample points were identified across the two trails, including the 39 locations at which PTNY conducted electronic trail counts over the five-year period. All sample points are provided in the table below.
2. **Determine population, area, and population density for each sample point.** Following a similar methodology to that which was used for the electronic count points, each block group within a three-mile radius of the sample points were combined, and a total population figure (2020 Decennial Census Total Population data), square mileage, and population density) was calculated. For seven points across the state, multiple counts were performed at various points over the two year time period. These counts were given a weighted average based on the number of days installed to determine one single annual use figure for that point. (See points in italics in Table 4 below for instances where count data was collected at multiple locations.
3. **Calculate estimated trail use at each sample location.** Population densities at each of the 46 sample locations along the Canalway Trail system were entered into the equation ($y = 85.51x$), where x is population density and y is annual trail visits. For locations where electronic count data was collected, that data was used rather than the projected use data. For locations where two locations of electronic count data were collected in close proximity to one another, the two sites were combined in a weighted average to give one estimate for the location as a whole.

TABLE 4 - TRAIL USER PROJECTIONS

Sample No.	Trail	Sample Location	Observed Count	Sample Density (Pop/SqMi)	Annual Use
1	ECT	Buffalo		4,735	389,000
2	ECT	Black Rock		4,857	399,000
3	ECT	Tonawanda	270,469	2,196	270,000
4	ECT	Amherst South	47,672	1,535	48,000
5	ECT	Amherst North		450	37,000
6	ECT	Pendleton	77,853	481	78,000
7	ECT	Lockport	35,025	580	35,000
8	ECT	Gasport		87	7,000
9	ECT	Middleport		81	7,000
10	ECT	Medina	22,881	119	23,000
11	ECT	Albion	10,674	111	11,000
12	ECT	Holley		116	10,000
13	ECT	Brockport	50,378	301	50,000
14	ECT	Spencerport		410	34,000
15	ECT	Greece		1,962	161,000
16	ECT	Rochester		2,820	232,000
17	ECT	Pittsford	167,040	1,668	167,000
18	ECT	Fairport		1,526	125,000
19	ECT	Macedon	34,330	201	34,000
20	ECT	Newark	37,529	182	38,000
21	ECT	Lyons		98	8,000
22	ECT	Clyde		67	6,000
23	ECT	Port Byron	28,939	99	29,000
24	ECT	Jordan	18,824	119	19,000
25	ECT	Camillus	125,374	403	125,000
26	ECT	Syracuse		4,487	369,000
27	ECT	DeWitt	149,557	1,096	149,000
28	ECT	Chittenango		175	14,000
29	ECT	Canastota	15,403	169	15,000
30	ECT	State Bridge		122	10,000
31	ECT	Lock E22		73	6,000
32	ECT	Rome West	12,610	173	13,000
33	ECT	Rome East	16,540	416	17,000
34	ECT	Oriskany		283	23,000
35	ECT	Utica	33,663	1,167	34,000
36	ECT	Ilion	28,009	392	28,000
37	ECT	German Flatts	31,660	52	32,000
38	ECT	Little Falls	35,803	70	36,000
39	ECT	St. Johnsville		65	5,000
40	ECT	Fort Plain	27,217	98	27,000
41	ECT	Sprakers		54	4,000
42	ECT	Fultonville		93	8,000
43	ECT	Amsterdam	31,065	143	31,000
44	ECT	Pattersonville	28,526	84	29,000
45	ECT	Rotterdam		691	57,000
46	ECT	Schenectady	53,844	1,680	54,000
47	ECT	Niskayuna		778	64,000
48	ECT	Colonie		1,265	104,000
49	ECT	Watervliet		2,804	230,000
50	ECT	Albany	138,578	2,736	139,000
Erie Canalway Trail Total					3,840,000
51	CCT	Cohoes/Waterford	46,497	1,319	47,000
52	CCT	Halfmoon	11,775	365	12,000
53	CCT	Schuylerville	26,403	91	27,000
54	CCT	Fort Edward	21,643	256	21,000
55	CCT	Kingsbury	21,643	233	22,000
56	CCT	Fort Ann	10,291	53	10,000
Champlain Canalway Trail Total					139,000
TOTAL ALL LOCATIONS					3,979,000

MAP - SAMPLE AND COUNT LOCATIONS FOR TRAIL USER PROJECTIONS (2020-2024)

