

Connecticut Trail Census

Statewide multi-use trail user study



2018 Aggregated Intercept Survey Data Report

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The Connecticut Trail Census is made possible by the Department of Energy and Environmental Protection Recreational Trails Program as well as partnerships with the University of Connecticut Center for Land Use Education and Research, the Naugatuck Valley Council of Governments, the University of Connecticut Extension, the Connecticut Greenways Council and hundreds of volunteers from trail advocacy groups across the state of Connecticut.



Background

This report provides a summary of intercept survey data collected from multi-use trail users by volunteer surveyors at sites participating in the Connecticut Trail Census. The Connecticut Trail Census is a statewide volunteer data collection program intended to inform a better understanding of multi-use trail use in the state of Connecticut and to make this important information available to trail user groups, administrators, government agencies, and the general public. The Census involves a trail user intercept survey as well as infrared user counts on twelve multi-use trail sites throughout the state of Connecticut.

The goals of the Connecticut Trail Census are to: understand when, who, how, and why people make use of Connecticut's multi-use trails, educate trail user groups, administrators, state and local government agencies, and the general public about trails and their impacts, obtain multi-year information about trail use, user demographics, economic impacts, and trail amenities for identification of patterns and trends, promote active citizen participation in monitoring and understanding the value of trails and to encourage sound trail building and maintenance programs based on data. The project is funded by the Department of Energy and Environmental Protection Recreational Trails Program and project partners include the Connecticut State Greenways Council and the Naugatuck Valley Council of Governments.

This report includes reporting of intercept survey data collected in both 2017 and 2018. A full report of prescribed data collection methods can be found at www.cttrailcensus.uconn.edu. Sites were chosen for data collection by trail administrators familiar with trail use to most accurately represent normal use along the trail segment. These sites varied slightly from the locations chosen for infrared counts. Count summaries are not included in this report but are available on the Trail Census website www.cttrailcensus.uconn.edu.

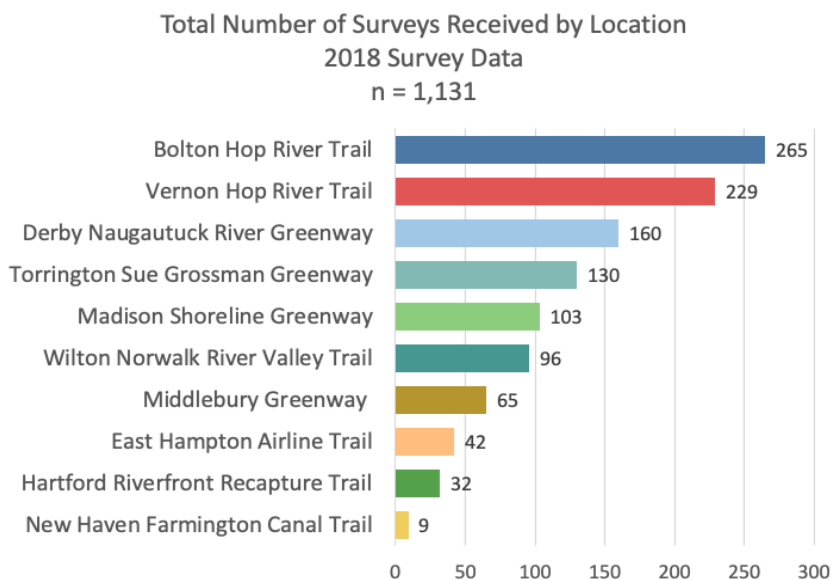
Methods

The survey tool and methods were developed under the advisement of a survey advisory team consisting of trail administrators from around the state by Connecticut Trail Census staff in partnership with the University of Connecticut Extension and Naugatuck Valley Council of Governments. Survey questions were based on those identified from similar surveys around the country and the National Bicycle and Pedestrian Data Collection Project. The paper survey took about 5 minutes to complete. Note that from 2017 to 2018 some survey questions and procedures were modified to decrease error.

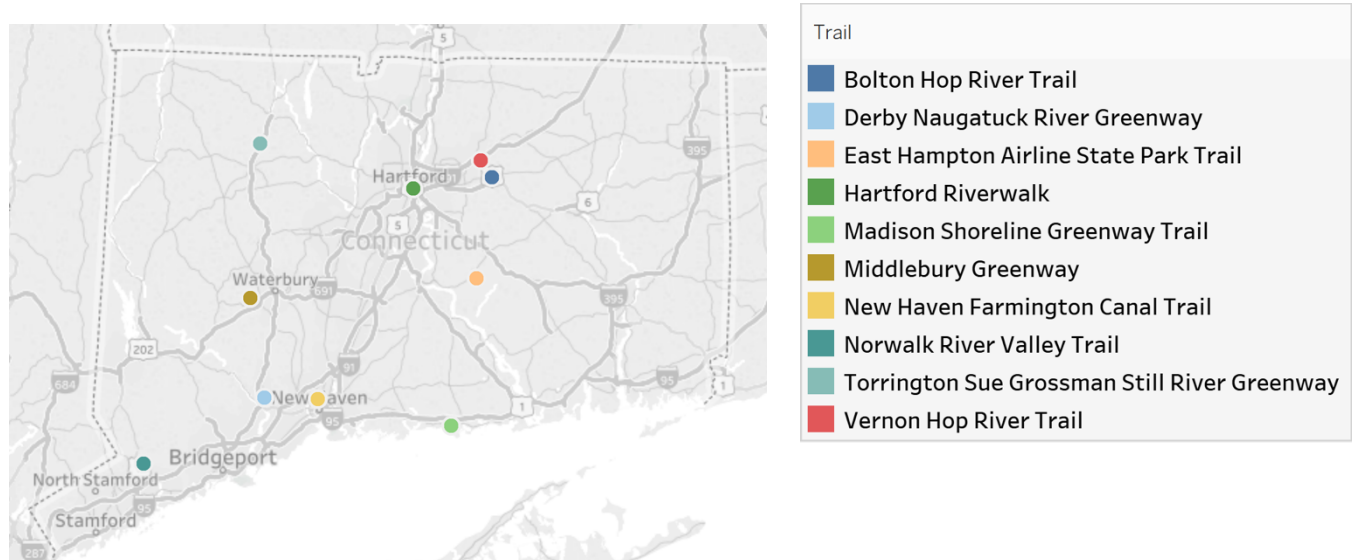
Data was collected by local volunteers who received supplies and training from the Connecticut Trail Census and data was provided on a voluntary and de-identified basis to the University of Connecticut Extension for analysis. In 2018, ten of the sixteen participating (63%) sites collected an aggregated total of 1,146 surveys. In 2017 eleven of the fifteen sites (73%) collected an aggregated total of 1,042 surveys. This project was reviewed and determined exempt by the University of Connecticut Review Board (IRB) Exemption #XI5-174. However, under IRB guidelines, data received from minors under the age of 18 was removed prior to analysis. With data from minors removed there were a total of 1,131 surveys for analysis from 2018 and 1,003 surveys for analysis from 2017. Data was also reviewed prior to analysis to identify data entry errors. Additional information about how errors were handled for each question was documented and is available on request. For more information about this data or the Connecticut Trail Census visit <http://cttrailcensus.uconn.edu>.

The 1,131 surveys analyzed here were collected from ten multi-use trail sites shown on the map below over 44 data collection periods. The sites that collected survey data in 2018 were: the Hop River Trail at Bolton and Vernon, the Naugatuck River Greenway Trail in Derby (Derby Greenway), the Sue Grossman Trail in Torrington, the Shoreline Greenway in Madison, the Norwalk River Valley Trail in Wilton, the Middlebury Greenway in Middlebury, the Airline Trail in East Hampton, the Hartford Riverwalk Trail in Hartford, and the Farmington Canal Heritage Trail in New Haven. While surveying methods were prescribed to maximize representation of total trail users across months, days, and times, the survey times were ultimately chosen based on volunteer availability so rigorous randomization was not entirely possible.

Chart 1: Number of Surveys Received by Location



Map 1: Survey Data Collection Sites



Margins of Error

Total survey margins of error were calculated based on the survey sample and the estimated total trail user population at each data collection site. The total user population was calculated using the adjusted infrared annual counter totals. For more information about adjustment factors used to correct the infrared count data please visit www.cttrailcensus.uconn.edu. Most counters had some days of missing data. For those days, the average daily count was added to the adjusted counter totals. Because the counters only count “uses,” not “users,” the total annual uses estimated were divided in half to adjust for “out and back” trips which account for the vast majority of trips on these trails.

The following formula was used to calculate overall survey margins of error (MOE):

$$\text{MOE (with finite population correction)} = z * \sqrt{p * (1 - p)} / \sqrt{(N - 1) * n / (N - n)}$$

We assume a confidence interval of 95% ($z=1.96$). This means that we can say with 95% confidence that the characteristics of the actual population of trail users survey sample is within the range of the survey value plus or minus the margin of error shown in Chart 2 below. Some margins of error are quite large due to very small sample sizes. Since our samples were also not random, this margin of error does not account for sampling error but it gives us a feel for about how representative we think the survey data is of the overall population. Margins of error may also be calculated for individual quantitative questions on request.

Margins of error for 2018 survey samples ranged from 6.0% on the Hop River Trail in Vernon to 32% on the Farmington Canal Heritage Trail as shown below in Chart 2. Survey sites were asked to collect at least 100 surveys. Based on the known overall use counts on the trails in the program in 2017 this would result in roughly a 10% margin of error at a confidence level of 95%.

Chart 2. Overall Survey Margins of Error

	East Hampton Air Line Trail	New Haven Farmington Canal Heritage Trail	Bolton Hop River Trail	Vernon Hop River Trail	Middlebury Greenway	Naugatuck River Greenway Derby	Wilton Norwalk River Valley Trail	Hartford Riverfront Recapture Trail	Torrington Sue Grossman Greenway	Madison Shoreline Greenway Trail
2018 ADJUSTED INFRARED COUNT	52,165	108,212	51,722	120,660	61,517	295,422	71,834	140,212	66,513	91,811
Estimates for Missing Data	7,522	0	2,371	5,532	0	27,419	2,865	0	1,112	0
Adjusted Counts + Missing Data Estimates	59,687	108,212	54,093	126,192	61,517	322,841	74,699	140,212	67,625	91,811
2018 ANNUAL USER ESTIMATE	29,844	54,106	27,047	63,096	30,759	161,421	37,350	70,106	33,812	45,906
2018 Survey Sample Size	42	9	265	229	65	160	96	32	130	103
2018 SURVEY MARGIN OF ERROR	15.1%	32.7%	6.0%	6.5%	12.1%	7.7%	10.0%	17.3%	8.6%	9.6%

Additional information about this data and data collection methods is available at www.cttrailcensus.uconn.edu.

Respondents

The charts below compare the survey data collection months, days and hours to overall trail use across all of the trails for which Infrared Counter data was available. This demonstrates that while usage declines in Jan through March, the survey samples are heavily skewed to warmer months and may not be representative of winter users. Surveys were also heavily skewed to Sundays (likely due to surveyor availability). In terms of time of day, the survey samples appeared to more accurately represent hours of the day as there are fewer users before 6 am and after 9 pm. These use patterns are likely to vary significantly from trail to trail based on use patterns at each location. When comparing surveys collected to day of week estimates for the counter data, as show in Chart 3, significantly more surveys were collected on the weekend compared to overall use estimates. Hour of day comparisons, as shown in Chart 4 indicate that survey collections were roughly comparable to overall use times. It should be noted that use patterns are likely to vary from trail to trail.

Chart 3. Percent Surveys Collected Compared to Use Estimates by Month

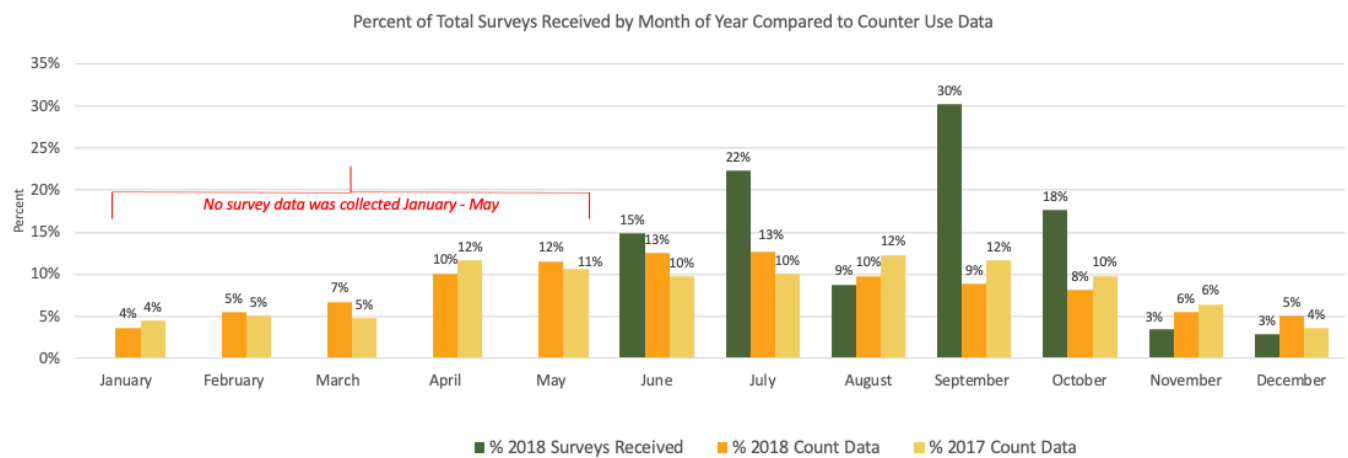


Chart 4: Percent Surveys Collected Compared to Use Estimates by Day of Week

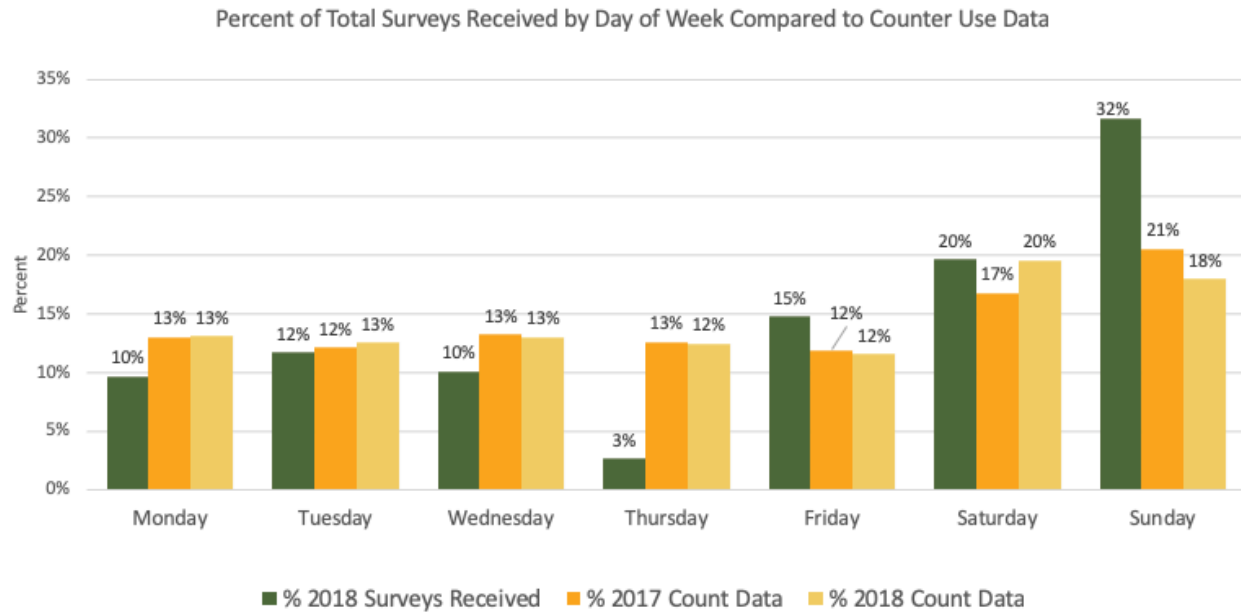
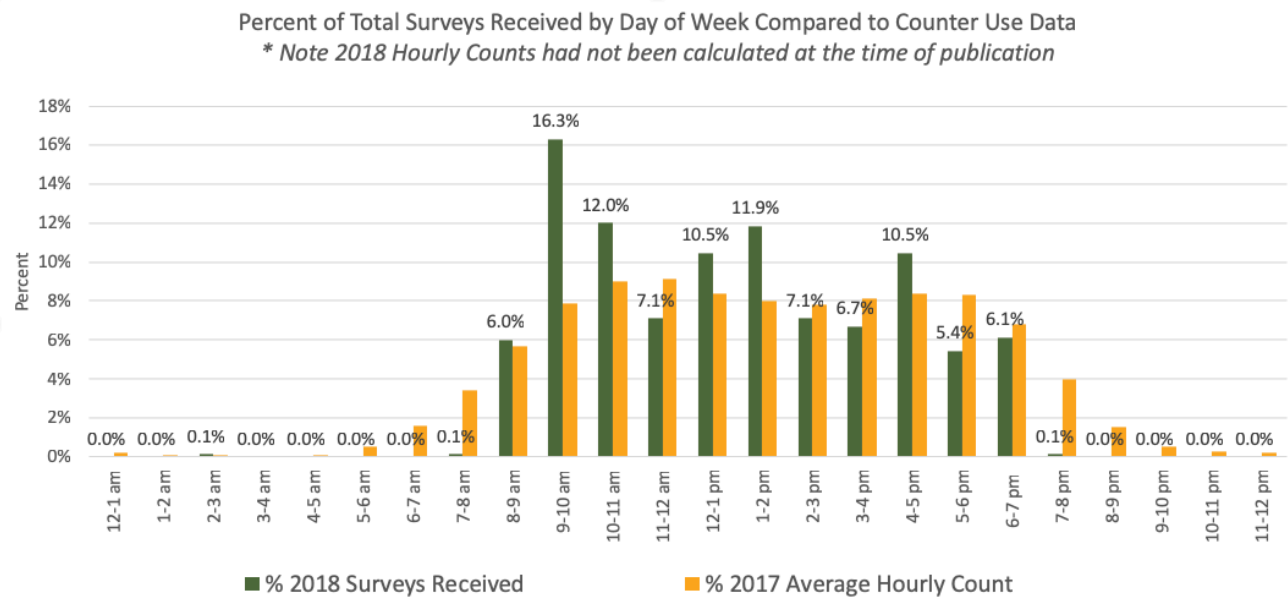


Chart 5: Percent Surveys Collected Compared to Use Estimates by Hour



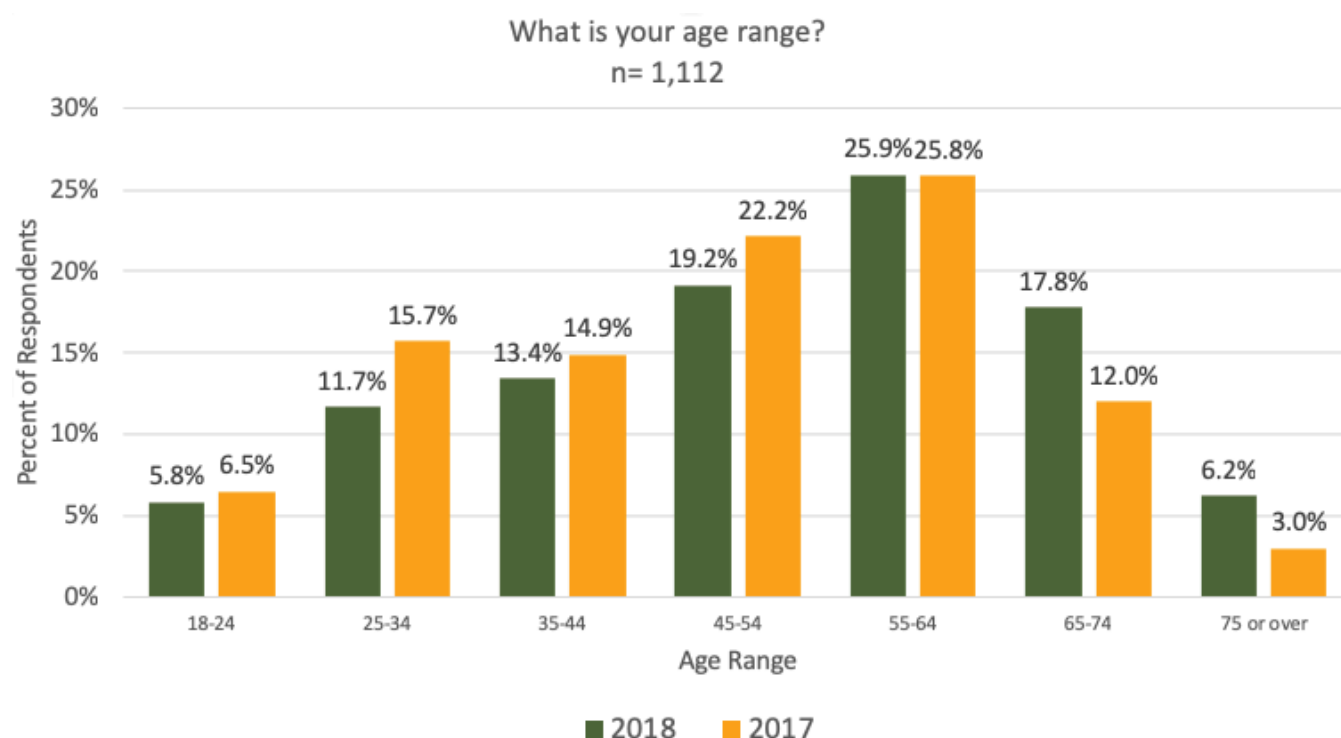
Respondents reported a total of 245 young people under the age of 18 joining them in their activities on the trail. For those reporting traveling on the trail with young people, the average number of young people in the group was 2.4. The 2018 survey did explicitly ask about group size. Based on the 2017 survey data, the average group size was 2.3 people (n=1,003).

Demographics

More trail users surveyed are female than male 53.3% of survey respondents identified as female and 46.7% identified as male. This reflects a slightly higher percentage of male users than the 2017 respondents which were 56.5% female and 43.5% male.¹ There is a greater proportion of female trail users than the population of the state of Connecticut as a whole which is 48.8% male and 51.2% female.

Trail users are largely older than the general population of Connecticut and respondents in 2018 were older than those surveyed in 2017. In 2018 69.1 % users all of those surveyed were over 45 years of age compared to 63.0% in 2017. According to the US Census only 44.7% of the general population of Connecticut is over age 45.² In 2018 users aged 25-34 represented only 12% of all those surveyed but 15.7% of users surveyed in 2017.

Chart 6: Respondent Age Range

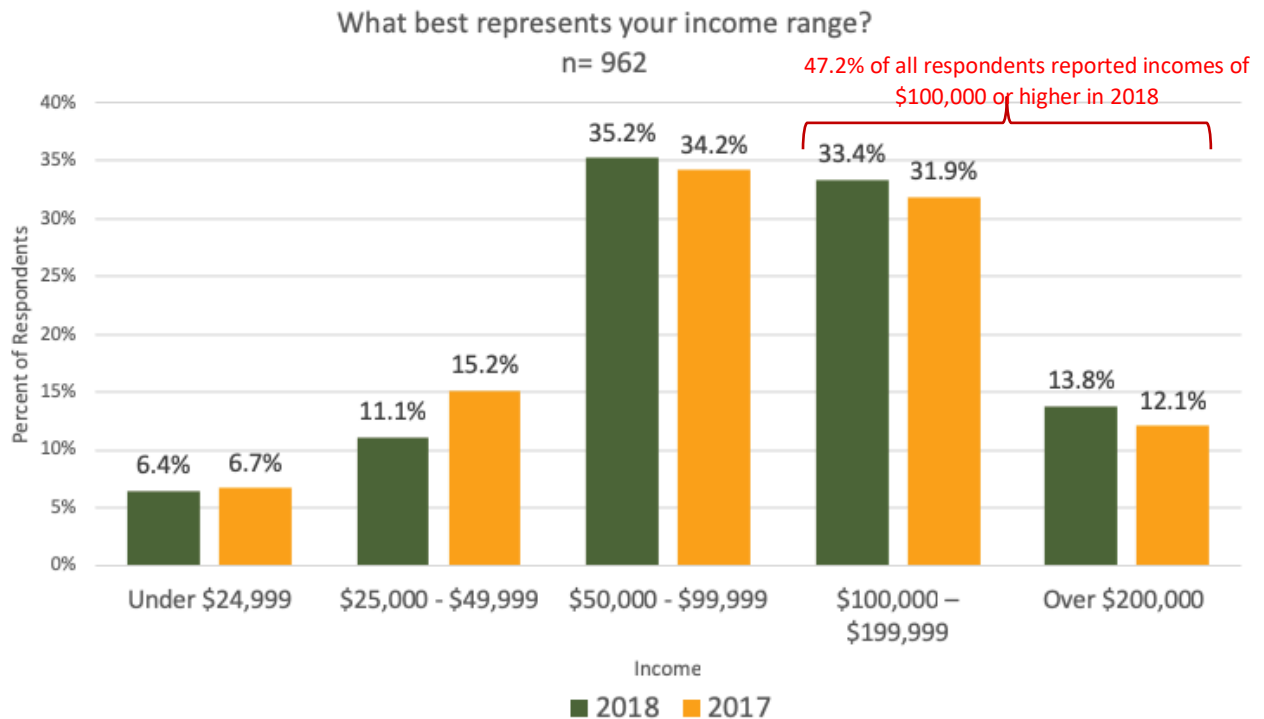


Respondents in 2018 were also wealthier than 2017 respondents. As shown in the table below 47.2% of all respondents in 2018 reported household incomes of \$100,000 or more while only 43.9% of all respondents in 2017 reported incomes in this range. Similarly, a lower percentage of respondents reported household incomes of less than \$50,000. This data alone does not explain if this represents a shift in the types of users on these trails or if the same users simply increased their incomes.

¹ Gender was observed by the interceptor in the 2017 survey which likely created some error. In 2018 this was a respondent question.

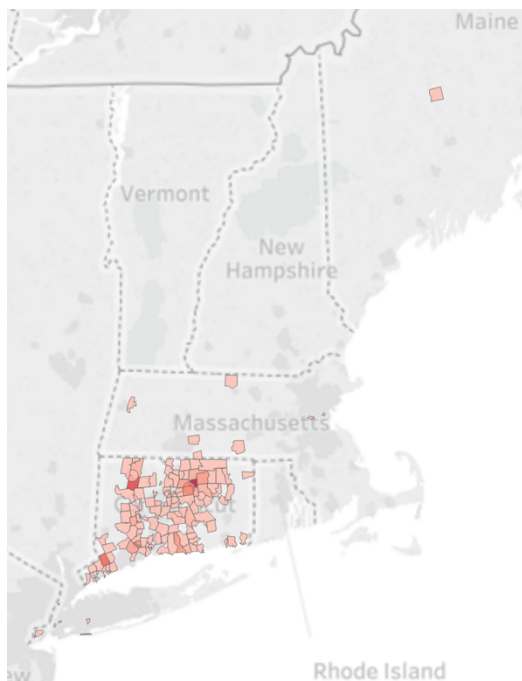
² US Census Bureau (2017). *American Community Survey 5-Year Estimates*. Retrieved from <https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=CF>

Chart 7: Income Range

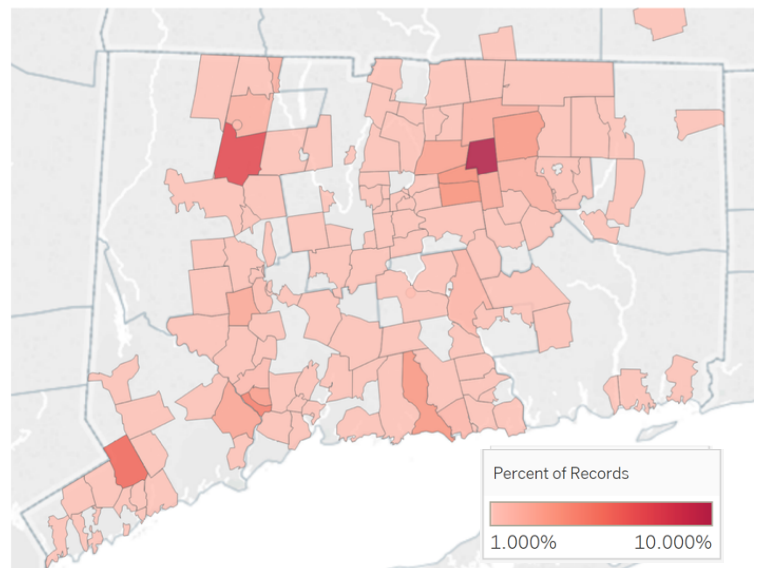


Zip Codes and Transportation

Respondents represented 162 unique zip codes and 8 states (with one user from abroad). The map below shows the zip codes where respondents live as well as the data collection point(s).



Map 2: Respondent Home Zip Code



An overwhelming majority of users drive to these trails. 55.6% of respondents drove their car or motorcycle alone to get to the trail, and 26.9% drove with someone else. About an equal percentage walk (7.4%) or bike (7.3%) to the trail and 1.2% run or jog. 1.5% of respondents used multiple means and no respondents reported using public transportation.

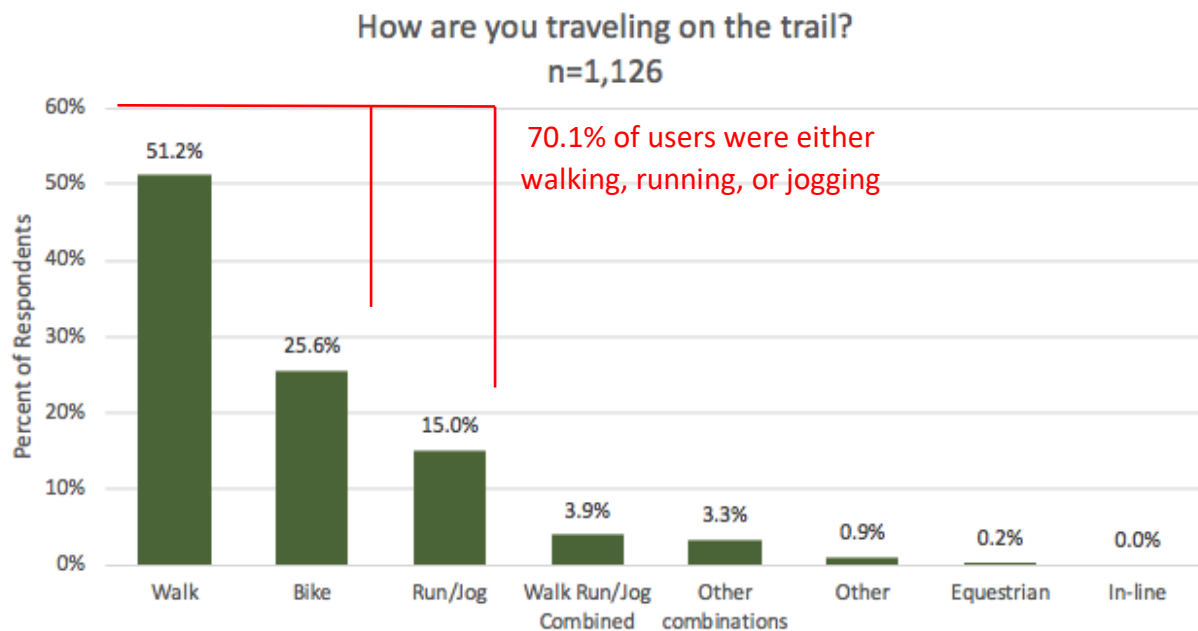
Chart 8: Mode of Transportation to the Trail



Activities and Purpose

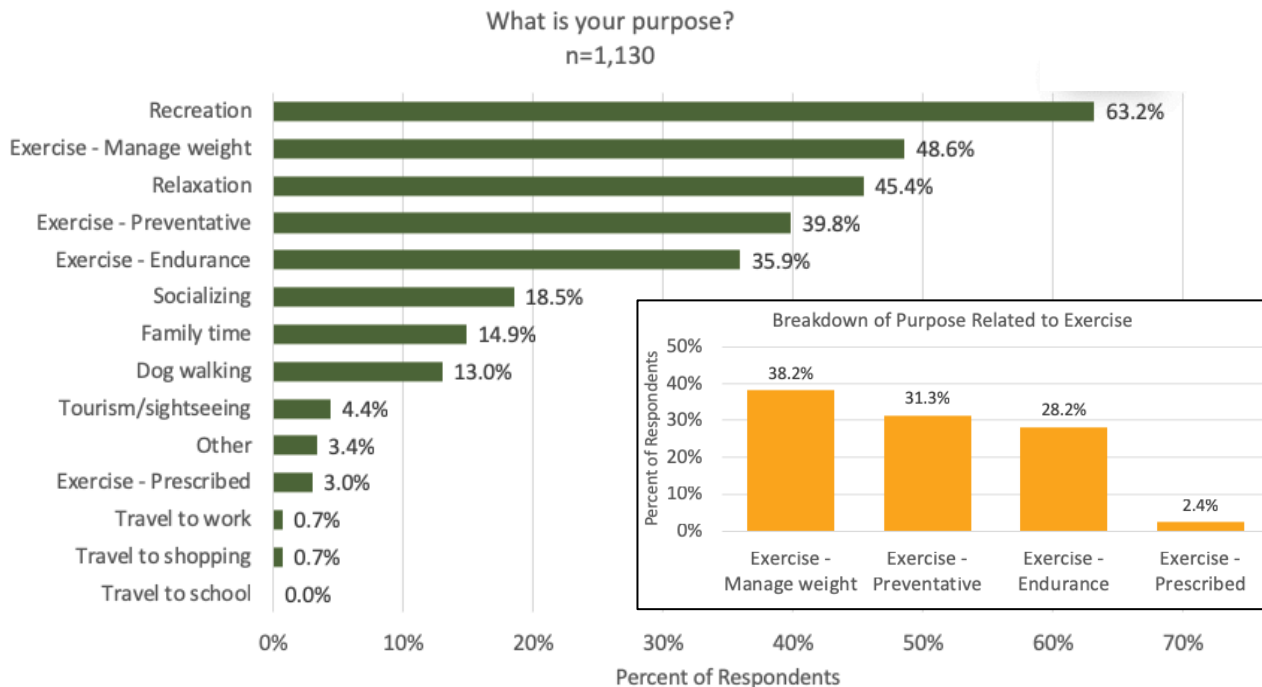
The overwhelming majority of users, 70.1% on these trails use them for walking, running, jogging or a combination of these. 25.6% indicated bicycling, 0.2% were equestrian users, 0.9% indicated other modes of traveling on the trail and 3.3% indicated some other combination of travel.

Chart 9: Mode of Activity on the Trail



These trails serve as a health asset for users. The majority of users, 70.1%, indicated using the trails for the purpose of exercise, primarily to manage weight but also for prevention, and endurance. Only 3.0% indicated that they used the trail for prescribed exercise. (Respondents could provide multiple responses). As shown in the chart below, 63.2% of users indicated using the trails for recreation and 45.4% for relaxation.

Chart 10: Purpose on the Trail



The trails also serve an important social function with 18.5% of users indicating they use the trails for socializing and 14.9% for family time. Other uses included dog walking (13%), and tourism (4.4%). 3.4% indicated other purposes including Traveling to Church, Pokemon Go, Exploring, Meet up Group, Geocoding, Nature Study, Cross Country team practice, Historical Education, and Mushroom Hunting.

These trails are not used significantly for transportation. While 0.7% of respondents did indicate using the trails for travel to shopping, no users indicated using them for travel to school.

The 2018 survey was updated to include several additional questions about use of the trails for health related purposes. This data can be used to understand how trail use, or activity on trails, might contribute to positive health outcomes and monetized health impacts.³ Findings from trail impacts studies have found that monetized health impacts represent a significant portion of the long term impacts of having a trail. In 2018 respondents were asked “if the availability of the trail impacts your decision to exercise or the frequency at which you exercise?” and 80% indicated that it did.

³ Brown, L. & Aseltine, M. (2018). Investigating the Relationship between Trail Usage and Health in Connecticut through Pilot Use of Volunteer Based Data and an Online Health Calculator. Unpublished white paper.

The survey also asked respondents about the number of days in the past week in which they engaged in at least 30 minutes or more of physical activity and how many of these days were vigorous. Respondents who indicated engaging in 150 minutes a week of moderate physical activity or 75 minutes of vigorous physical activity meet the surgeon general’s active living recommendations. At the time of publication this data had not been fully analyzed.

Time and Frequency of Use

Respondents were asked to provide the number of minutes spent on the trail. This quantitative data was analyzed using basic descriptive statistics for various measures of dispersion in the charts below. The average time spent on the trail across all users was 72 minutes. However, when the data from those who walked or jogged/ran was segregated from those who were bicycling, this varied significantly. The average walk/run/jog time (including anyone who indicated any combination of walk, run/jog, or other but not including bicycling) was 63.47 minutes while the average time for anyone who indicated bicycling (or any combination of bicycling and other) was 94.49 minutes.

Chart 11. Time Spent on the Trail

In the chart below the “Mean” is the average value, the Median is the value in the middle of the sample, and the Mode is the value that occurs most frequently in the sample. The Standard Error of the mean is an indicator of the reliability of the mean. Typically, the larger the sample size, the smaller the standard error. In this case the population of bicyclists was relatively low compared to other samples. The “Standard Deviation” indicates how far individual samples deviate from the mean. “Confidence Interval” indicates that 95% of actual values fall within the mean plus or minus the confidence interval.

Minutes on Trail	Mean	Standard Error	Median	Mode	Standard Deviation	Confidence Interval (95.0%)
All Modes	71.95	1.19	60.00	60.00	39.56	2.33
Bicyclists	94.49	2.87	90.00	120.00	50.46	5.65
Walk/Run/Jog or Combination	63.47	1.09	60.00	60.00	30.47	2.14

The majority of users on these trails use them frequently 55.7% of users use the trails two or more times per week. Those surveyed use the trails most often in the summer (94.9%), fall (93.0%) and spring (87.7%) but a surprising percentage also use them in winter (36.9%). This data may be significantly affected by sampling error due to the seasons chosen for data collection as well as likely variations between winter maintenance on these trails.

Chart 12: Frequency of Use

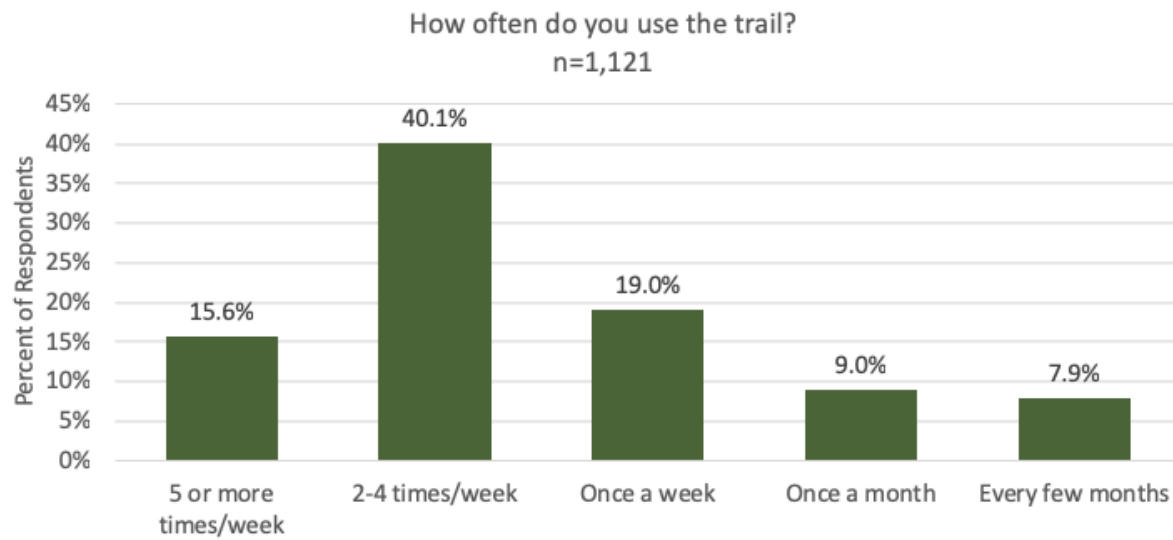
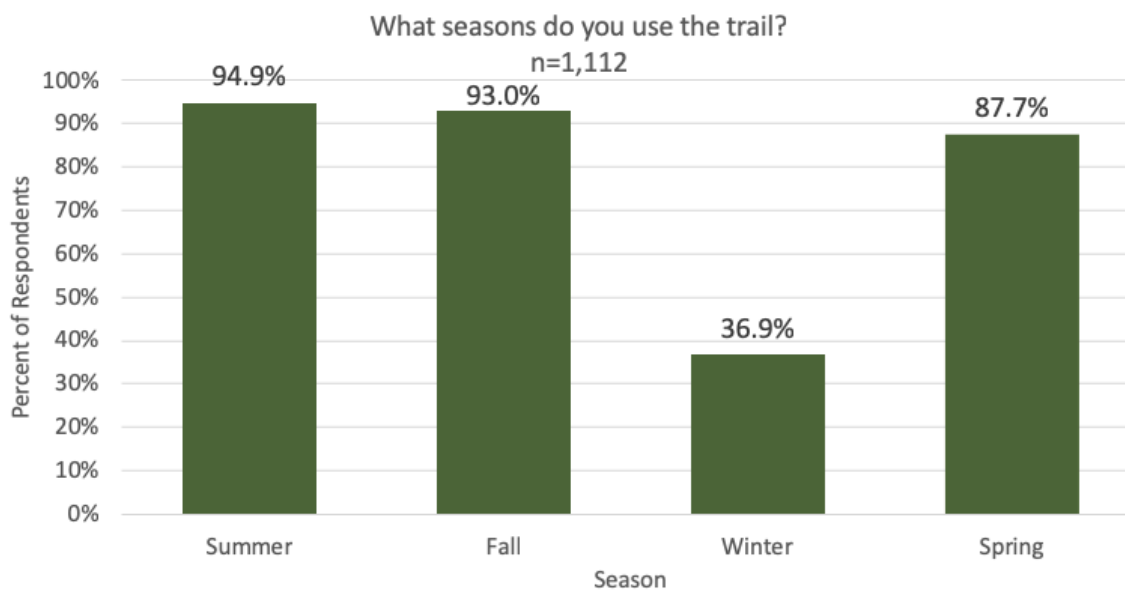


Chart 13: Use by Season



Spending

The 2018 respondent spending data was similar to data collected in 2017 however estimated expenditures by category did vary significantly with average expense for beverages, meals, and gas significantly higher among 2017 respondents. Some of this variation may be due to the way the spending question was asked and reported in 2017. This question was changed in 2018 to address some non-response error. In 2018, 25.8% (292) of respondents reported spending any money at all on that trip to the trail. This was up from 19.2% in 2017. Average user spending on that trip to the trail was also higher in 2018 with an average total of \$7.95 compared to \$5.64 in 2017. The chart below provides an overview of spending calculations in 2017 and 2018.

In 2018 73.6% of respondents reported annual spending related to the trail, compared to 61.4% in 2017. Respondents reported average annual spending on \$168.73 in 2018 however which is lower than the average annual spending of \$277.39 per year reported in 2017.

Some respondents (12) reported spending on other items including groceries, pumpkins, flowers, breakfast, shoes, bike spray, and a bike.

Chart 14: Expenditures

2017-2018 Trail Census Respondent Expenditure Profile						
Expenditure	2017 % Respondents with Expenditures *	2017 Average Expense Per User (Includes respondents who spent nothing)**	2017 Average Expense (Only respondents with expenditures in this category)	2018 % Respondents with Expenditures	2018 Average Expense Per User (Includes respondents who spent nothing)	2018 Average Expense (Only respondents with expenditures in this category)
Beverages	11.57%	\$3.16	\$5.69	13.6%	\$0.83	\$6.10
Food	5.98%	\$1.79	\$6.23	10.3%	\$1.26	\$12.31
Meals at a restaurant	5.08%	\$7.98	\$32.37	4.6%	\$1.02	\$22.09
Gas	8.77%	\$6.60	\$15.69	9.3%	\$1.36	\$14.58
Retail (gifts, clothing, etc)	1.00%	\$2.80	\$58.00	1.6%	\$1.01	\$63.33
Equipment rental	0.00%	\$0.00	\$0.00	0.5%	\$0.46	\$86.67
Lodging	0.00%	\$0.00	\$0.00	0.4%	\$1.22	\$343.75
Nearby activities	0.70%	\$1.43	\$42.14	1.0%	\$0.39	\$40.00
Other	1.50%	\$3.46	\$48.00	0.9%	\$0.41	\$46.70
Total	19.14%	\$5.64	\$29.48	25.8%	\$7.95	\$30.78

2017-2018 Trail Census Annual Expenditure Profile						
	2017 % Respondents Reporting Annual Expenditures	2017 Average Annual Expenditure Per User	2017 Average Expenditures Non Zero	2018 % Respondents Reporting Annual Expenditures	2018 Average Annual Expenditure Per User	2018 Average Expenditures Non Zero
Annual Expenditures	61.40%	\$277.39	\$339.54	73.6%	\$168.73	\$229.67

Survey respondents were asked to comment on their favorite things about the trail and things they would improve about their trail experience. For this report, this data was analyzed in aggregate and coded for basic themes. Additional analysis is still being conducted with this data. Primary themes from this coding process are provided below in no particular order.

Primary themes in no particular order

- The word cloud below illustrates the words used in all aggregated responses to this question. Larger words appeared with more frequency.



Primary themes in no particular order

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