
Hershey Medical Center Trail Study

By Megan Rowe and Glenn Rowe, P.E



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Executive Summary

The Susquehanna Area Mountain Bike Association (SAMBA) opened the Hershey Medical Center (HMC) Trail System in October of 2018 to serve the surrounding community as a multiuse trail system. Since inception, the trails have provided a healthy new space for outdoor activities and exercise while also boosting the economy for many local establishments.

With a generous cash investment from The Hershey Company and an immense amount of support from volunteers, the HMC trails have quickly become a popular destination and **draw over 21,000 users a year**. While the trails were primarily built for mountain biking, they are enjoyed by many other users such as hikers, families, geocachers, dog walkers and trail runners. The HMC trails serve the local area but visitors from as far as Hawaii, Texas, Michigan and Florida have ridden or hiked the trails thanks to promotions on [Single tracks](#), [Strava](#), [Trail Forks](#), Instagram and Facebook.

The HMC trails inspired the formation of the [Hershey Composite Mountain Bike Club](#) which is an interscholastic mountain bike team composed of boys and girls in grades 6 – 12 from Derry Township, Lower Dauphin, and Central Dauphin school districts. Because of the convenient access to both the trails and lodging, the [Pennsylvania Interscholastic Cycling League](#) is moving their annual Leader Summit to Hershey from the Philadelphia suburbs. The summit draws over 150 coaches of youth mountain bike clubs each year from across the state.

Local bike shops and restaurants have also reaped a financial benefit from the HMC trails, with many trail visitors enjoying the diverse food and beverage opportunities that Hershey has to offer. Bicycle shops have also seen an increase in sale of bikes and cycling accessories. It is estimated the use of **HMC trails contributes over \$550,000 dollars per year to the local economy**, and its economic impact will certainly increase with exposure.

Introduction

Through an agreement with Penn State College of Medicine and Penn State Health, built over 10 miles of recreational trails on and around the HMC campus. As responsible landowners, Penn State developed a Forest Stewardship Program for the vacant lands behind the medical facility. The creation of the HMC trail system aligns with the Forestry Stewardship Plan.

Through the tireless effort of many volunteers and an initial donation by The Hershey Company for the purchase of tools, the trails were built in less than 9 months. Over 143 volunteers donated 1,600 hours to build the entire 10 plus miles of trails. More than 150 bikers attended the grand opening on Oct. 13, 2018 with local media covering the event. The looped trails were designed for mountain bikers, but they also have been used by hikers, trail runners, dog walkers and geocachers. Many love to congregate at the teak wood seating area at the trail head. The trails wind through a variety of terrain, including woods and meadows, with several vista points. The trails are also designed to challenge mountain bike riders' skills and abilities at all levels, with clearly marked trails for beginners, intermediate, and experts.



The Hershey Company building trails on their "Give Back to the Community Days"

What is Susquehanna Area Mountain Bike Association?

The [Susquehanna Area Mountain Bike Association](#) (SAMBA) is a community-minded central Pennsylvania mountain bike association. We build, ride, and maintain multiuse trail systems around the Susquehanna Valley, near Harrisburg, Pennsylvania. SAMBA has over 300 members and over 2,000 followers on social media. It is the third largest mountain bike organization in the state. SAMBA currently maintains:

- Camp Mack (15 miles)
- Coleman Memorial Park Bicycle Playground
- Ephrata Bike Park at Heatherwood
- Governor Dick (10 miles)
- Hershey Medical Center trail system(10 miles)
- Lititz Rock Garden
- Parkway Trails System (10 miles)
- Rattling Creek Trail System (30+ miles) (awarded Epic trail status by the International Mountain Bike Association)



Volunteers of all ages participate in trail building and maintenance.

SAMBA is an official chapter of [International Mountain Bicycling Association](#) (IMBA). IMBA is the worldwide leader in mountain bike advocacy, and the only organization in the U.S. focused entirely on trails and access for all types of mountain bikers in all parts of the country. Established in 1988, IMBA has encouraged low-impact riding, grassroots advocacy, sustainable trail design, innovative land management practices and cooperation among trail user groups. IMBA designed SAMBA's Rattling Creek Trail as an EPIC trail which is a true backcountry, single track system that is at least over 20 miles in length. There are only 40 recognized EPIC trails in the United States.



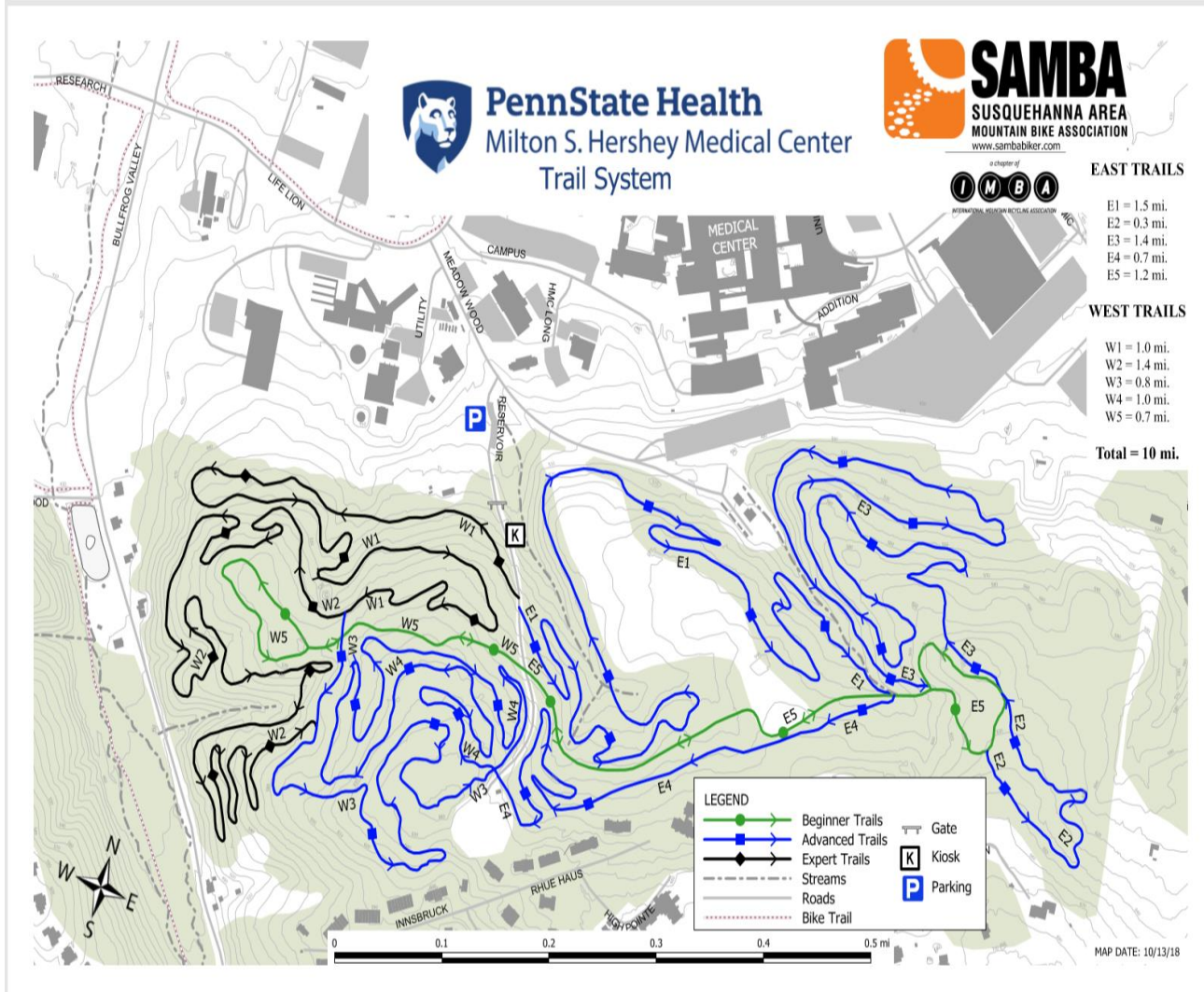
Elizabethtown Youth Mountain Bike Team at the grand opening of the HMC trails

Hershey Medical Center Trail Development

Derry Township residents, Glenn Rowe and Jesse Williams were looking to expand mountain biking options in the area when they realized the potential of the HMC trails. The HMC property contained several existing “trails” that were old logging roads or former deer trails. In most cases the existing trails were severely degraded by erosion and drainage issues. Rogue dirt bikers had also poorly erected built ramps and jumps that were hazardous. The foresight of Rowe and Williams led to a formalized agreement between SAMBA and Penn State making the trails possible and outlining how SAMBA responsibilities for building and maintaining the trails. The Hershey Company kick-started the project with a generous donation for tools.



Bike repair station



HMC trail system map

Trail Study

The trail study was conducted during the COVID. While not a typical year, observed numbers of trail users were closely aligned with non-COVID periods. Questions 11 and 12 on the survey instrument (Appendix A) were the most difficult to quantify because they asked how much money a trail user spent locally. These numbers had to be estimated by survey participants because most restaurants were either closed or had limited capacity during this time. First-time trail users also would not have planned to dine out or purchase a beverage after a ride or hike, many of those would have listed zero dollars spent. In normal non-COVID times numerous trail users would have visited restaurant adjacent to the trails such as the Cocoa Beanery, Your Place Pizza, Troegs, Rubber Sole or The Englewood . Therefore, the numbers estimated for the final economic impacts are on the conservative side.

Trail Counts

With a generous donation by [Imperial Traffic & Data Collection](#) counts were collected from October 7, 2020 to Sunday October 11, 2020. Weather conditions as reported by [Weather Underground](#) at Harrisburg International Airport was as follows:

Day	High Temp (°F)	Low Temp (°F)	Precipitation (inches)
Wednesday October 7, 2020	79	51	0.00
Thursday October 8, 2020	68	49	0.00
Friday October 9, 2020	75	45	0.00
Saturday October 10, 2020	77	54	0.00
Sunday October 11, 2020	69	58	0.00

Weather conditions were ideal for mountain biking, trail running, hiking, geocaching or any other outdoor activity. The trail data was collected with a [Miovision](#) Scout video data collection device. Beyond conducting manual counts, using video technology is one of the most accurate ways of collecting data. Miovision processed the video, separating bike riders from walkers as well as categorizing into northbound and southbound users. Only one camera was located beside Reservoir Road across from the trailhead kiosk. While Reservoir Road is the main entrance there are other “unofficial” trail access points from Sand Hill Road, BullFrog Valley Road, Appenzell Development , Alpine Heights and the HMC parking lot near the Academic Support Building. Because of the lack of resources to collect data at these additional access points, the counts used in this study are on conservative. From non-scientific historical observations the counts could be off 5% to 10%. The detailed data (collected in 15 minute intervals) can be found in Appendix.

For the five-day study period, the following numbers will be used for the economic impacts:

- 286 mountain bikers
- 70 hikers

The 5 day counts were converted to an annual count based on the same calculations used by the York County Heritage Rail Trail Study and recommended by Carl Knoch, Principal Consultant at Trail Facts and manager of trail development for the Rail-to-Trails Conservancy.

Trail count calculation

Five-day counts converted into 30-day counts

286 bikers x 6 = 1,716 biker/30 days

70 hikers x 6 = 420

The conversion for the month of October is .085

1,716 / .085 = 20,188 mountain bikers per year

70 / .085 = 823 hikers per year

Total = 21,011 trail users



Trail markers designate number and difficulty

Trail Survey Results

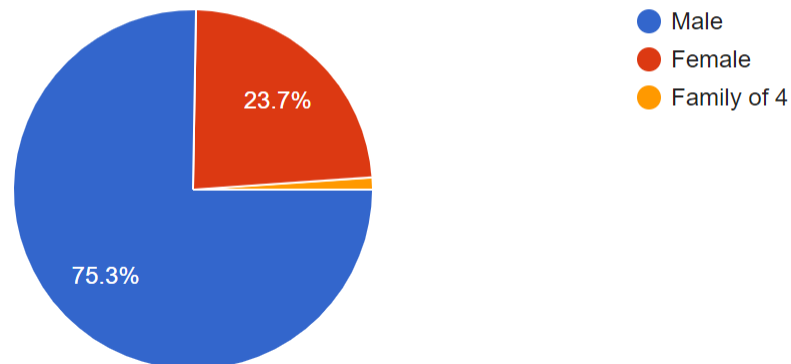
The trail survey was conducted using two different platforms in order to maximize the number of people who would complete it. The first platform was an online survey run through Google which was accessible by scanning a QR code or typing in the link. The second platform was a paper copy which was available at the trailhead. The survey's goal was to collect basic demographic information on the trail users, as well as gauge the health and economic impacts of the trails. Survey questions were reviewed by SAMBA members, as well as Penn State staff members, Gail Snyder and Austin Cohrs. The results follow:



Volunteer working on the trail

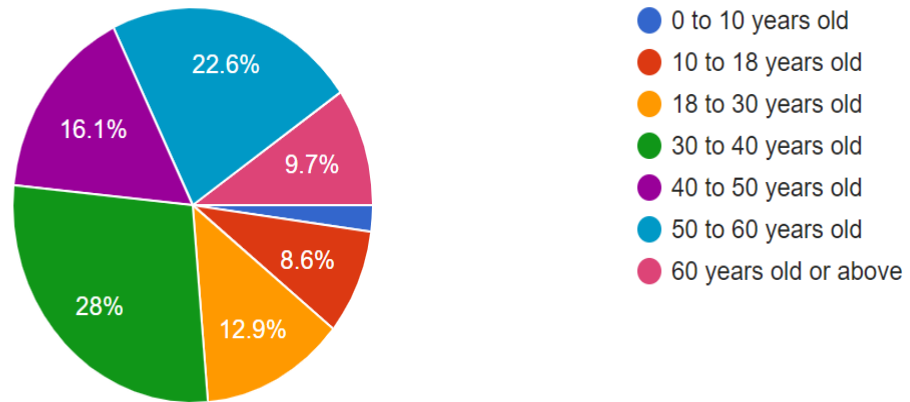
Gender

93 responses



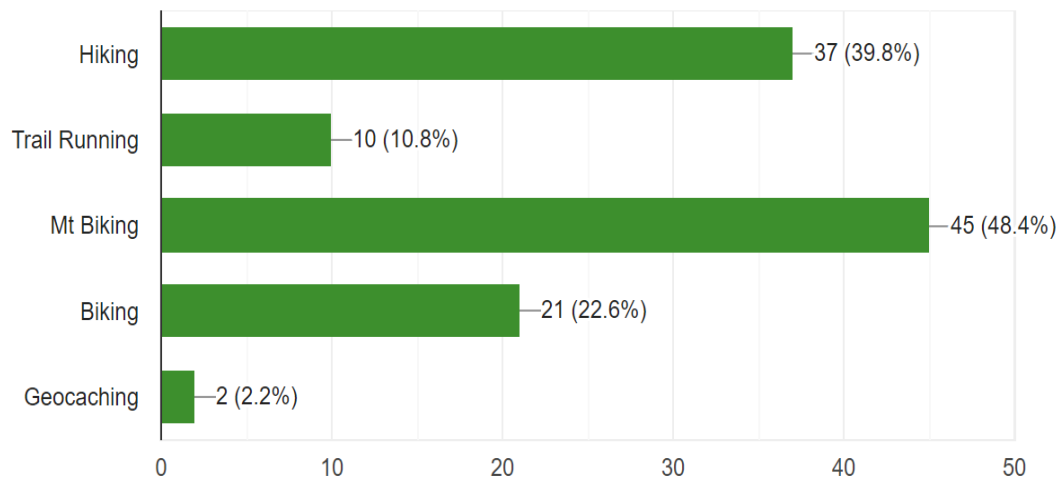
Age

93 responses



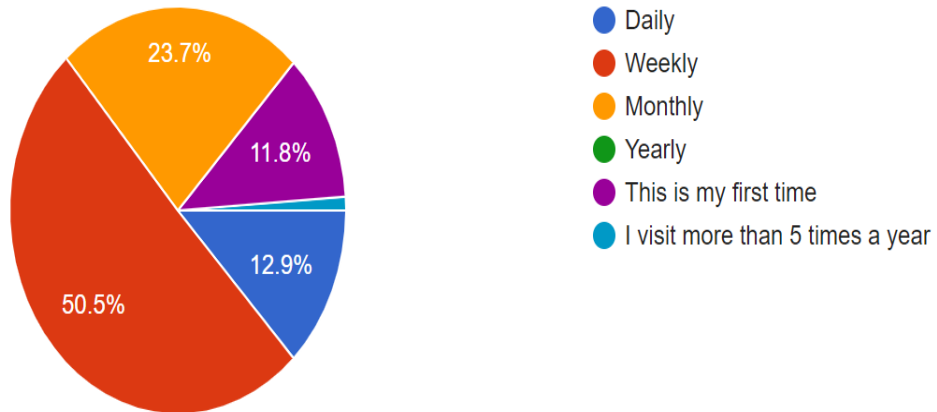
How do you use the trail? (Please select all that apply)

93 responses



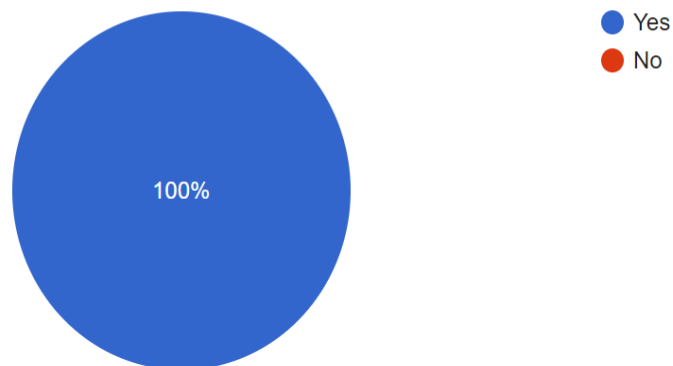
Please choose which option best describes how frequently you use the trails

93 responses

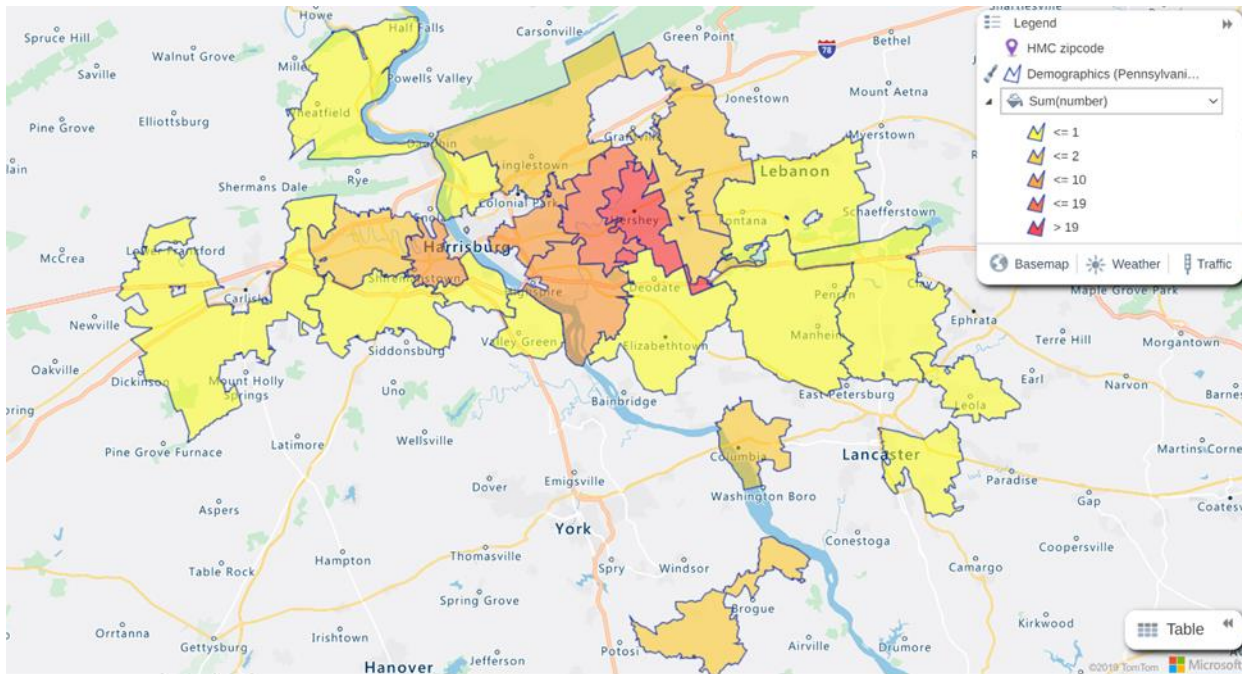


Has the Hershey Medical Center Trails contributed to maintaining or increasing your activity level?

92 responses

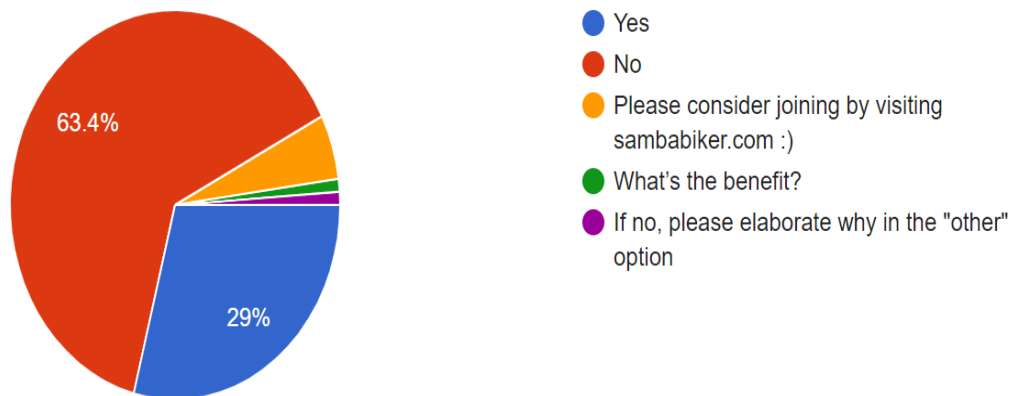


What is the zip code where you reside?



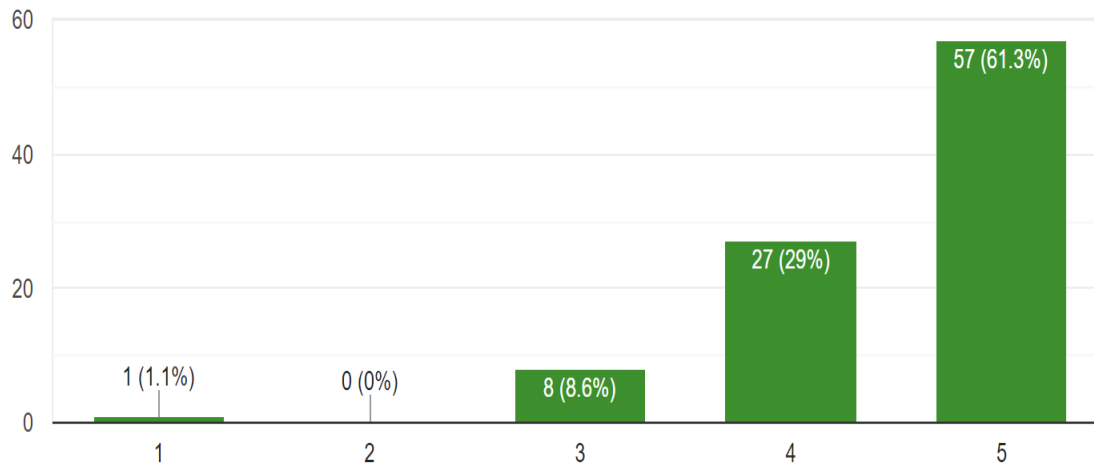
Are you a member of SAMBA?

93 responses



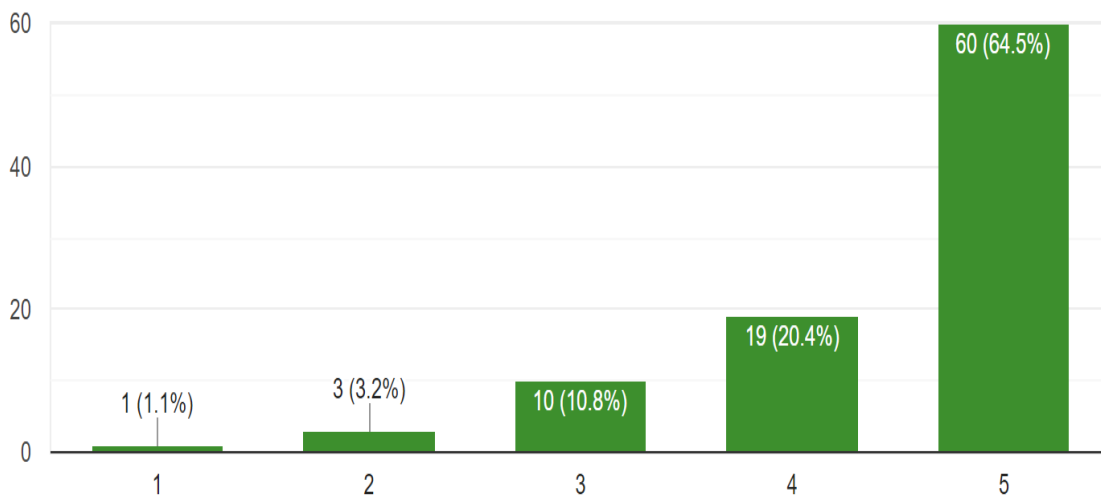
Please rank how satisfied you are with the trail maintenance

93 responses



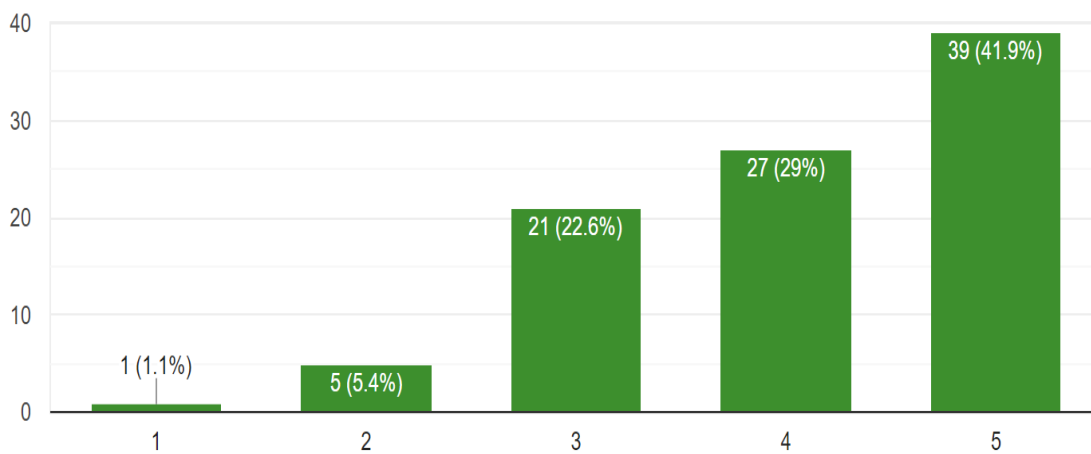
Please rank how satisfied you are with the variety of the terrain and difficulty of the trail.

93 responses



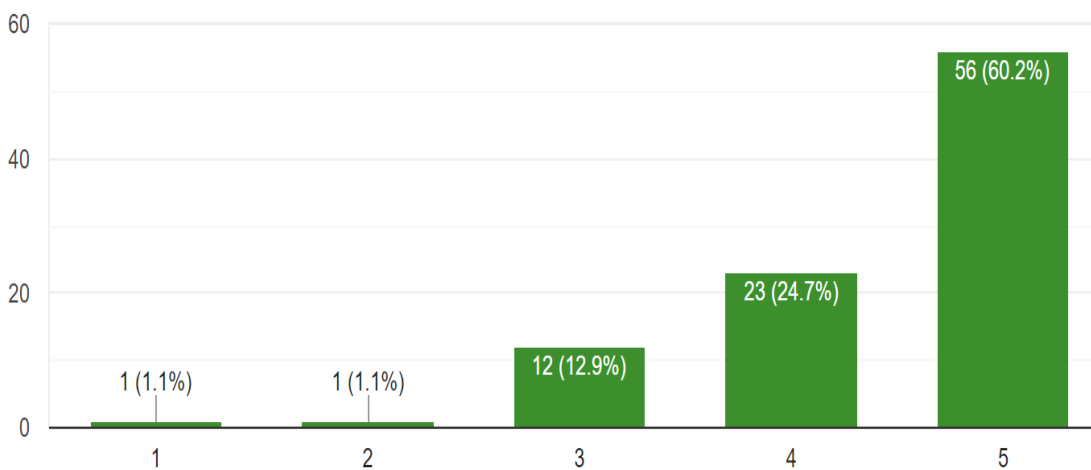
Please rank how satisfied you are with the trail signing and map

93 responses

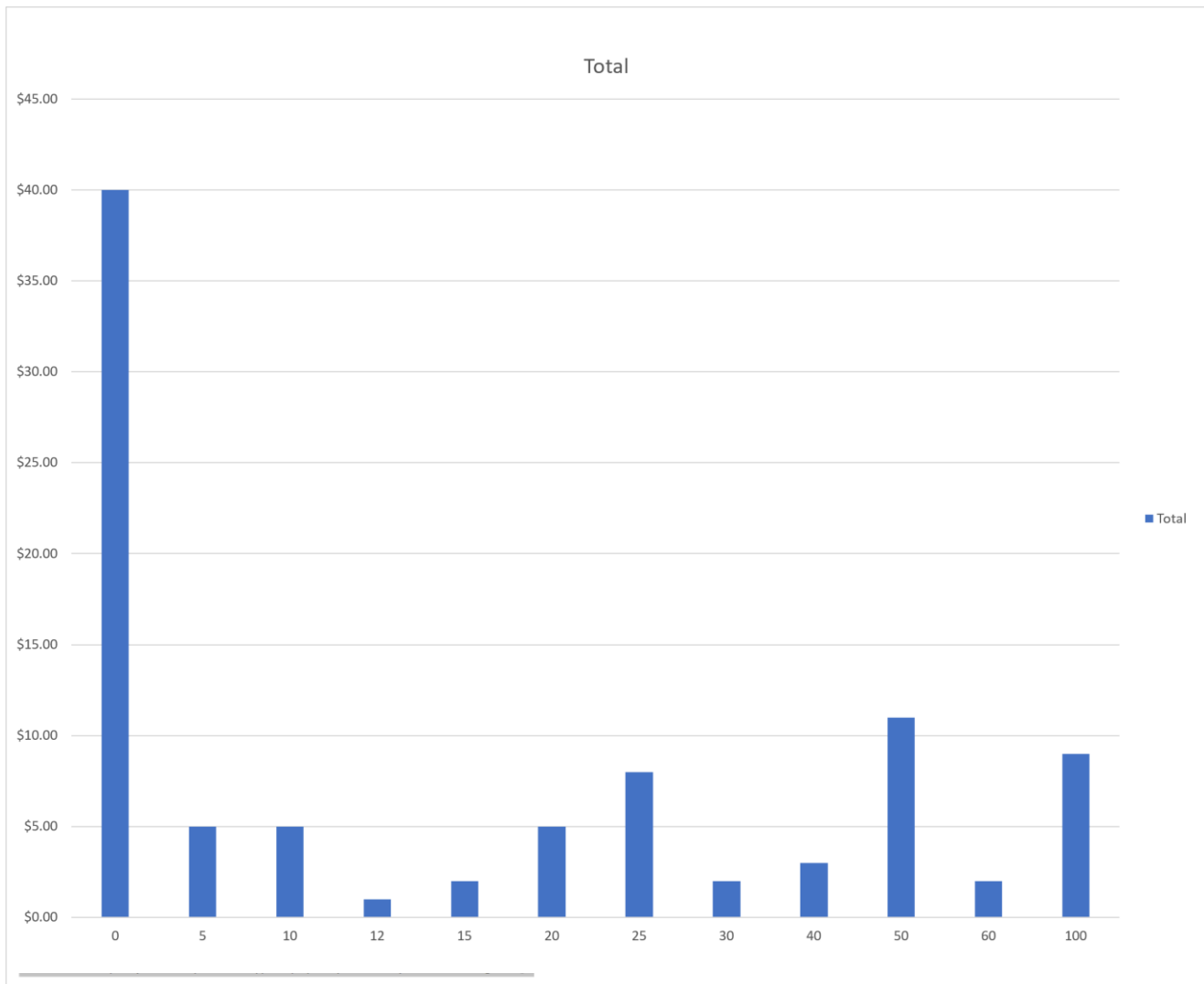


Please rank how satisfied you are with the parking for the trail

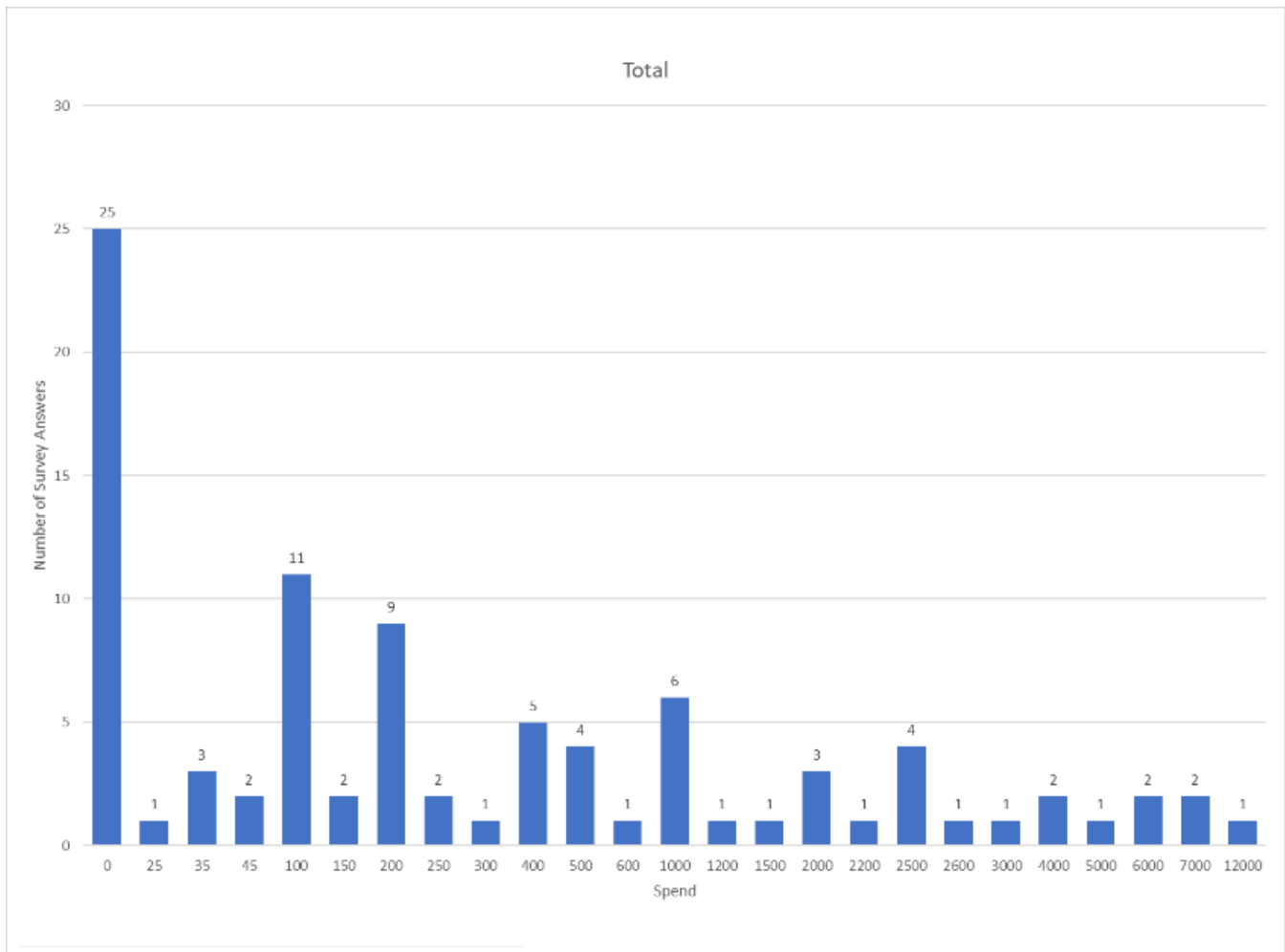
93 responses



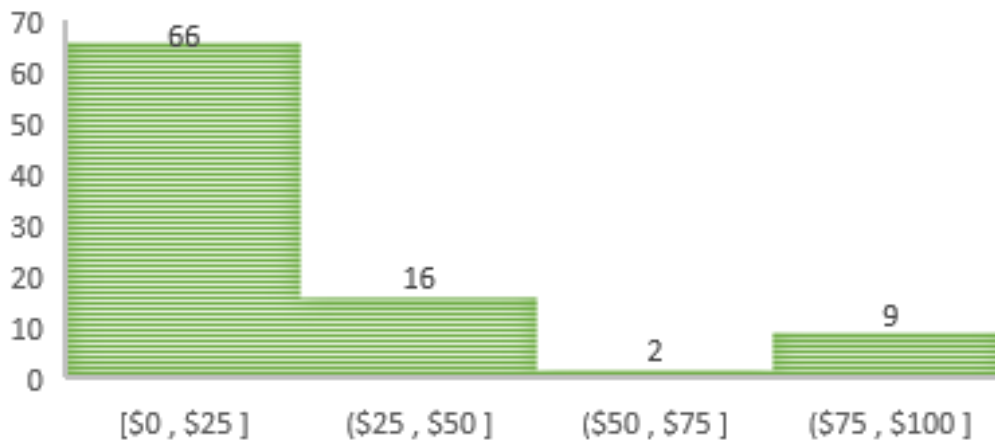
How much did you (would you have typically spent pre-COVID) on this outing?



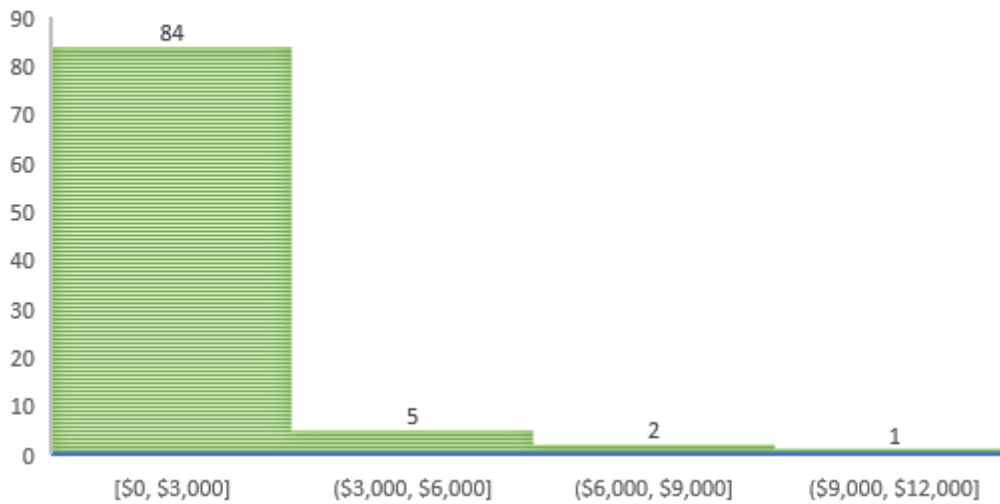
How much did you spend in a year on the items above in the past year?



\$ ON EACH VISIT TO THE TRAILS



\$ SPENT PER YEAR ON EQUIPMENT/CLOTHES



Survey Feedback:

More jumps

Rocky base over a high percentage of the trail. This robs much of the fun from this trail system. Even full suspension with a 2.2" tire, these trails are punishing. You can't carry any speed for the obstacles. Love the layout and great use of space; nice interspersing of obstacles and jumps. Lots of potential! The rock base is just too much. I'd need a fat tire full suspension to want to come back.

Keep up the great work

Great job

Love it here. Great job. Thanks for the leaf blowing

Keep up the good work and thank you SAMBA

The increased trail marks are great, I'm eager to see more.

Very good trails, it's awesome that you blow the leaves off. You guys do a great job

Thank you very much for your hard work.

Great trails but lack diversity which would bring in more riders. The trails don't offer anything unique so patrons are locals from the other side of town chasing Strava goals on largely XC trails and won't spend a penny locally because of the trip. If you want economic impact you need to offer something that is unique to the area. I would also lose the naming of the "jump line" trail. It's misleading and if I drove any distance to ride a Jump line with no jumps I'd be upset and lose faith in SAMBA trail classification.

Amazing Trails and immaculate maintenance 10/10

Thank You for the awesome work

More Jumps

more signage to denote trails direction would help. Any chance more trails could be added? This is the coolest thing to come to Hershey in the past 30 years! I'd love to see more trail runners using the trails as well as mountain bikers.

The pathway along the fence near the Village of Innsbruck requires attention for weed growth. Also, I noticed a rusted out old car in one area behind the big air vent fans. Kind of bizarre.

Thanks JD Williams

Thank you for all the work you do, I will donate. Need a portapotty in the parking lot. Trails on west side are not marked well.

Thank you! Now we need connecting bike Paths! Let's become a bike friendly community
Fabulous Resource

Great Work. I love the trails. I bring my little ones and we enjoy nature and the great outdoors
Thank you for the wonderful trails. I will be joining Samba.

Please open up the Bobby pins on W3 too sharp. I'm local, I just drove here. It's very nice having another
place to ride local

Great fun trails! Thank you

Love the Hershey trails and the teak furniture at trailhead. My favorite part is the bowls up on W1.

I would love to see a pump track! Also, it would be great to have trails that go out over the meadows to catch
sunsets ... maybe have some benches there to watch sunsets. Negative: is the signing. The signing is
confusing and not enough signs. It's difficult to tell which are the easy vs hard trails. Perhaps the signs
could have a bright sticker like green circles applied to the easy trails and black diamond stickers applied to
the challenging trails. Lastly, the map seems upside down to me! Great addition to Hershey!

Great trails. So close to my new home

Add more jumps and technical stuff

I love the trail and the gnomes

The southwest part of the trail could really use better markers.

Like the rollers

Love the trails. Fantastic resource. Improves outdoor experience in the region. Has gotten me and my wife
very into mountain biking.

Love this trail system and all that SAMBA does. You guys are awesome.
Thank you

Love these trails. Keep it up!

Love this trail!

Keep riding

I love the Hershey trails and they're incredibly well maintained. I think I liked the recommended direction
when they first opened and I find the uphill on W1 harder with the current recommended direction. W2 is
my favorite section and the bowls are unique. I love the little pump track jump section on W2. The terrain is
varied and techy but not over the top

My family LOVES this trail. Thank you for maintaining it

Make more access points

Great trail! I ride hard tail and don't like the fist sized rock. Make some trails without rock gardens. Thanks for all you do.

Please add a kiosk w/ signage at E1 exit E4 E5

Need to assess the \$\$\$ of the trail

Economic Benefit Calculation:

Daily spending:

The average visitor will spend \$23 locally on food, drink, or gas. $\$23 \times 21,000 = \$483,000$

Annually spending:

Annual spending would be significant bike parts and accessories. An assumption on the life cycle of accessories and bikes was made based on the amount spent.

\$1000 to \$12,000

It is assumed anyone who spent between \$1,000 and \$12,000 bought a new bike. This was a total of 27 trail users. After an extensive Internet search on bike life cycle, it was concluded an average of eight years would be a conservative estimate.

A total of \$82,000 was spent on bicycles/27 bikes = \$3,037 per bicycle.

$\$82,000 / 8 \text{ years} = \$10,250 \text{ per year}$

\$200 to \$999

The next spending group was assumed to be major accessories, such as new shocks, new tires, shifters, etc. A total of \$5,400 was spent in this category. It is assumed these parts have a life cycle of two years

$$\$5,400/2 = \$2,700/\text{year}$$

\$1 to \$199

The last spending categories would be accessories that would be purchased every year

A total of \$2,420 was spent.

Annual special event:

The Pennsylvania Interscholastic Cycling League moved their annual Leaders Summit to the Hershey area from the Philadelphia suburbs due to the new HMC trails. The event brings 150 to 200 coaches and league leaders together annually for a long weekend of education and riding, with the league planning to expand the event in the future and invite more participants. Based on room costs and the investment the league makes in the local community to host the event, estimated economic impact from this weekend is at least \$60,000 to \$70,000. Additionally, those who attend the weekend make up the local leadership in a statewide organization of mountain biking and outdoor recreation enthusiasts. Their enjoyment of the HMC trails is then conveyed to the 2000+ student athletes, coaches and family members who are members of their teams, which are spread across the state from Pittsburgh to Wilkes-Barre/Scranton and from Erie to Philadelphia. In a league that is growing 33% annually on average, those numbers will soon reach 5,000 members and beyond

Trail user expenditure annually

Daily trips	$\$23 \times 21 = \$483,000$
Annual major expenditure \$1,000 to \$12,000	$\$82,000 / 8 \text{ years} = \$10,250$
Annual median expenditures \$200 to \$999	$\$5,400/2 = \$2,700$
Annual low-cost expenditures \$1 to \$199	\$2,420
Leader summit	\$70,000 annually

Total Annual Economic Benefit \$568,370

Special thanks to the HMC generous donators

Hershey Medical Center

Penn State College of Medicine

The Hershey Company

Hershey Entertainment and Resorts

Imperial Traffic and Data Collection

Boyer Foods

New Belgium Brewing

Troegs Brewing

Maguire's Ford

Teresa Rowe

Tracy Forray

Jim St. John

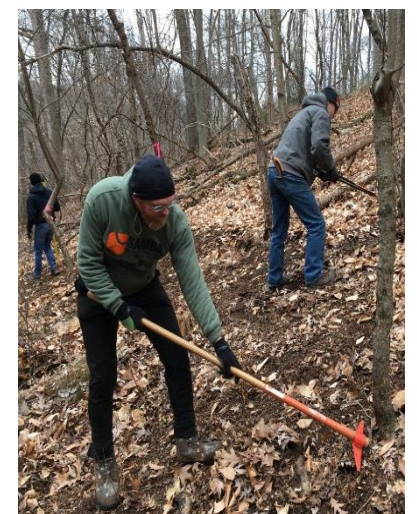
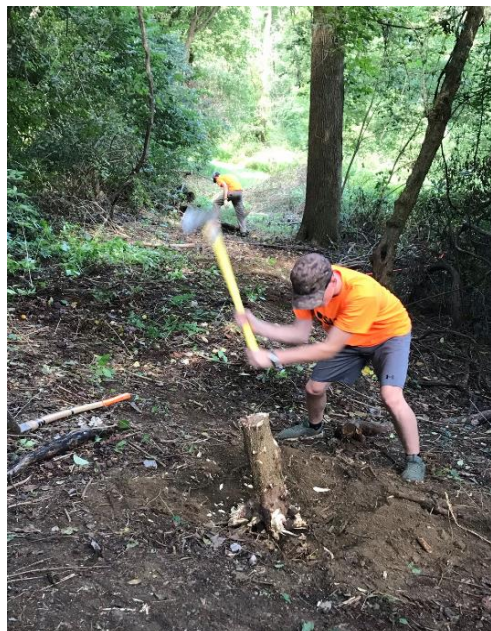
Goods Tree and Lawn Care

ARM Group

Leed's Cyclery

The hundreds of volunteers

SAMBA Board



Conclusion and Recommendations

Analysis of the data collected during the study has shown the trails have made a positive impact on users' health by increasing activity levels and on the local economy by increasing spending at local businesses.

Recommendations for further research studies will be implemented to reduce potential confounding variables that would skew results. This includes :

- Conduct another study post-epidemic
- Conduct manual survey in conjunction with the online and paper surveys
- Collect trail counts continuously for two weeks or longer and at different times of the year
- Collect counts at the trail head and other unofficial entrances to the trail

Implementing these small modifications will mitigate the need to extrapolate data and make inferences.

Special Thanks to Imperial Traffic & Data Collection for donating the resources to make this study possible.



Appendix A Trail counts

1. SAMBA Trail Counts - Ped & Bike Pathway
 Wed Oct 7, 2020
 Full Length (7 AM-6:30 PM (+2))
 All Classes (Pedestrians, Bicyclists, Bicycles)
 All Channels
 ID: 789737, Location: 40.257505, -76.676485, Site Code: 1

Provided by: Imperial Traffic & Data Collection
 PO Box 4637, Cherry Hill, NJ, 08003, US

Tag Direction Time	South Northbound		North Southbound		T	App	T	App	T	App
	T	App	T	App						
2020-10-07 7:30AM	0	0	0	0	0	0	0	0	0	0
7:30AM	0	0	0	0	0	0	0	0	0	0
7:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	0	0	0	0	0	0	0	0	0	0
8:00AM	0	0	0	0	0	0	0	0	0	0
8:15AM	0	0	0	0	0	0	0	0	0	0
8:30AM	0	0	0	0	0	0	0	0	0	0
8:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	0	0	1	1	1	1	1	1	1	1
9:00AM	0	0	0	0	0	0	0	0	0	0
9:15AM	0	0	0	0	0	0	0	0	0	0
9:30AM	0	0	0	0	0	0	0	0	0	0
9:45AM	0	0	1	1	1	1	1	1	1	1
Heavily Trained	0	0	1	1	1	1	1	1	1	1
10:00AM	0	0	0	0	0	0	0	0	0	0
10:15AM	0	0	0	0	0	0	0	0	0	0
10:30AM	0	0	0	0	0	0	0	0	0	0
10:45AM	0	0	1	1	1	1	1	1	1	1
Heavily Trained	0	0	1	1	1	1	1	1	1	1
11:00AM	1	1	4	4	4	4	4	4	4	4
11:15AM	0	0	0	0	0	0	0	0	0	0
11:30AM	0	0	0	0	0	0	0	0	0	0
11:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	0	0	1	1	1	1	1	1	1	1
12:00PM	0	0	1	1	1	1	1	1	1	1
12:15PM	0	0	2	2	2	2	2	2	2	2
12:30PM	1	1	2	2	2	2	2	2	2	2
12:45PM	0	0	4	4	4	4	4	4	4	4
Heavily Trained	5	5	5	5	5	5	5	5	5	5
1:00PM	2	2	1	1	1	1	1	1	1	1
1:15PM	1	1	1	1	1	1	1	1	1	1
1:30PM	1	1	0	0	0	0	0	0	0	0
1:45PM	0	0	2	2	2	2	2	2	2	2
Heavily Trained	4	4	3	3	3	3	3	3	3	3
2:00PM	1	1	0	0	0	0	0	0	0	0
2:15PM	3	3	1	1	1	1	1	1	1	1
2:30PM	0	0	0	0	0	0	0	0	0	0
2:45PM	0	0	1	1	1	1	1	1	1	1
Heavily Trained	4	4	1	1	1	1	1	1	1	1
3:00PM	0	0	0	0	0	0	0	0	0	0
3:15PM	0	0	0	0	0	0	0	0	0	0
3:30PM	0	0	2	2	2	2	2	2	2	2
3:45PM	0	0	5	5	5	5	5	5	5	5
Heavily Trained	0	0	1	1	1	1	1	1	1	1
4:00PM	0	0	1	1	1	1	1	1	1	1
4:15PM	0	0	0	0	0	0	0	0	0	0
4:30PM	0	0	1	1	1	1	1	1	1	1
4:45PM	0	0	2	2	2	2	2	2	2	2
Heavily Trained	2	2	2	2	2	2	2	2	2	2
5:00PM	0	0	1	1	1	1	1	1	1	1
5:15PM	0	0	2	2	2	2	2	2	2	2
5:30PM	3	3	0	0	0	0	0	0	0	0
5:45PM	0	0	5	5	5	5	5	5	5	5

Tag Direction Time	South Northbound		North Southbound		T	App	T	App	T	App
	T	App	T	App						
2020-10-08 7:30AM	0	0	0	0	0	0	0	0	0	0
7:30AM	0	0	0	0	0	0	0	0	0	0
7:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	1	1	2	2	2	2	2	2	2	2
8:00AM	0	0	0	0	0	0	0	0	0	0
8:15AM	0	0	0	0	0	0	0	0	0	0
8:30AM	0	0	0	0	0	0	0	0	0	0
8:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	0	0	5	5	5	5	5	5	5	5
9:00AM	0	0	2	2	2	2	2	2	2	2
9:15AM	0	0	0	0	0	0	0	0	0	0
9:30AM	0	0	1	1	1	1	1	1	1	1
9:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	0	0	4	4	4	4	4	4	4	4
10:00AM	0	0	0	0	0	0	0	0	0	0
10:15AM	0	0	0	0	0	0	0	0	0	0
10:30AM	4	4	2	2	2	2	2	2	2	2
10:45AM	2	2	0	0	0	0	0	0	0	0
Heavily Trained	7	7	6	6	6	6	6	6	6	6
11:00AM	0	0	0	0	0	0	0	0	0	0
11:15AM	0	0	1	1	1	1	1	1	1	1
11:30AM	0	0	0	0	0	0	0	0	0	0
11:45AM	3	3	0	0	0	0	0	0	0	0
Heavily Trained	3	3	1	1	1	1	1	1	1	1
12:00PM	0	0	0	0	0	0	0	0	0	0
12:15PM	0	0	0	0	0	0	0	0	0	0
12:30PM	0	0	0	0	0	0	0	0	0	0
12:45PM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	1	1	1	1	1	1	1	1	1	1
1:00PM	1	1	1	1	1	1	1	1	1	1
1:15PM	0	0	0	0	0	0	0	0	0	0
1:30PM	0	0	0	0	0	0	0	0	0	0
1:45PM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	2	2	2	2	2	2	2	2	2	2
2:00PM	0	0	0	0	0	0	0	0	0	0
2:15PM	0	0	0	0	0	0	0	0	0	0
2:30PM	2	2	2	2	2	2	2	2	2	2
2:45PM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	2	2	2	2	2	2	2	2	2	2
3:00PM	0	0	0	0	0	0	0	0	0	0
3:15PM	0	0	0	0	0	0	0	0	0	0
3:30PM	0	0	0	0	0	0	0	0	0	0
3:45PM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	2	2	7	7	7	7	7	7	7	7
4:00PM	0	0	0	0	0	0	0	0	0	0
4:15PM	0	0	0	0	0	0	0	0	0	0
4:30PM	0	0	0	0	0	0	0	0	0	0
4:45PM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	0	0	10	10	10	10	10	10	10	10
5:00PM	0	0	2	2	2	2	2	2	2	2
5:15PM	0	0	0	0	0	0	0	0	0	0
5:30PM	4	4	2	2	2	2	2	2	2	2
5:45PM	0	0	12	12	12	12	12	12	12	12
Heavily Trained	2	2	1	1	1	1	1	1	1	1

Tag Direction Time	South Northbound		North Southbound		T	App	T	App	T	App
	T	App	T	App						
2020-10-09 7:30AM	0	0	0	0	0	0	0	0	0	0
7:30AM	0	0	0	0	0	0	0	0	0	0
7:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	1	1	2	2	2	2	2	2	2	2
8:00AM	0	0	0	0	0	0	0	0	0	0
8:15AM	0	0	0	0	0	0	0	0	0	0
8:30AM	0	0	0	0	0	0	0	0	0	0
8:45AM	0	0	0	0	0	0	0	0	0	0
Heavily Trained	2	2	0	0	0	0	0	0	0	0
9:00AM	0	0	0	0	0	0	0	0	0	0
9:15AM	0	0	1	1	1	1	1	1	1	1
9:30AM	0	0	2	2	2	2	2	2	2	2
9:45AM	1	1	0	0	0	0	0	0	0	0
Heavily Trained	1	1	3	3	3	3	3	3	3	3
10:00AM	0	0	0	0	0	0	0	0	0	0
10:15AM	0	0	0	0	0	0	0	0	0	0
10:30AM	4	4	0	0	0	0	0	0	0	0
10:45AM	0	0	1	1	1	1	1	1	1	1
Heavily Trained	5	5	1	1	1	1	1	1	1	1
11:00AM	1	1	0	0	0	0	0	0	0	0
11:15AM	0	0	0	0	0	0	0	0	0	0
11:30AM	1	1	1	1	1	1	1	1	1	1
11:45AM	0	0	0	0	0					

Fig	Southbound	Northbound	Southbound	Northbound
Direction	Northbound	Southbound	Northbound	Southbound
Time	App	App	App	App
7:30 AM	0	2	2	2
7:45 AM	0	4	4	4
Hourly Total	0	6	6	6
7:00 AM	0	2	2	2
8:15 AM	2	2	2	2
8:30 AM	0	2	2	2
8:45 AM	2	2	2	2
Hourly Total	4	4	4	4
9:00 AM	1	2	2	2
9:15 AM	2	2	2	2
9:30 AM	1	4	4	4
9:45 AM	3	2	2	2
Hourly Total	7	10	10	10
10:00 AM	4	10	10	10
10:15 AM	0	2	2	2
10:30 AM	3	2	2	2
10:45 AM	4	2	2	2
Hourly Total	11	10	10	10
11:00 AM	5	5	5	5
11:15 AM	0	2	2	2
11:30 AM	8	1	1	1
11:45 AM	2	4	4	4
Hourly Total	15	12	12	12
12:00 PM	6	4	4	4
12:15 PM	4	1	1	1
12:30 PM	2	1	1	1
12:45 PM	1	3	3	3
Hourly Total	13	11	11	11
1:00 PM	2	0	0	0
1:15 PM	4	0	0	0
1:30 PM	1	0	0	0
1:45 PM	1	1	1	1
Hourly Total	8	1	1	1
2:00 PM	0	0	0	0
2:15 PM	0	0	0	0
2:30 PM	0	0	0	0
2:45 PM	1	0	0	0
Hourly Total	1	0	0	0
3:00 PM	2	1	1	1
3:15 PM	0	0	0	0
3:30 PM	0	4	4	4
3:45 PM	0	0	0	0
Hourly Total	2	5	5	5
4:00 PM	4	0	0	0
4:15 PM	2	0	0	0
4:30 PM	0	4	4	4
4:45 PM	0	0	0	0
Hourly Total	6	4	4	4
5:00 PM	0	0	0	0
5:15 PM	0	0	0	0
5:30 PM	0	0	0	0
5:45 PM	0	0	0	0
Hourly Total	0	0	0	0
6:00 PM	4	0	0	0
6:15 PM	0	0	0	0
Hourly Total	4	0	0	0
Total	243	243	246	233
% Northbound	49%	49%	49%	49%
% Southbound	45.5%	45.5%	54.5%	54.5%
Percentage	0	0	0	0

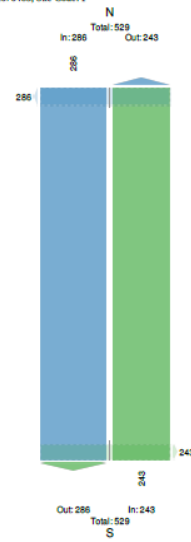
Leg Direction	South		North			
	Northbound	App	Southbound	App	App	Out
% Pedestrians	0%	0%	0%	0%	0%	0%
Bicycles	0	0	0	0	0	0
% Pedestrians	53	53	70	70	70	123
% Pedestrians	100%	100%	100%	100%	100%	100%
Bicycles	100	100	210	210	210	405
% Bicycles	100%	70.2%	100%	75.5%		76.7%

T: Thru

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Wed Oct 7, 2020
Full Length (7 AM-6:30 PM (+2))
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1



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1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Thu Oct 8, 2020
AM Peak (Oct 08 2020 10AM - 11 AM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1

Leg Direction	South		North			
	Northbound	App	Southbound	App	App	Out
2020-10-08 10:00AM	1	1	0	0	0	1
10:10AM	0	0	0	0	0	0
10:20AM	4	4	2	2	2	4
10:45AM	2	2	0	0	0	2
Total	7	7	2	2	2	11
% Pedestrians	100%	100%	100%	100%	100%	100%
% Total	53.8%	53.8%	46.2%	46.2%		
Pedestrians	0	0	0	0	0	0
% Pedestrians	0%	0%	0%	0%	0%	0%
Bicycles	0	0	0	0	0	0
% Bicycles	0%	0%	0%	0%	0%	0%
Pedestrians	0	0	0	0	0	0
% Pedestrians	0%	0%	100%	100%	100%	100%
Bicycles	7	7	2	2	2	11
% Bicycles	100%	100%	100%	100%	100%	100%

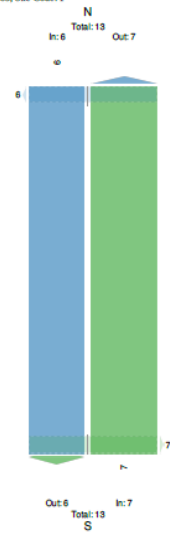
T: Thru

8 of 10

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Thu Oct 8, 2020
AM Peak (Oct 08 2020 10AM - 11 AM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1



9 of 10

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Thu Oct 8, 2020
PM Peak (Oct 08 2020 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1

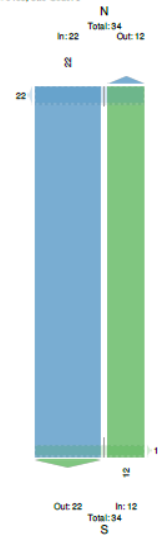
Dir	Direction	South		North	
		Northbound	App	Southbound	App
T	Time	T	App	T	App
	2020-10-08 4:30PM	2	2	2	2
	4:45PM	5	5	6	11
	5:00PM	0	0	2	2
	5:15PM	0	0	7	7
	Total	7	7	17	22
	% Approach	100%	100%	100%	100%
	% Total	35.3%	35.3%	64.7%	64.7%
	Pedestrians	0	0	0	0
	% Pedestrians	0%	0%	0%	0%
	Bicycles	0	0	0	0
	% Bicycles	0%	0%	0%	0%
	Pedestrians	0	0	3	3
	% Pedestrians	-	0%	100%	13.6%
	Bicycles	7	7	14	14
	% Bicycles	100%	100%	100%	61.4%

T: Thru

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Thu Oct 8, 2020
PM Peak (Oct 08 2020 4:30PM - 5:30 PM) - Overall Peak Hour
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1



1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Fri Oct 9, 2020
Midday Peak (Oct 09 2020 12PM - 1 PM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1

Dir	Direction	South		North	
		Northbound	App	Southbound	App
T	Time	T	App	T	App
	2020-10-09 12:00PM	0	0	3	3
	12:15PM	1	1	4	4
	12:30PM	0	0	2	2
	12:45PM	2	2	0	0
	Total	3	3	9	9
	% Approach	100%	100%	100%	100%
	% Total	25.0%	25.0%	75.0%	75.0%
	Pedestrians	0	0	0	0
	% Pedestrians	0%	0%	0%	0%
	Bicycles	0	0	0	0
	% Bicycles	0%	0%	0%	0%
	Pedestrians	0	0	0	0
	% Pedestrians	-	0%	-	0%
	Bicycles	3	3	9	9
	% Bicycles	100%	100%	100%	100.0%

T: Thru

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Fri Oct 9, 2020
Midday Peak (Oct 09 2020 12PM - 1 PM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1



1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Sat Oct 10, 2020
PM Peak (WKND) (Oct 10 2020 1PM - 2 PM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1

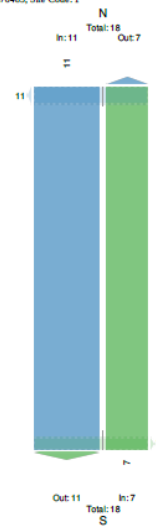
Leg Direction	South Northbound		North Southbound		App In	App Out
	T	App	T	App		
Time						
2020-10-10 1:00PM	3	3	5	5	1	8
1:15PM	3	3	3	3	1	6
1:30PM	0	0	0	0	0	0
1:45PM	1	1	5	5	1	6
Total	7	7	11	11	3	18
% Approach	100%	-	100%	-	-	-
% Total	38.5%	38.5%	61.5%	61.5%	-	-
Pedestrians	0	0	0	0	0	0%
% Pedestrians	0%	0%	0%	0%	0%	0%
Bicycles	7	7	11	11	3	100%
% Bicycles	100%	100%	100%	100%	100%	100%
Pedestrians	1	1	3	3	3	100%
% Pedestrians	100%	14.3%	100%	27.3%	100%	22.2%
Bicycles	6	6	8	8	0	100%
% Bicycles	100%	85.7%	100%	72.7%	0%	77.8%

T: Thru

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Sat Oct 10, 2020
PM Peak (WKND) (Oct 10 2020 1PM - 2 PM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1



1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Sun Oct 11, 2020
AM Peak (WKND) (Oct 11 2020 9:15AM - 10:15 AM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1

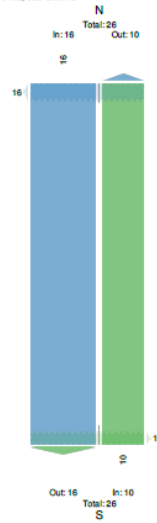
Leg Direction	South Northbound		North Southbound		App In	App Out
	T	App	T	App		
Time						
2020-10-11 9:15AM	2	2	1	1	1	3
9:30AM	1	1	4	4	4	5
9:45AM	3	3	1	1	1	4
10:00AM	4	4	10	10	10	14
Total	10	10	16	16	16	26
% Approach	100%	-	100%	-	-	-
% Total	38.5%	38.5%	61.5%	61.5%	-	-
Pedestrians	0	0	0	0	0	0%
% Pedestrians	0%	0%	0%	0%	0%	0%
Bicycles	10	10	16	16	16	100%
% Bicycles	100%	100%	100%	100%	100%	100%
Pedestrians	1	1	3	3	3	100%
% Pedestrians	100%	10.0%	100%	18.8%	100%	15.4%
Bicycles	9	9	13	13	13	100%
% Bicycles	100%	90.0%	100%	81.3%	100%	84.6%

T: Thru

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection
PO Box 4637, Cherry Hill, NJ, 08003, US

Sun Oct 11, 2020
AM Peak (WKND) (Oct 11 2020 9:15AM - 10:15 AM)
All Classes (Pedestrians, Pedestrians, Bicycles, Bicycles)
All Channels
ID: 789737, Location: 40.257505, -76.676485, Site Code: 1



1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection

Sun Oct 11, 2020
 Midday Peak (WKND) (Oct 11 2020 11:30AM - 12:30 PM)
 All Classes (Pedestrians, Pedestrians, Bicycles)
 All Channels
 ID: 789737, Location: 40.257505, -76.676485, Site Code: 1

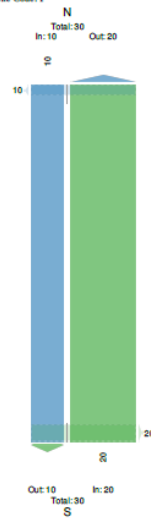
Dir	South	North	South	North
Direction	Southbound	Northbound	Southbound	Northbound
Time	In	App	In	App
2020-10-11 11:30AM	0	0	1	1
11:45AM	2	2	4	4
12:00PM	0	0	4	4
12:15PM	4	4	1	1
Total	20	20	10	10
% Appearance	100%	100%	100%	100%
% Total	66.7%	66.7%	33.3%	33.3%
Pedestrians	0	0	0	0
% Pedestrians	0%	0%	0%	0%
Bicycles	0	0	0	0
% Bicycles	0%	0%	0%	0%
Pedestrians	0	0	0	0
% Pedestrians	100%	45.0%	100%	20.0%
Bicycles	11	11	0	0
% Bicycles	100%	55.0%	100%	80.0%

T: Thru

1. SAMBA Trail Counts - Ped & Bike Pathway

Provided by: Imperial Traffic & Data Collection

Sun Oct 11, 2020
 Midday Peak (WKND) (Oct 11 2020 11:30AM - 12:30 PM)
 All Classes (Pedestrians, Pedestrians, Bicycles)
 All Channels
 ID: 789737, Location: 40.257505, -76.676485, Site Code: 1



Appendix B Trail Survey Questions



Help us out by
completing a
survey!



Scan the QR code to take the survey online
OR

Complete a hard copy of the survey
found in the bin behind this page

QR code for on-line survey posted at Kisok

Paper survey

Hershey Medical Center Trail Survey

In order to provide you with a high-quality recreational experience, the Susquehanna Area Mountain Bike Association (SAMBA) is soliciting your feedback on the Hershey Medical Center (HMC) Trail and the impact it has on the region. The results of this survey will be used to improve the HMC Trail and support the expansion of additional trails in South Central Pennsylvania.

Please complete the survey for EACH trail user.

1. Gender

- Male
- Female
- Other

2. Age

- 0 - 10 years old
- 10 - 18 years old
- 18 - 30 years old
- 30 - 40 years old
- 40 - 50 years old
- 50 - 60 years old
- 60 years old and above

3. What is your home zip code? _____

4. Please choose which option best describes how frequently you use the trails

- Daily
- Weekly
- Monthly
- Yearly
- This is my first time

5. How do you use the trail? (Please select all that apply)

- Mt Bike
- Hiking
- Trail Running
- Other: _____

6. Has the Hershey Medical Center Trails contributed to maintaining or increasing your daily activity level?

- Yes
 No

Please check the box on your satisfaction level.....

	1. Very Unsatisfied	2. Unsatisfied	3. Content	4. Satisfied	5. Very Satisfied
7. Trail Maintenance					
8. The variety of the terrain and difficulty of the trail					
9. Trail signing and map					
10. Parking for the trail					

Please answer the next few questions as if COVID-19 were not a factor OR based on pre-Covid-19

11. Did you or would you spend money locally on this outing? (Please mark all that apply)

- Gas
 Food
 Beverages
 Overnight accommodations
 I have not spent money locally for this trip
 Other: _____

12. How much did you or would you spend on this outing? \$_____

13. Over the last year, did the trail influence your purchase of... (Please mark all that apply)

- Clothing
 Bike Equipment
 Bike Accessories
 Nothing
 Other: _____

14. Approximately how much did you spend on the items above in the last year? \$_____

15. How did you hear about the HMC trail?

- Facebook
- Instagram
- SAMBA website
- A national mountain bike organization (Trailforks, Singletracks, Strava, etc..)
- International Mountain Biking Association (IMBA)
- Word of mouth
- Other: _____

16. Are you a member of SAMBA?

- Yes
- No
- Please consider joining by visiting sambabiker.com :)

17. Comments / Feedback

Appendix C Trail count estimator

Perkiomen Trail User Estimate

From mid-August through late November 2008, Rails-to-Trails Conservancy placed three infrared counters along the Perkiomen Trail. The counters were placed at the following locations: just north of the intersection of the Perkiomen Trail and Cider Mill Road; at the south end of Central Perkiomen Valley Park off of Plank Road; just south of the Crusher Road trailhead. The counters were approximately 7 ½ miles apart. During the course of the data collection period 62,554 hits were recorded on the counters. The daily output reports generated by the counter software can be found in Appendix A. These reports reflect the assumption that all users were out and back and thus passed a counter twice so that the actual number of hits on the counters is divided by 2 in each of the reports.

For the purpose of creating this estimate, the data collected by the counters during September and October was subjected to a thorough analysis. This analysis is based upon methodologies used previously to make estimates of trail user volume.

The following are the set of assumptions that were made in order to account for users who may not have passed one of the counters or may have passed multiple counters. These assumptions result in an estimate of all unique trail users during the time period under consideration.

Assumptions:

Infrared trail counters were positioned approximately 7.5 miles apart therefore, only trail users who were on the trail for more than 2 hours passed more than one counter.

All trips were out in back which means that each unique user passed a counter twice.

The distribution of usage across the full year is unknown; therefore distribution examples from secondary sources have been employed to obtain an annual user estimate.

For the purpose of estimating annual trail user visits, the data from September 1 through September 30 and October 1 through October 31 were used to establish a base estimate.

The following table represents the estimate of the annual number of user visits based upon the average distribution of recreational facility users over a twelve month period.

Perkiomen Trail User Visit Projections 2008

	Average Distributio n of Trail Visitation*	Monthly Estimate of Perkiomen Trail Users
January	.03	11,934
February	.033	13,128
March	.065	25,858
April	.086	34,212
May	.104	41,373
June	.131	52,114
July	.145	57,683
August	.129	51,318
September	.095	37,792
October	.091	36,201
November	.055	21,880
December	.036	14,321
Total		397,814

* Average Distribution of Trail Visitation – The percentages represent the average monthly distribution of trail users from studies conducted on seven different parks and trails in the United States.