

Date: September 20, 2024

To: HHFT and VDC

From: Georges Jacquemart, PE, PP, FAICP
 Contact Information: g.jacquemart@bfjplanning.com

Subject: VDC Final Review of Visitation Growth for the HHFT Project

Introduction and General Conclusion

The purpose of this memorandum is to conclude the review of the future growth assumptions for the Hudson Highland State Park Preserve (HHSP) and more specifically for the Fjord Trail. The estimated number of new annual visitors attracted by the Fjord Trail to the Hudson Highlands area is 268,700. The annual visitation numbers were translated into design day and design hour numbers based on percentages available from comparable venues. The 2033 Design Day visitation for the Fjord Trail is projected to be 4,100 with 1,710 of these visitors representing incremental design day visitors. The 2033 Fjord Trail peak hour visitation is estimated at 732, or 347 incremental visitors.

Projected (2033) Fjord Trail Visitation by Component

Visitation component	<u>Low Estimate</u>	<u>Mid-range Estimate</u>	<u>High Estimate</u>
<u>New visitation</u>			
Visitation from increased visitation frequency	88,500	104,100	119,700
Visitation from new users (including Dutchess Manor)	<u>139,900</u>	<u>164,600</u>	<u>189,300</u>
Subtotal new visitation	228,400	268,700	309,000
<u>Other visitation</u>			
Shifted visitation from the adjacent attractions	27,100	31,900	36,700
Users of adjacent attractions that will also visit Fjord Trail ("crossover" visits)	93,900	110,500	127,100
Captured visitation	<u>192,000</u>	<u>225,900</u>	<u>259,800</u>
Subtotal "other" visitation	313,000	368,300	423,600
Total Fjord Trail Visitation	541,400	637,000	732,600

Projected (2033) Total Visitation to the Fjord Trail Corridor

	<u>Low Estimate</u>	<u>Mid-range Estimate</u>	<u>High Estimate</u>
No-development visitation	517,700	609,000	700,400
Fjord Trail new visitation	<u>228,400</u>	<u>268,700</u>	<u>309,000</u>
Total visitation to Hudson Highlands area	746,100	877,700	1,009,400

The main discussions centered on the determination of the most appropriate data of relevant and comparable parks or trails to project visitation growth of HHSP over the next 10 years. Figure 5 of ORCA's HHFT Visitation Projection Report was the main source of relevant growth data and was the focus of extensive VDC discussions. These discussions together with the review of additional data led to a data set yielding:

BFJ Planning

Page 2

- an average annual growth rate of 3.2% for the next 10 years.
- a revised mid-range annual projection that is 114,000 higher than the original ORCA projection in their original report dated March 6, 2024
- low-range and high-range projections that deviate by 15% from the mid-range projections.

Approach and Review of Visitation Projections

Four ORCA Visitation Projection Reports were submitted to the expanded VDC members together with detailed data tables showing key calculations. They were dated June 18, July 18, July 24 and August 21, 2024. Each of the later reports responded to the comments and questions that were raised on previous reports. Three meetings were held with the reconstituted VDC members for the visitation projections: June 25, July 23 and August 6, 2024. At the August 6, 2024 meeting ORCA addressed questions and comments that were submitted by BFJ and VDC members. The questions, comments and responses are summarized in detail in the log attached to this memorandum. The Final Revised ORCA Visitation Projection Report dated August 21, 2024 represents the final Growth Report for the Fjord Trail.

The HHFT reports by ORCA can be found at the following site: <https://hhft.org/about-the-fjord-trail/community/>

To project visitation figures for the HHSP and the Fjord Trail over the next 10 years ORCA focused on comparable parks and trails and their average growth rates over the last 6 to 10 years. There was a general agreement that the best period would be to use average growth rates from 2016 to 2023, a seven-year recent period that includes two significant COVID-affected years and five years that could be considered more regular. However, as the New York State visitation data for HHSP indicated a substantial growth of 51% from 2016 to 2017, it was agreed that it was prudent to exclude that increase for HHSP and to use the more recent growth rate starting in 2017. The other comparables included the Walkway over the Hudson, the Eastern US National Parks and the Taconic and Palisades Region State parks (excluding the HHSP and Walkway over the Hudson from the Taconic and Palisades data set).

The following table summarizes these data points. Previous versions of this table included other parks and trails and had one data point for the Taconic State Parks and a separate one for the Palisades State Parks. The committee members raised the question of the weight that should be given to the growth rate of the HHSP since that rate is higher than for the other comparables and is also specific to the Fjord Trail. By combining the growth rates for the Taconic State Parks and the Palisades State Parks into one data point the growth rate of the Hudson Highlands State Parks Preserve is in effect weighed as one fourth (25%) of the data points considered. A minority of the VDC members felt that the HHSP growth rate should get a higher weight.

BFJ Planning

Page 3

Park/Trail	Average annual growth 2016-2023
Eastern U.S. National Parks	3.30%
Taconic & Palisades Regions State Parks	2.40%
Hudson Highlands State Parks Preserve*	5.10%
Walkway Over the Hudson	<u>2.10%</u>
Average	3.20%
* for the years 2017 to 2023	

This analysis yielded an average growth rate of 3.2% per year for the next 10 years. It was also concluded that these growth projections would lead to the future mid-range visitation level for the HHSP and Fjord Trail and that the low-range and high-range variations from the mid-range would deviate by 15%. The VDC members questioned whether the 15% range was adequate for these projections given the numerous factors that influence the forecasts. Given that most transportation projections tend to fall into a variability range of 5%, the 15% variability seemed appropriate.

ORCA broke down the various visitation markets (visitors that are already going to the area today and shift to the Fjord trail, visitors making more frequent trips and new visitors making new trips to the area) and analyzed them based on past counts at some of the parks in the area. The growth factors applied to the demographic sub-markets were based on user survey results and were presented as assumptions for the year 2033 projections. The year 2033 was chosen as the year when visitation will have settled to a normal visitation level after the initial one- or two-year surge following the completion of the Fjord Trail.

Based on the August 21, 2024 ORCA report, the year 2033 No-Build Projection for the HHSP (without the Fjord Trail project) is 609,000 (mid-range projection). With the Fjord Trail the 2033 Visitation for HHSP increases to 877,700, a **visitation increase of 268,700 per year. The total annual visitation to the Fjord Trail itself is estimated at 637,000 in 2033 (mid-range visitation).** The visitation increment generated by the Fjord trail project is now 63,700 (31%) higher than in the first version of the ORCA report (March 6, 2024). The annual Fjord Trail visitation of 637,000 is now 114,000 higher (22%) than in the original projection report. More importantly, these new projection figures represent the 2033 mid-range projections, as compared to the original projection to the high range.

ORCA used annual-to-daily visitation factors based on detailed daily visitation data from the Susquehanna River Walk and Buffalo Valley Trail to translate the annual projections into Design Day projections. The design day visitation numbers were then factored to peak-hour data based on hourly arrival data available for the Breakneck Ridge Trail.

ORCA predicts a Design Day visitation of 4,100 for the Fjord Trail. Approximately 21 days per year are estimated to exceed the design-day level, with an estimated 7 of these days occurring in September. The average 2033 September weekend/holiday visitation is projected to be approximately 5,400. On a Peak Day (presumably foliage

BFJ Planning

Page 4

weekend in October) the visitation of the Fjord Trail is projected to be 6,300. This visitation level would be exceeded on two days in the year.

The incremental 2033 design day visitation to the Fjord Trail is projected to be 1,710 and for a peak day the incremental visitation is projected at 2,660. These estimated arrivals are broken down by transportation mode as follows: 74.5% by car, 19% by Metro North, 0.8% by bike and 5.7% walk or Seastreak. Based on ORCA visitation surveys 14% of the daily trips occur in the peak hour, except for the Metro North trips which experience a 47% peak-hour factor.

For the peak hour (10 am to 11 am) the total arrivals by transportation mode to the Fjord Trail are estimated as follows:

Total Fjord Trail Visitation		
Arrival Mode	Design Day Peak Hour	Peak Day Peak Hour
By private vehicle	337	517
By train	367	564
By bike	3	5
Walking	25	38
Total	732	1124

Note that the above numbers are the total number of persons traveling to the Fjord Trail (including existing trips being diverted to the trail and new trips being made as the result of the Fjord Trail Project). The new (incremental) trips to the Fjord Trail will be as follows:

Incremental Fjord Trail Visitation		
Arrival Mode	Design Day Peak Hour	Peak Day Peak Hour
By private vehicle	178	278
By train	153	238
By bike	2	3
Walking	14	21
Total	347	539

Please note that the above peak-hour person trips are for the mid-range projection. The upper-range projections will be 15% higher and the lower-range projections will be 15% lower. The Design Day peak hour trips shown above (347 person trips traveling in the Design Day peak hour) will be used in the DGEIS for the transportation impact analysis.

Hudson Highlands Fjord Trail
Visitation Data Committee
Visitation Projection Questions & Responses
7/31/2024 Rev. 02 - 8/19/24

					Designer of Record	
Item	Commenter	Date Recieved	Issuance Source	Review Comments / Questions	Response From	Resolution/ Response Comment
1	BFJ Planning	3/21/24	Memo	<p>Clarifications regarding the Geographic Areas Studied and some Visitation Data</p> <p>The narrative is sometimes difficult to follow as it relates to the Fjord Trail and then sometimes to the Hudson Highlands Parks and Trails, or the HH Parks Preserve or Hudson Highlands area or Trails and Parks within the Fjord Trail Corridor. It would help the reader if there was a more common terminology and a reference to a map that shows the various geographies referred to. The report should make clear whether the given visitation numbers include visitation or trend data for the adjacent tourist centers (Cold Spring, Beacon, Mt. Beacon) that consist of visitors to these areas that do not also visit the relevant parks or hike one of the studied trails. ORCA should clarify whether the visitation data by travel mode (figure 14) represent total 2033 visitation on the Fjord trail or the additional visitation generated by the Fjord Trail project. Are the numbers given in the "Private Vehicle" row the numbers of persons in vehicles or the number of vehicles?</p>	AtW Reviewed during 6/25/24 meeting	A terms section was added to the final Fjord Trail Use Projections dated 7/24/24.
2	BFJ Planning	3/21/24	Memo	<p>The use of Comparable Projects</p> <p>Are the projects listed in Figure 5 really comparable? Do they have direct train stops from a city with an 8M population? Are there any other comps from other parts in the US?</p>	AtW Reviewed during 6/25/24 meeting	Comparables were further discussed and reviewed during VDC meetings conducted on 6/25 and 7/23. See item number 8 below.
3	BFJ Planning	3/21/24	Memo	<p>Assumptions that seem arbitrary</p> <p>The statement on top of page 10 that total annual visitation in the Hudson Highlands area with the full Fjord trail build out is estimated to increase by 30% to 50% seems arbitrary and needs more justification or support. We agree that it is prudent to look at ranges of visitation numbers, but why 40% to 50%, and not 50% to 75%, for instance? Regarding new visits on page 12, how were these estimates arrived at? The 10% increase for those less than 55 years seems extremely low. It does not seem to include families or other new groups of visitors of 55 and under who may be enticed to come just for the local stroll and not for the more ambitious bike or hike tour.</p>	AtW Reviewed during 6/25/24 meeting	Expanded calculations were provided and reviewed with the committee during the 7/23 VDC committee meeting. Assumptions were modified to account for increased family visitation.

4	BFJ Planning	3/21/24	Memo	<p>Design Day and Other Peak Days Whereas it is reasonable to look at a high day for design purposes, the committee feels that it is important to also present the visitation data for peak days, especially in a case where the analyst uses ranges of projections with significant uncertainty. The visitation numbers in Figure 14 represent the numbers for a busy September weekend day under the mid-range estimate. What would these numbers look like under the high estimate for the peak October day?</p> <p>For the future No Build visitor projections ORCA uses an average growth rate from its comparables of 4.2%, after discarding the highest and lowest samples. Without the extreme exclusions the number would be 4.7%. What was the justification for using these adjusted averages for the high-end visitation projection for the study area? Shouldn't that be used for the mid-range projection?</p>	AtW Reviewed during 6/25/24 meeting	Design and Peak day adjustments included in the revised visitation summary dated 7/24/24. Annual growth percentage was updated per committee conversations on 6/25 and 7/23. See item 8 below.
5	BFJ Planning	3/21/24	Memo	<p>Base Data and Data Expansions - Baseline 2022-2023 estimate: For the current base line data provided by the trail stewards what did ORCA do to assess that the quality of those data? How are trail stewards trained to conduct counts? What are the time frames for these counts? Please describe in more detail the multi-variate regression analysis that was conducted to estimate weekday visitation projections. Did ORCA extrapolate from weekend/weekday ratios at the other 3 parks mentioned where it appears weekday data was available? What is the level of confidence. For the offseason period: please describe how estimates were produced from data at other parks. There is a mention in the report that Breakneck Ridge (BNR) trail was not open March through June of 2023. How was that fact reflected in the annual visitation data count? Was an "as if open" number extrapolated and added to the count or was it simply treated as part of the annual variability along with weather?</p>	AtW Reviewed during 6/25/24 meeting	ORCA relied on the accuracy of the trail stewards and did not question the numbers that were provided. Hikers are counted from 8 AM to 5 PM and the counts are recorded each hour. Regression analysis was conducted to determine the relationship between daily # of hikers and temperature and rainfall. Since there were very few weekday counts for Breakneck Ridge, weekday vs. weekend counts were extrapolated from the other comparables where more complete data were available. Level of confidence testing was not conducted. For the offseason period, visitation estimates were developed from regression analysis of visitation and temperature by month. To keep the 2023 hiker estimates consistent with the other years, the March through June period was evaluated as if the trail were open, i.e., visitation estimates were developed for this period and included in the annual visitation estimate.

6	BFJ Planning	3/21/24	Memo	<p>Base Data and Data Expansions - No build growth estimates to 2033:</p> <p>It is striking that ORCA shows visitation to the HHFT region decline in from 2016-2023 while all comparables (including data for Hudson Highlands State Parks Preserve showing steady growth). Did ORCA explore the possibility that this could be an error in its own estimates for the HHFT areas? Any exogenous variables that might be at play? For example, the report notes in footnote 4 that the visitation ratio estimated for the Washburn trail was a surprising 1.23 despite that BNR is the most popular site.</p> <p>Did ORCA consider that the Washburn trail and trailhead were substantially upgraded in recent years including (1) grading and laying gravel on the trail up to the old quarry, (2) increased signage, widening and reducing obstacles from the trail, the placement of stone steps and the addition of new scenic lookout locations on the Washburn trail up Mt. Taurus, (3) building a paved parking lot at the trail head with expanded parking, new plantings, signage, a trail stewards station and bathrooms and (4) improving the portion of the Cornish trail that parallels Route 9D from the Washburn trailhead and leads to the pavement trail to the ruins in order to mitigate muddy areas and reduce grades?</p>	AtW Reviewed during 6/25/24 meeting	<p>Updates were made to the Fjord Trail Use Projections dated 7/24/24 taking agency questions and comments made to previous reports and meeting held on 6/25/24 and 7/23/24.</p> <p>Washburn Trail visitation increases are accounted for under section "Data Gathered for other Hudson Highlands area locations"</p>
---	--------------	---------	------	--	-------------------------------------	---

				<p>Did ORCA consider that the data they are seeing may reflect a substitution effect with visitation migrating off BNR to Washburn during the 2021-2023 period? To the extent ORCA modeled over multiple years based on an assumption of consistent relationships between BNR visitation and visitation to other parks and trailheads, that may not be a good assumption. Note that Dockside Park has also recently been improved and the Ninham trail was also recently created and opened as an alternative to the BNR climb to the first summit. The report shows that the annual visitation increase rate at the Hudson Highlands State Parks Preserve during the 2016-2023 period was actually quite high (7.6%). Isn't there a strong overlap between that area and the area studied? What does ORCA know about that data and how does it explain the discrepancy? It appear that ORCA at least in part used survey data about visitor origins to the HHFT trailheads and census information for the locations identified in part to come up with its growth range estimates. Please discuss the basis for that methodology vs. modeling more directly off of the comparables. The committee has the survey data with the zip codes but not the place names and summary statistics for those place names. Can ORCA provide those?</p>		
7	BFJ Planning	3/21/24	Memo	<p>Base Data and Data Expansions - Estimates of Impact of building the trail:</p> <p>The new visits estimate (for people who do not currently visit) seems based on very little underlying data and there are no formal efforts to extrapolate from comparables described in the report. Did Orca look at comparable project for their build years or other gravity models for new attractions to generate those? If not, why not? New York State parks data, for example, shows several new parks that have been built in recent years and the visitation they generated. Presumably, other NE states and other states with Parks in similarly situated geographies also have such data. To what extent, if any, did the preferred design (e.g., location, amenities, parking lots, social media campaigns) of the HHFT affect the visitation estimates? Figures 11, 13 and 14 appear to show visitation projections for the HHFT trail specifically, but not for the Hudson Highlands area (including the other parks and trail heads) including the impact of the build scenario. For clarity and to inform local stakeholders who care about regional visitation as well as HHFT usage, the projected numbers for the region assuming the build should be provided.</p>	AtW Reviewed during 6/25/24 meeting	Updates were made to the Fjord Trail Use Projections dated 7/24/24 taking committee questions and comments made to previous reports and meetings held on 6/25/24 and 7/23/24.

8	BFJ Planning	5/8/24	Email	Based on the New York State visitation data for all NYS parks between 2003 and 2023 (file attached) the 2016 to 2023 average exponential growth for Hudson Highlands is not 7.6% but 10.7%. In fact it has been an average of 10% over the last 20 years.	AtW Reviewed during 6/25/24 meeting	Expanded calculations were provided and reviewed with the committee on 6/25/24 and 7/23/24. The committee agreed to the following: -Annual Comparable park visitation to include visitation from 2016-2023 with the exception of Hudson Highlands State Parks Preserve (HHSPP). The committee agreed to exclude HHSPP visitation from 2016-2017 due to a change in OPRHP data collection methodology and 51% visitor increase. -Taconic and Palisades State Park Data to be used as comparables in lieu of all 216 New York State Parks. Per 7/23 meeting, Palisades and Taconic data to be averaged in order to provide greater weight on HHSPP visitation growth -Existing visitation (no-build projection) based on comparables to be included as the mid-range projection The Fjord Trail Use Projections dated 7/24/24 and BFJ majority consensus memo took the above parameters into account.
9	BFJ Planning	5/8/24	Email	If we do the same calculation as ORCA did based on Table 5 eliminating the outliers we get an average growth rate of 5.2% instead of 4.2%. (it appears that the 1.0% average annual growth rate listed for Walkway Over the Hudson is also incorrect, and should be 2.1% per the NYS Parks data, but I have not had time to verify this- that may increase the 5.2% number further).		
10	BFJ Planning	5/8/24	Email	If we apply the 5.2% to the 433200 over 10 years we get a 2033 projection of 719,194 ($433,200 * 1.052^{10}$) instead of 623,000		
11	BFJ Planning	5/8/24	Email	The growth that ORCA applied for the high growth scenario is not 4.2% but 3.7%		
12	BFJ Planning	5/8/24	Email	And given the prevalence of the Hudson Highlands data for this application, we believe that the Hudson Highlands growth should get greater weight in that calculation and that the 5.2% growth assumption calculated above (and possibly corrected for the Walkway over the Hudson) should be used for the mid growth projection not the high growth projection.		
13	Chris Winward	7/23/2024 (Sent before 7/23 VDC meeting)	Email	New Report released - July 2024, State Comptroller's Report - "Welcome Back New York" Interesting facts included about NYS Parks and Hudson Valley State Parks attendance: - NYS park attendance in the Hudson Valley region increased by 1.2 million visits from 2019-2023. And it is the second most popular region to visit after Long Island. - NYS Park attendance grew by 9.1%, or 7 million since 2020. - Bear Mountain Park saw 2.2 million visitors in 2023. Report p. 6-8 - NYS Park Attendance https://www.osc.ny.gov/files/reports/pdf/welcome-back-to-ny-an-analysis-of-post-pandemic-travel.pdf	AtW, reviewed during 7/23 meeting	Report and comments were provided for interest/record

14	Chris Winward	7/23/2024 (Sent before 7/23 VDC meeting)	Email	<p>Figure 5 comparables:</p> <ul style="list-style-type: none"> - This may have been covered last time, but why did the Eastern U.S. National Parks go from 4.0% in the previous report to 3.3% now? - Why are only 12 of the 32 Palisades sites used in the Palisades regional park rate? Which are used? It looks like all 23 of the Taconic Region sites are used (the 23 Taconic sites include Parks, Historic Sites and golf courses), so why different for Palisades? What is the rate including all 32 parks? <p>List of Palisades parks sites: https://parks.ny.gov/regions/palisades/default.aspx</p> <ul style="list-style-type: none"> - Is it ok to use the data of the former comparables to extrapolate the full year visitation projections of the Fjord Trail if we are changing the annual rate increase dependent on the new comparables? It may be, just asking. 	ORCA, reviewed during 7/23 meeting	<p>The previous 4.0% rate was based on 2016 to 2022. To make the analysis consistent between the comparables, the 2023 visitation was added for the update, which reduced the growth rate to 3.3%.</p> <p>The number of sites for Palisades and Taconic parks were mistakenly inverted. 12 Taconic sites were used and 23 Palisades sites. All historic sites were excluded, as these are less applicable to Fjord Trail (and these generally showed a lower growth rate), along with sites where data was missing for some of the years.</p>
15	Chris Winward	7/23/2024 (Sent before 7/23 VDC meeting)	Email	P. figure 14 re: Travel Mode - How many people per vehicle is the estimated 2980 based on? What is the estimated # of vehicles?	ORCA, reviewed during 7/23 meeting	Based on the results of the 2023 visitor survey, the average group size for visitors in private vehicles was 2.35. So the equivalent # of vehicles is 1,268.
16	Chris Winward	7/23/2024 (Sent before 7/23 VDC meeting)	Email	Cyclists - p. 12 of report says 400 visitors are expected to cycle on a design day and 620 cyclists are expected on a peak day. However, figure 14 shows only 30 expected by bike on a design day. Does that need updating to 400? Does that change other tables, ie. figure 13, others?	ORCA, reviewed during 7/23 meeting	<p>Figure 14 is based on the results of the 2023 visitor survey. Orca did not assume the percentage arriving by bike would increase, as these are the extreme bicycling enthusiasts. The increase in cycling activity is attributable to those who bring either bring their bikes with them in their vehicles and those who rent bikes when they arrive, assuming that bike rental facilities will develop to meet this expected demand.</p> <p>A biking specific section has been added to the Visitation Projection Summary.</p>

17	Zack Smith	7/23/2024 (Sent post 7/23 VDC meeting)	Email	General summary of regression analysis	ORCA via email 7/30	<p>We initially looked at several alternative regression approaches, including regression of all years combined, years grouped by similar visitation levels, and weekly visitation vs. temperature; but we achieved the highest correlations by analyzing daily visitation for each year, separated into Summer (May through August) and Fall (September through October). Visual inspection of the scatterplots with the linear regression line superimposed suggested that the relationships had a linear trend within the typical range of temperatures, so we saw little value in exploring non-linear curve fitting equations, as the correlations would not improve appreciably. Recognizing that the sample sizes for each year at Breakneck were smaller than desirable (between 51 and 64 per year), we developed a composite regression equation for all years combined, adjusting for year-to-year attendance differences by changing the x-intercept – I think this approach improved the correlation, but did not specifically quantify the improvement in R2. The alternate approach would be to use different equations for each year, but I reasoned that the relationship of visitation to temperature is a similar trend from year to year.</p> <p>What would the result be of using a non-linear regression equation? The R2 values would improve a bit. Estimated visitation for individual days would change slightly – some would increase, and others would decrease; but the estimated annual totals for the Memorial Day weekend through October would stay about the same – I venture to guess that the annual totals may change by +/-2%</p>
----	------------	--	-------	--	------------------------	---

18	Zack Smith	7/23/2024 (Sent post 7/23 VDC meeting)	Email	Can we get a high level summary of the regression? Ex: "we are trying to quantify visitation growth as a function of temperature and rainfall"	ORCA via email 7/30	<p>There were actually two sets of regression analyses conducted, with some subsets based on the objective of maximizing the correlation factors: (1) regressions of weekend day visitation vs. weather for Breakneck Trail (used as the basis for projecting daily Breakneck visitation for the Memorial Day to end of October period), and (2) regressions of weekly visitation vs. weather conditions for the comparable venues (Buffalo Valley Trail, Walkway Over the Hudson, Susquehanna River Valley, and Sams Point) – used as the basis for projecting Breakneck Trail visitation for the November to Memorial Day period. The covariates used were (1) average “feels like” temperature (Fahrenheit) between 7 and 4 PM, and (2) total rainfall (inches) from 7 AM to 4 PM, obtained from the weather station in Fishkill, NY. The “feels like” temperature is calculated by the weather service that we used (Visual Crossing), based on the temperature and heat index. Initially we had looked at correlations of visitation to maximum temperature, average temperature, and total daily rainfall, but achieved higher correlations using the average temperature and total rainfall for the 7 AM to 4 PM period. We did not investigate correlations for any other time periods, but reasoned that hikers’ decision to visit is most affected by weather for the 7 AM to 4 PM period.</p> <p>Breakneck visitation regression. Initially, we conducted linear regressions of visitation vs. temperature for all years combined, but this resulted in very low correlations, likely due to the variation in visitor demand level from year to year, so we then conducted regressions for each individual year and season (Memorial Day weekend through August and September through November), which resulted in increased r2 values.</p>
19	Zack Smith	7/23/2024 (Sent post 7/23 VDC meeting)	Email	Can we get a high level summary of the covariates used and how they were coded? Ex: "We used temperature, represented linearly in degrees, we also used rainfall figures bucketized in low-medium-high"	ORCA via email 7/30	We used the average temperature (Fahrenheit) from 7 AM to 4 PM and total rainfall from 7 AM to 4 PM for each weekend day during which hiker counts were available. These were arranged in a dataset used as the basis for the regressions.

20	Zack Smith	7/23/2024 (Sent post 7/23 VDC meeting)	Email	Can we get a summary statistics table for the regression we ultimately used to make our projection? I'd like to see R2, adjusted R2, and the ANOVA value	ORCA via email 7/30	Initially we did test a multiple regression analysis using temperature and rainfall as the independent variables, but this resulted in unreliable results – I believe the reason for this is that rainfall is not actually a continuous variable, but rather a combination of binary (rain or no rain) and continuous (amount of rainfall), so linear regression for two independent variables is not applicable here, as it does not account for the binary characteristic of rainfall. As a result, we opted for a two-step process: (1) regressions on visitation (dependent variable) vs temperature (independent variable); then regressions on the residual visitation variance (i.e., actual visitation minus projected visitation based on temperature) vs. rainfall for the days during which rainfall occurred. Thus, the adjusted R2 is not relevant as we did not use the standard model for multivariate regression. We did not conduct ANOVA testing.
21	Zack Smith	7/23/2024 (Sent post 7/23 VDC meeting)	Email	Can we get similar coefficients and p-values for the covariates?	ORCA via email 7/30	We did not conduct any hypothesis testing, so these are not available at this time.
22	Chris Winward	7/30/2024 (Sent before 7/30 VDC meeting)	Email	<p>Some questions based on information available for Breakneck and Washburn trail usage from 2020-2022 from May-Oct. Please see attached spreadsheet. [Data available from HHFT 11/22/22 presentation pdf p. 21: https://hhft.org/wp-content/uploads/2023/01/HHFT-11.20.22-Summary_Findings-02-opt.pdf]</p> <p>“Based on the above annual projections, ORCA predicts a design-day visitation of 4,100 for the Fjord Trail. Approximately 21 days per year will exceed the design-day level, with 7 of these days occurring in September. The average 2033 September weekend/holiday visitation is projected to be approximately 5,400. On a peak foliage day (presumably in October) the visitation of the Fjord Trail is projected to be 6,300.”</p> <p>1) In 2022, a better weather year, versus 2023 which was mostly rainy on peak weekend days, the average # of hikers per weekend day to Breakneck and Washburn was near or over 1,000 hikers per day in the months of June, July, Sept, and Oct for a total of 36 peak days. Can you please explain how you've developed the 21 days which exceed the design day? What criteria is a “design day” and a “peak day” based on?</p>	ORCA via email 7/31	The Design Day is defined as the visitation level at which 15% of the annual visitation occurs on days with visitation at or above the Design Day. It represents a very high, but not peak day, useful for design and planning purposes. Based on the expected visitation seasonality and day of week patterns for Fjord Trail, 15% of the annual visitation will occur on days with visitation at or above the Design Day. The peak day is calculated as the average of the 2nd and 3rd highest visitation days of the year (the highest day is not used, as it tends to vary considerably).

23	Chris Winward	7/30/2024 (Sent before 7/30 VDC meeting)	Email	2) If based on 2023, shouldn't 2022 be used instead since 2023 was an anomaly with bad weather?	ORCA via email 7/31	Our analysis indicates similar visitation levels for 2022 and 2023. Initially, we had used the average of 2022 and 2023 as the basis, but shifted to 2023 to simplify the analysis, considering that the two years were similar. The hiker estimates for Memorial Day through October were higher for 2022 than 2023, but the estimated for November through Memorial Day were higher for 2023 than 2022 due to warmer temperatures experienced during that period in 2023 - 3 degrees F warmer than for the same period in 2022.
24	Chris Winward	7/30/2024 (Sent before 7/30 VDC meeting)	Email	3) Could those "design day" and "peak day" definitions please be explained more clearly in the ORCA report? Is Design day and Peak day synonymous with Mid-range and High-range, respectively? Or when you are talking about peak, is that still using mid-range projections?	ORCA via email 7/31	Design Day and Peak Day are independent of the visitation scenario. They represent consistent factors that are used for planning and design purposes. Typically, recreational venues should be designed to provide a comfortable visitor experience on the Design Day, and to also accommodate the Peak Day with the potential implementation of visitation management tools.
25	Chris Winward	7/30/2024 (Sent before 7/30 VDC meeting)	Email	4) RE: Daily Projections: Are the Fjord Trail daily projections of 5400 on a design day and 6,300 on a peak day, in addition to the projected no-development visitation numbers like in figure 7? Could a table please be included to show the total daily visitors including no-development and with the FT so we can have a clear picture of the total number of people coming to the area on a given day? I think this is incredibly important for planning and managing daily visitors.	ORCA via email 7/31	Yes, that can be developed and added to the summary.
26	BFJ Planning	7/31/24	Email	Can ORCA address the statistical questions raised by Zack in the 7/23 email and explain their significance in regards to the key results (total future visitation for the Fjord Trail and the new future visitation?)	ORCA via email 8/5	See responses above.
27	BFJ Planning	7/31/24	Email	Can ORCA address the question raised by Chris regarding the growth rates being calculated to the year 2023 vs 2022?	ORCA via email 8/5	ORCA's analysis indicated slightly lower hiker counts for 2022 than 2023. Although hiker counts were lower for the Memorial Day to October period for 2023 vs. 2022, this was offset by ORCA's estimate of higher visitation for the January to Memorial Day and November/December periods for 2023 - this higher estimate was due to the warmer temperatures in 2023 vs 2022 (average of 3 degrees F warmer) and regression analysis of the comparable venues that showed that visitation is directly related to the temperature for these periods.

28	BFJ Planning	7/31/24	Email	Can ORCA address the question raised by Chris regarding the growth rates being calculated to the year 2023 vs 2022?	ORCA via email 8/5	The Design Day is a daily visitation level developed for planning purposes to ensure adequate design and sizing of the visitor related components of a recreational venue. By planning for a comfortable visitor experience on the Design Day, only 15% of the annual visitation is exposed to conditions that are more crowded than those on the Design Day. For Fjord Trail, this corresponds to about 21 days per year. Yes, the 4,100 represents the Design Day for the mid-range projection. Since September is a busy month for Fjord Trail, it is estimated that there are 8 days that exceed the Design Day visitation level, so the average September weekend day is higher than the Design Day. However, there are three weekend days in September that are very close to the Design Day level.
29	BFJ Planning	7/31/24	Email	The daily and peak hour visitation numbers shown in Figures 13 and 14 represent total 2033 visitation for the Fjord Trail. Should we also obtain the daily and peak-hour visitation numbers for the new (incremental) visitation (268,700)?	ORCA via email 8/5	Design Day for new visitation = 1,710. Peak hour for new visitation = 347.
30	BFJ Planning	7/31/24	Email	How do these two numbers (total visitation and new visitation) affect pedestrian flows along the key streets in Cold Spring, and vehicular flows along Main Street, Fair Street and Route 9D, and parking along key locations?	ORCA via email 8/5	Since there will be a significant expansion of parking for Fjord Trail and the adjacent parks and trails, and a shuttle system will be implemented to transport Fjord Trail visitors, the impact on pedestrian flows in Cold Spring and vehicular flows along Main Street will be significantly improved over the no-development alternative. Also, the addition of the Fjord Trail entrance at Dockside Park will provide an alternative access point for Little Stony Point and Washburn Trail users, so there will be a further reduction in crowd levels on Main Street east of the Tunnel.
31	Chris Winward	7/31/24	Email	Figure #s are off on Page 14 – should be figures 14 and 15.	ORCA via email 8/5	Corrections to be made in an updated report.
32	Chris Winward	7/31/24	Email	The report and BFJ memo say the design-day peak hour is 10-11 AM. Page 5 of the report says peak arrival is 11-12 PM. Which is correct? Which hour is page 14 figure 13 based on (should be figure 14)?	ORCA via email 8/5	The peak arrival hour can vary from day to day, but 10 to 11 AM is the most frequent period. The peak hour in the tables is based on 10 – 11 AM.
33	Chris Winward	7/31/24	Email	Can you please explain the changes and non-changes on Page 14's figures 13 and 14 from last version to this version? Many of the numbers have changed, but not all.	ORCA via email 8/5	All of the figures increased by about 2% in these two figures as a result of the revised annual visitation increase from 3.0% to 3.2% annually.
34	Chris Winward	7/31/24	Email	I appreciate the addition of figure 7 on page 9 very much, though I think the section may be better placed at the very end as a summary of the overall expected growth though. It was hard to follow the numbers unless you go to figure 13 on page 13 later in the report.	ORCA via email 8/5	Report updated moves the overall expected growth discussion to the end of the summary, as suggested.

35	Sarah Mencher	8/6/24	Email	Correct the capitalization of "Review" in the subheading "Review of Breakneck Ridge Trends"	ORCA projection revision dated 8/16	Projection summary updated accordingly.
36	Sarah Mencher	8/6/24	Email	add a footnote about the "source counties and states" in the low-end estimate paragraph	ORCA projection revision dated 8/16	Projection summary updated accordingly.
37	Sarah Mencher	8/6/24	Email	correct the Figure number reference under "Trip Add-On And Shifted Visits" (should reference Figure 9)	ORCA projection revision dated 8/16	Projection summary updated accordingly.
38	Sarah Mencher	8/6/24	Email	update Figure number references at end of section about Visitors using bicycles	ORCA projection revision dated 8/16	Projection summary updated accordingly.
39	Sarah Mencher	8/6/24	Email	for this Figure (Fjord Trail Visitation by component) I suggest improving clarity by labeling <i>Subtotal</i> new visitation and <i>Subtotal</i> "other" visitation, which, added together, will equal Total Fjord Trail Visitation. I also suggest adding a column that indicates which prior Figure in the report the reader can reference for more detail about how the numbers were calculated. Pages 16-18: ensure all Figure numbers are updated. There are 16 Figures total in the report.	ORCA projection revision dated 8/16	Projection summary updated accordingly.
40	Sarah Mencher	8/6/24	Email	as others have mentioned, please confirm whether Peak Hour is 10-11am, or 11am-12noon?	ORCA projection revision dated 8/16	See item 32 above.
41	Sarah Mencher	8/6/24	Email	in the discussion of Visitation by travel mode, should we include a note about visitor arrivals in the Village of Cold Spring via Seastreak?	ORCA projection revision dated 8/16	Projection summary updated accordingly.