

GRAND VALLEY PUBLIC TRAIL SYSTEMS
SOCIO-ECONOMIC STUDY
MESA COUNTY, COLORADO

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Produced by the Natural Resource Center at Colorado Mesa University

The Natural Resource Center is part of the Redifer Research Institute at CMU. The Natural Resource Center consortium of researchers that focuses on studying recreation issues associated with public lands managed by the Bureau of Land Management and other federal and state agencies. Dr. T. Timothy Casey, Colorado Mesa University, is the Director of the Center and the Principal Investigator and lead for part 3: Trail User Interaction and Preferences. Dr. Nathan Perry, Colorado Mesa University, is project CO-PI and lead on Part 1: The Economic Impact of Trails. He also led the data collection phase, and organized and managed the data and report. Cory Castaneda, Economist, is a CO-investigator and led the research on Part 2: Estimating Values for Trail Systems in Western Colorado.

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EXECUTIVE SUMMARY

Economic Impact

- This report evaluates the economic impact, willingness to pay, and user satisfaction of visitors in Mesa County for Bureau of Land Management trails, specifically the Kokopelli, 18 Road, and Lunch Loops trail systems. Results are based on intercept surveys given onsite at these trail locations.
- The economic impact of trail users on Gross Regional Product (GRP) is \$14,586,336. The contribution to GRP represents the value of final goods and services, and is the proportion of total output that is paid to businesses and other entities in the form of employee compensation, proprietor income, taxes on production, and profits. GRP is the local equivalent of the Gross Domestic Product (GDP). This number adjusts for leakages, supply chain effects, and multiplier effects. For comparison purposes, local Gross Regional Product is \$5,429,000,000.¹
- Visitor spending creates 345 jobs (part-time or full-time) in Mesa County through a combination of direct spending, supply chain effects, and multiplier effects.
- Total labor income (wages paid to workers) as a result of visiting trail user spending is \$9,004,913.

Willingness to Pay

- Two different models are used to determine willingness to pay: A stated preference contingent valuation model and a revealed preference travel cost model.
- The stated preference model reveals what people are willing to pay to use the trail for a day. The question was anchored to what the authors thought were realistic entrance fees for a trail (\$1-\$9, although they had the opportunity to state a higher number). The estimated willingness to pay for day trail use is \$7.02 for the three trails.
- The travel cost model takes into account all the costs to travel (transportation costs) to the trail destination and measures their willingness to pay by estimating the total cost of their trip. The travel cost model willingness to pay is \$174.50 per year.
- If the travel cost model only takes into account locals, the estimated consumer surplus for respondents who originated in Mesa County was \$241.90. This is expected as people who

¹ Gross Regional Product data from the Bureau of Economic Analysis, Grand Junction Metro Area (2015 prices).

live closer to the trails will gain more benefits from their use. Although their travel cost is lower, the frequency at which they visit the trails is higher, leading to a higher willingness to pay.

- Using the stated preference model willingness to pay number of \$7.02, the total value of the trail would be \$1,391,792.22. It is well known that state preference models do not account for all of the factors involved by which a person would be willing to pay (such as travel cost). This amount should be seen as the value that a hypothetical entrance fee would bring.
- A more accurate model of the trails total value is the travel cost model. Multiplying total trail users by the revealed preference willingness to pay amount of \$174.50 shows a value of the three trails systems of \$34,596,544.50.

Trail User Interaction and Preferences

- In general, visitors to each of the trail systems are satisfied with the 18 amenities and trail characteristics surveyed. This satisfaction is evidenced by the largest support for the “leave as is” option on 17 of the 18 characteristics. The only characteristic that these visitors wanted “more of” is bike trails. These results are consistent between Mesa County residents and visitors from outside of the county.
- There were some differences between the trails on certain characteristics such as evidence of use and dedicated trails; there is stronger support to decrease evidence of use and dedicated trails at 18 Road, for example.
- There is a slightly stronger interest in additional directional signs at Lunch Loops, and stronger support for additional marketing focus regarding the Kokopelli trail.
- The Kokopelli trail system has the highest satisfaction rating on most of these characteristics except vendors.
- Other signs of satisfaction include every variable rated as above 3 on a 5 point satisfaction scale. Individual trails showed some difference on the intensity of this satisfaction, which might suggest further scrutiny in determining how the management might be more responsive to public demands in particular locations.
- In general, most visitors did not see crowding as an issue on the trail systems at this time. Non-Mesa County visitors perceived slightly more crowding than Mesa County visitors did.

PURPOSE OF THE REPORT

The purpose of this report is to determine the economic impact of visitors to three important Bureau of Land Management trails systems located in Mesa County, Colorado: Kokopelli trail, 18 Road trail, and Lunch Loops trail. This study uses onsite survey data administered from late April to early June 2017 to determine expenditures from non-Mesa County residents inside of Mesa County during their visit. These expenditures are then extrapolated on a per-person basis to the Bureau of Land Management's estimation of total users from the three trails, providing an estimate of the total economic impact of trail users visiting the three trails.

Introduction

Trails provide several benefits to a community by improving the physical and mental health of the community as well as adding indirect value through property values and positive economic impact through recreation tourism spending. Previous literature illustrates that recreation tourists, including trail users such as mountain bikers and hikers, spend a considerable amount of money on their trips to areas with trails.

The 2016 Grand Junction Visitor Satisfaction and Loyalty Research Report provides data on what the average visitor spends in Grand Junction on the average trip. Guest Research Inc. (2016) found the following regarding visitors to Grand Junction:

“25% of overnight visitors spent \$101-\$200 on lodging during their visit, while 16% of overnight visitors spent \$51-\$100 and 15% spent \$201-\$300.

26% of all Grand Junction visitors reported spending \$51-\$100 on food expenses during their visit, followed by 21% spending \$101-\$200 and 18% spending \$25-\$50.

For all other expenses, 20% of all respondents reported spending \$101-\$200, while 18% reported \$51-\$100 and 17% reporting \$25-\$50. (Summary numbers directly from Guest Research, Inc., 2016).”

These spending numbers aggregated over thousands of people provides a considerable impact. For the subsequent study on Kokopelli, Lunch Loop, and 18 Road trails, a sample of trail users is used to estimate the average spending of tourists visiting trails in Mesa County.

Since public lands and the associated trails are generally free, it is difficult to place a monetary value on these public goods. That is why economists and social scientists attempt to determine the intangible and indirect values of public goods as a way of understanding the value of goods that don't have a price.

One of the ways to indirectly value public lands and trails is to estimate the value that proximity to these amenities brings to home values. People are willing to pay to live close to trails, which increases home values in various communities. Perry, Castaneda, Parece, and Casey (2017) find that homes within close proximity to natural amenities have a higher value than other homes, controlling for important characteristics of the home. Living within 250 meters increases home values by 4.54%, while living within 500 meters of a trail increases home values by 3.26%. For the average home value of approximately \$210,000, this equates to approximately \$9,534 and \$6,846, respectively. In addition to this, proximity to BLM land as well as proximity to the Colorado National Monument also increase home values. Living within 250 meters of the Colorado National Monument increase home values by 12.90%, while living within 500 meters increases home values by 9.93%. There are similar results for living close to BLM land, with living within 500 meters of BLM land increasing home values by 9.97%.

Summit Economics (2016) reported that in their interviews, almost every person cited outdoor recreation as an important part of the Mesa County travel industry (Summit Economics, pg. 22). Northstar (2015) cites the Grand Valley natural geography as a "rare asset" (Northstar, pg. 29). These "assets" directly translate to economic impact through visitor spending.

The studies performed in this report attempt to add to this discussion by addressing three questions:

- 1) What is the economic impact of Lunch Loops, Kokopelli, and 18 Road trail tourist spending?
- 2) What are people willing to pay to use these trails systems?
- 3) What are the opinions of trails users regarding facilities, interactions, and experience?

The second question is an attempt to provide an intangible value to a public good that does not have a private market value due to the lack of fee charged for entrance to public lands. The report is divided into three distinct sections that attempt to answer these three questions individually.

PART 1: THE ECONOMIC IMPACT OF TRAILS

Survey Data Analysis: Trail Visitor Information

One survey was used for all three parts of this study. The surveys were administered from the last week in April, to the first week in June, for a total of 6 weeks. 340 people responded to intercept surveys on three different trails: Kokopelli trail, 18 Road trail and Lunch Loops. Respondents were given a choice at each trail to fill out an in-person survey, where a Colorado Mesa University student administered the survey and wrote down answers. The respondent could also opt to take a card home with a distinctive number code and complete the survey online. The survey is listed in Appendix D. Table 1 illustrates the percentages of people responding to the survey inside and outside of Mesa County. 68.5% of respondents were from outside of the County, whereas 31.5% were from inside of the County. This is important because for economic impact, only spending numbers from outside of the County are counted.

TABLE 1: TRAIL VISITOR DEMOGRAPHIC INFORMATION

	TOTAL	PERCENTAGE
Outside Mesa County	233	68.5%
Inside Mesa County	107	31.5%

Table 2 lists questions regarding length of stay and the responses for non-Mesa County residents. The average length of stay for trail recreation visits is 3.56 days. Of the 3.56 days, 2.58 of them were spent on trails. Group sizes average 4.23, and many of these people have been visiting trails in Mesa County for an average of 7.67 years. Many who use these trails are frequent repeat users, having visited 4.10 times in the last year.

TABLE 2: LENGTH OF STAY

How many days in Mesa County?	3.56
How many days did you spend on the BLM trails in Mesa County?	2.58
How many nights did you stay in Mesa County?	2.45
How many people (including yourself) were in your group during your visit to BLM recreation sites?	4.23
How many years have you been visiting the BLM Trails in Mesa County?	7.67
How many times have you visited this trailhead or similar trailheads in Mesa County in the last year?	4.10

Table 3 illustrates the primary activities that survey respondents participated in. Biking and mountain biking were almost 97% of the responses. This particular question was open-ended, so there is not specific distinction between biking and mountain biking other than what the survey respondent chose to call their activity.

TABLE 3: PRIMARY ACTIVITIES

Mountain biking	26	11.61%
Biking	191	85.27%
Running	4	1.79%
Festival	1	0.45%
JUCO Baseball Tournament	1	0.45%
Wine Country	1	0.45%

Table 4 illustrates the percentage of males vs. females. Males were the vast majority of survey respondents (72.56%). Note that this number contrasts with the Guest Research (2016) report that shows that 58% of total visitors to Grand Junction are females, and 42% are males. This is likely because this study surveyed just trailheads which may have more male visitors, as opposed to Guest Research (2016) which collects data for all Grand Junction visitations.

The average age of respondents was 32.36 years old. The general population of survey respondents were college educated, with 56.22% having a 4 year degree, and 26.27% having a professional degree. Only 2.76% of respondents did not have at least some college education (see table 5).

Table 6 illustrates the income levels of the respondents.

TABLE 4: GENDER

Male	156	72.56%
Female	59	27.44%

TABLE 5: EDUCATION

Less than high school	1	0.46%
High school graduate	5	2.30%
Some college	13	5.99%
2 year degree	3	1.38%
4 year degree	122	56.22%
Professional degree	57	26.27%
Doctorate	16	7.37%

TABLE 6: INCOME

Less than \$25,000	15	7.14%
\$25,000 - \$50,000	22	10.48%
\$50,000 - \$75,000	27	12.86%
\$75,000 - \$100,000	32	15.24%
\$100,000 - \$125,000	40	19.05%
\$125,000 - \$149,999	26	12.38%
More than \$150,000	48	22.86%

TABLE 7: HOUSEHOLD QUESTIONS

How many people are in your household (including yourself)?	2.62
How many in your household are working adults (employed for wages)?	1.73

In addition to this demographic information, respondents were asked to report their spending inside of Mesa County for their family group on the trip. The average family group size for survey respondents was 2.62. Respondents listed lodging, gasoline, transportation, shopping and gifts, entertainment, food meals and drinks, groceries, tourist services, and other categories that allowed specific spending categories to be aggregated and input into IMPLAN. Expenditure numbers were estimates based on the total trip inside of Mesa County.

Table 9 illustrates average spending per family group, as well as total spending estimates for all BLM trail visitors. The BLM estimates that between Kokopelli trail, Lunch Loops, and 18 Road trails,

198,261 people use these three trails every year (table 8).² Average spending numbers for visitors to Mesa County trailheads are adjusted for family size to calculate the average spending. This is then adjusted to reflect the finding that 68.5% of people who use these trails are from outside of Mesa County. This approximation is made using a sample of 235, which provides 95% confidence with a confidence interval of plus/minus 6.39%

TABLE 8: BLM TRAIL USE ESTIMATES

TRAIL	COUNT
Kokopelli	54,586
Lunch Loops	86,147
18 Road	57,528
Total	198,261

TABLE 9: AVERAGE SPENDING INSIDE MESA COUNTY PER FAMILY GROUP

	AVERAGES	OUT OF TOWN TOTALS
Lodging	\$133.46	\$6,971,353
Gasoline	\$60.43	\$3,156,691
Other Transportation (repairs, parking, etc)	\$7.06	\$369,225.9
Shopping and Gifts (clothing, sporting goods, souvenirs, etc.)	\$36.06	\$1,884,016
Entertainment	\$9.65	\$504,182.8
Food, meals, and drink (purchased at restaurants, bars, etc.)	\$111.40	\$5,819,108
Groceries (purchased at supermarket/convenience store)	\$46.92	\$2,451,239
Tourist Services (Jeep tours, boat rentals, bike rentals, outfitters, etc.)	\$10.92	\$570,540.4
Other	\$21.30	\$1,113,058
Total	\$437.25	\$22,839,415

² Note that trail use estimates are from the BLM and reflect the dates 5/1/16 – 4/30/17.

Economic Impact Results

This report uses an economic impact modeling program called IMPLAN to calculate the economic impact of visitor trail user spending on the Mesa County economy. IMPLAN refers to IMPact analysis for PLANning, and uses industry sales, income, and employment data for each sector of Mesa County along with national input output matrices to create a model of the economy. IMPLAN's input output model of the economy tracks trade flows and estimates industry multipliers for regional economies. Only non-Mesa County residents are counted in economic impact, because in economic impact the idea is to estimate the new money into the county due to the event (trails). Counting locals in economic impact is bad practice because it is assumed that if these trails did not exist these local residents would spend their money on something else inside of Mesa County. This is a typical assumption for economic impact reports.

Total expenditures inside of Mesa County by visitors to BLM trails totaled \$22,839,415, but this is not the total economic impact of visitor spending. To calculate the total economic impact, these spending numbers need to be adjusted for leakages from the local economy, adjusted for supply chain effects, and adjusted for multiplier effects.

Leakages are important because not every dollar that is spent in a local region stays in a local region. For instance, local non-profit organizations reported spending a lot of money on office supplies. Many gas stations are not local companies, and they buy their gasoline from refineries outside of the County. Hence only a certain percentage of the money spent on gasoline ends up having a legitimate impact on the local economy. Because Mesa County is fairly isolated from other large economic areas, there is a higher likelihood of leakages since many of the goods and services purchased come from distant metropolitan areas.

IMPLAN also calculates supply chain effects for each spending category and industry. Supply chain effects are the effects of local direct spending on suppliers down the chain. For instance, a purchase of food by visitors has a direct effect on a local restaurant. But that restaurant may buy their supplies from a wholesaler or from an assortment of different companies. Each of these companies are affected by the direct spending, and IMPLAN estimates how much of this supply chain effect is local.

Multiplier effects are also calculated by IMPLAN and are vital to an economic impact report. When visiting trail users spend \$22,839,115 in Mesa County, it is not the end of the spending story. Every dollar spent by visitors in the local area becomes income to someone else, such as a local business, a hotel employee, gas station attendee, or waiter/waitress. Each of these businesses or employees spends this new income, creating income for someone else. The cumulative impact of these rounds of spending is known as the multiplier effect.

Table 10 illustrates jobs, labor income, gross regional product, and total output that results from visitor spending in the county. The "direct effects" are the direct expenditures in the County region subtracted for leakages. The "indirect effects" are supply chain effects, and the "induced effects" are the increase in expenditures from the multiplier effect, or the increase in expenditures that the increased wages from direct and indirect spending creates. The "total effect" is the combination of direct, indirect, and induced effects.

Adjusting for these "total effects," visitor spending contribution to Gross Regional Product (GRP) is \$14,586,336. The contribution to GRP represents final goods and services and is the proportion of total output that is paid to business and other entities in the form of employee compensation, proprietor income, taxes on production, and profits. Gross Regional Product is the final value of goods and services, and in calculating this subtracts intermediate goods from the estimation. Total output does not subtract intermediate goods and instead adds all transactions that take place through the supply chain.³

The total output number of \$27,068,817.9 represents the gross total value of all sales and production due to CIC member expenditures. This is a broader measure than the standard Gross Domestic Product (GDP), or in a local economy, Gross Regional Product (GRP). This measure looks at the total value to each business, and does not avoid the traditional "double counting" issue that arises in calculating GDP. Total output represents how a business sees its activity, or the gross sales and production that funnel through businesses. This total output measure is the gross measure of local economic activity, and is more in line with how a business would account for the sales transaction from one firm to another.

³ A good example between Total Output and GRP is car production: GRP only counts the final value of the car, but total output adds the steel, rubber, and other parts, plus the total value of the car. This is known as double counting in GDP calculations.

The total number of jobs created by visitors and their spending is 345. The total number of jobs created is a result of direct, indirect, and induced effects that have taken place over time. Note that these jobs are not full-time equivalent and can be part-time or full-time. Total labor income created is \$9,004,913.3. This is income that lands directly in the pockets of local workers.⁴

The "direct effects" are the direct expenditures in Mesa County subtracted for leakages. The "indirect effects" are supply chain effects, and the "induced effects" are the increase in expenditures from the multiplier effect, or the increase in expenditures that the increased wages from direct and indirect spending creates. The "total effect" is the combination of direct, indirect, and induced effects.

Table 11 illustrates the top 10 industries affected by visitor spending. Hotel spending tops the list, while three types of restaurants and miscellaneous retail account for the top 5. Food and beverage retail, amusement industries, real estate, gasoline retail, and other personal services round out the 10 industries most impacted by visitor spending.

TABLE 10: ECONOMIC IMPACT RESULTS

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	259	5,892,075	9,287,157	16,770,419
Indirect Effect	40	1,424,985	2,324,403	4,811,814
Induced Effect	45	1,687,853	2,974,775	5,486,583
Total Effect	345	9,004,913	14,586,336	27,068,817

TABLE 11: INDUSTRY EMPLOYMENT EFFECTS

Sector	Description	Total Employment	Total Labor Income	Total Value Added	Total Output
499	Hotels and motels, including casino hotels	74	1,885,599	3,999,537	6,981,726

⁴ Some explanations and verbiage of economic impact concepts/definitions are from previous economic impact reports written by Nathan Perry. See bibliography for exact sources.

503	All other food and drinking places	53	1,254,776	1,158,078	2,045,968
501	Full-service restaurants	44	969,668	1,091,454	2,100,911
406	Retail - Miscellaneous store retailers	27	438,727	545,591	940,518
502	Limited-service restaurants	27	478,248	1,229,428	2,179,695
400	Retail - Food and beverage stores	11	363,213	542,398	781,497
496	Other amusement and recreation industries	10	146,428	300,528	593,515
440	Real estate	8	67,617	552,283	1,009,586
402	Retail - Gasoline stores	6	240,749	280,423	433,210
512	Other personal services	6	140,162	118,317	215,163

TABLE 12: TAX IMPACT

Total State and Local	\$2,250,035
Total Federal	\$2,301,164

Table 12 illustrates the total estimated tax impact for Federal taxes, and State and Local taxes. IMPLAN cannot distinguish between State and Local taxes. Because of this, a rough estimate is performed at the County and City level by knowing the current tax rates. The state of Colorado has a 2.9% sales tax, Mesa County 2%, and the City of Grand Junction 2.75% for a combined 7.65%.⁵ Taking a simple ratio, one can get an estimation of the breakdown for state, county, and city. Note

⁵ <http://www.gjcity.org/city-government/financial-operations/sales-use-and-lodging-taxes/>

that this is a very rough estimate conducted by the author and does not take into account the purchase location, or other variables not accounted for in the model. This rough estimation of the tax breakdown is simply for illustrative purposes, and should not be used to make policy decisions. Table 13 illustrates the rough tax breakdown.

TABLE 13: ROUGH ESTIMATE TAX BREAKDOWN

Tax Entity	Ratio	Estimated Tax Share
State of Colorado	37.9%	\$852,763
Mesa County	26%	\$585,009
City of Grand Junction	35.7%	\$803,262

Lunch Loops

As requested by the Mesa County Land Trust, a separate economic impact was conducted for the Lunch Loops trail system alone. The same methodology for the earlier study was used, except the proportion of people who are from outside of Mesa County was different and this needed to be taken into account. It is important to note that when looking at a single trail such as Lunch Loops, the sample size falls, which decreases the statistical significance of the estimation. Because of this, the authors believe that the individual Lunch Loop results should be viewed with more skepticism because of the lower statistical significance. To capture the same significance as the earlier results, a larger sample size is needed for the Lunch Loops trailhead alone.

Table 14 illustrates the percentage and count of respondents who were from Mesa County and who were visiting Mesa County from outside of the County. It is clear that more locals visit the Lunch Loops trailhead, potentially due to the proximity to so many homes. Because of this, the proportion of visitors to locals used in the Lunch Loops economic impact model is lower than for the previous results.

TABLE 14: VISITOR VS. LOCAL PER TRAIL

	Non-Mesa County	Mesa County	Count
Lunch Loops	50.7%	49.3%	142
Kokopelli	81.7%	18.3%	109
18 Road	80.9%	19.1%	89

Table 15 illustrates that the total economic impact of Lunch Loops is \$4,513,162.7, approximately one-third of the previous results economic impact. Lunch Loops visitor spending creates approximately 108 full- and part-time jobs, and creates \$2,798,272.6 worth of labor income. The top 10 industries ranked by employment are listed in table 16.

TABLE 15: ECONOMIC IMPACT RESULTS FOR LUNCH LOOPS

Impact Type	Employment	Labor Income	Total Value Added	Output
Direct Effect	82	1,844,253	2,884,161	5,129,407
Indirect Effect	12	429,525	704,574	1,454,931
Induced Effect	14	524,493	924,426	1,704,954
Total Effect	108	2,798,272	4,513,162	8,289,293

TABLE 16: INDUSTRY EMPLOYMENT EFFECTS FOR LUNCH LOOPS

Sector	Description	Total Employment	Total Labor Income	Total Value Added	Total Output
499	Hotels and motels	22	579,010	1,228,137	2,143,877
503	All other food and drinking places	16	399,812	369,001	651,912
501	Full-service restaurants	14	308,825	347,612	669,109
406	Retail - Miscellaneous store retailers	9	150,923	187,684	323,540
502	Limited-service restaurants	8	152,167	391,175	693,528
400	Other amusement and recreation industries	4	62,138	127,533	251,865

496	Retail - Food and beverage stores	3	102,277	152,734	220,062
440	Real estate	2	21,166	172,883	316,034
402	Other personal services	2	62,104	52,425	95,337
512	Retail - Gasoline stores	1	57,245	66,678	103,008

Part 1: Conclusion

Kokopelli trail, 18 Road trail, and the Lunch Loop trails attract visitors from a high-income demographic who on average spend 3.56 days in Mesa County. The average family group spends an average of \$437.25 on a trip to Mesa County. 198,261 people ride the three trails in this study per year. After adjusting family size for individual spending, total expenditures from trail users from outside of Mesa County total \$22,839,415. After adjusting for leakages from the economy, supply chain effects, and multiplier effects, the total economic impact of non-Mesa County trail users is \$14,586,336.

PART 2: ESTIMATING VALUES FOR TRAIL SYSTEMS IN WESTERN COLORADO

Stated and Revealed Preference Models

This section of the report estimates the recreational value that trail users place on three highly used trails systems on Bureau of Land Management in Mesa County, CO. The trail systems includes 18 Road, Kokopelli, and Lunch Loops. This section will perform two models: The first model is what is called a stated preference contingent valuation model. This model asks trails users at the trail how much they would be willing to spend to use the trail for that day. This model provides a willingness to pay estimation for the use of the trail. The second model is a revealed preference travel cost model. The travel cost model looks at the cost to travel to the trail and implicitly estimates the willingness to pay to use the trail by seeing what people are willing to pay to travel and visit the trail. It is called revealed preference because unlike the first model where people state their preference (or how much they are willing to pay for the trail in front of them), the revealed preference model “reveals” their willingness to pay by looking at the total costs of the trip to the trail over a full year. The two models are different and not comparable, but each model allows for an estimation of the value of a trail system that has no entrance fee.

Studies that value natural amenities, or public goods that do not have a market value are called non-market valuation. Mesa County, CO is a prime location for a non-market valuation study due to the various types of recreational outdoor activities available to both residents and visiting travelers. The majority of the land in Mesa County is owned or managed by federal agencies including the National Park Service, U.S. Forest Service, and the Bureau of Land Management. The trail system located in the county is well known to travelers inside and outside of Colorado. There is also an already prominent outdoor recreation industry in the county, which makes observing travel costs to the trails possible. Due to the prominence of the trail systems, there is a high chance that there were many single purpose and destination trips to the county that could be used for the travel cost method study.

In a revealed preference travel cost model, people who visit the trail systems incur both travel and time costs associated with their visit. These costs are used as a proxy for the price of using the site. It is assumed and confirmed in the results that if a user has to pay more to visit the site, they will visit that site relatively less. To empirically measure, this, this model uses the number of trips that a user takes as a function of the trip cost and other selected variables to estimate a demand function for access to the site. The quantity demanded is the number of trips taken to the single site, and the

price is the cost of accessing the site. This relationship models a classic downward sloping demand function and is useful when estimating the access value of a recreation site (Parsons, 2003).⁶

Stated preference methods directly ask an individual's willingness to pay or accept for various environmental amenities. The surveyor gathers this information either through open-ended or closed-ended questions. Closed-ended questions give the respondent a chance to select a value from a predetermined list, while open-ended questions describe an attribute then ask the individual to estimate how much they would be willing to pay to preserve the attribute (Boyle, 2003). Note that this study uses a closed ended survey question.

Very few studies have attempted to conduct this type of studies on trails in Western Colorado. The closest area found in a literature review was Moab, Utah. Fix and Loomis (1996) estimate the value of mountain biking to visitors in Moab, Utah. They employ a travel cost model along with a dichotomous choice contingent valuation. Their estimates were for the spring of 1996 and found the estimated benefits to be \$205 and \$235 for the travel cost model and contingent valuation model respectively. Their survey design was based on dichotomous choice instead of the respondent simply stating their valuation for the site, which leads to results for the revealed preference model that are not comparable to this study. Their travel cost model is comparable, however.

Methodology: Contingent Valuation (Stated Preference)

In this paper, we estimate the economic benefits of the trail system located in Mesa County, CO. Access to the trails can be viewed as a bundle of goods in which the visitor reveals a monetary value they place on the trail system that is the total benefits they gain from having access to the site. Through the survey we explicitly ask what value the individual places on the trail. This value represents the dependent variable in our analysis. Along with this variable, we estimate coefficients for various explanatory variables in the analysis. The individual's economic value is measured as:

$$c_i = z_i' \beta + u_i \quad (1)$$

⁶ Some explanations of contingent valuation and travel cost methods, as well as some references in part 2 are from previous work by Cory Castaneda. See Castaneda (2017) in references.

where c_i represents the reported value for respondent, u_i is the random error term with mean zero and standard deviation σ , z_i' is a vector of independent variables, and β is the vector of coefficients associated with the independent variables.

Travel Cost Method (Revealed Preference)

Price is a function of travel and time costs in the travel cost method. It is assumed that as the variable costs to access the site increase, the number of trips taken to the site decrease (Parsons, 2003). This is represented as a downward sloping demand curve. The linear version of this function is specified as:

$$r = \beta_{tc}tc + \beta_y y + \beta_z z \quad (2)$$

The variable r is the number of trips that the individual made to the various trails during the season, tc is the various trip costs for accessing the site, y is the income of the individual visiting the trail, and z is a vector of socio-economic and demographic variables that influence the number of trips to the trail system that the individual made (Parsons, 2003).

If the coefficient for the trip costs is negative, this shows that as trip costs increase the overall number of trips will decrease. If the coefficient for income is negative, this shows that as income decreases then the number of overall trips decrease.

The consumer surplus to the trails calculates the difference between how much a visitor would be willing to pay to visit the trail and the actual cost that they spent to visit the trail (Creel & Loomis, 1990). It can be estimated as:

$$Consumer\ Surplus = \frac{1}{-\beta_{tc}} \quad (3)$$

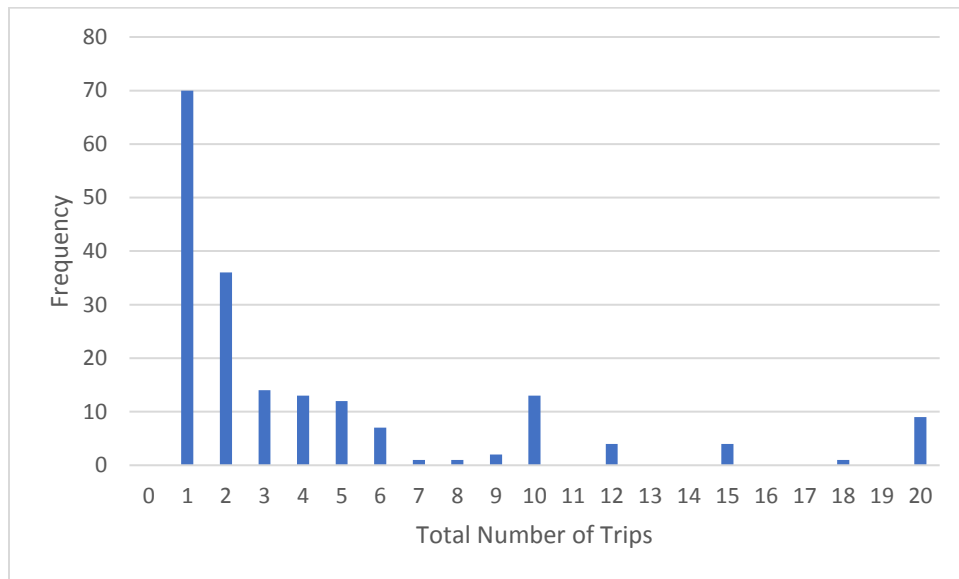
This estimate reveals how much value the respondents gain from simply having access to the site and having the opportunity to utilize its resources.

Data Analysis

Due to the respondents being intercepted and surveyed on-site, the analysis did not include respondents who made zero trips to the trail system during the season. 37.4% of individual's surveyed made 1 trip to a trail during the season, and the next highest reported amount was 19.3%

for 2 trips. Interestingly, the total number of respondents who reported larger numbers of overall trips did not decline as the total number of trips reported increased as shown in Figure 1. Normally, the number of respondents who take more trips steadily decreases as the number of trips increases. This is usually due to the cost associated with making the trips. The fact that this is not occurring reflects that the respondents interviewed were of a high enough income level that the cost may not have impacted their decision making.

FIGURE 1: TOTAL REPORTED TRIPS



To estimate the total trip costs associated with visiting the trail system, it was necessary to evaluate the total distance and time spent traveling to the trails. The average distance traveled to the trail system was 280 miles and the average time spent traveling was 526 minutes as shown in Table 17. This indicates that the majority of responses were from individuals who do not originate from Mesa County, CO. Of the 187 observations used in the analysis, 87.7% of the surveys received did not come from respondents who originated from Mesa County. This means that there is a lower representation of local trail users in the analysis and that the travel costs associated with the site will be larger.

TABLE 17: TRAVEL TIMES AND DISTANCE

	Mean	St. Dev.	Min	Max
Average Travel Distance (mi)	280.05	356.87	1	3000
Average Travel Time (min)	526.36	639.60	0	5760

Note: The number of observations for which the number of trips was greater than zero is 187

The trip cost estimations were calculated using both time and travel costs. The time cost was estimated using the reported time spent traveling to the site from the respondent's home address. The respondent was asked to give this travel time. In order to estimate the respondent's opportunity cost of leisure, an estimate was made using their hourly wage rate that was either given or calculated (Cesario, 1976). If it was not given, the annual income from the respondent was divided by the number of employed adults in the household, and then was divided by 2087. This represents the average number of hours worked by individuals in the United States and is reported from the Office of Personnel Management. It takes into account weekends, time off, and holidays. The opportunity cost of travel was estimated using the standard one-third of the respondents wage rate (Armbrecht, 2014). The time cost is then estimated as:

$$\text{Time Cost} = \text{Travel Time} \times \text{Opportunity Cost} \times 2 \quad (4)$$

The respondents were asked to state the total amount of money spent on gas for the trip to the trail. This amount was then divided by the total number of adults on the trip to estimate a vehicle cost. The time cost and vehicle costs were added to obtain total travel costs to the trails as shown in Table 18.

TABLE 18: TRAVEL COSTS

	Number	Mean	St. Dev.	95% Conf. Int	
Travel Cost - All	187	104.85	114.96	88.26	121.43
18 Road Trail	63	98.36	83.38	77.36	119.36
Kokopelli Trailhead	63	157.18	157.18	96.83	176.01
Lunch Loops	61	80.51	80.51	58.32	99.56

Kokopelli trailhead had the highest estimated travel costs while Lunch Loops had the lowest. The number of observations for each site were approximately equal and each amount was not statistically different from each other. The majority of the estimated travel costs came from the opportunity cost of leisure. Approximately one-third of the respondents indicated that their income was more than \$125,000 yearly as shown in Table 19, so the amount of money they could potentially miss out on will be a significant amount.

TABLE 19: INCOME BREAKDOWN

Income	Count	Percent
Less than \$25,000	14	7%
\$25,000-\$49,999	21	11%
\$50,000-\$74,999	29	16%
\$75,000-\$99,999	29	16%
\$100,000-\$125,000	31	17%
More than \$125,000	63	34%
Total	187	100%

The lack of variation in low income levels may be due to the smaller overall sample size. The overall reported number of trips was high and the estimated travel costs were also high, so this signifies that the estimates for the consumer surplus are most likely also going to be high.

The Statistical Models

The stated preference model uses a linear regression and a logistic regression for comparative purposes. The travel cost model needs more sophisticated econometric techniques. For each observation in the dataset, the number of trips during the year is non-negative and an amount larger than zero. Therefore it is appropriate to use a count data model to estimate benefits in the travel cost model (Creel & Loomis, 1990). The standard method in non-market valuation is to use a Poisson model that assumes equal variance and mean of the number of trips. However, this is usually not the case with recreational trip data where the variance is usually larger than the mean. To correct for this over dispersion, a negative binomial model is used to relax this constraint.

Due to the data containing no observations with zero trips during the past year, it is not appropriate to use a standard negative binomial model. Because only visitors to the site were

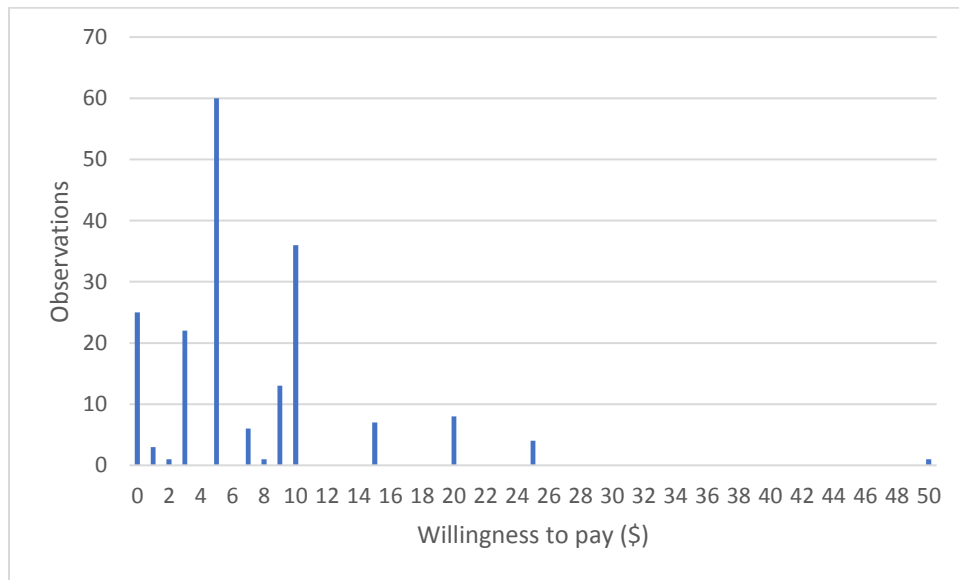
observed, each observation will have at least 1 recorded trip to the site. A zero-truncated negative binomial truncates the data at 1 trip in order to estimate situations where no trips may occur and to not bias the overall results upward. This will also deal with the issue of upward bias in the dependent variable. With the data being truncated at 1, it is now possible to account for visitors who possibly wouldn't visit the site so as to deal with the issue of endogenous stratification (Ridout, Demetrio, & Hinde, 1998).

$$P_i(r) = \frac{\bar{\omega}^k}{1 - \bar{\omega}^k} \frac{(k+r-1)!}{(k-1)!r!} \eta^r \quad (5)$$

Results: Stated Preference Willingness to Pay

The results of the stated willingness to pay show how much each visitor values the different trailheads. The majority of the observations showed a willingness to pay value below \$15, while some visitors placed a much larger monetary value on the trails. The highest reported amount was \$5, with 32% of respondents selecting that value. The next highest value was \$10, with 19% of respondents selecting that value. Approximately 13% of respondents selected that they would be willing to pay \$0 for the trails. 96% of the respondents who said they would not pay to use the trails originated from outside of Mesa County. Figure 2 displays the distribution of responses.

FIGURE 2: STATED WILLINGNESS TO PAY ESTIMATES



The model of explanatory variables was run as a linearized regression and as a logistic regression, and the results are reported in Table 20. Originating from Mesa County was significant in the logistic regression. The majority of the respondents intercepted at the trails did not originate from within Mesa County, so the fact that those who originate from within the county place a higher value on the trail system is reasonable.

The choice of trailhead that the respondent was intercepted at was significant in both of the regressions. Lunch Loops was excluded from the analysis as a benchmark. In both models, if the respondent visited the 18 Road Trail, they placed a much higher value of on the trail when compared to the Kokopelli Trail. This is significant due to the fact that visitors spent the most amount of money traveling to and visiting Kokopelli Trail. It would be reasonable to expect that because they spent more time and money to get to the trail, that they would not be willing to pay more on top of that amount. If people visiting an area already invest a lot in reaching that area, an additional fee on top of the travel costs would most likely deter visitors from that site.

The respondent's level of education was significant in both models. The results show that those with a higher level of education place more value on the trail in the linearized regression, but then it switches in the logistic regression. The results for education are compared to those with higher than a bachelor's degree. This can be explained by the fact that if you have a higher level of education, your income is most likely higher so they will have more access to alternative recreational sites. Race was significant in the linearized model, but not in the logistic regression. The variable for other race was excluded as a baseline in both models. In both versions, Hispanics stated a willingness to pay value on the trail system that was less than any other group. This is common in recreational research where minorities tend to visit areas that are more suitable to group recreation rather than individual types of recreation.

The results for income level were similar to those for education level, with lower income respondents valuing the trails less compared to respondents in higher income categories. Income and education are highly correlated, so this result is reasonable. Gender was insignificant in both models, and the respondent's age was also insignificant in both models. Household size was significant in the linear model. This shows that if you live with more people, you are more likely to try outdoor recreational activities. If someone you live with is interested in visiting trails, you are more likely to also visit trails due to the peer effect.

TABLE 20: STATED PREFERENCE MODEL RESULTS

	Linear Regression	Logistic Regression
Mesa County Residence	0.3190 (0.22)	0.2771* (1.84)
18 Road Trail	2.2275** (1.94)	0.2219* (1.80)
Kokopelli Trailhead	0.4139 (-0.84)	0.0565 (0.44)
High School Diploma	-3.1532* (-1.75)	-0.0639 (-0.30)
Bachelor's Degree	-1.6237 (-1.59)	-0.2013* (-1.81)
Caucasian	0.8623 (0.26)	0.0994 (0.29)
Hispanic/Latino	-6.0196** (-1.97)	-0.5050 (-1.62)
Asian	0.6716 (0.12)	0.5979 (0.82)
Low Income	-2.4652* (-1.91)	-0.0100 (-0.06)
Middle Income	-0.8843 (-0.83)	-0.0431 (-0.37)
Gender	-0.1206 (-0.12)	-0.0553 (-0.50)
Age	-0.9932 (1.66)	-0.0015 (-0.31)
Household Size	0.9932* (1.66)	0.1163 (1.65)
Constant	13.0815 (3.29)	1.9463 (4.34)

Note: (***)(**)(*) denote (p<.01)(p<.05)(p<.10)

The mean stated willingness to pay values for each of the individual trails is shown in Table 21. This amount shows the difference between the differing sites. The maximum amount stated by respondents for 18 Road trail and Lunch Loops were both around \$20. This is reasonable given that the responses reflect a willingness to pay an entrance fee for a trail pass. The maximum value for Kokopelli Trail is \$50. This amount is high and could be reflection of the high travel costs many respondents incurred while visiting the site.

TABLE 21: MEAN STATED WILLINGNESS TO PAY

WTP	N	Mean	SD	Min	Max
18 Road Trail	63	8.63	0.77	0	25
Kokopelli Trailhead	63	6.56	0.92	0	50
Lunch Loops	61	5.84	0.61	0	20
Total	187	7.02	0.46	0	50

The responses for the 18 Road trail were more tightly grouped than the other two trails as shown in Figure 3. This lack of variation shows that visitors are most likely getting similar experiences and placing similar values on them. The varied responses can be explained by personal preference that was not captured in the surveying.

FIGURE 3: STATED WILLINGNESS TO PAY FOR 18 ROAD TRAIL

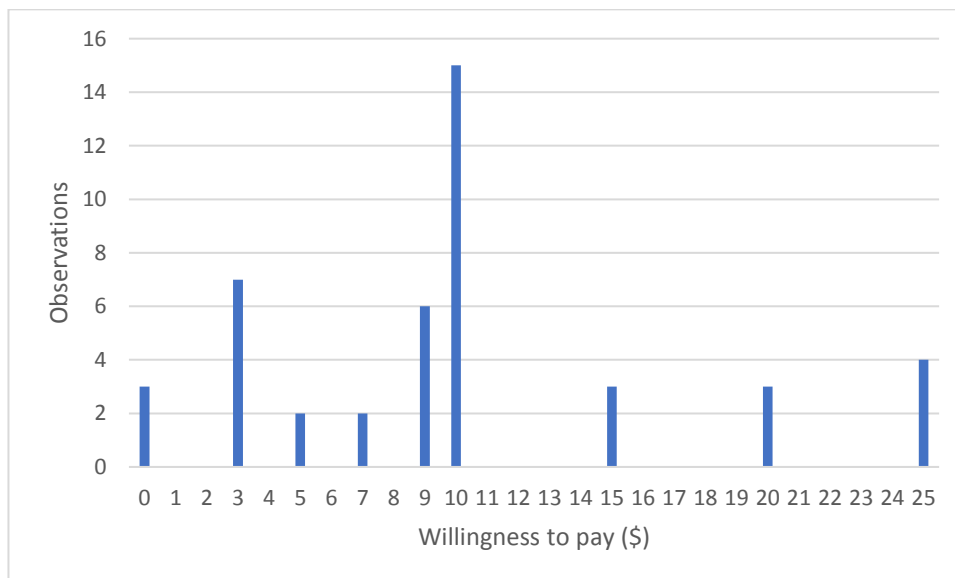


Figure 4 shows the stated willingness to pay responses for Kokopelli Trail. The trail had the most reported \$0 responses. It also had the most responses skewed to the right towards lower amounts. This is to be expected given the high travel cost values respondents had visiting the site. This variation reflects that if the trail visitors have to pay fees on top of their travel costs, they are more likely not to visit the trail.

FIGURE 4: STATED WILLINGNESS TO PAY FOR KOKOPELLI TRAIL

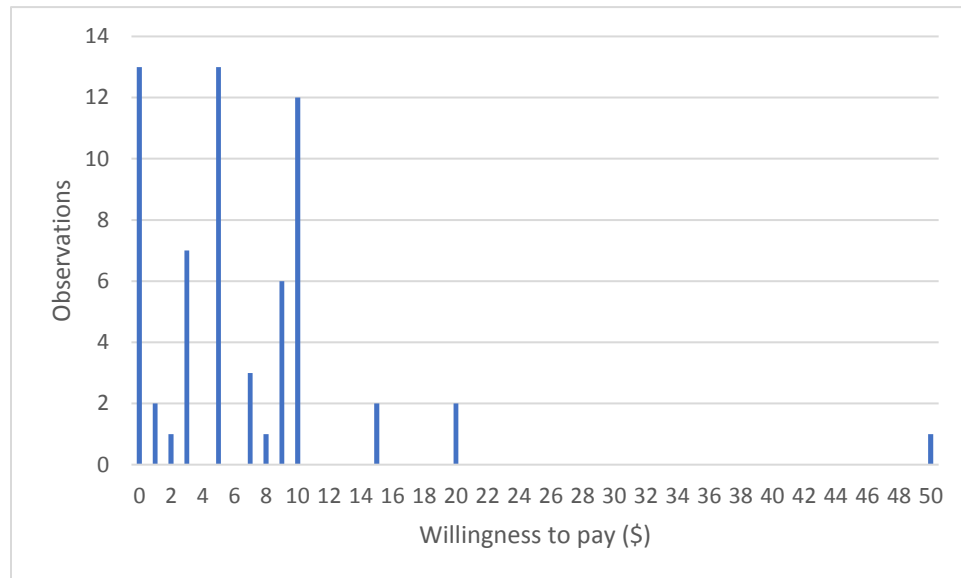


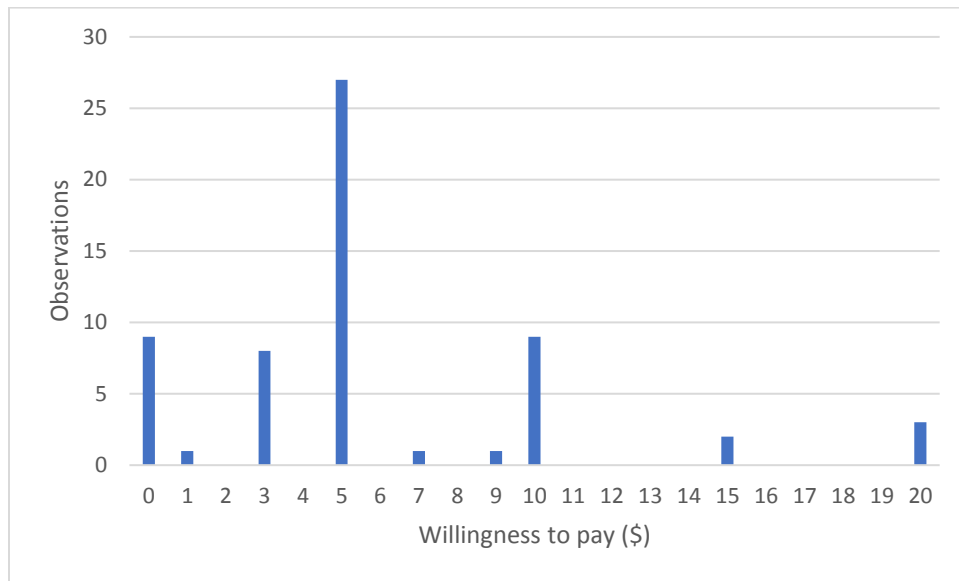
Figure 5 illustrates the stated willingness to pay for Lunch Loops. The Lunch Loops trail had many varied responses from the surveyed visitors, similar to the 18 Road trail. The majority of respondents would be willing to pay a small amount to visit the trail.

Results: Revealed Preference Model (Travel Cost)

The results from the travel cost demand function are shown in Table 22. The coefficient for the travel cost variable was negative and significant. This shows that as the cost of trips increase, the total overall number of trips taken to the trails will decrease as is expected with travel cost models.

Household size was significant and negative in the model. Visiting a trail is viewed as more of an individualistic activity, so this result furthers this assumption by showing that the more people you know who may visit the trail with you, the less you will go. Most likely, households with larger sizes would seek out areas with more group activities available.

FIGURE 5: STATED WILLINGNESS TO PAY FOR LUNCH LOOPS



The indicator variable for gender was not significant. The variable for gender was also not significant in the contingent valuation model. This result gives credit to the idea that the activity of visiting a trail is not gender specific.

Indicator variables for race were created. The races included were Caucasian, Hispanic/Latino, Asian, and Other Race. Asian was excluded from the regression as a baseline. Race was not a significant factor in the model. This is most likely due to the fact that over 95% of the respondents surveyed identified as Caucasian, which does not allow for the possibility of identifying the importance of racial variation in the model.

Indicator variables for income levels were created. The different incomes included were low income, which was represented as incomes up to \$49,999 annually. Middle incomes were identified as between \$50,000 - \$99,999, and high incomes were defined as being over \$100,000. High income was excluded from the regression as a baseline. Being considered low income was significant in the regression and negative. This means that people who are considered low income are less likely to visit the trails as compared to individuals with higher incomes. This is reasonable given that the estimated costs of visiting the trails was high.

Indicator variables for differing levels of education were created. Respondents were separated into whether their highest level of education was at least a high school diploma, an undergraduate

degree, or a graduate degree. Having at most a high school diploma was significant and negative in the regression. This shows that those with lower levels of education tend to visit the trails less. This result is correlated with the fact that low income level visitors visited the trails less as well. Education level and income tend to be highly correlated so this result is reasonable.

Age was not significant in the regression. Being a Mesa County resident was significant and negative in the regression. This shows that local residents are less likely to visit the trails when compared to non-local trail users. This could be due to the fact that for many Mesa County residents, there are many options for outdoor recreation to pursue at substitute sites.

TABLE 22: REVEALED PREFERENCE MODEL RESULTS

Zero-Truncated Negative Binomial	
Travel Cost	-0.0024** (-2.45)
Household Size	-0.3031* (-1.75)
Gender	-0.2303 (-0.84)
Caucasian	.6805 (0.59)
Hispanic/Latino	1.1189 (1.05)
Other Race	1.3062 (0.80)
Low Income	-0.9754*** (-2.61)
Middle Income	-0.0532 (-0.18)
High School Diploma	-0.9206** (-1.97)
Bachelor's Degree	-0.1764 (-0.64)
Age	-0.0077

	(-0.87)
Mesa County Resident	-1.7469***
	(-4.29)
Constant	1.8660
	(1.06)
Inalpha	1.066
N	187

Note: (***)(**)(*) denote (p<.01)(p<.05)(p<.10)

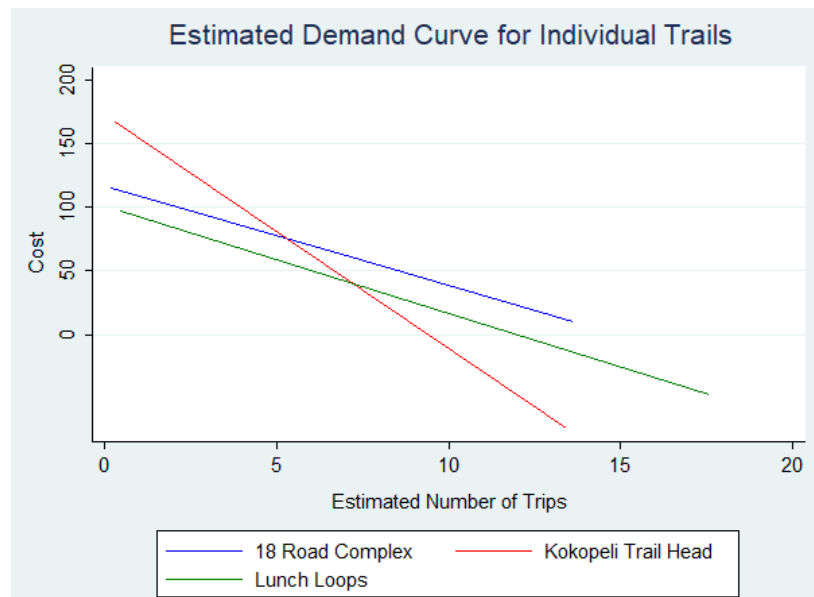
The consumer surplus was estimated by dividing 1 by the coefficient absolute value of the travel cost variable. This amount was then divided by the group size of the respondent in order to calculate an individual estimate per-trip. The average group size when visiting the trails was 4.13 people. The mean estimates are shown in Table 23. The overall consumer surplus for the trail system was \$174.50 per trip for the season. The average per day value for individuals who went for multiple days to the trails was \$94.49, and was estimated by dividing the consumer surplus by the average number of days spent on the trails. The average number of days spent on the trails was 2.25. The estimated consumer surplus for respondents who originated in Mesa County was \$241.90. This is expected as people who live closer to the trails will gain more benefits from their use. The results differed between the different trailheads but they were not statistically different based on the confidence intervals at 95%. Lunch Loops had the highest estimates per trip and per day, while 18 Road trail had the lowest estimates per trip and per day.

TABLE 23: ESTIMATED CONSUMER SURPLUS

	N	Mean CS (\$)/Trip	Mean CS (\$)/Day	St. Dev.	95% Conf. Interval (\$)	
18 Road Trail	63	156.91	78.48	98.23	158.28	190.73
Kokopelli Trailhead	63	167.93	99.92	107.25	140.92	194.94
Lunch Loops	61	199.45	105.71	127.80	166.72	232.19
Total	187	174.50	94.49	112.44	158.28	190.73

The estimated demand curve for the three trailheads is shown below. They are all downward sloping as expected. Figure 6 shows that as the costs of visiting the trails increases, the expected number of overall trips decreases.

FIGURE 6: ESTIMATED DEMAND CURVES FOR TRAILS



Conclusion: Willingness to Pay

The stated preference model illustrates that respondents were willing to pay to visit the trail system in Mesa County Colorado at an average of \$7.02. The 18 Road trail was valued the highest, with Lunch Loops trail being valued the lowest. The values for the stated willingness to pay represent what can be considered as a willingness to pay an entrance fee to these trail sites. The estimates are significantly smaller than the revealed preference analysis, but the values for the survey were made purposely smaller in order to represent a realistic hypothetical entrance fee.

The revealed preference model estimated much higher values for the trail system. The value that respondents were willing to pay to visit the trail system in Mesa County, CO from the summer of 2016 to the summer of 2017 was \$174.50. There was not a statistically significant difference in the value of the three reported trails including the 18 Road trail, Kokopelli trail, and Lunch Loops trail systems. Due to Mesa County being a unique location in terms of outdoor recreation opportunities,

the results most likely will not represent values for similar sites. However, it has shown that trail visitors do indeed gain value by being able to use the trail system.

Using these estimates it is possible then to estimate the total value of the trail systems. In order to do this, the two willingness to pay numbers are multiplied by the number of trail users. This establishes an actual value of the trails. Using trail estimates from table 8 show total trail use estimates from the three trails in the study to be 198,261 users. Using the stated preference model willingness to pay number of \$7.02, the total value of the trail would be \$1,391,792.22. It is well known that state preference models do not account for all of the factors involved by which a person would be willing to pay (such as travel cost). This amount should be seen as the value that a hypothetical entrance fee would bring. A more accurate model of the trails value is the travel cost model. Multiplying total trail users by the revealed preference willingness to pay amount of \$174.50 shows a value of the three trails systems of \$34,596,544.50.

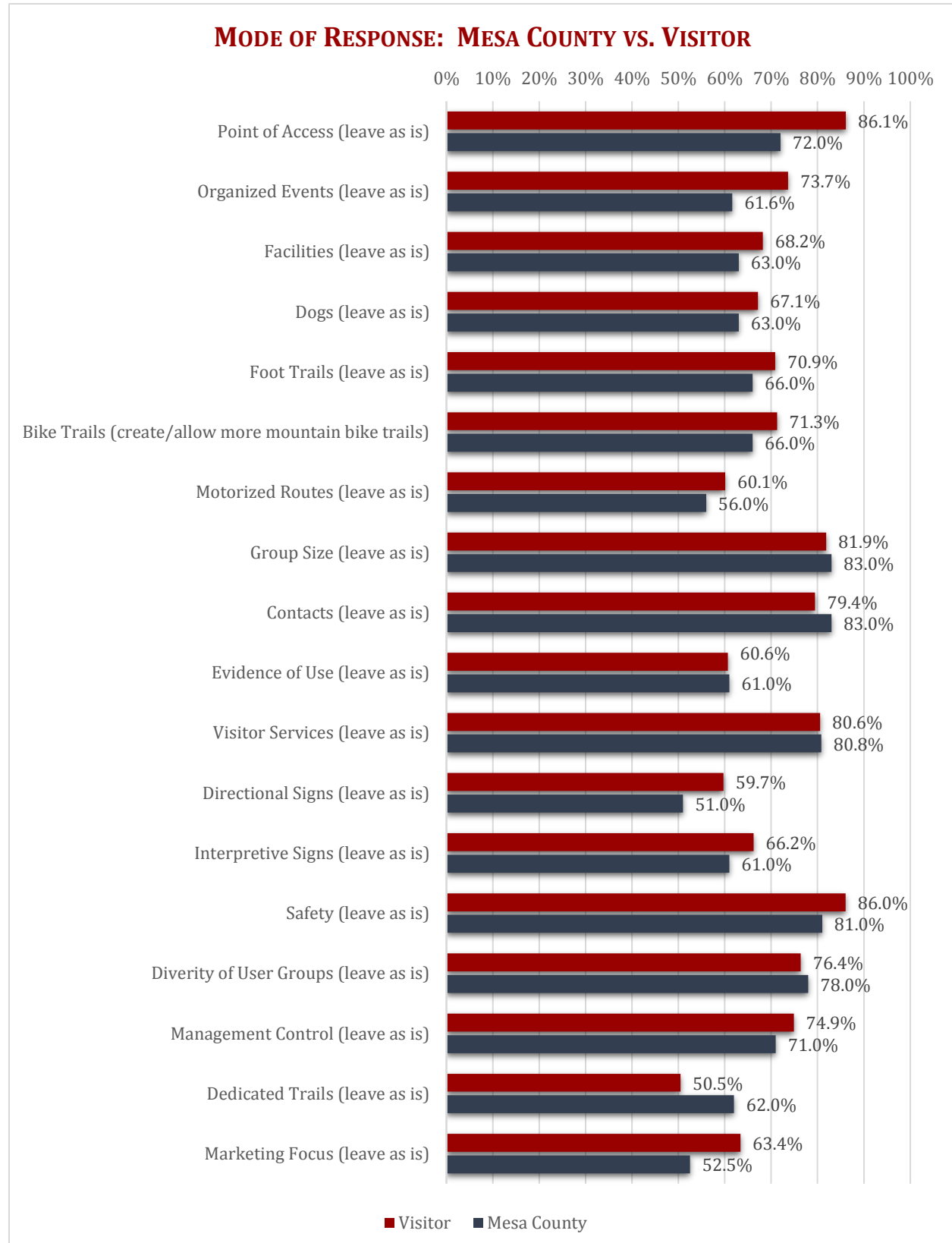
PART 3: TRAIL USER INTERACTION AND PREFERENCES

This section of the report details questions 14 through 19 of the survey. These questions address user preferences about recreation settings, facilities, and management provided at the trail system visited. These questions also address the issue of quality, and give opportunities for open-ended answers for the survey respondent.

The variables in Figure 7 represent a variety of recreation setting characteristics commonly managed on public lands to support outdoor recreation activities. These are the characteristics that land managers need to consider as they manage the lands to achieve the desired recreational outcomes for the public. In order to do this, planners in the BLM need to assess the public's perception of the condition of these characteristics in order to determine if they are meeting the management objectives established in the land use plan for the area. While managers will consider a broad spectrum of recreational settings for each characteristic, it is easier for the public to react to the conditions as they experience them. Thus the question was asked of each participant, on a given characteristic, would you prefer to see more, or less of the characteristic, or would you like it to be left as they experienced it in its current condition. Since the participants were surveyed at the trailhead, they have just experienced the current condition, and can easily imagine more or less of the feature; thus they can meaningfully answer the questions regarding their preferred conditions of the trail and surrounding settings.

In the case of the 18 characteristics surveyed in question 14 and displayed in figure 7, the most common response (mode) of both tourists (recreational visitors from outside Mesa County) and Mesa County residents (who are recreating on the land) is to "leave the feature as it is." Although there are differences in the percentage of tourists or residents selecting the "leave as is" they always chose the same option as their most common option. The only recreational setting that was not most common to "leave as is" was Bike Trails. Not surprisingly given the number of mountain bikers in the survey, the most common response for that characteristic is to "create/allow more mountain biking trails." A complete list of the percentages of support for each option on all 18 characteristics for tourists and residents as well as delineated by each of the three individual trail systems can be found in Appendix B.

FIGURE 7: MODE OF RESPONSE: MESA COUNTY VS. VISITOR



The higher the percentage in Figure 7, the broader the commitment of participants to leave the characteristic as it is (since that is the value represented by the percentage of those choosing the mode in all but one case noted above). The broadest commitment for both tourists and residents surveyed can be found in the characteristics of point of access, group size, visitor services, safety, diversity of user groups and management controls. The lowest commitment (even though it is still the most common response) to leaving characteristics as is can be found in motorized routes and directional signals, indicating the need to look more closely at the direction participants preferred those features to change if needed. Visitors from outside Mesa County in general were more likely to choose “leave it as is” on most of the characteristics. The largest gap between the percentages of tourists and local residents choosing “leave it as is” can be found on the tourists preferences for points of access (+14%), Organized Events (+12%), Marketing focus (+11%), and Directional signals (+9%), and for the local residents’ preference for dedicated trails (+11.5). Overall, this survey question seems to confirm a general satisfaction on almost all of the measured characteristics (with the previously noted exception of Bike Trails). However, all values are located in Appendix B so that managers and planners can better understand the subtleties and direction of change of the larger minorities that preferred the characteristics to change.

FIGURE 8: MEAN OF RESPONSE PER TRAIL

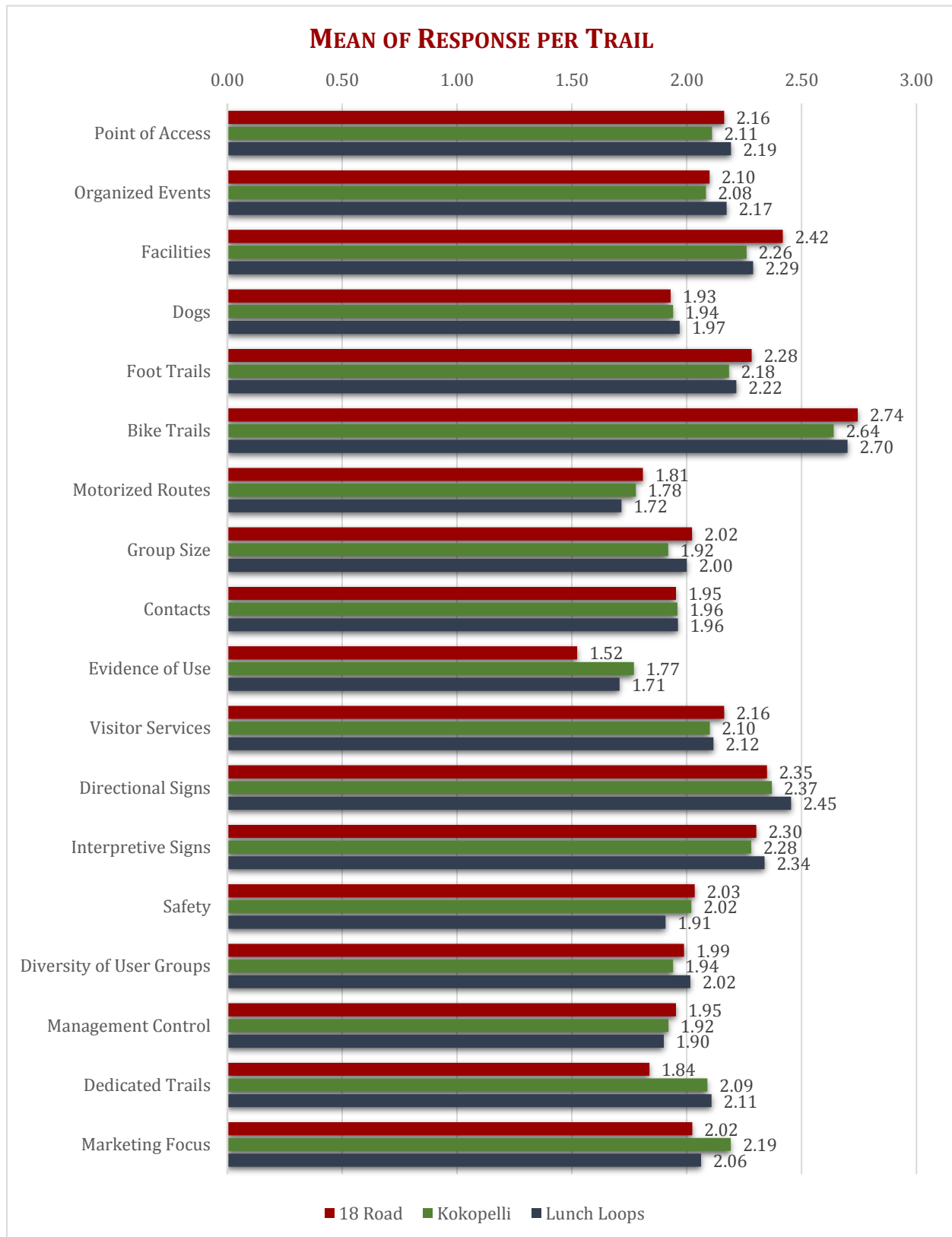


Figure 8 combines the responses from all participants (tourists and local residents), but distinguishes the responses based on the trail system where the survey was collected. This table will be useful to see differences on the 18 characteristics surveyed in question 14 as they relate to particular trails. Land managers and planners can use this data to see if certain trail systems might need attention concerning any given characteristic rather than broadly assuming all trails are the same regarding these characteristics. The characteristics were coded along three options: less of an amenity (1), leave as is (2), more of an amenity (3) to determine the average (mean) depicted in Figure 8. The closer the value is to 2, the broader the support to leave the characteristic as is on that particular trail system. A lower value indicates broader support to have less of the characteristic, and a higher value indicates broader support to have more of a characteristic. As the results show in Figure 8, there are not substantial differences between the trails, although there are some important differences on some characteristics. In terms of facilities, there is slightly higher support for additional facilities at 18 Road. In terms of evidence of use and dedicated trails, there is stronger support to decrease evidence of use and dedicated trails at 18 Road. There seems to be a slightly stronger interest in additional directional signs at Lunch Loops, and stronger support for additional marketing focus regarding the Kokopelli trail.

FIGURE 9: AVERAGE VALUES PER TRAILHEAD

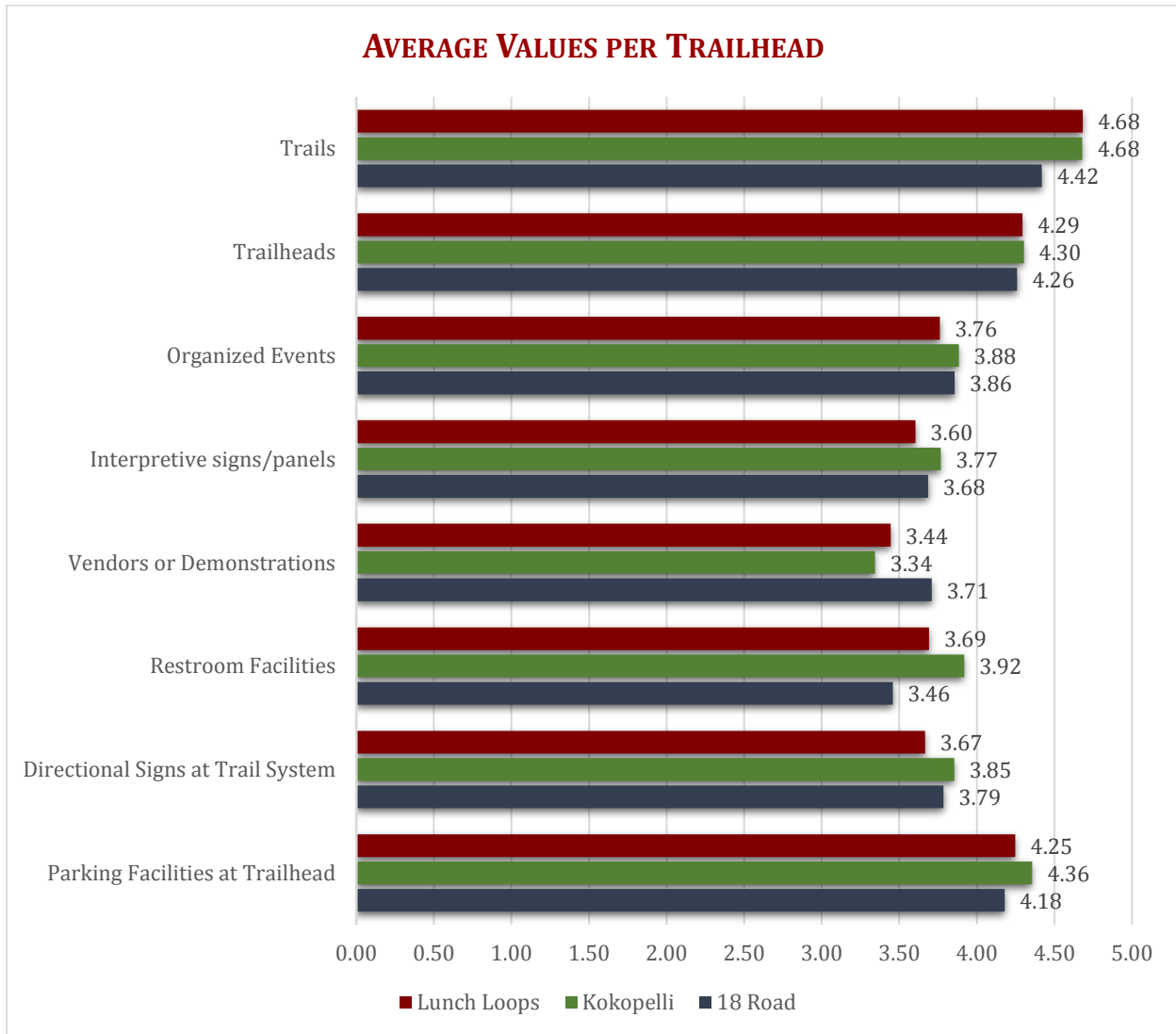


Figure 9 shows the level of satisfaction (1-5 scale) with particular characteristics broken down by individual trail system; the higher the number, the greater the overall satisfaction with that characteristic on that given trail system. It should be noted at the outset, that every characteristic on every trail system ranked above the average in satisfaction. The Kokopelli trail system seems to have the highest satisfaction on most of these characteristics except vendors. There is not a huge difference between levels of satisfaction on each of the trail systems for each characteristic with the exception of vendors (with Kokopelli lower than the others) and restrooms (with Kokopelli the highest of the three trail systems and 18 Road the lowest).

FIGURE 10: AVERAGE VALUES OF MESA COUNTY/TOURISTS

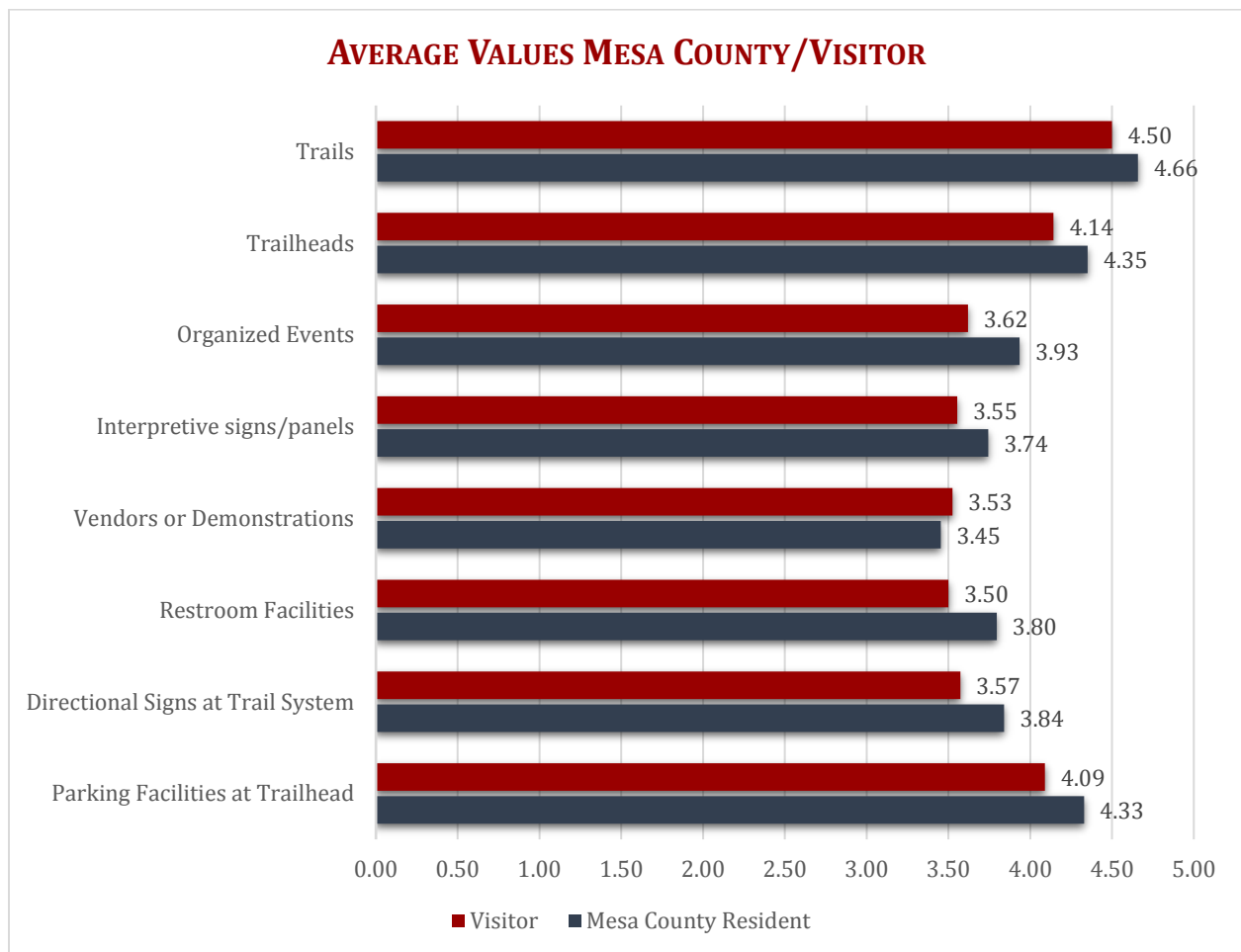


Figure 10 shows the satisfaction on those same characteristics as divided between tourists (visitors from outside Mesa County) and residents (recreation visitors from within Mesa County). Again, there is broad satisfaction for each of the characteristics with the greatest levels of satisfaction regarding trails and parking facilities. It is interesting to note that Mesa County residents are more satisfied with every characteristic except vendors/demonstrations. While they are not dissatisfied, it is the lowest characteristic in terms of satisfaction for both groups with tourists having a slightly higher level of satisfaction on that characteristic.

TABLE 24: QUALITY QUESTIONS (QUESTION 15)

	18 ROAD	KOKOPELLI	LUNCH LOOPS	MESA COUNTY RESIDENT	VISITOR
Parking Facilities at Trailhead	4.18	4.36	4.25	4.33	4.09
Directional Signs at Trail System	3.79	3.85	3.67	3.84	3.57
Restroom Facilities	3.46	3.92	3.69	3.80	3.50
Vendors or Demonstrations	3.71	3.34	3.44	3.45	3.53
Interpretive Signs/Panels	3.68	3.77	3.60	3.74	3.55
Organized Events	3.86	3.88	3.76	3.93	3.62
Trailheads	4.26	4.30	4.29	4.35	4.14
Trails	4.42	4.68	4.68	4.66	4.50
Average	3.92	4.01	3.92	4.01	3.81

Table 24 illustrates the average answer for the question 15 quality questions broken down by trail and tourist/local. This provides an alternative way to view the data in comparison to the figures above.

Question 16 of the survey asks “what is/are the most important improvements(s) that recreation managers could make to enhance your visits in the future?” Appendix C lists the open-ended answers to this question.

Crowding and Encounters

Questions 17, 18, and 19 in the survey ask questions regarding visitor encounters with other visitors on the trail systems. Table 25, 26, and 27 illustrate the level of crowding that visitors experienced on their visit to the respective trail, as well as the degree of crowding and the number of encounters. Mesa County residents in general find less crowding than tourists, while Lunch Loops is perceived as the less crowded trail, while 18 road is perceived as the most crowded trail.

TABLE 25: LEVEL OF CROWDING

CROWDING	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	1.4%	6.0%	2.9%	1.1%	3.1%	3.9%
High	15.4%	13.0%	14.6%	21.8%	15.3%	9.4%
Moderate	29.9%	19.0%	26.4%	27.6%	30.6%	22.0%
Low	28.0%	27.0%	27.7%	23.0%	33.7%	26.8%
Not at all	25.2%	35.0%	28.3%	26.4%	17.3%	37.8%
Count	214	100	314	87	98	127

TABLE 26: IF YOU FELT CROWDED, RATE THE DEGREE OF CROWDING

DEGREE OF CROWDING	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Moderate	3.3%	5.1%	3.9%	2.3%	2.1%	5.6%
Slight	11.3%	6.1%	9.6%	12.6%	12.5%	5.6%
Somewhat	10.4%	9.1%	10.0%	10.3%	11.5%	8.7%
I did not feel crowded	55.7%	66.7%	59.2%	54.0%	53.1%	67.5%
Not at all	19.3%	13.1%	17.4%	20.7%	20.8%	12.7%
Count	212	99	311	87	96	126

TABLE 27: NUMBER OF ENCOUNTERS WITH OTHERS

ENCOUNTERS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Significantly Above	2.8%	2.0%	2.6%	1.1%	4.1%	2.4%
Above	8.5%	8.1%	8.4%	9.2%	9.3%	7.2%
About what I expected	58.0%	59.6%	58.5%	58.6%	53.6%	62.4%
Below	24.1%	24.2%	24.1%	26.4%	26.8%	20.8%
Significantly below	6.6%	6.1%	6.4%	4.6%	6.2%	7.2%
Count	212	99	311	87	97	125

In conclusion, visitors to each of the trail systems are satisfied with the 18 amenities and trail characteristics surveyed. This satisfaction is evidenced by the largest support for the “leave as is” option on 17 of the 18 characteristics. The only characteristic that these visitors wanted “more of” is bike trails. These results are consistent between visitors from out of Mesa County, and Mesa County residents. There were some differences between the trails on certain characteristics such as evidence of use and dedicated trails; there is stronger support to decrease evidence of use and dedicated trails at 18 Road, for example. In addition to this there is a slightly stronger interest in additional directional signs at Lunch Loops, and stronger support for additional marketing focus regarding Kokopelli.

In terms of satisfaction, the Kokopelli trail system seems to have the highest satisfaction on most of these characteristics except vendors. Other signs of satisfaction include every variable rated as above 3.0 on a 5 point satisfaction scale. Individual trails showed some difference on the intensity of this satisfaction which might suggest further scrutiny in determining how the management might be more responsive to public demands in particular locations. In general, most visitors did not see crowding as an issue on the trail systems at this time. Non-Mesa County visitors perceived slightly more crowding than Mesa County visitors did.

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APPENDIX A:

TAX IMPACT FOR LUNCH LOOPS, KOKOPELLI AND 18 ROAD VISITOR SPENDING

TABLE 28: FEDERAL TAX IMPACT

DESCRIPTION	EMPLOYEE COMPENSATION	PROPRIETOR INCOME	TAX ON PRODUCTION AND IMPORTS	HOUSEHOLDS	CORPORATIONS
Social Ins Tax- Employee Contribution	\$422,831	\$37,594			
Social Ins Tax- Employer Contribution	\$412,755				
Tax on Production and Imports: Excise Taxes			\$164,625		
Tax on Production and Imports: Custom Duty			\$61,980		
Tax on Production and Imports: Fed NonTaxes			\$10,064		
Corporate Profits Tax					\$219,169
Personal Tax: Income Tax				\$608,843	
Total Federal Tax	\$835,586	\$37,594	\$236,668	\$608,843	\$219,169

TABLE 29: STATE AND LOCAL TAX IMPACT

DESCRIPTION	EMPLOYEE COMPENSATION	PROPRIETOR INCOME	TAX ON PRODUCTION AND IMPORTS	HOUSEHOLDS	CORPORATIONS
Dividends					\$2,193
Social Ins Tax- Employee Contribution	\$4,820				
Social Ins Tax- Employer Contribution	\$9,739				

Tax on Production and Imports: Sales Tax		\$935,345		
Tax on Production and Imports: Property Tax		\$607,562		
Tax on Production and Imports: Motor Vehicle Lic		\$17,621		
Tax on Production and Imports: Severance Tax		\$30,825		
Tax on Production and Imports: Other Taxes		\$19,426.00		
Tax on Production and Imports: S/L NonTaxes		\$26,614		
Corporate Profits Tax			\$19,987	
Personal Tax: Income Tax			\$136,382	
Personal Tax: NonTaxes (Fines- Fees			\$46,589	
Personal Tax: Motor Vehicle License			\$7,410	
Personal Tax: Property Taxes			\$2,463	
Personal Tax: Other Tax (Fish/Hunt)			\$6,262	
Total State and Local Tax	\$14,559	\$1,637,393	\$199,105	\$22,180

APPENDIX B:

PREFERENCES CONCERNED RECREATION SETTINGS, FACILITIES, AND MANAGEMENT

TABLE 30: POINT OF ACCESS

POINT OF ACCESS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
More points of access/trailheads	13.0%	26.0%	17.1%	16.3%	13.0%	21.1%
Leave as is	86.1%	72.0%	81.6%	83.7%	85.0%	77.3%
Fewer points of access/trailheads	0.9%	2.0%	1.3%	0.0%	2.0%	1.6%
Count	216	100	316	86	100	128

TABLE 31: ORGANIZED EVENTS

ORGANIZED EVENTS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
More organized events at the trail system	18.5%	27.3%	21.4%	17.3%	16.7%	28.0%
Leave as is	73.7%	61.6%	69.7%	75.3%	75.0%	61.6%
Fewer organized events at the trail system	7.8%	11.1%	8.9%	7.4%	8.3%	10.4%
Count	205	99	304	81	96	125

TABLE 32: FACILITIES

FACILITIES	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Develop more facilities (e.g., restrooms)	30.4%	37.0%	32.5%	41.9%	28.0%	29.4%
Leave as is	68.2%	63.0%	66.6%	58.1%	70.0%	69.8%

Remove some facilities (e.g., restrooms)	1.4%	0.0%	1.0%	0.0%	2.0%	0.8%
Count	214	100	314	86	100	126

TABLE 33: DOGS

DOGS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
More restrictions on dogs in the area	11.1%	22.0%	14.6%	10.5%	13.0%	18.8%
Leave as is	67.1%	63.0%	65.8%	72.1%	68.0%	60.2%
Less restrictions on dogs in the area	21.8%	15.0%	19.6%	17.4%	19.0%	21.1%
Count	216	100	316	86	100	128

TABLE 34: TRAILS

FOOT TRAILS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Create/allow more foot trails	24.9%	30.0%	26.5%	30.6%	23.5%	26.6%
Leave as is	70.9%	66.0%	69.3%	67.1%	71.4%	68.8%
Reduce/limit foot trails	4.2%	4.0%	4.2%	2.4%	5.1%	4.7%
Count	213	100	313	85	98	128

TABLE 35: BIKE TRAILS

BIKE TRAILS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Create/allow more mountain bike trails	71.3%	66.0%	69.6%	74.4%	65.0%	69.5%
Leave as is	28.2%	34.0%	30.1%	25.6%	34.0%	30.5%
Reduce/limit mountain bike trails	0.5%	0.0%	0.3%	0.0%	1.0%	0.0%
Count	216	100	316	86	100	128

TABLE 36: MOTORIZED ROUTES

MOTORIZED ROUTES	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Create/allow more motorized routes	9.4%	7.0%	8.6%	4.8%	9.1%	10.9%
Leave as is	60.1%	56.0%	58.8%	71.4%	59.6%	50.0%
Reduce/limit motorized routes	30.5%	37.0%	32.6%	23.8%	31.3%	39.1%
Count	213	100	313	84	99	128

TABLE 37: GROUP SIZE

GROUP SIZE	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Provide for larger groups	7.9%	8.0%	7.9%	5.8%	7.1%	9.4%
Leave as is	81.9%	83.0%	82.2%	90.7%	77.8%	80.5%
Limit the group size allowed	10.2%	9.0%	9.8%	3.5%	15.2%	10.2%
Count	215	100	315	86	99	128

TABLE 38: CONTACTS

CONTACTS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Allow more interaction with others	7.9%	7.0%	7.6%	3.5%	9.2%	9.4%
Leave as is	79.4%	83.0%	80.6%	88.4%	77.6%	78.1%
Lower interaction with others	12.6%	10.0%	11.8%	8.1%	13.3%	12.5%
Count	214	100	314	86	98	128

TABLE 39: EVIDENCE OF USE

EVIDENCE OF USE	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Allow more evidence of other visitors	3.2%	4.0%	3.5%	0.0%	5.0%	4.7%
Leave as is	60.6%	61.0%	60.8%	52.3%	67.0%	62.5%
Rehab and reduce signs of otherâ€™s use	36.1%	35.0%	35.8%	47.7%	28.0%	32.8%
Count	216	100	316	86	100	128

TABLE XXX: VISITOR SERVICES

VISITOR SERVICES	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Provide more services, staff contact, and assistance	15.3%	17.2%	15.9%	18.6%	13.0%	15.7%
Leave as is	80.6%	80.8%	80.6%	79.1%	84.0%	79.5%

Reduce services, staff contact, and assistance	4.2%	2.0%	3.5%	2.3%	3.0%	4.7%
Count	216	99	315	86	100	127

TABLE 40: DIRECTIONAL SIGNS

DIRECTIONAL SIGNS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Provide more directional signs	39.8%	45.0%	41.5%	36.0%	39.0%	46.9%
Leave as is	59.7%	51.0%	57.0%	62.8%	59.0%	51.6%
Reduce/limit directional signs	0.5%	4.0%	1.6%	1.2%	2.0%	1.6%
Count	216	100	316	86	100	128

TABLE 41: INTERPRETIVE SIGNS

INTERPRETIVE SIGNS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Provide more interpretive signs	32.4%	35.0%	33.2%	31.4%	30.0%	36.7%
Leave as is	66.2%	61.0%	64.6%	67.4%	68.0%	60.2%
Reduce/limit interpretive signs	1.4%	4.0%	2.2%	1.2%	2.0%	3.1%
Count	216	100	316	86	100	128

TABLE 42: SAFETY

SAFETY	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Increase restrictions to provide safety	6.5%	7.0%	6.7%	7.0%	8.1%	5.5%
Leave as is	86.0%	81.0%	84.4%	89.5%	85.9%	79.7%

Reduce/limit restrictions to provide safety	7.4%	12.0%	8.9%	3.5%	6.1%	14.8%
Count	215	100	315	86	99	128

TABLE 43: DIVERSITY OF USER GROUPS

DIVERSITY OF USER GROUPS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
More types of recreation on the same trail system	10.2%	12.0%	10.8%	11.6%	6.0%	14.1%
Leave as is	76.4%	78.0%	76.9%	75.6%	82.0%	74.2%
Fewer types of recreation on the same trail system	13.4%	10.0%	12.3%	12.8%	12.0%	11.7%
Count	216	100	316	86	100	128

TABLE 44: MANAGEMENT CONTROL

MANAGEMENT CONTROL	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Exercise more visitor and land use controls	6.5%	15.0%	9.2%	8.2%	9.0%	10.2%
Leave as is	74.9%	71.0%	73.7%	78.8%	74.0%	69.5%
Use a more hands off management style	18.6%	14.0%	17.1%	12.9%	17.0%	20.3%
Count	215	100	315	85	100	128

TABLE 45: DEDICATED TRAILS

DEDICATED TRAILS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Dedicate specific trails for multiple types of recreation activity	28.2%	16.0%	24.4%	17.4%	23.0%	28.9%
Leave as is	50.5%	62.0%	54.1%	48.8%	63.0%	51.6%
Dedicate specific trails for single type of recreation activity	21.3%	22.0%	21.5%	33.7%	14.0%	19.5%
Count	216	100	316	86	100	128

TABLE 46: MARKETING FOCUS

MARKETING FOCUS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI I	LUNCH LOOPS
Focus more on national/international visitors	21.1%	32.3%	24.7%	16.5%	29.3%	26.2%
Leave as is	63.4%	52.5%	59.9%	69.4%	60.6%	53.2%
Focus more on bringing in more local visitors	15.5%	15.2%	15.4%	14.1%	10.1%	20.6%
Count	213	99	312	85	99	126

TABLE 47: FACILITIES

FACILITIES	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	43.5%	38.0%	41.8%	32.1%	47.5%	44.2%
High	47.2%	38.0%	44.3%	54.8%	42.6%	39.5%
Moderate	7.9%	20.0%	11.7%	11.9%	7.9%	14.0%

Low	1.4%	3.0%	1.9%	1.2%	2.0%	1.6%
Poor	0.0%	1.0%	0.3%	0.0%	0.0%	0.8%
Count	216	100	316	84	101	129

TABLE 48: DIRECTIONAL SIGNS

DIRECTIONAL SIGNS AT TRAIL SYSTEM	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	25.8%	17.0%	23.0%	20.9%	27.0%	21.7%
High	39.2%	35.0%	37.9%	41.9%	35.0%	37.2%
Moderate	24.9%	33.0%	27.4%	29.1%	27.0%	26.4%
Low	6.9%	8.0%	7.3%	4.7%	7.0%	9.3%
Poor	0.9%	3.0%	1.6%	1.2%	0.0%	3.1%
Did not observe	2.3%	4.0%	2.8%	2.3%	4.0%	2.3%
Count	217	100	317	86	100	129

TABLE 49: RESTROOM FACILITIES

RESTROOM FACILITIES	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	26.7%	17.0%	23.7%	17.6%	28.7%	24.0%
High	31.8%	31.0%	31.5%	28.2%	38.6%	27.9%
Moderate	26.7%	35.0%	29.3%	35.3%	24.8%	28.7%
Low	8.3%	9.0%	8.5%	14.1%	5.9%	7.0%
Poor	0.9%	4.0%	1.9%	2.4%	0.0%	3.1%
Did not observe	5.5%	4.0%	5.0%	2.4%	2.0%	9.3%
Count	217	100	317	85	101	129

TABLE 50: VENDORS OR DEMONSTRATIONS

VENDORS OR DEMONSTRATIONS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	6.0%	5.1%	5.7%	5.8%	6.9%	4.7%
High	6.4%	17.2%	9.8%	10.5%	8.9%	9.4%
Moderate	7.8%	13.1%	9.5%	10.5%	9.9%	8.6%
Low	0.9%	4.0%	1.9%	0.0%	0.0%	4.7%
Poor	3.2%	1.0%	2.5%	1.2%	5.9%	0.8%
Did not observe	75.7%	59.6%	70.7%	72.1%	68.3%	71.9%
Count	218	99	317	86	101	128

TABLE 51: INTERPRETIVE SIGNS/PANELS

INTERPRETIVE SIGNS/PANELS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	19.9%	11.1%	17.1%	14.1%	22.0%	14.8%
High	30.6%	30.3%	30.5%	34.1%	29.0%	29.7%
Moderate	25.0%	36.4%	28.6%	34.1%	29.0%	24.2%
Low	6.0%	6.1%	6.0%	3.5%	5.0%	8.6%
Poor	1.4%	0.0%	1.0%	0.0%	1.0%	1.6%
Did not observe	17.1%	16.2%	16.8%	14.1%	14.0%	21.1%
Count	216	99	315	85	100	128

TABLE 52: TRAILHEADS

TRAILHEADS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	45.8%	33.0%	41.8%	38.8%	48.0%	39.5%
High	42.6%	47.0%	44.0%	48.2%	33.0%	48.8%
Moderate	10.2%	17.0%	12.3%	12.9%	18.0%	7.8%
Low	0.5%	1.0%	0.6%	0.0%	0.0%	1.6%
Did not observe	0.9%	2.0%	1.3%	0.0%	1.0%	2.3%
Count	216	100	316	85	100	129

TABLE 53: TRAILS

TRAILS	VISITOR	MESA COUNTY	TOTAL	18 ROAD	KOKOPELLI	LUNCH LOOPS
Very High	70.0%	63.0%	67.8%	55.8%	72.0%	72.9%
High	25.8%	26.0%	25.9%	31.4%	25.0%	22.5%
Moderate	4.1%	9.0%	5.7%	11.6%	2.0%	4.7%
Low	0.0%	2.0%	0.6%	1.2%	1.0%	0.0%
Count	217	100	317	86	100	129

APPENDIX C:

OPEN ENDED RESPONSES TO QUESTION 16

TABLE 54: OPEN ENDED RESPONSES TO “WHAT IS/ARE THE MOST IMPORTANT IMPROVEMENTS(S) THAT RECREATION MANAGERS COULD MAKE TO ENHANCE YOUR VISITS IN THE FUTURE?”

Build more trails
Nothing
Get rid of potholes on road
Great job
Picnic Tables
No more wind
More cycle pamphlets, more local biking information about trails
Less motorized vehicle trails, less road for access
DQ and Bar
Overflow campsites
Number of restrooms
More parking
Need better signage or suggested laps for out of towners...got super lost, bathrooms smelled terrible
Horses off trails
More uphill trails instead of road.
More concentrated trails
Lower grade into TH
Double truck rides and more leisure routes/rides.
A posted map of good quality in all parking lots as well as trail intersections would be helpful, i.e. Moab.
More bathrooms and interpretive signs and better maps.
Keep up the good work
More funding
Improved trail sign between loops. It is sometimes difficult to understand what direction the sign is pointing to. Without a map (or experience) it is easy to take the wrong route.

Make the loops one directional. We had a very hard time staying on our bikes because of the bikers coming from the opposite direction.
Excellent! Consider a "haval" Colorado Mtn Bike stamp for insurance. Similar to hunting or fishing for search & rescue.
Add camping
Make some potable water available
None
Parking Coverage
18 Road- Paved roads
Better Signage
More bike specific trails. Mountain bikes, no grazing rights.
Marijuana on BLM
Broken directional signs on trail
Drinking Fountain. Trail etiquette classes
Put difficulty square on trails
None!
Keep maintaining Trails
More trails
Garbage cans, bathrooms emptied, need changing area
Thumbs up!
Move away from resource removal aka gas/oil
More water fountains/wells
Nothing
Trail Signage
More bike etiquette signs
More maps available at bottom, printouts
Keep it up!
Great!
More events
Don't interfere
Picnic Benches more bathrooms during festival
More dedicated to hiking/biking

Over the edge has an awesome shuttle service
More facilities
Bike Maintenance Stations
Brewery @ trailhead
More, larger trailhead signs
More directional Signage
More user friendly- More directional signs, kids come here
Shelters on trailhead
Directional trails to avoid conflict (hike only, bike only). Permit or bike registration
Trail maintenance
More separated trails (directional specific)
Single use systems
Bathrooms with running water and flushing toilets that are cleaned frequently
Ensure no rogue land users deface existing landscape or create negative impacts by going off of designated trails.
More commuter trails
Some potential primitive camping (back in the day that was allowed).
Pro-protecting public lands.
Water fountain
More of the specified trails for specified activities. Seperate trails for different activities.
Mitigate land use impact. Mitigize damage to natural landscape, especially land use w/ motorized vehicles.
Re-vegetation area signs
signs that "keep single tracks single"
Happy with experiences this weekend
More directional signs out before leaving pavement.
Signs fading
Increase bathroom capacity, water stations, and more parking.
Continue to build additional designated trails both mountain bike specific 1 foot traffic specific.
Directional signs more prominent
more camping, more restroom facilities
Thanks for effort. More waste control, bathrooms and recycling.

More directional signs from motorized to bike trails. More restrooms at the top of trail and trailhead. There are long lines at the restrooms.
More restroom facilities
marked features on trails (safe landing, jumps, etc)
Entry-fee, more signs
More camping spots and alleviate trailhead signage arrow confusion.
More trail junction difficulty ratings and 1 bathroom at the top of the trail.
Update all/directional signs that are faded, more campground
More restrooms and trails
More systems
Doing well
Provide water here. Pay a little for someone to supervise.
Not much, this place is great, if anything an extra bathroom would be nice near the camping area.
More shaded areas and better restrooms
Less parking lots, its confusing.
Thank you!
Take down the barbwire fences
More picnic tables
Really enjoy trail system
More camping
Relaxed runs for BUM dispersed camping
Parking for dispersed camping
Signs for camping, directional signs.
Expand # of trails
close/rehab trails that are heavily used
Trails are very nice.
More directional signs.
Add water facilities
If parks pass paid, should include National parks pass and interagency government land.
Appreciate trails, continue to work with oil and gas.
Donation tubes
Charge for dispersed camping

Ridges to rivers, win win, erosion.

handwriting unclear.

Rented bikes at Fruita Fat Tire Festival.

Better than Moab. Keep it a hidden gem.

Showers and toilet paper refill

Update trail signs ex) kessel run

More trails. Like the area - less regulation. Create more motorized routes separate from mtn bike.

More directional trails, signs are fine.

Better maps. Paper maps that crumble cost \$5, would pay \$10 for laminated.

Maintain the trails system and keep it at the current level

Education

"We're from San Francisco and never heard of this place!"

Beer vendors at trailhead post-ride.

Russlers trail. Trail approach is not kid friendly.

Perfect, more trails.

Great trails, great curves.

Have maps available

Advertising on maps

Don't ask money income

Signage to trailhead from highway

Separate dirt bike amenities.

Don't restrict dogs.

Hiking/biking separate trails.

Hikers are being favored!

Bathrooms, tool rack work bench.

More trails! We love this area and look forward to continue to visit. Great trails, great food!

Good markings on directional signs.

More campsites on or off river.

No pay for trails.

Great job, thanks. Stay cool.

Just keep the space on trails in tact, don't Beiber them.

Trail signage in Bunny Ranch/West Rim could be improved.

Doing alright.
Map's available at trailheads.
Nothing. Leave as is.
More shade
None! Maybe better mapping online to get to the trailhead.
Awesome trails!
Keep public lands public.
Trails are lots of fun!
Compared to many other newer locations such as recently developed trail systems in and around Moab, the signage in the trail systems near Loma and Rabbit Valley could use much improvement and/or enhancement.
Outdoor showers
More advanced and easy trails
Fine as is
Higher quality directional signs. Use concrete mounted signs. Look at Oregon. More entertainment! Better bathrooms. No horses only mountain bikes.
More maps at the intersections
I like the way things are going. You guys are doing a good job.
Additional advanced mountain bike trails
I would love to see an expanded parking lot, more amenities like picnic benches or shade.
Increase trails for new users/beginners/kids
One additional bathroom facility and add more than 1 trail every 5 years.
Fire pits. Recycling. WATER
More maps/access/knowledge about
Parking expansion. Signage to stay on trail. Covered aning. Don't use trail when wet. recycle bin. getting back to trailhead/suggested direction on trailhead.
Better directional signage for people who are unfamiliar
More foot trail only
More trails more manmade features
Less people
Trash Cans
Nice! keep growing

No oil/gas drilling, leave public lands public, impeach trump, encourage biking
Biodegradable poop bags more handicap accessibility
More parking more education on trails/ecosystems. bike patrol ranger
Restroom improvement
Fresh water supply- more accurate difficulty ratings
Add more trails/downhills
More parking, more bathrooms, shade
Bike registration, improvements on parking area (easier mobility), designated trails, shower, crowded parking
More trails/trailheads
Remove cactus and make trails wider
Clean the restrooms more often
Changing rooms
Roads out to the trailhead, get washed out.
Better camping around trailhead
Water stations and restrooms, maintain single track, and speed restriction in parking and access points.
Develop camping area for more facilities/expand trails
More bathrooms at the top of trail
More directional signs, no more ramps, trail sanitation
Focus less on tourism for revenue; don't overrun trails with tourism
Thanks
Shaded areas
Trails are always in great shape!
People ride when muddy
Be aware of taking out difficult features when trail grooming.
More directional signs. Wouldn't come alone, get lost.
Keep single tracks single.
Fix corners being obstructed.
Campsites! BLM should add more.
Curtz down trail (downhill) beware hikers - safety concern going down.
More beginner/easy trails and keep them from falling off trails. Keep beginners off of harder

trails.
Keep up the good work, keep communicating and cooperating.
Keep residential development limited
More tables and benches
Low on maps
More trails! keep up the good work, wishes to work with BLM again.
More uphill trails. Cows tear up the trail.
Moved from FL for these trails.
Leave it as is. Too many land managers try to keep on improving the experience and in turn end up over-regulating or over-developing the trails. I left Boulder for GJ because of this!
More trails.
Keep up trail maintenance.
Continue with E-bike ban.
Very good directional signs
Fantastic coop with Copmoba.
Improved parking at Mack, add shade.
Spread people out.
No dogs on mountain biking trails!!!!
Single track should be "one way."
This is a wonderful Mesa County resource! First and foremost I am in favor of maintaining what we have. I think that the resource might also benefit from more recreation manager outreach.
Keep up the good work!
Pace large groups of mountain bikers for runners.
More restrictions to ensure dog cleanup.
Add water stations and shade
Curtz reroute needs to be one-way, can still be multiuse but for safety measures should be one-way.
More signs relative to difficulty of the trail.
"More events for us college students"
More shade and trash cans.
Clean bathrooms more often.
They do a great job on trails.

More shade and water would be nice.

More updated maps.

Directional signs should be more clear. Marketing focus should be on both local and national/international visitors. Lots of bugs.

Keep up truckin'

More trails, and more advanced trails.

APPENDIX D:

SURVEY

Bureau of Land Management Monument Road Project Recreation Impact Study Master Survey

(Note: Surveyor will approach public lands visitors, and ask them to complete an anonymous, voluntary survey on their preferences for public lands recreation in the area. If there is more than one person in the group, the surveyor will randomly select a person to complete the survey by asking the person whose birthday is closest on the day of the survey to please complete the survey. If people don't have time to do the survey on sight, the exact same survey will be set up in Qualtrics. They will be asked to give only an e-mail address to receive a link to the survey, and their e-mail will not be stored or identified with any information gathered)

"Good morning/afternoon: I am _____ a research assistant at Colorado Mesa University. The Natural Resource Center at CMU is partnering with Mesa County, the Mesa Land Trust and The Bureau of Land Management (BLM) to learn more about public lands visitors so that the Bureau of Land Management can improve their management of the area and enhance recreation opportunities. Would you be willing to participate in an anonymous, voluntary 15 minute survey at this time so we can better understand your interests and expectations for public lands recreation in this area?"

(If they say no, ask if they would be willing to take the survey on-line when they get home. If they agree, ask them to put their e-mail address – but no other information- on a list to receive a link to the survey. Remind them that their responses will not be linked to their e-mail, that we will only use their e-mail for the purposes of sending them the survey link, and that we will destroy all e-mail addresses at the end of our data collection. If they agree, take their e-mail address, if the decline, thank them for their time.)

(If they say yes to participating in the survey on-sight, proceed with the rest of this script)

“Thank you for visiting public lands administered by the Bureau of Land Management, and for agreeing to participate in this study. Please answer the questions in this survey that reference “your visit” or “this trip” with respect to this visit in which you are completing the onsite survey.

You have been chosen randomly to represent visitors to public lands, so your participation is of great importance to us. All the information we collect will be used for our statistical purposes and at no time will your name be identified with any results. You are free to withdraw from the study at any time. Your continued participation by answering question on this the survey will be considered as your consent to participate in the study. All results will be analyzed in such a way that your answers cannot be identified with you.

If you have any questions about the survey, please feel free to contact Tim Casey or Louis Nadelson at Colorado Mesa University at (970) 248-1095. **Thanks Again!”**

This study is being conducted by Colorado Mesa University

Tim Casey, Ph.D.
Director of the Natural Resource Center
Colorado Mesa University
1100 North Avenue
Grand Junction, Colorado 81501

PRIVACY ACT and PAPERWORK REDUCTION ACT STATEMENT: The Bureau of Land Management is authorized by 16 U.S.C. 1a-7 to collect this information. This information will be used by BLM managers to better understand recreational visits to Mesa County, Colorado. Your response to this request is voluntary and completely anonymous. No action may be taken against you for refusing to supply the information requested. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number.

BURDEN ESTIMATE STATEMENT: Public reporting for this form is estimated to average 15 minutes per response. Direct comments regarding the burden estimate or any other aspect of this questionnaire to: Tim Casey, Colorado Mesa University. nrc@coloradomesa.edu.

Topic Area 1: TRIP PLANNING AND ACCOMMODATIONS

PART 1- First, we would like to begin by asking you some questions about your recent visit to the BLM lands in Mesa County, Colorado.

1. ZIPCODE: What is the zip code of your home address? _____

2. STAY LENGTH: If you are visiting from outside of Mesa County, how many days were you in Mesa County on your visit to BLM Recreation areas?

___ I live here or ___ days on this visit.

3. TRAILDAYS: How many days during your visit did you spend on the BLM trails in Mesa County?

___ days on this visit.

4. OVERNIGHT ACCOMMODATIONS (Answer only if you were visiting the area from beyond Mesa County)

ACCOM1: What type of overnight accommodations did you use while in the area? *(please ✓ all that apply)*

- | | |
|---|--|
| <input type="checkbox"/> I didn't stay overnight in the area | <input type="checkbox"/> Commercial campground |
| <input type="checkbox"/> Camped in a BLM designated campground | <input type="checkbox"/> Hotel/motel/resort |
| <input type="checkbox"/> Camped on BLM public lands (no campground) | <input type="checkbox"/> Other paid accommodations |
| <input type="checkbox"/> Camped in another public campground | <input type="checkbox"/> Friends or family |
| <input type="checkbox"/> Camped on other public lands | <input type="checkbox"/> Other <i>(please specify)</i> _____ |

ACCOM1a. If you did stay overnight, how many nights did you stay? _____

5. GROUP SIZE: How many people (including yourself) were in your group during the visit?

6. PROXIMITY: How far away (in approximate miles) do you live from the trail you were contacted at for this survey? _____ miles.

Topic Area 2: TRIP BEHAVIOR AND PAST EXPERIENCE

PART 2 - Now we would like to ask you some questions about the recreation activities you participated in during your visit.

7. YEARSITE1: How many years have you been visiting the BLM Trails in Mesa County?

(If this was your first visit, please enter 1)

_____ Years

8. PREVIS1: Approximately how many times have you been to this trail system in the past year?

(please ✓ box or enter number of visits)

☐ This is my first visit or _____ times

9. VISITATION: How many times have you visited this trailhead or similar trailheads in Mesa County in the last year? _____

10. TRAVEL TIME: About how long (one-way) did it take you to travel from your home to the trail you used? _____ # Hours _____ # Minutes

11. ACTIV1: Please check each activity that you participated in while recreating on public lands during this trip. *(please ✓ all that apply)*

☐ Day hiking

☐ Camping

☐ Photography

- | | | |
|---|--|--|
| <input type="checkbox"/> Walking or running | <input type="checkbox"/> OHV riding | <input type="checkbox"/> Bird watching |
| <input type="checkbox"/> Biking | <input type="checkbox"/> Driving and sightseeing | <input type="checkbox"/> Watching wildlife |
| <input type="checkbox"/> Horseback riding | <input type="checkbox"/> Picnic | |

12. PRIMACT1: From the activities marked above, which one was your primary activity during your visit?

Topic Area 3: Value of Amenities

PART 3 - Now we would like to ask you about how much you value the trails and other amenities. Please note: There are no plans to charge fees for these amenities. Typical research on the economic impact of recreation only focuses on money spent by visitors who travel from outside the Grand Valley. This question is another way to gauge the economic value of these amenities.

13. WILLINGNESSTO PAY: What is the Maximum amount you would be willing to pay to use this trail for a day?

- ☐ \$1 per day ☐ \$3 per day ☐ \$5 per day
☐ \$ 9 per day ☐ I would not be willing to pay to use this trail system
☐ Other _____

Topic Area 4: YOUR EVALUATIONS AND PREFERENCES CONCERNING RECREATION SETTINGS, FACILITIES, AND MANAGEMENT

PART 4 - Now we would like to ask you to provide some evaluations and share your preferences about the recreation settings, facilities and management provided in the trail system you visited.

14. PREF1: For your primary destination zone, please indicate your preference for how each of the following recreation setting characteristics should be managed. Please base your answer on the character of the recreation setting condition that would best enhance the experience and benefits you desire. *(please ✓ one answer for each of the twelve setting conditions)*

- | | | | |
|-----------------------|---|--------------------------------------|---|
| 1. Points of access: | <input type="checkbox"/> Fewer points of access/trailheads | <input type="checkbox"/> Leave as is | <input type="checkbox"/> More points of access/trailheads |
| 2. Organized Events: | <input type="checkbox"/> Fewer organized events at the trail system | <input type="checkbox"/> Leave as is | <input type="checkbox"/> More organized events at the trail system |
| 3. Facilities: | <input type="checkbox"/> Remove some facilities (e.g., restrooms) | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Develop more facilities (e.g., restrooms) |
| 4. Dogs: | <input type="checkbox"/> Less restrictions on dogs in the area | <input type="checkbox"/> Leave as is | <input type="checkbox"/> More restrictions on dogs in the area |
| 5. Foot trails: | <input type="checkbox"/> Reduce/limit foot trails | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Create/allow more foot trails |
| 6. Bike trails: | <input type="checkbox"/> Reduce/limit mountain bike trails | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Create/allow more mountain bike trails |
| 7. Motorized routes: | <input type="checkbox"/> Reduce/limit motorized routes | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Create/allow more motorized routes |
| 8. Group size: | <input type="checkbox"/> Limit the group size allowed | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Provide for larger groups |
| 9. Contacts: | <input type="checkbox"/> Lower interaction with others | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Allow more interaction with others |
| 10. Evidence of use: | <input type="checkbox"/> Rehab and reduce signs of other's use | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Allow more evidence of other visitors |
| 11. Visitor services: | <input type="checkbox"/> Reduce services, staff contact, and assistance | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Provide more services, staff contact, and assistance |

- | | | | |
|-------------------------------|--|--------------------------------------|---|
| 12. Directional signs: | <input type="checkbox"/> Reduce/limit directional signs | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Provide more directional signs |
| 13. Interpretive signs: | <input type="checkbox"/> Reduce/limit interpretive signs | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Provide more interpretive signs |
| 14. Safety | <input type="checkbox"/> Reduce/limit restrictions to provide safety | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Increase restrictions to provide safety |
| 15. Diversity of user groups: | <input type="checkbox"/> Fewer types of recreation on the same trail system | <input type="checkbox"/> Leave as is | <input type="checkbox"/> More types of recreation on the same trail system |
| 16. Management control: | <input type="checkbox"/> Use a more "hands-off" management style | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Exercise more visitor and land use controls |
| 17. Dedicated trails | <input type="checkbox"/> Dedicate specific trails for single type of recreation activity | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Dedicate specific trails for multiple types of recreation activity |
| 17. Marketing focus: | <input type="checkbox"/> Focus more on bringing in more local visitors | <input type="checkbox"/> Leave as is | <input type="checkbox"/> Focus more on national/international visitors |

15. SATSERV1: Please rate the quality of each of the following items that you observed on the trail system you visited on this trip when you were contacted for this survey. (*circle the most appropriate answer or ✓ did not observe*)

<i>For these facilities:</i>	<i>The quality was...</i>					
	Poor	Low	Moderate	High	Very high	Did not observe
Parking Facilities at trailhead	1	2	3	4	5	<input type="checkbox"/>
Directional signs at trail system	1	2	3	4	5	<input type="checkbox"/>

Restroom Facilities	1	2	3	4	5	<input type="checkbox"/>
Vendors or Demonstrations	1	2	3	4	5	<input type="checkbox"/>
Interpretive signs/panels	1	2	3	4	5	<input type="checkbox"/>
Organized Events	1	2	3	4	5	<input type="checkbox"/>
Trailheads	1	2	3	4	5	<input type="checkbox"/>
Trails	1	2	3	4	5	<input type="checkbox"/>

16. MGTSUG1: As you think about your visit to the trail system where you received this survey, what is/are the most important improvements(s) that recreation managers could make to enhance your visits in the future? *(If you have any suggestions, please write your response below.)*

Topic Area 5: ENCOUNTERS AND EXPECTATIONS

PART 5 - Now we would like to ask you some questions about the number of other visitors you encountered while using the trail system

17. CROWD1: Please circle the number that best represents the level of crowding you experienced in your primary destination zone during your visit. *(please circle one)*

Not at all	Low	Moderate	High	Very high
1	2	3	4	5

18. CROWD2: If you felt crowded, rate the degree to which that crowding level negatively impacted the attainment of your desired experiences and benefits from recreating on the trail system. *(please circle one, or indicate you did not feel crowded)*

☐ I did not feel crowded.

If you felt crowded, the negative impact on attaining your desired experiences and benefits was:

Not at all	Slight	Somewhat	Moderate	Very much
1	2	3	4	5

19. EXPECT2: Was the number of encounters with other groups on the trails below or above your expected number of encounters? *(Circle the number that best describes your number of expected encounters compared to actual encounters.)*

Significantly below	Below	About what I expected	Above	Significantly above
1	2	3	4	5

Topic Area 6: OVERALL TRIP CHARACTERISTICS & EVALUATION

PART 6 – This section asks questions about your overall trip to Mesa County.

20. EIMPACT1: Please estimate the amount of money you spent inside of Mesa County for your entire trip to recreate on BLM trails system. *(Enter the amount for each category.)*

Lodging (Motel, lodge, cabin, campground, etc.)	\$ _____
Gasoline	\$ _____
Other Transportation (repairs, parking, etc)	\$ _____
Shopping and gifts (clothing, sporting goods, souvenirs, etc)	\$ _____
Entertainment	\$ _____
Food, meals and drink (purchased at restaurants, bars, etc)	\$ _____

Groceries (purchased at supermarket/convenience store) \$ _____
Tourist Services (Jeep tours, boat rentals, bike rentals, outfitters, etc) \$ _____
Other (*please specify*): _____ \$ _____

Topic Area 7: RESPONDENT'S CHARACTERISTICS

PART 7 - The final section asks for some background information about you and your household. This information will be used for statistical purposes only.

21. GENDER: What is your sex? (*please check only one*)

☐ Male ☐ Female

22. AGE: In what year were you born? _____

23. EDUCATION: Indicate the highest level of education you have attained. (*please check one*)

- ☐ Less than High School
- ☐ High School Graduate
- ☐ Some College
- ☐ 2 year degree
- ☐ 4 year degree
- ☐ Professional Degree
- ☐ Doctorate

24. RACE/ETHNICITY: Do you consider yourself to be Hispanic or Latino (*please ✓ one*)

☐ Yes ☐ No

25. RACE/ETH2: With which racial group(s) do you identify? (*please ✓ all that apply*)

- ☐ White
- ☐ Black or African American
- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ Other-please specify

26. HOUSEHOLD INCOME: Which of the following categories best describes your total annual household income for the last calendar year? (*please ✓ one*)

- ☐ \$25,000 or less
- ☐ \$25,001 – \$50,000
- ☐ \$50,001 – \$75,000
- ☐ \$75,001 – \$100,000
- ☐ \$100,001 – \$125,000
- ☐ \$125,001 – \$150,000
- ☐ More than \$150,000

27. HOUSEHOLD SIZE: How many people are in your household (including yourself)? _____

28. HOUSEHOLD SIZE: How many in your household are working adults (employed for wages)?

Thank you for your participation!!!

ID#: _____

(Note: Responses to questions 6, 9 and 12 will be written out on a laminated card and surveyor will had the participant the card so they can see all options. The participant will then be asked to name their selections from each respective list and the researcher will record their responses. This is intended to ease of facilitation on multiple response questions)