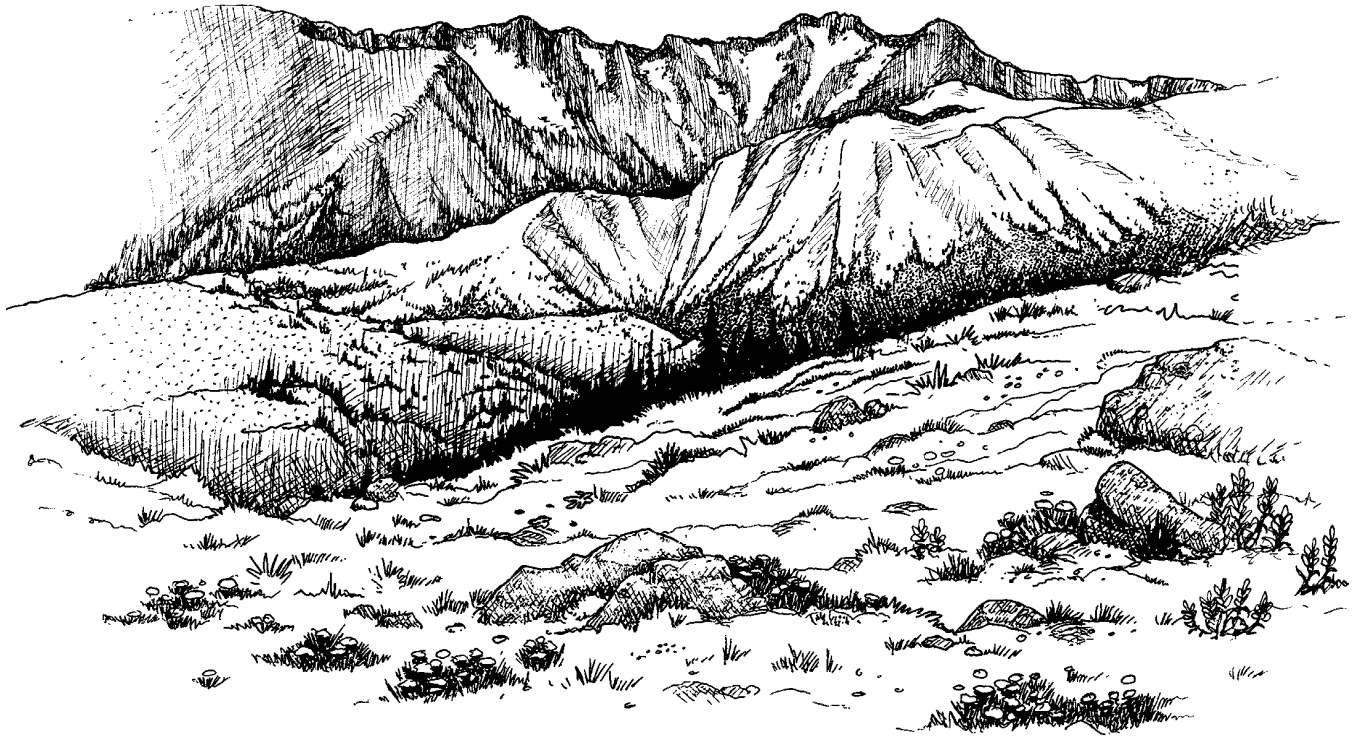




Impacts of Visitor Spending on the Local Economy

Rocky Mountain National Park, 2010

Natural Resource Report NPS/NRSS/EQD/NRR—2012/510



ON THE COVER

Tundra at Rocky Mountain National Park

Pen and ink courtesy of Rocky Mountain National Park

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U.S. Department of the Interior
National Park Service
Natural Resource Stewardship and Science
Fort Collins, Colorado

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Executive Summary

Rocky Mountain National Park hosted almost three million recreation visits in 2010. Adjustments for visitor group size and re-entries resulted in 718,184 visitor group trips to the park in 2010. Based on two Visitor Services Project surveys conducted July 18–24, 2010, and February 19–27, 2011, 62% of these visitor group trips were local residents or non-locals on day trips, not including an overnight stay within 20 miles of the park.¹ Twenty-one percent of visitor group trips involved an overnight stay in hotels, motels, cabins, B&Bs, etc. in the local area.

Visitors reported their group's expenditures in the park and in the surrounding communities within 20 miles of the park. The average visitor group size was 2.9 people and spent an average of \$233 in the park and within 20 miles of the park.

Total visitor spending in 2010 within 20 miles of the park was \$167.5 million, including \$21.9 million inside the park. The greatest proportions of expenditures were for overnight accommodations (38%) and restaurants and bars (18%). Overnight visitors staying in hotels, motels, cabins, B&Bs, etc. in the local area accounted for 69% of total spending.

Sixty-nine percent of visitor groups indicated the park visit was the primary reason for their trip to the area. Counting only a portion of visitor expenses if the park visit was not the primary reason for the trip yields \$138.5 million in spending attributed directly to the park.

The economic impact of park visitor spending was estimated by applying the spending to an input-output model of the local economy. The local region was defined as a three-county region including Boulder, Grand, and Larimer counties, Colorado. This region roughly coincides with the 20-mile radius around the park for which expenditures were reported.

Including direct and secondary effects, the \$138.5 million in visitor spending attributed to the park generates \$177.6 million in direct sales in the region, which support 2,153 jobs. These jobs pay \$63.2 million in labor income, which is part of \$105.4 million in value added to the region.²

A separate study estimated impacts of the park employee payroll on the local economy.³ The park itself employed 319 people in FY 2010 with a total payroll including benefits of \$18.2 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$8.6 million in sales, supporting 392 jobs, \$20.9 million in labor income, and \$23.4 million in value added.

Local Economic Impacts of Rocky Mountain National Park

	<u>Sales</u>	<u>Jobs</u>	<u>Labor Income</u>	<u>Value Added</u>
Park Visitor Spending	\$177.6M	2,153	\$63.2M	\$105.4M
Park Payroll	+ \$8.6M	+ 392	+ \$20.9M	+ \$23.4M
Park Visitor Spending + Payroll	\$186.2M	2,545	\$84.1M	\$128.8M

¹ Results in this study sometimes differ from those reported in the VSP study reports (Blotkamp et al. 2011, Papadogiannaki et al. 2011) for two reasons. First, the results in this report adjust for seasonal differences in visitor group trip characteristics and combine data from the two VSP surveys. Second, the current analysis excludes some cases as outliers. See Study Limitations and Errors section and Appendix D.

² Jobs include fulltime and part-time jobs. Labor income consists of wages and salaries, payroll benefits and income of sole proprietors. Value added includes labor income as well as property income (dividend, royalties, interest and rents) to area businesses and indirect business taxes (sales, property, and excise taxes).

³ Stynes (2011).

Acknowledgments

The author thanks Dr. Dan Stynes (1945-2012), Professor Emeritus, Michigan State University, for his assistance with MGM2, and Margaret Littlejohn, Visitor Services Project Director, and Marc Manni, Park Studies Unit Research Team Supervisor, for their reviews of an early draft of this report.

Introduction

Rocky Mountain National Park (NP) showcases the grandeur of the Rocky Mountains, with elevations ranging from 8,000 feet in the valleys to 14,259 feet at the top of Longs Peak. The park features majestic mountain views, a variety of wildlife, varied climates and environments, and easy access to backcountry trails and campsites. The park is located in Boulder, Grand, and Larimer counties, in north-central Colorado. Rocky Mountain NP received almost three million recreation visits in 2010, including 174,202 overnight stays (Table 1).

Table 1. Recreation visits and overnight stays, Rocky Mountain National Park, 2010

Month	Recreation visits	Overnight (OVN) Stays			Total OVN stays
		Tent and RV campers	Backcountry campers	Group campers	
January	64,618	216	130	0	346
February	44,576	96	56	0	152
March	70,117	429	246	0	675
April	69,097	627	134	0	761
May	180,710	5,508	922	296	6,726
June	441,738	28,716	4,599	1,356	34,671
July	668,418	38,259	12,452	2,477	53,188
August	574,638	31,878	9,687	1,154	42,719
September	461,942	25,803	4,135	631	30,569
October	245,770	2,826	833	15	3,674
November	67,862	396	138	0	534
<u>December</u>	<u>66,335</u>	<u>114</u>	<u>73</u>	<u>0</u>	<u>187</u>
Total	2,955,821	134,868	33,405	5,929	174,202

Source: NPS Public Use Statistics 2010.

The purpose of this study is to estimate the annual, local economic impacts of visitors to Rocky Mountain NP in 2010. Economic impacts are measured as the direct and secondary sales, income, and jobs in the local region resulting from spending by park visitors. (See Appendix A: Glossary for definitions of terms.) In addition, a separate study estimated the impacts of the NPS park payroll on the local region (Stynes 2011), and those results are reported herein. Neither study estimated the economic impacts of park operations or construction spending on the local region.

The local economic region defined for this study includes Boulder, Grand, and Larimer counties, Colorado. This three-county region has a population of 596,052 (USCB 2010), gross regional product of \$31.4 billion (MIG, Inc. 2008), median household income of \$59,267, and family poverty rate of 6.5% (USCB 2010). State and local governments, education, and food services and drinking places are the major employers in the region (MIG, Inc. 2008), and the region experienced a 7.3% unemployment rate in 2010 (BLS 2010).

Methods

The economic impact estimates are produced using the Money Generation Model 2 (MGM2) (Stynes et al. 2007). The three main inputs to the model are:

1. number of visits broken down by lodging-based segments;
2. spending averages for each segment; and
3. economic multipliers for the local region.

Inputs are estimated from the Rocky Mountain NP Visitor Services Project (VSP) survey data (Blotkamp et al. 2011, Papadogiannaki et al. 2011), National Park Service Public Use Statistics (2010), and IMPLAN input-output modeling software (MIG, Inc. 2008). The MGM2 model provides a spreadsheet template for combining park use, spending, and regional multipliers to compute changes in sales, labor income, jobs, and value added in the region.

The VSP visitor surveys were conducted at Rocky Mountain NP from July 18–24, 2010 and February 19–27, 2011.⁴ The VSP surveys measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 1,099 visitor groups in summer 2010 and 792 visitor groups in winter 2011. Response rates were 69% and 73%, respectively.

Spending and economic impact estimates for Rocky Mountain NP are based on the summer 2010 and winter 2011 VSP survey data. Spending averages for summer visitor groups were estimated using the summer 2010 VSP survey data and applied to visitor groups between May and October. Winter visitor group spending averages were estimated using the winter 2011 VSP survey data and assumed to represent visitor groups from November through April. Although winter visitor spending data were collected in February 2011, spending averages and patterns are assumed to apply to all winter visitors in 2010.

Visitors were asked to report expenditures within 20 miles of the park. The local region for determining economic impact was defined as a three-county area around the park including Boulder, Grand, and Larimer counties, Colorado, which roughly coincides with the 20-mile radius for which visitor spending was reported.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Six segments were established for Rocky Mountain NP visitors based on reported trip characteristics and lodging expenditures:

Local: Visitors from the local region, not staying overnight inside the park.

Day trip: Visitors from outside the local region, not staying overnight within 20 miles of the park.

Camp-in: Visitors reporting camping expenses inside the park.

⁴ Results in this study sometimes differ from those reported in the VSP study reports (Blotkamp et al. 2011, Papadogiannaki et al. 2011) because of the omission of cases considered to be outliers in the current analysis. See Study Limitations and Errors section.

Motel-out: Visitors reporting motel expenses within 20 miles of the park.⁵

Camp-out: Visitors reporting camping expenses outside the park within 20 miles of the park.

Other overnight (Other OVN): Visitors staying overnight in the local region but not reporting any lodging expenses. This segment includes visitors staying in private homes, with friends or relatives, or in other unpaid lodging.⁶

The VSP survey data were used to estimate the percentage of visitors from each segment as well as spending averages, lengths of stay, and visitor group sizes for each segment. Segment shares from the VSP surveys were adjusted to be consistent with the park's NPS Public Use Statistics (2010) overnight stay figures.

⁵ The questionnaire asked about expenditures for "Hotels, motels, cabins, B&B, etc." For convenience, these expenditures are referred to as "motel" in this report.

⁶ Visitors reporting multiple lodging types and expenditures were classified based on the greatest reported lodging expense. Some visitors listing motels or campgrounds as lodging types did not report any lodging expenses and were classified in the other overnight (Other OVN) category.

Results

Visits

Based on the VSP survey data, almost half of park entries were classified as day trip visits by either local residents or visitors from outside the region, and the remainder were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 2.4 to 3.3 people across the six segments with an average visitor group of 2.9 people.⁷ The average length of stay in the local region on overnight trips was 2.7 nights.

Table 2. Selected visit/trip characteristics by segment, 2010

Characteristic	Segment						All visitors
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	
Visitor segment share (park entries)	8.5%	40.0%	5.5%	32.0%	4.5%	9.5%	100.0%
Average visitor group size	2.4	2.9	3.3	3.1	2.9	2.7	2.9
Length of stay (days or nights)	1.0	1.0	2.7	2.7	3.2	3.0	2.7
Re-entry rate (park entries per trip)	1.8	1.1	2.1	2.0	1.7	1.6	1.5
Percent primary purpose trips	100%	71%	78%	70%	86%	48%	69%

Sixty-nine percent of visitor groups indicated that visiting the park was the primary reason for their trip to the area. Other stated reasons included visiting friends and relatives in the area, business, traveling through, or visiting other area attractions.

The 2,955,821 recreation visits in 2010 were allocated to the six segments using the visit segment shares in Table 2. Because spending is reported for the stay in the area, recreation visits were converted to visitor group trips to the area by dividing recreation visits by the average number of times each visitor entered the park during their stay and the average visitor group size. Park re-entry rates were estimated based on the number of entries into the park reported by survey respondents. The 2,955,821 recreation visits represented 718,184 visitor group trips (Table 3).

Table 3. Recreation visits and visitor group trips by segment, 2010

Measure	Segment						All visitors
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	
Recreation visits	251,245	182,328	162,570	945,863	133,012	280,803	2,955,821
Visitor group trips	89,357	362,158	22,934	154,317	26,665	62,752	718,184
Percent of visitor group trips*	12%	50%	3%	21%	4%	9%	100%

*Segment percentages do not total 100% due to rounding.

⁷ Visitor group size reported herein is based on the number of people covered by expenditures reported in the VSP surveys.

Visitor Spending

The VSP survey collected data about expenditures of visitor groups inside the park and within 20 miles of the park.⁸ Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent \$233 on the trip inside the park and in the local region (Table 4). On a visitor group trip basis, average spending was \$51 for day trips by local residents and \$70 for day trips by non-local visitors. Visitor groups staying in motels spent an average of \$751 on their trips. Visitor groups camping in the park spent an average of \$271 on their trips, while visitor groups camping outside the park spent an average of \$368 on their trips. Visitor groups spent about 13% of their total spending inside the park and 87% outside the park.

Table 4. Average spending by segment , 2010 (dollars per visitor group per trip)

Expenditures	Segment						
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	All visitors*
<u>Inside Park</u>							
Camping fees	0.00	0.00	39.96	1.38	0.66	0.00	1.60
Restaurants & bars	2.50	2.25	5.49	4.14	0.12	3.18	2.79
Groceries & takeout food	0.00	0.56	4.00	1.01	0.71	1.99	0.82
Gas & oil	1.40	0.33	8.06	0.74	1.24	2.04	0.98
Local transportation	0.00	0.00	3.48	0.07	2.48	0.00	0.22
Admission & fees	5.86	12.20	15.12	16.01	8.72	5.63	11.62
<u>Souvenirs & other expenses</u>	<u>4.21</u>	<u>12.28</u>	<u>21.72</u>	<u>17.60</u>	<u>12.01</u>	<u>8.96</u>	<u>12.42</u>
Total Inside Park	13.98	27.62	97.83	40.95	25.96	21.79	30.46
<u>Outside Park</u>							
Motels	0.00	0.00	1.04	379.84	0.00	0.00	81.65
Camping fees	0.00	0.00	1.92	0.53	149.67	0.00	5.73
Restaurants & bars	15.47	16.54	29.64	115.75	40.96	28.17	40.07
Groceries & takeout food	7.39	3.26	41.55	44.65	34.37	13.04	15.90
Gas & oil	8.08	9.53	30.04	41.95	56.95	12.99	19.03
Local transportation	0.16	3.27	33.68	40.35	2.48	3.20	11.78
Admission & fees	1.71	2.64	10.01	28.08	23.15	3.98	9.10
<u>Souvenirs & other expenses</u>	<u>4.39</u>	<u>6.68</u>	<u>25.58</u>	<u>59.07</u>	<u>34.66</u>	<u>9.12</u>	<u>19.51</u>
Total Outside Park	37.20	41.92	173.46	710.22	342.24	70.50	202.78
Total Inside & Outside Park	51.18	69.54	271.29	751.16	368.20	92.29	233.24

*Weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average is 9%. A 95% confidence interval for the overall visitor group spending average is therefore \$233 plus or minus \$22 or between \$211 and \$255.

⁸ Some expenditure categories in the VSP questionnaire were combined for reporting herein and MGM2 analysis. See Appendix B.

On a per night basis, visitor groups staying in motels spent \$209 in the local region, and campers spent \$111 (Table 5). The average reported per-night lodging expense was \$110 for motels and \$41 for camping fees.

Table 5. Average spending per night for visitor groups on overnight trips, 2010 (dollars per visitor group per night)

Expenditures	Segment			
	Camp-in	Motel-out	Camp-out	Other OVN
Motels	0.39	141.68	0.00	0.00
Camping fees	15.70	0.71	46.66	0.00
Restaurants & bars	13.18	44.72	12.75	10.57
Groceries & takeout food	17.08	17.03	10.89	5.07
Gas & oil	14.29	15.92	18.06	5.07
Local transportation	13.93	15.08	1.54	1.08
Admission & fees	9.42	16.44	9.89	3.24
<u>Souvenirs & other expenses</u>	<u>17.73</u>	<u>28.60</u>	<u>14.49</u>	<u>6.10</u>
Total per visitor group per night	101.73	280.18	114.27	31.12

Total spending was estimated by multiplying the number of visitor group trips for each segment by the average spending per trip and summing across segments. Rocky Mountain NP visitors spent a total of \$167.5 million in the local region in 2010 (Table 6). Overnight visitors staying in motels account for 69% of the total spending, while non-local visitors on day trips account for 15%. Motel expenses represent 35% of the total spending, and restaurant & bar expenses represent 18% (Figure 1).

Table 6. Total visitor spending by segment, 2010 (thousands of dollars)

Expenditures	Segment						All visitors
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	
Inside Park							
Camping fees	0	0	916	213	18	0	1,148
Restaurants & bars	224	814	126	639	3	200	2,006
Groceries & takeout food	0	201	92	156	19	125	592
Gas & oil	125	120	185	114	33	128	705
Local transportation	0	0	80	10	66	0	156
Admission & fees	524	4,418	347	2,470	233	353	8,344
<u>Souvenirs & other expenses</u>	<u>376</u>	<u>4,448</u>	<u>498</u>	<u>2,716</u>	<u>320</u>	<u>562</u>	<u>8,921</u>
Total Inside Park	1,249	10,002	2,244	6,319	692	1,368	21,873
Outside Park							
Motels	0	0	24	58,617	0	0	58,641
Camping fees	0	0	44	82	3,991	0	4,117
Restaurants & bars	1,382	5,991	680	17,862	1,092	1,767	28,775
Groceries & takeout food	661	1,182	953	6,890	916	818	11,421
Gas & oil	722	3,451	689	6,474	1,519	815	13,669
Local transportation	14	1,183	772	6,227	66	201	8,463
Admission & fees	152	955	230	4,332	617	250	6,536
<u>Souvenirs & other expenses</u>	<u>393</u>	<u>2,420</u>	<u>587</u>	<u>9,115</u>	<u>924</u>	<u>572</u>	<u>14,012</u>
Total Outside Park	3,324	15,182	3,978	109,599	9,126	4,424	145,633
Total Inside & Outside Park	4,573	25,184	6,222	115,918	9,818	5,791	167,506
Segment Percent of Total	3%	15%	4%	69%	6%	3%	100%

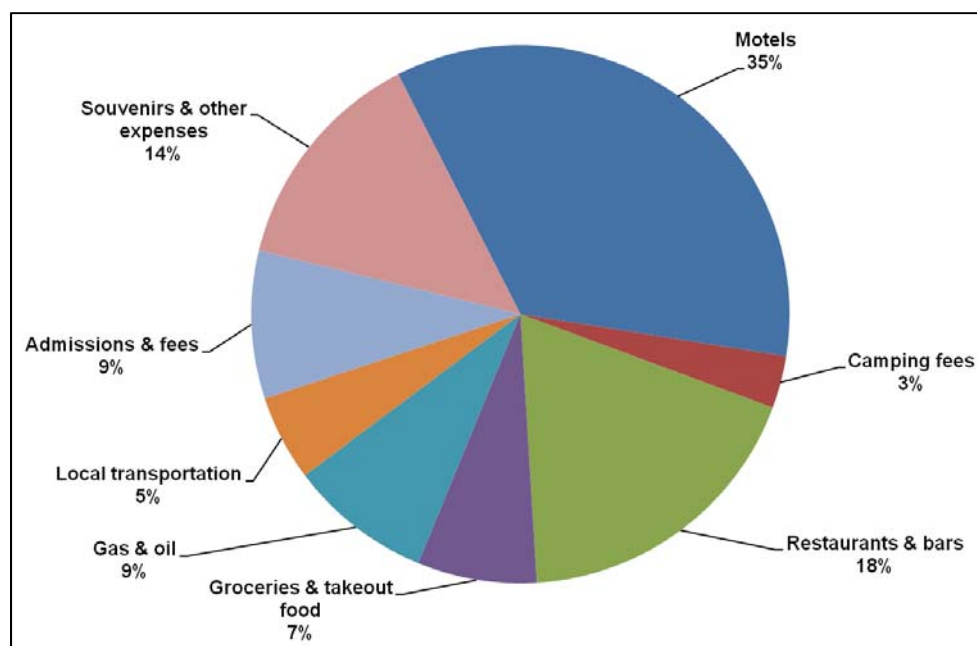


Figure 1. Rocky Mountain NP visitor spending by category, 2010

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Thirty-one percent of visitor groups did not make the trip primarily to visit Rocky Mountain NP. Spending directly attributed to park visits was estimated by counting all spending on trips for which the park was the primary reason for the trip. If the park was not the primary trip purpose, one night of spending was counted for overnight trips and half of the spending in the region was counted for day trips. All spending inside the park was treated as park-related spending. With these assumptions, a total of \$138.5 million in visitor spending is attributed to park visits (Table 7). This represents 83% of the overall visitor spending total.

Table 7. Total spending attributed to park visits, 2010 (thousands of dollars)

Expenditures	Segment						All visitors
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	
Motels	0	0	21	47,648	0	0	47,669
Camping fees	0	0	954	280	3,616	0	4,850
Restaurants & bars	224	5,927	711	15,158	988	1,356	24,364
Groceries & takeout food	0	1,210	912	5,757	845	660	9,384
Gas & oil	125	3,065	778	5,377	1,402	661	11,408
Local transportation	0	1,009	745	5,072	126	132	7,084
Admission & fees	524	5,233	545	5,992	789	517	13,599
<u>Souvenirs & other expenses</u>	<u>376</u>	<u>6,514</u>	<u>1,003</u>	<u>10,126</u>	<u>1,154</u>	<u>937</u>	<u>20,109</u>
Total Attributed to Park	1,249	22,959	5,669	95,410	8,919	4,262	138,467
Percent of Spending Attributed to the Park	27%	91%	91%	82%	91%	74%	83%
Percent of Attributed Spending	1%	17%	4%	69%	6%	3%	100%

Economic Impacts of Visitor Spending

The economic impacts of Rocky Mountain NP visitor spending on the local economy are estimated by applying visitor spending to a set of economic ratios and multipliers in MGM2 representing the economy of the three-county region—Boulder, Grand, and Larimer counties, Colorado.⁹ Economic ratios and multipliers for the region were estimated using the *Impact Analysis for Planning (IMPLAN) Professional software* (version 3, MIG, Inc. 2008) with 2008 data.¹⁰ Multipliers were updated to take into account price changes from 2008 to 2010 (see Study Limitations and Errors section below).

Not all visitor spending was counted as direct sales to the region. The amount a visitor spends for a retail good is made up of the cost of the good from the producer, a markup by a wholesaler, and a markup by a retailer. In MGM2, retail and wholesale margins for grocery & takeout food, gas & oil, and souvenirs & other expenses are applied to visitor spending to account for mark-ups by retailers and wholesalers. The retail margins for the three sectors are 25.3%, 22.3%, and 50.0%, respectively, and the wholesale margins are 12.3%, 8.3%, and 11.4%. In addition, regional purchase coefficients from IMPLAN for all sectors are used to account for the proportion of demand within the region satisfied by imports into the region.

The tourism output sales multiplier for the region is 1.52. Every dollar of direct sales to visitors generates another \$0.52 in secondary sales through indirect and induced effects.¹¹ (See Appendix A: Glossary for further explanation of terms.)

The economic impacts to the local region are presented in two ways: (1) based on all visitor spending and (2) based only on visitor spending attributable to the park. The first estimate—including all visitor spending—shows the overall contribution park visitors make to the local region. The second estimate—including only visitor spending attributable to the park—shows the impact or contribution the park makes to the economy of the local region.

⁹ Economic ratios convert between various economic measures, e.g., direct spending to the directly associated jobs, labor income, and value added in each sector. Economic multipliers capture the secondary effects of economic measures.

¹⁰ See Appendix C: Economic Ratios and Multipliers for the region.

¹¹ Indirect effects result from tourism businesses buying goods and services from local firms, while induced effects stem from household spending of income earned from visitor spending.

Impacts of All Visitor Spending

Using all visitor spending and including direct and secondary effects, the \$167.5 million spent by park visitors generates \$214.2 million in sales, which support 2,594 jobs in the local region (Table 8). These jobs pay \$76.0 million in labor income, which is part of \$126.8 million in value added to the region.¹²

Table 8. Impacts of all visitor spending on the local economy, 2010*

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	58,641	659	18,011	32,081
Camping fees	5,265	60	1,669	2,813
Restaurants & bars	30,780	550	11,162	15,789
Groceries & takeout food	14,881	256	6,368	9,748
Gas & oil	8,620	144	4,640	5,791
Local transportation	3,039	49	1,590	2,590
Admission & fees	3,205	60	1,615	2,669
Souvenirs & other expenses	11,466	223	5,953	9,692
Wholesale trade	3,663	16	1,409	2,433
Local production of goods	1,529	8	337	537
Total Direct Effects	141,090	2,025	52,755	84,142
<u>Secondary Effects</u>	<u>73,161</u>	<u>569</u>	<u>23,254</u>	<u>42,712</u>
Total Effects	214,250	2,594	76,008	126,854

*Note: Impacts of \$167.5 million in visitor spending reported in Table 6. Totals may not equal sum of individual categories due to rounding.

Value added is the preferred measure of the contribution of visitors to the local economy as it includes all sources of income to the area—payroll benefits to workers, profits and rents to businesses, and sales and other indirect business taxes that accrue to government units. Value added impacts are also comparable to Gross Regional Product, the broadest measure of total economic activity in a region. The largest direct effects are in restaurants & bars and motels.

Impacts of Visitor Spending Attributed to the Park

Using only visitor spending attributable to the park by including only some spending on trips where the primary trip purpose was not to visit Rocky Mountain NP reduces the overall impacts by about 17% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$138.5 million spent by park visitors and attributable to the park generates \$177.6 million in sales, which support 2,153 jobs in the local region. These jobs pay \$63.2 million in labor income, which is part of \$105.4 million in value added to the region.

¹² Jobs include full and part time jobs. Labor income consists of wages and salaries, payroll benefits and income of sole proprietors. Value added includes labor income as well as profits and rents to area businesses and sales and excise taxes.

Table 9. Economic impacts of visitor spending attributed to the park, 2010*

Sector/Expenditure category	Sales (thousands of dollars)	Jobs	Labor Income (thousands of dollars)	Value Added (thousands of dollars)
Direct Effects				
Motels	47,669	536	14,641	26,078
Camping fees	4,850	56	1,538	2,591
Restaurants & bars	24,364	435	8,836	12,498
Groceries & takeout food	13,599	234	5,820	8,908
Gas & oil	7,084	119	3,813	4,759
Local transportation	2,374	38	1,242	2,023
Admission & fees	2,544	47	1,281	2,118
Souvenirs & other expenses	10,055	196	5,220	8,499
Wholesale trade	3,045	13	1,171	2,023
<u>Local production of goods</u>	<u>1,299</u>	<u>7</u>	<u>289</u>	<u>460</u>
Total Direct Effects	116,883	1,680	43,851	69,957
<u>Secondary Effects</u>	<u>60,744</u>	<u>473</u>	<u>19,309</u>	<u>35,483</u>
Total Effects	177,628	2,153	63,160	105,440

*Note: Impacts of \$138.5 million in visitor spending attributed to park reported in Table 7. Totals may not equal sum of individual categories due to rounding.

Economic Impacts of the NPS Park Payroll

In addition to visitor spending, spending by park employees also impacts the local region. A separate study (Stynes 2011) estimated the impacts of park payroll by applying economic multipliers to wage and salary data to capture the induced effects of NPS employee spending on local economies. Rocky Mountain NP itself employed 319 people in FY 2010 with a total payroll including benefits of \$18.2 million.¹³ Including secondary effects, the local impacts of the park payroll in FY 2010 were \$8.6 million in sales, 392 jobs, \$20.9 million in labor income, and \$23.4 million value added (Stynes 2011).

Combined Economic Impacts

The combined impacts to the region of visitor spending attributable to the park and NPS payroll are \$186.2 million in sales, which support 2,545 jobs with labor income of \$84.1 million, which is part of a total value added of \$128.8 million.

¹³ The number of employees was estimated by totaling the number of distinct social security numbers in each pay period and dividing by the number of pay periods. The figure is therefore an annual average. Four seasonal jobs for three months count as one job. No distinction is made between part-time and full-time employees. Jobs, salary, and payroll benefits are assigned to the park where the employee's time was charged, which may differ from their duty station (Stynes 2011).

Study Limitations and Errors

The accuracy of the MGM2 estimates rests on the accuracy of three inputs: visits, spending averages, and multipliers. Visits are taken from NPS Public Use Statistics (2010). Recreation visit estimates rely on counting procedures at the park, which may miss some visitors and count others more than once during their visit. Re-entry rates are important to adjust the park visit counts to reflect the number of visitor group trips to the region rather than park entries. Re-entry rates were estimated based on best available knowledge about park visitor-counting methods and visitors' responses to a park re-entry question on the VSP visitor surveys.

Spending averages are derived from the summer 2010 and winter 2011 Rocky Mountain NP VSP visitor surveys (Blotkamp et al. 2011, Papadogiannaki et al. 2011). Estimates from the surveys are subject to sampling errors, measurement errors, and potential seasonal biases. The overall spending averages are subject to sampling errors of 9%.

Spending averages are also sensitive to decisions about outliers and treatment of missing data. In order to estimate spending averages, incomplete spending data were filled with zeros. Visitor groups of more than 8 people (19 cases in summer sample, 12 cases in winter sample), visiting the local region for more than 7 nights (34 cases in summer sample, 5 cases in winter sample), or arriving in more than four vehicles (2 cases in winter sample) were omitted from the analysis. In addition visitor groups with total spending greater than \$3,000 in the summer sample (34 cases) and \$1,950 in the winter sample (5 cases; the mean for each sample plus two times the standard deviation of the mean for spending) were omitted from the analysis. These are conservative assumptions about outliers and likely result in conservative estimates of economic impacts.

The sample only covers visitors during a single week in July for summer visitors and one week in February for winter visitors. To extrapolate to annual totals, it was assumed that the summer sample represented visitors from May thru October, and the winter sample represented visitors from November thru April. Visitors in February 2011 were assumed to be similar to winter visitors throughout 2010.

Multipliers are derived from an input-output model of the local economy using IMPLAN (MIG, Inc. 2008). The basic assumptions of input-output models are that sectors have homogeneous, fixed and linear production functions, that prices are constant, and that there are no supply constraints. The IMPLAN system uses national average production functions for each of 440 sectors based on the NAICS system (see Appendix B, Table B2). The most recent local IMPLAN datasets available for this analysis were 2008. National IMPLAN multiplier data were available for 2009, so local employment, labor income, and value added multipliers were updated to 2009 using 2008/2009 national ratios. In addition, local employment multipliers were updated to 2010 based on changes in consumer price indices.

Sorting out how much spending to attribute to the park when the park is not the primary reason for the trip is somewhat subjective. Because 31% of visitor groups to Rocky Mountain NP did not make the trip primarily to visit the park and most spending occurred outside the park, adjustments for non-primary purpose trips have a significant effect on the overall spending and impact estimates.

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Appendix A: Glossary

Term	Definition
Direct effects	Changes in sales, income and jobs in those business or agencies that directly receive visitor spending.
Economic multiplier	Captures the size of secondary effects and are usually expressed as a ratio of total effects to direct effects.
Economic ratio	<p>Converts various economic measures from one to another. For example, direct sales can be used to estimate direct effects on jobs, personal income, and value added by applying economic ratios. That is:</p> <ul style="list-style-type: none"> • Direct jobs = direct sales * jobs to sales ratio • Direct personal income = direct sales * personal income to sales ratio • Direct value added = direct sales * value added to sales ratio.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to visitors, i.e., businesses in the supply chain. For example, linen suppliers benefit from visitor spending at motels.
Induced effects	Changes in economic activity in the region resulting from household spending of income earned through a direct or indirect effect of visitor spending. For example, motel and linen supply employees live in the region and spend their incomes on housing, groceries, education, clothing and other goods and services. IMPLAN's Social Accounting Matrix (SAM) multipliers also include induced effects resulting from local/state/federal government spending.
Jobs	The number of jobs in the region supported by visitor spending. Job estimates are not full time equivalents, but include both fulltime and part-time positions.
Labor income	Wage and salary income, sole proprietor (business owner) income and employee payroll benefits.
Regional purchase coefficient (RPC)	The proportion of demand within a region supplied by producers within that region.
Retail margin	The markup to the price of a product when a product is sold through a retail trade activity. Retail margin is calculated as sales receipts minus the cost of goods sold.
Sales	Direct sales (retail goods and services) of firms within the region to park visitors.

Term	Definition
Secondary effects	Changes in the economic activity in the region that result from the re-circulation of money spent by visitors. Secondary effects include indirect and induced effects.
Total effects	Sum of direct, indirect and induced effects. <ul style="list-style-type: none"> • Direct effects accrue largely to tourism-related businesses in the area. • Indirect effects accrue to a broader set of businesses that serve these tourism firms. • Induced effects are distributed widely across a variety of local businesses.
Value added	Labor income plus property income (rents, dividends, royalties, interest) and indirect business taxes. As the name implies, it is the net value added to the region's economy. For example, the value added by a motel includes wages and salaries paid to employees, their payroll benefits, profits of the motel, and sales, property, and other indirect business taxes. The motel's non-labor operating costs such as purchases of supplies and services from other firms are not included as value added by the motel.
Visitor group	A group of people traveling together to visit the park. Visitor group is the basic sampling unit for VSP surveys; each visitor group receives only one questionnaire.
Wholesale margin	The markup to the price of a product when a product is sold through wholesale trade. Wholesale margin is calculated as wholesale sales minus the cost of the goods sold.

Appendix B: Expenditure Sector Assignments

Table B1 shows expenditure categories visitors were asked to estimate in the Rocky Mountain NP VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

Table B1. Expenditure categories in Rocky Mountain NP questionnaire and MGM2 sector assignment

Questionnaire expenditure categories	Inside park	Outside park	MGM2 sector
Hotels, motels, cabins, B&B, etc.		X	Motels
Camping fees and charges	X	X	Camping fees
Guide fees and charges	X	X	Admissions & fees
Restaurants and bars	X	X	Restaurants & bars
Groceries and takeout food	X	X	Groceries & takeout food
Gas and oil (auto, RV, boat, etc.)	X	X	Gas & oil
Other transportation expenses (rental cars, auto repairs, but NOT airfare)	X	X	Local transportation
Admission fees	X	X	Admissions & fees
Recreation, entertainment fees (including equipment rental)	X	X	Admissions & fees
All other purchases (souvenirs, film, books, sporting goods, clothing, etc.)	X	X	Souvenirs & other expenses
Donations	X	X	Souvenirs & other expenses

X = category included in questionnaire.

MGM2 sectors names correspond to similar sector names and numbers in IMPLAN (Table B2). IMPLAN sectors also correspond to 2007 NAICS sectors.

Table B2. MGM2 sector correspondence to IMPLAN and 2007 NAICS sectors

MGM2 sector	IMPLAN		2007 NAICS
	No.	Name	
Motels	411	Hotels and motels, including casino hotels	72111-2
Camping fees	412	Other accommodations	72119, 7212-3
Restaurants & bars	413	Food services and drinking places	722
Groceries & takeout food	324	Retail - Food and beverage	445
Gas & oil	326	Retail - Gasoline stations	447
Local transportation	336	Transit and ground passenger transportation	485
Admissions & fees	410	Other amusement and recreation industries	71391-3, 71399
Souvenirs & other expenses	329	Retail - General merchandise	452
Local production of goods	317	All other miscellaneous manufacturing	339993, 339995, 339999
Wholesale trade	319	Wholesale trade	42

Source: IMPLAN (MIG, Inc. 2008).

Appendix C: Economic Ratios and Multipliers

Table C1. Economic ratios and multipliers for selected tourism-related sectors, Rocky Mountain NP region, 2010

Sector	Direct effects			Total effects multipliers				
	Jobs /\$MM sales	Income /sales	Value added/sales	Sales I	Sales SAM	Job II/ MM sales	Income II/ sales	Value added II/sales
Motels	12.52	0.33	0.61	1.27	1.52	16.69	0.50	0.91
Camping fees	10.33	0.26	0.54	1.30	1.52	14.63	0.43	0.85
Restaurants & bars	18.37	0.34	0.50	1.26	1.51	22.16	0.49	0.80
Groceries & takeout food	8.25	0.21	0.37	1.40	1.60	12.97	0.40	0.73
Gas & oil	10.50	0.39	0.58	1.19	1.45	14.25	0.54	0.86
Local transportation	12.76	0.30	0.69	1.23	1.44	16.16	0.44	0.96
Admission & fees	19.26	0.39	0.64	1.27	1.54	23.46	0.56	0.97
Souvenirs & other expenses	6.80	0.29	0.40	1.23	1.45	10.38	0.45	0.66
Local production of goods	5.87	0.25	0.18	1.22	1.41	8.72	0.39	0.42
Wholesale trade	17.68	0.44	0.65	1.26	1.56	22.03	0.61	0.99

Source: IMPLAN (MIG, Inc. 2008) updated to 2010.

Explanation of table

Direct effects are economic ratios to convert sales in each sector to jobs, income and value added.

Jobs/\$MM sales is jobs per million dollars in sales.

Income/sales is the percentage of sales going to wages, salaries, and employee benefits.

Value added/sales is the percentage of sales that is value added (Value added covers all income, rents and profits and indirect business taxes).

Total effects are multipliers that capture the total effect relative to direct sales.

Sales I captures only direct and indirect sales.

Sales SAM is the SAM sales multiplier = (direct + indirect + induced sales) /direct sales.

Job II/ MM sales = total jobs (direct + indirect + induced) per \$ million in direct sales.

Income II /sales = total income (direct + indirect + induced) per \$ of direct sales.

Value added II/sales = total value added (direct + indirect + induced) per \$ of direct sales.

Using the motels sector row to illustrate

Direct Effects: Every million dollars in motel sales creates 12.5 jobs in motels. Sixty-one percent of motel sales are value added, including 33% that goes to wages and salaries of motel employees. That means 39% of motel sales goes to purchase inputs by motels (e.g., linens, cleaning supplies). The wage and salary income creates the induced effects and the 39% spent on purchases by the motel starts the rounds of indirect effects.

Multiplier effects: There is an additional 27 cents of indirect sales in the region for every dollar of direct motel sales (type I sales multiplier = 1.27). Total secondary sales are 52 cents per dollar of direct sales, which means 27 cents in indirect effects and 25 cents in induced effects. An

additional 4.2 jobs are created from secondary effects of each million dollars in motel sales (16.7 total jobs – 12.5 direct jobs per million dollars). These jobs are distributed across other sectors of the local economy. Similarly, the secondary effects on income for each dollar of motel sales are 30% (91%-61%), and the secondary effects on value added for each dollar of motel sales are 17% (50%-33%). Including secondary effects, every million dollar of motel sales in the region yields \$1.52 million in sales, which supports 16.7 jobs. Those jobs pay \$500,000 in labor income, which is part of the overall value added of \$910,000.

Appendix D: Comparison of Summer and Winter Visitors

There are differences in spending and trip characteristics between the summer and winter samples. Winter visitor groups are less likely to camp and include higher percentages of day trips by local residents and non-locals. Winter visitors have smaller visitor group sizes, shorter lengths of stay in the area, and fewer park re-entries. Differences in spending patterns between summer and winter visitor groups reflect these differences in trip characteristics. Spending averages for visitor groups throughout the year were computed by weighting seasonal spending averages by the percentage of visits occurring during each season (summer or winter).

Table D1. Visitor segment mix and conversion factors, summer versus winter

Characteristic	Segment						All visitors
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	
Winter							
Visitor segment share (park entries)	21%	50%	<1%*	19%	<1%*	9%	100%
Average visitor group size	2.4	2.5	-*	2.7	-*	2.6	2.5
Length of stay (days or nights)	1.0	1.0	-*	2.1	-*	2.5	2.3
Re-entry rate (park entries per trip)	1.0	1.0	-*	1.5	-*	1.3	1.2
Percent primary purpose trips	100%	84%	-*	61%	-*	45%	75%
Summer							
Visitor segment share (park entries)	7%	39%	6%	34%	5%	9%	100%
Average visitor group size	2.4	3.0	3.3	3.1	2.9	2.7	3.0
Length of stay (days or nights)	1.0	1.0	2.7	2.7	3.2	3.0	2.8
Re-entry rate (park entries per trip)	1.2	1.1	2.1	2.0	1.7	1.7	1.6
Percent primary purpose trips	100%	68%	78%	71%	86%	48%	69%

*In the winter sample, only 5 visitor groups reported camping in the park and 1 visitor group reported camping outside the park. Trip characteristics were not estimated due to the small sample sizes and missing data.

Table D2. Average visitor spending by segment, dollars per visitor group per trip, summer 2010

Expenditures	Segment						All visitors*
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	
<u>Inside Park</u>							
Camping fees	0.00	0.00	39.96	1.53	0.66	0.00	1.73
Restaurants & bars	3.21	2.66	5.49	4.61	0.12	3.71	3.25
Groceries & takeout food	0.00	0.60	4.00	1.12	0.71	2.32	0.93
Gas & oil	2.04	0.40	8.06	0.82	1.24	2.38	1.14
Local Transportation	0.00	0.00	3.48	0.08	2.48	0.00	0.24
Admission & fees	6.69	12.48	15.12	16.17	8.72	5.80	12.08
<u>Souvenirs & other expenses</u>	<u>5.66</u>	<u>14.79</u>	<u>21.72</u>	<u>19.30</u>	<u>12.01</u>	<u>10.29</u>	<u>14.62</u>
Total Inside Park	17.60	30.94	97.83	43.62	25.96	24.50	34.00
<u>Outside Park</u>							
Motels	0.00	0.00	1.04	390.91	0.00	0.00	91.37
Camping fees	0.00	0.00	1.92	0.59	149.67	0.00	6.71
Restaurants & bars	15.29	17.21	29.64	116.46	40.96	24.81	42.33
Groceries & takeout food	8.90	3.46	41.55	45.90	34.37	9.82	17.13
Gas & oil	9.34	9.99	30.04	43.83	56.95	11.22	20.66
Local Transportation	0.19	3.77	33.68	43.19	2.48	1.91	13.40
Admission & fees	0.00	2.48	10.01	28.35	23.15	3.10	9.48
<u>Souvenirs & other expenses</u>	<u>3.84</u>	<u>7.11</u>	<u>25.58</u>	<u>61.55</u>	<u>34.66</u>	<u>6.59</u>	<u>21.27</u>
Total Outside Park	37.55	44.02	173.46	730.79	342.24	57.45	222.33
Total Inside & Outside Park	55.15	74.96	271.29	774.41	368.20	81.95	256.33

*Weighted by percent visitor group trips.

Table D3. Average visitor spending by segment, dollars per visitor group per trip, winter 2010

Expenditures	Segment						All visitors*
	Local	Day trip	Camp-in	Motel-out	Camp-out	Other OVN	
<u>Inside Park</u>							
Camping fees	0.00	0.00	-**	0.12	-**	0.00	0.02
Restaurants & bars	0.97	0.36	-**	0.00	-**	0.00	0.43
Groceries & takeout food	0.00	0.35	-**	0.00	-**	0.00	0.20
Gas & oil	0.00	0.00	-**	0.00	-**	0.00	0.00
Local Transportation	0.00	0.00	-**	0.00	-**	0.00	0.00
Admission & fees	4.07	10.92	-**	14.57	-**	4.59	9.29
<u>Souvenirs & other expenses</u>	<u>1.06</u>	<u>0.86</u>	-**	<u>2.49</u>	-**	<u>0.99</u>	<u>1.13</u>
Total Inside Park	6.09	12.49	-**	17.17	-**	5.58	11.06
<u>Outside Park</u>							
Motels	0.00	0.00	-**	281.43	-**	0.00	37.43
Camping fees	0.00	0.00	-**	0.00	-**	0.00	0.00
Restaurants & bars	15.85	13.50	-**	109.37	-**	48.25	29.43
Groceries & takeout food	4.12	2.38	-**	33.51	-**	32.32	9.20
Gas & oil	5.33	7.43	-**	25.22	-**	23.54	10.51
Local Transportation	0.11	0.97	-**	15.12	-**	10.97	3.40
Admission & fees	5.42	3.35	-**	25.64	-**	9.23	7.25
<u>Souvenirs & other expenses</u>	<u>5.60</u>	<u>4.75</u>	-**	<u>37.00</u>	-**	<u>24.29</u>	<u>10.72</u>
Total Outside Park	36.43	32.38	-**	527.30	-**	148.59	107.93
Total Inside & Outside Park	42.53	44.87	-**	544.47	-**	154.17	119.00

*Weighted by percent visitor group trips.

**In the winter sample, only 5 visitor groups reported camping in the park and 1 visitor group reported camping outside the park. Spending averages were not estimated due to the small sample sizes and missing data.

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