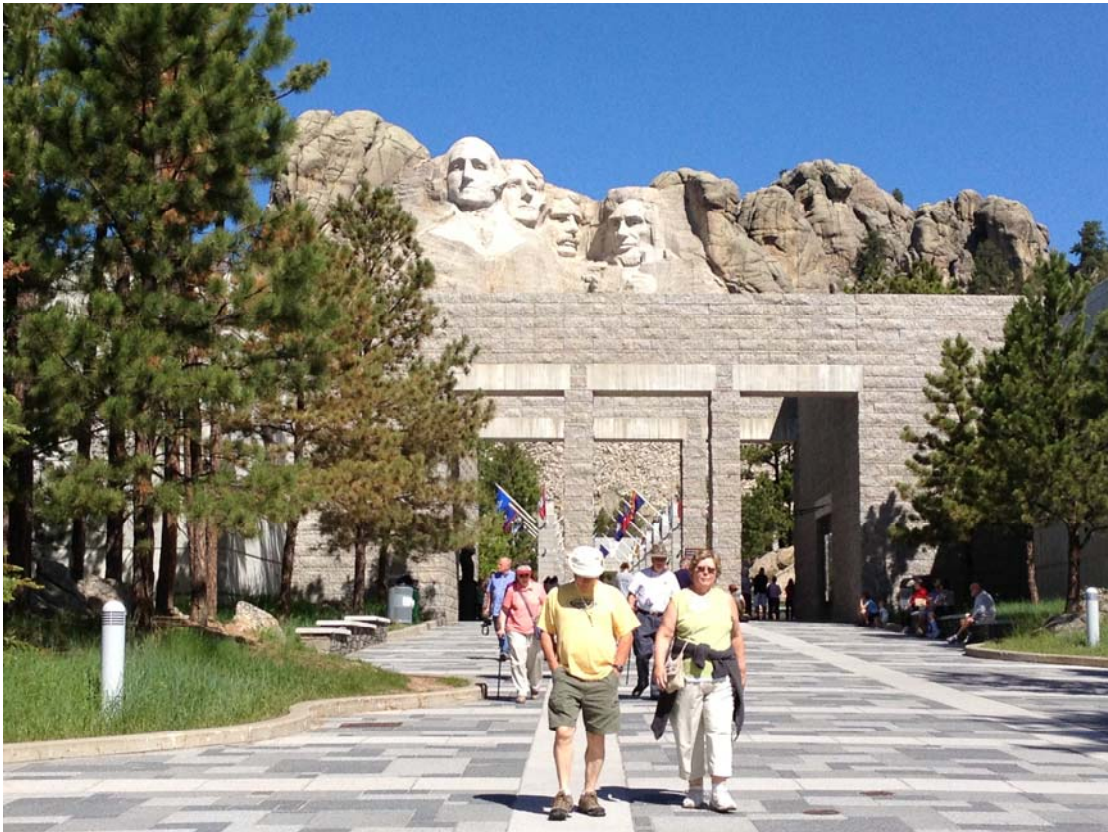




# Impacts of Visitor Spending on the Local Economy

## *Mount Rushmore National Memorial, 2013*

Natural Resource Report NPS/NRSS/EQD/NRR—2014/796



**ON THE COVER**

Mount Rushmore National Memorial  
Photograph by Park Studies Unit staff

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# **Impacts of Visitor Spending on the Local Economy**

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Natural Resource Report NPS/NRSS/EQD/NRR—2014/796

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## Executive Summary

Mount Rushmore National Memorial hosted 2,162,998 recreation visits in 2013. Adjustments for visitor group size and re-entries resulted in 558,257 visitor group trips to the park in 2013. Based on a 2013 Visitor Services Project survey conducted June 21–27, 11% of these visitor group trips were made by local residents or non-locals on day trips, not including an overnight stay within a 100-mile drive of the park.<sup>1</sup> Sixty-five percent of visitor group trips involved an overnight stay in a lodge, hotel, motel, cabin, B&B, etc. in the local area, and 12% were overnight camping stays in the local area. Twelve percent of visitor group trips were overnight stays in non-paid lodging, such as private homes.

Visitors reported their group’s expenditures in the park and within a 100-mile drive of the park. Visitor groups spent an average of \$620 on their trips. Ninety-five percent of visitor spending took place in the area outside the park.

Total visitor spending in 2013 in the park and within a 100-mile drive of the park was \$346.0 million. The greatest proportion of expenditures was for overnight accommodations (37%). Overnight visitors staying in a lodge, hotel, motel, cabin, B&B, etc. in the local area accounted for 81% of total spending.

Sixty-five 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 \$278.6 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 12-county area around the park including Pennington, Custer, Fall River, Shannon, Meade, Butte, and Lawrence counties in South Dakota, Crook, Weston, and Niobrara counties in Wyoming, and Sioux and Dawes counties in Nebraska. This region roughly coincides with the 100-mile driving radius around the park for which expenditures were reported.

Including direct and secondary effects, the \$278.6 million in visitor spending attributed to the park generated \$353.9 million in direct sales in the region, which supported 4,928 jobs. These jobs paid \$117.7 million in labor income, which was part of \$194.4 million in value added to the region.<sup>2</sup>

A separate study estimated impacts of the park employee payroll on the local economy<sup>3</sup> and the results are reported herein. The park itself employed 69 people in FY 2010 with a total payroll including benefits of \$4.4 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$2.1 million in sales, supporting 90 jobs, \$5.1 million in labor income, and \$5.7 million in value added.

### **Local Economic Impacts of Mount Rushmore National Memorial**

	<u>Sales</u>	<u>Jobs</u>	<u>Labor Income</u>	<u>Value Added</u>
Park Visitor Spending	\$353.9M	4,928	\$117.7M	\$194.4M
<u>Park Payroll</u>	<u>+\$2.1M</u>	<u>+ 90</u>	<u>+\$5.1M</u>	<u>+\$5.7M</u>
Park Visitor Spending + Payroll	\$356.0M	5,018	\$122.8M	\$200.1M

<sup>1</sup> Results in this study sometimes differ from those reported in the VSP study report (Littlejohn and Le 2014) because of the omission of cases considered to be outliers in the current analysis. See Study Limitations and Errors section.

<sup>2</sup> 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).

<sup>3</sup> Stynes (2011).

## **Acknowledgments**

The author thanks Cindi Jette, Park Studies Unit Survey Technician, for her review of an early draft of this report.

## Introduction

Mount Rushmore National Memorial (NMEM) celebrates the founding, expansion, development, and preservation of the United States through large carvings of presidents Washington, Jefferson, Lincoln, and Theodore Roosevelt in the Black Hills of South Dakota. The park is located in Pennington County, South Dakota. Mount Rushmore NMEM received 2,162,998 recreation visits in 2013 (Table 1).

**Table 1.** Recreation visits, Mount Rushmore NMEM, 2013

<b>Month</b>	<b>Recreation visits</b>
January	18,721
February	21,258
March	45,612
April	44,431
May	168,619
June	411,023
July	584,665
August	463,548
September	290,369
October	61,295
November	32,238
<u>December</u>	<u>21,219</u>
<b>Total</b>	<b>2,162,998</b>

Source: NPS Visitor Use Statistics 2013.

The purpose of this study is to estimate the annual, local economic impacts of visitors to Mount Rushmore NMEM in 2013. Economic impacts were measured as 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 included Pennington, Custer, Fall River, Shannon, Meade, Butte, and Lawrence counties in South Dakota, Crook, Weston, and Niobrara counties in Wyoming, and Sioux and Dawes counties in Nebraska. This 12-county region had a population of 216,915 (USCB 2013), gross regional product of \$7.3 billion (MIG, Inc. 2008), median household income of \$46,698, and family poverty rate of 9.7% (USCB 2013). Food and drinking establishments and state and local governments were the major employers in the region (MIG, Inc. 2008), and the region experienced a 4.4% unemployment rate in 2013 (BLS 2013).



## Methods

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

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

Inputs were estimated from the Mount Rushmore NMEM Visitor Services Project (VSP) survey data (Littlejohn and Le 2014), National Park Service Visitor Use Statistics (2013), and Impact Analysis for Planning (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 survey was conducted at Mount Rushmore NMEM from June 21–27, 2013.<sup>4</sup> The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 1,298 visitor groups. Visitors returned 782 questionnaires resulting in a response rate of 60.2%.

Spending and economic impact estimates for Mount Rushmore NMEM are based in part on the 2013 VSP survey data. Visitors were asked to report expenditures inside the park and within a 100-mile drive of the park. The local region for determining economic impact was defined as a 12-county area around the park including Pennington, Custer, Fall River, Shannon, Meade, Butte, and Lawrence counties in South Dakota, Crook, Weston, and Niobrara counties in Wyoming, and Sioux and Dawes counties in Nebraska. This area roughly coincides with the 100-mile driving radius around the park for which visitors reported expenditures.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Five segments were established for Mount Rushmore NMEM visitors based on reported trip characteristics and lodging expenditures:

**Local:** Visitors who were residents of the local region, i.e., lived within a 100-mile drive of the park.

**Day trip:** Visitors from outside the local region who did not stay overnight in the local region.

**Motel:** Visitors who reported motel expenses in the local region.<sup>5</sup>

**Camping:** Visitors who reported camping expenses in the local region.

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<sup>4</sup> Results in this study sometimes differ from those reported in the VSP study report (Littlejohn and Le 2014) because of the omission of cases considered to be outliers in the current analysis. See Study Limitations and Errors section.

<sup>5</sup> The questionnaire asked about expenditures for “Lodge, hotel, motel, cabin, B&B, etc.” For convenience, these expenditures are referred to as “motel” in this report.

**Other overnight (Other OVN):** Non-local visitors who stayed overnight in the local region, but did not report any lodging expenses. This segment included visitors who stayed in private homes, with friends or relatives, or in other unpaid lodging.<sup>6</sup>

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.

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<sup>6</sup> 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 VSP survey data, 10% of park entries were classified as day visits either by residents or by visitors from outside the local region, and the remaining 90% were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 2.7 to 3.8 people across the five segments with an average visitor group of 3.4 people.<sup>7</sup> The average length of stay in the local region on overnight trips was 2.8 nights. Sixty-five percent of visitor groups indicated that visiting the park was the primary reason for their trip to the area.

**Table 2.** Selected visit/trip characteristics by segment, 2013

Characteristic	Segment					All visitors
	Local	Day trip	Motel	Camping	Other OVN	
Visitor segment share (park entries)	1%	9%	64%	15%	11%	100%
Average visitor group size	2.7	3.4	3.4	3.8	3.3	3.4
Length of stay (days or nights)	1.0	1.0	2.5	3.6	3.0	2.8
Re-entry rate (park entries per trip)	1.1	1.1	1.1	1.2	1.1	1.1
Percent primary purpose trips	100%	66%	68%	56%	62%	65%

The 2,162,998 recreation visits in 2013 were allocated to the five segments using the visit segment shares in Table 2. Because spending was 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. The 2,162,998 recreation visits represented 558,257 visitor group trips (Table 3).

**Table 3.** Recreation visits and visitor group trips by segment, 2013

Measure	Segment					All visitors
	Local	Day trip	Motel	Camping	Other OVN	
Recreation visits	21,630	194,670	1,384,319	324,450	237,930	2,162,998
Visitor group trips	7,210	53,974	363,230	69,628	64,215	558,257
Percent of visitor group trips	1%	10%	65%	12%	12%	100%

<sup>7</sup> Visitor group size reported herein is based on the number of people covered by expenditures reported in the VSP survey.

## Visitor Spending

The VSP survey collected data about expenditures of visitor groups inside the park and within a 100-mile drive of the park.<sup>8</sup> Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent \$620 on the trip, including expenditures inside the park and within a 100-mile drive of the park (Table 4). On a visitor group trip basis, average spending was \$54 for day trips by local residents and \$82 for day trips by non-local visitors. Visitor groups staying in motels spent an average of \$772 on their trips, and those camping spent an average of \$773 on their trips. Visitor groups spent about 95% of their total spending outside the park.

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

Expenditures	Segment					All visitors*
	Local	Day trip	Motel	Camping	Other OVN	
<b>Inside Park</b>						
Restaurants & bars	5.63	6.35	7.00	6.21	8.05	6.94
Groceries & takeout food	0.00	0.22	0.36	3.05	1.74	0.83
Local transportation	0.00	9.04	4.57	4.17	4.93	4.94
Admission & fees	0.00	0.00	0.43	0.25	0.12	0.32
<u>Souvenirs &amp; other expenses</u>	<u>13.13</u>	<u>15.51</u>	<u>19.64</u>	<u>15.83</u>	<u>12.70</u>	<u>17.88</u>
<b>Total Inside Park</b>	<b>18.75</b>	<b>31.12</b>	<b>32.00</b>	<b>29.51</b>	<b>27.53</b>	<b>30.92</b>
<b>Outside Park</b>						
Motels	0.00	0.00	315.11	2.65	0.00	205.35
Camping fees	0.00	0.00	2.48	169.88	0.00	22.80
Restaurants & bars	13.75	5.63	134.13	111.81	17.50	103.95
Groceries & takeout food	1.25	0.09	30.40	70.95	9.17	29.70
Gas & oil	12.50	17.04	90.92	188.60	23.58	87.20
Local transportation	1.50	1.07	28.51	35.87	2.92	23.49
Admission & fees	1.38	5.37	65.26	81.06	8.80	54.12
<u>Souvenirs &amp; other expenses</u>	<u>5.00</u>	<u>21.32</u>	<u>72.88</u>	<u>83.03</u>	<u>19.87</u>	<u>62.19</u>
<b>Total Outside Park</b>	<b>35.38</b>	<b>50.53</b>	<b>739.69</b>	<b>743.85</b>	<b>81.84</b>	<b>588.81</b>
<b>Total Inside &amp; Outside Park</b>	<b>54.13</b>	<b>81.65</b>	<b>771.69</b>	<b>773.36</b>	<b>109.37</b>	<b>619.73</b>

\*Weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average was 8%. A 95% confidence interval for the overall visitor group spending average was therefore \$620 plus or minus \$50 or between \$570 and \$670.

On a per night basis, visitor groups staying in motels spent \$304 in the local region, and campers spent \$213 (Table 5). The average reported per-night lodging expense was \$124 for motels and \$47 for camping fees.

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



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

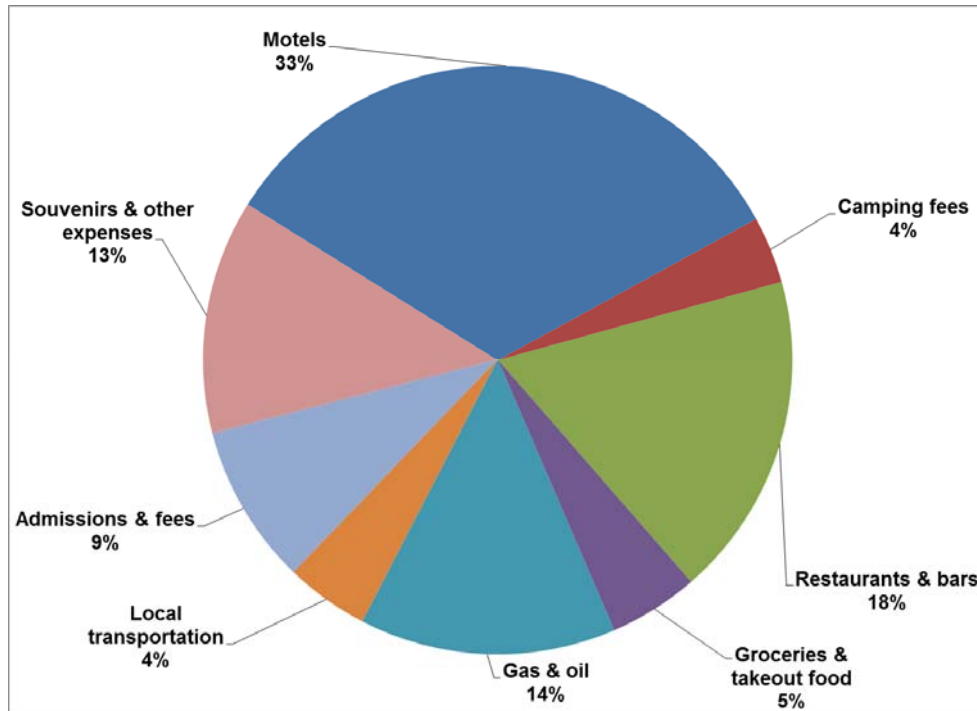
Expenditures	Segment		
	Motel	Camping	Other OVN
Motels	124.08	0.73	0.00
Camping fees	0.98	46.72	0.00
Restaurants & bars	55.57	32.46	8.44
Groceries & takeout food	12.11	20.35	3.60
Gas & oil	35.80	51.87	7.79
Local transportation	13.03	11.01	2.60
Admission & fees	25.86	22.36	2.95
<u>Souvenirs &amp; other expenses</u>	<u>36.43</u>	<u>27.19</u>	<u>10.77</u>
<b>Total per visitor group per night</b>	<b>303.86</b>	<b>212.67</b>	<b>36.16</b>

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. Mount Rushmore NMEM visitors spent a total of \$346 million in the local region in 2013 (Table 6). Visitors who stayed in motels accounted for 81% of the total spending. Motel expenses represented 33% of total spending (Figure 1).

**Table 6.** Total visitor spending by segment, 2013 (thousands of dollars)

Expenditures	Segment					All visitors
	Local	Day trip	Motel	Camping	Other OVN	
<b>Inside Park</b>						
Restaurants & bars	41	343	2,544	432	517	3,877
Groceries & takeout food	0	12	129	212	111	465
Local transportation	0	488	1,662	290	317	2,756
Admission & fees	0	0	154	18	8	180
<u>Souvenirs &amp; other expenses</u>	<u>95</u>	<u>837</u>	<u>7,135</u>	<u>1,102</u>	<u>815</u>	<u>9,984</u>
<b>Total Inside Park</b>	<b>135</b>	<b>1,680</b>	<b>11,624</b>	<b>2,055</b>	<b>1,768</b>	<b>17,262</b>
<b>Outside Park</b>						
Motels	0	0	114,456	185	0	114,640
Camping fees	0	0	901	11,828	0	12,730
Restaurants & bars	99	304	48,722	7,785	1,124	58,034
Groceries & takeout food	9	5	11,041	4,940	589	16,583
Gas & oil	90	920	33,025	13,132	1,514	48,680
Local transportation	11	58	10,357	2,497	188	13,111
Admission & fees	10	290	23,703	5,644	565	30,213
<u>Souvenirs &amp; other expenses</u>	<u>36</u>	<u>1,151</u>	<u>26,472</u>	<u>5,782</u>	<u>1,276</u>	<u>34,716</u>
<b>Total Outside Park</b>	<b>255</b>	<b>2,727</b>	<b>268,676</b>	<b>51,793</b>	<b>5,255</b>	<b>328,707</b>
<b>Total Inside &amp; Outside Park</b>	<b>390</b>	<b>4,407</b>	<b>280,301</b>	<b>53,847</b>	<b>7,023</b>	<b>345,969</b>
Segment Percent of Total	0%	1%	81%	16%	2%	100%

Note: Totals may not equal sum of individual categories due to rounding.



**Figure 1.** Mount Rushmore NMEM visitor spending by category

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Thirty-five percent of visitor groups did not make the trip primarily to visit Mount Rushmore NMEM. 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. With these assumptions, a total of \$279 million in visitor spending was attributed to the park visit (Table 7). This represented 81% of the overall visitor spending total.

**Table 7.** Total spending attributed to park visits, 2013 (thousands of dollars)

Expenditures	Segment					All visitors
	Local	Day trip	Motel	Camping	Other OVN	
Motels	0	0	92,027	126	0	92,154
Camping fees	0	0	756	9,253	0	10,008
Restaurants & bars	41	595	43,392	6,522	1,425	51,974
Groceries & takeout food	0	16	9,007	3,593	549	13,164
Gas & oil	0	763	26,553	8,986	1,125	37,427
Local transportation	0	536	9,989	1,999	456	12,980
Admission & fees	0	241	19,213	3,880	428	23,761
Souvenirs & other expenses	95	1,792	28,419	5,058	1,764	37,128
<b>Total Attributed to Park</b>	<b>135</b>	<b>3,943</b>	<b>229,356</b>	<b>39,417</b>	<b>5,747</b>	<b>278,598</b>
Percent of Spending Attributed to the Park	35%	89%	82%	73%	82%	81%
Percent of Attributed Spending	0%	1%	82%	14%	2%	100%

## **Economic Impacts of Visitor Spending**

The economic impacts of Mount Rushmore NMEM visitor spending on the local economy were estimated by applying visitor spending to a set of economic ratios and multipliers in MGM2 representing the economy of the 12-county region— Pennington, Custer, Fall River, Shannon, Meade, Butte, and Lawrence counties in South Dakota, Crook, Weston, and Niobrara counties in Wyoming, and Sioux and Dawes counties in Nebraska.<sup>9</sup> Economic ratios and multipliers for the region were estimated using IMPLAN (version 3, MIG, Inc. 2008) with 2008 data.<sup>10</sup> Multipliers were adjusted to 2013 based on structural changes in the national IMPLAN models between 2008 and 2009 and price changes between 2008 and 2013 (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 were applied to visitor spending to account for mark-ups by retailers and wholesalers. The retail margins for the three sectors were 25.3%, 22.3%, and 50.0%, respectively, and the wholesale margins were 12.3%, 8.3%, and 11.4%. In addition, regional purchase coefficients from IMPLAN for all sectors were 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 1.55. Every dollar of direct sales to visitors generated another \$0.55 in secondary sales through indirect and induced effects.<sup>11</sup> (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.

### ***Impacts of All Visitor Spending***

Using all visitor spending and including direct and secondary effects, the \$346 million spent by park visitors generated \$437 million in sales, which supported 6,076 jobs in the local region (Table 8). These jobs paid \$145 million in labor income, which was part of \$240 million in value added to the region.<sup>12</sup>

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<sup>9</sup> 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.

<sup>10</sup> See Appendix C: Economic Ratios and Multipliers for the region.

<sup>11</sup> 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.

<sup>12</sup> 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 profits and rents to area businesses and sales and excise taxes.

**Table 8.** Impacts of all visitor spending on the local economy, 2013

<b>Sector/Expenditure category</b>	<b>Sales</b> (thousands of dollars)	<b>Jobs</b>	<b>Labor Income</b> (thousands of dollars)	<b>Value Added</b> (thousands of dollars)
<b>Direct Effects</b>				
Motels	114,640	1,523	34,348	61,268
Camping fees	12,730	153	4,017	6,624
Restaurants & bars	61,910	1,242	20,812	29,282
Groceries & takeout food	30,393	588	11,032	16,863
Gas & oil	15,867	403	7,507	9,393
Local transportation	4,313	86	2,221	3,576
Admission & fees	10,856	207	5,482	9,039
Souvenirs & other expenses	22,350	462	11,469	18,662
Wholesale trade	7,587	52	2,838	4,876
<u>Local production of goods</u>	<u>1,408</u>	<u>10</u>	<u>269</u>	<u>431</u>
<b>Total Direct Effects</b>	<b>282,054</b>	<b>4,725</b>	<b>99,994</b>	<b>160,014</b>
<u>Secondary Effects</u>	<u>155,206</u>	<u>1,351</u>	<u>45,366</u>	<u>80,314</u>
<b>Total Effects</b>	<b>437,260</b>	<b>6,076</b>	<b>145,361</b>	<b>240,328</b>

Note: Impacts of \$346 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 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 Mount Rushmore NMEM reduced the overall impacts by about 19% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$279 million spent by park visitors and attributable to the park generated \$354 million in sales, which supported 4,928 jobs in the local region. These jobs paid \$118 million in labor income, which was part of \$194 in value added to the region.

**Table 9.** Economic impacts of visitor spending attributed to the park, 2013

<b>Sector/Expenditure category</b>	<b>Sales</b> (thousands of dollars)	<b>Jobs</b>	<b>Labor Income</b> (thousands of dollars)	<b>Value Added</b> (thousands of dollars)
<b>Direct Effects</b>				
Motels	92,154	1,224	27,611	49,251
Camping fees	10,008	120	3,158	5,208
Restaurants & bars	51,974	1,043	17,472	24,583
Groceries & takeout food	23,761	460	8,625	13,184
Gas & oil	12,980	329	6,141	7,684
Local transportation	3,331	66	1,715	2,761
Admission & fees	8,346	159	4,215	6,950
Souvenirs & other expenses	18,564	384	9,526	15,500
Wholesale trade	6,051	41	2,263	3,888
<u>Local production of goods</u>	<u>1,168</u>	<u>8</u>	<u>224</u>	<u>358</u>
<b>Total Direct Effects</b>	<b>228,337</b>	<b>3,835</b>	<b>80,949</b>	<b>129,366</b>
<u>Secondary Effects</u>	<u>125,588</u>	<u>1,093</u>	<u>36,702</u>	<u>64,986</u>
<b>Total Effects</b>	<b>353,925</b>	<b>4,928</b>	<b>117,652</b>	<b>194,352</b>

Note: Impacts of \$279 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 in FY 2010 by applying economic multipliers to wage and salary data to capture the induced effects of NPS employee spending on local economies. Mount Rushmore NMEM itself employed 69 people in FY 2010 with a total payroll including benefits of \$4.4 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$2.1 million in sales, 90 jobs, \$5.1 million in labor income, and \$5.7 million value added (Stynes 2011).

### **Combined Economic Impacts**

The combined impacts to the region of visitor spending attributable to the park and NPS payroll were \$356 million in sales, which supported 5,018 jobs with labor income of \$123 million, which was part of a total value added of \$200 million.



## Study Limitations and Errors

The accuracy of the MGM2 estimates rests on the accuracy of three inputs: visits, spending averages, and multipliers. Visits were taken from NPS Visitor Use Statistics (2013). 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 visitor responses to a VSP survey question about the number of times the visitor entered the park.

Spending averages outside the park were derived from the 2013 Mount Rushmore NMEM VSP survey data (Littlejohn and Le 2014). Estimates from the survey are subject to sampling errors, measurement errors, and potential seasonal biases. The overall spending average is subject to sampling error of 8%.

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 15 people (8 cases), visiting the local region for more than 14 nights (3 cases), or spending more than \$2,881 (the mean plus two times the standard deviation of the mean for spending, 23 cases) 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 for a week in June. To extrapolate to annual totals, it was assumed that this sample represented visitors throughout the year.

Multipliers were 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 dataset available for this analysis was 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 2013 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 35% of visitors to Mount Rushmore NMEM did not make the trip primarily to visit the park and 95% of spending occurs 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"> <li>• Direct jobs = direct sales * jobs to sales ratio</li> <li>• Direct personal income = direct sales * personal income to sales ratio</li> <li>• Direct value added = direct sales * value added to sales ratio.</li> </ul>
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.

<b>Term</b>	<b>Definition</b>
Sales	Direct sales (retail goods and services) of firms within the region to park visitors.
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"> <li>• Direct effects accrue largely to tourism-related businesses in the area.</li> <li>• Indirect effects accrue to a broader set of businesses that serve these tourism firms.</li> <li>• Induced effects are distributed widely across a variety of local businesses.</li> </ul>
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 Mount Rushmore NMEM VSP questionnaire. Some expenditure categories were combined and renamed for MGM2 analysis.

**Table B1.** Expenditure categories in Mount Rushmore NMEM questionnaire and MGM2 sector assignment

Questionnaire expenditure categories	Inside park	Outside park	MGM2 sector
Lodge, hotel, motel, cabin, B&B, etc.		X	Motels
Camping fees and charges		X	Camping fees
Guide fees and charges (including audio tour fee)	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	Gas & oil
Other transportation expenses (Concession parking fee, rental cars, taxis, auto repairs, but NOT airfare)	X	X	Local transportation
Admission, recreation, entertainment fees		X	Admissions & fees
All other purchases (souvenirs, books, postcards, sporting goods, clothing, donations, etc.)	X	X	Souvenirs & other expenses

X = category included in questionnaire.

MGM2 sector names correspond to similar sector names and numbers in IMPLAN (Table B2). IMPLAN sectors also correspond to 2007 North American Industry Classification System (NAICS) sectors.

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

MGM2 sector	IMPLAN		
	No.	Name	2007 NAICS
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	69	All other food manufacturing	31199
	88	Men's and boys' cut and sew apparel manufacturing	31522
	115	Petroleum refineries	32411
	311	Sporting and athletic goods manufacturing	33992
	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, Mount Rushmore NMEM region, 2013

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	13.28	0.30	0.53	1.29	1.56	18.28	0.47	0.82
Camping fees	12.00	0.32	0.52	1.31	1.54	16.91	0.48	0.80
Restaurants & bars	20.06	0.34	0.47	1.28	1.53	24.49	0.49	0.75
Groceries & takeout food	19.94	0.51	0.83	1.25	1.57	24.93	0.68	1.13
Gas & oil	19.07	0.50	0.83	1.21	1.45	22.99	0.64	1.07
Local transportation	25.38	0.47	0.59	1.15	1.44	29.39	0.61	0.83
Admission & fees	19.35	0.36	0.55	1.42	1.62	24.71	0.54	0.88
Souvenirs & other expenses	20.69	0.51	0.83	1.24	1.57	25.68	0.68	1.14
Local production of goods	6.86	0.19	0.31	1.19	1.38	7.26	0.22	0.37
Wholesale trade	6.85	0.37	0.64	1.22	1.52	11.51	0.53	0.92

Source: IMPLAN (MIG, Inc. 2008), updated to 2013.

### 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 Motels sector sales (i.e., short-term lodging room rentals) creates 13.3 jobs in the Motels sector. Fifty-three percent of Motel sector sales are value added, including 30% that goes to wages and salaries of motel employees. That means 47% of Motels sector sales goes to purchase inputs by motels (e.g., linens, cleaning supplies). The wage and salary income creates the induced effects, and the 47% of sales spent on purchases by motels starts the rounds of indirect effects.

**Multiplier effects:** There is an additional 29 cents of indirect sales in the region for every dollar of direct Motels sector sales (type I sales multiplier = 1.29). Total secondary sales are 56 cents per dollar of direct sales, which means 29 cents in indirect effects and 27 cents in induced

effects. An additional 5.0 jobs are created from secondary effects of each million dollars in Motels sector sales (18.3 total jobs – 13.3 direct jobs per \$million). These jobs are distributed across other sectors of the local economy. Similarly, the secondary effects on income for each dollar of Motels sector sales are 17% (47%-30%), and the secondary effects on value added for each dollar of Motels sector sales are 29% (82%-53%). Including secondary effects, every million dollars of Motels sector sales in the region yields \$1.56 million in sales, \$470,000 in income, and \$820,000 in value added.



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