



# Impacts of Visitor Spending on the Local Economy

## *Jefferson National Expansion Memorial, 2012*

Natural Resource Report NPS/NRSS/EQD/NRR—2013/677



**ON THE COVER**

Museum of Westward Expansion, Jefferson National Expansion Memorial  
Photo by Park Studies Unit staff

---

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

*Jefferson National Expansion Memorial, 2012*

Natural Resource Report NPS/NRSS/EQD/NRR—2013/677

Philip S. Cook

Visitor Services Project  
Park Studies Unit  
University of Idaho  
Moscow, ID 83844-1139

July 2013

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

The National Park Service, Natural Resource Stewardship and Science office in Fort Collins, Colorado, publishes a range of reports that address natural resource topics. These reports are of interest and applicability to a broad audience in the National Park Service and others in natural resource management, including scientists, conservation and environmental constituencies, and the public.

The Natural Resource Report Series is used to disseminate high-priority, current natural resource management information with managerial application. The series targets a general, diverse audience, and may contain NPS policy considerations or address sensitive issues of management applicability.

All manuscripts in the series receive the appropriate level of peer review to ensure that the information is scientifically credible, technically accurate, appropriately written for the intended audience, and designed and published in a professional manner.

Data in this report were collected and analyzed using methods based on established, peer-reviewed protocols and were analyzed and interpreted within the guidelines of the protocols.

Views, statements, findings, conclusions, recommendations, and data in this report do not necessarily reflect views and policies of the National Park Service, U.S. Department of the Interior. Mention of trade names or commercial products does not constitute endorsement or recommendation for use by the U.S. Government.

This report is available from the Social Science Division (<http://www.nature.nps.gov/socialscience/index.cfm>) and the Natural Resource Publications Management website (<http://www.nature.nps.gov/publications/nrpm/>).

This report and other reports by the Visitor Services Project (VSP) are available from the VSP website (<http://www.psu.uidaho.edu/c5/vsp/vsp-reports/>) or by contacting the VSP office at (208) 885-2269.

Please cite this publication as:

Cook, P. S. 2013. Impacts of visitor spending on the local economy: Jefferson National Expansion Memorial, 2012. Natural Resource Report NPS/NRSS/EQD/NRR—2013/XXX. National Park Service, Fort Collins, Colorado.

# Contents

	Page
Figures.....	v
Tables.....	v
Appendices.....	v
Executive Summary .....	vii
Acknowledgments.....	viii
Introduction.....	1
Methods.....	3
Results.....	5
Visits.....	5
Visitor Spending .....	6
Economic Impacts of Visitor Spending.....	9
Impacts of All Visitor Spending .....	10
Impacts of Visitor Spending Attributed to the Park.....	10
Economic Impacts of the NPS Park Payroll .....	11
Combined Economic Impacts.....	12
Study Limitations and Errors .....	13
Literature Cited.....	15



## Figures

	Page
<b>Figure 1.</b> Jefferson NEM visitor spending by category, 2012 .....	8

## Tables

	Page
<b>Table 1.</b> Recreation visits, Jefferson NEM, 2012 .....	1
<b>Table 2.</b> Selected visit/trip characteristics by segment, 2012 .....	5
<b>Table 3.</b> Recreation visits and visitor group trips by segment, 2012 .....	5
<b>Table 4.</b> Average spending by segment , 2012 (dollars per visitor group per trip).....	6
<b>Table 5.</b> Average spending per night for visitor groups on overnight trips, 2012 (dollars per visitor group per night) .....	7
<b>Table 6.</b> Total visitor spending by segment, 2012 (thousands of dollars) .....	7
<b>Table 7.</b> Total spending attributed to park visits, 2012 (thousands of dollars) .....	8
<b>Table 8.</b> Impacts of all visitor spending on the local economy, 2012.....	10
<b>Table 9.</b> Economic impacts of visitor spending attributed to the park, 2012.....	11
<b>Table B1.</b> Expenditure categories in Jefferson NEM questionnaire and MGM2 sector assignment.....	19
<b>Table B2.</b> MGM2 sector correspondence to IMPLAN and 2007 NAICS sectors .....	19
<b>Table C1.</b> Economic ratios and multipliers for selected tourism-related sectors, Jefferson NEM region, 2012.....	21

## Appendices

	Page
Appendix A: Glossary.....	17
Appendix B: Expenditure Sector Assignments.....	19
Appendix C: Economic Ratios and Multipliers .....	21





## Executive Summary

Jefferson National Expansion Memorial hosted 2.5 million recreation visits in 2012. Adjustments for visitor group size and re-entries resulted in 654,865 visitor group trips to the park in 2012. Based on a Visitor Services Project survey conducted July 23–29, 2012, 39% of visitor group trips involved an overnight stay in paid accommodations within 30 miles of the park.<sup>1</sup>

Visitors reported their group’s expenditures inside the park and within 30 miles of the park. The average visitor group size was 3.6 people and spent an average of \$344 inside the park and within 30 miles of the park.

Total visitor spending in 2012 inside the park and within 30 miles of the park was \$225.5 million, including \$20.5 million inside the park. The greatest proportions of expenditures were for overnight accommodations (34%). Overnight visitors using paid accommodations in the local region accounted for 86% of total spending.

Forty-four 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 \$164.0 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 seven-county region including St. Louis, St. Louis City, St. Charles, and Jefferson counties in Missouri and Monroe, St. Clair, and Madison counties in Illinois.

Including direct and secondary effects, the \$164.0 million in visitor spending attributed to the park generated \$292.7 million in direct sales in the region, which supported 3,283 jobs. These jobs paid \$96.3 million in labor income, which was part of \$167.6 million in value added to the region.<sup>2</sup>

A separate study estimated impacts of the park employee payroll in FY 2010 on the local economy.<sup>3</sup> The park itself employed 180 people in FY 2010 with a total payroll including benefits of \$10.6 million. Including secondary effects, the local impacts of the park payroll in FY 2010 were \$5.0 million in sales, supporting 221 jobs, \$12.1 million in labor income, and \$13.4 million in value added.

### **Local Economic Impacts of Jefferson National Expansion Memorial**

	<u>Sales</u>	<u>Jobs</u>	<u>Labor Income</u>	<u>Value Added</u>
Park Visitor Spending	\$292.7M	3,283	\$96.3M	\$167.6M
Park Payroll	+ \$5.0M	+ 221	+ \$12.1M	+ \$13.4M
Park Visitor Spending + Payroll	\$297.7M	3,504	\$108.4M	\$181.0M

<sup>1</sup> Results in this study sometimes differ from those reported in the VSP study report (Manni et al. 2013) because the current analysis excludes some cases as outliers. 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 Margaret Littlejohn, National Park Service Social Science Specialist, for her review of an early draft of this report.

# Introduction

Jefferson National Expansion Memorial (NEM) commemorates Thomas Jefferson’s role in the westward movement of American explorers and pioneers, and includes the Gateway Arch and the Old Courthouse, where Dred Scott sued for his freedom from slavery. The park encompasses 91 acres in St. Louis, Missouri. Jefferson NEM received 2.5 million recreation visits in 2012 (Table 1).

**Table 1.** Recreation visits, Jefferson NEM, 2012

<b>Month</b>	<b>Recreation visits</b>
January	56,326
February	67,671
March	187,038
April	172,210
May	197,670
June	284,592
July	805,362
August	243,878
September	152,261
October	139,189
November	105,522
<u>December</u>	<u>85,007</u>
<b>Total</b>	<b>2,496,726</b>

The purpose of this study is to estimate the annual, local economic impacts of visitors to Jefferson NEM in 2012. 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 St. Louis, St. Louis City, St. Charles, and Jefferson counties in Missouri and Monroe, St. Clair, and Madison counties in Illinois. This seven-county region has a population of 2,460,054 (USCB 2011), gross regional product of \$131.2 billion (MIG, Inc. 2008), median household income of \$55,128, and family poverty rate of 9.0% (USCB 2011). Food services and drinking places and real estate establishments are the major employers in the region (MIG, Inc. 2008), and the region experienced a 7.6% unemployment rate in 2012 (BLS 2012).



## 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 Jefferson NEM Visitor Services Project (VSP) survey data (Manni et al. 2013), National Park Service Public Use Statistics (2012), 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 survey was conducted at Jefferson NEM from July 23–29, 2012.<sup>4</sup> The VSP survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 1,145 visitor groups. Of those, 547 questionnaires were returned, resulting in a response rate of 47.8%.

Visitors were asked to report expenditures within 30 miles of the park. The local region for determining economic impact was defined as a seven-county area around the park including St. Louis, St. Louis City, St. Charles, and Jefferson counties in Missouri and Monroe, St. Clair, and Madison counties in Illinois. The defined local region roughly coincides with the 30-mile radius from the park for which visitor spending was reported.

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

**Local:** Visitors from the local region, i.e., within 30 miles of the park.

**Day trip:** Visitors from outside the local region, not staying overnight within 30 miles of the park.

**Paid overnight:** Visitors reporting motel or camping expenses within 30 miles of the park.<sup>5,6</sup>

**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.<sup>7</sup>

---

<sup>4</sup> Results in this study sometimes differ from those reported in the VSP study report (Manni et al. 2013) 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.

<sup>6</sup> Only seven respondents reported camping fee expenditures within 30 miles of the park. Due to the small sample size, these responses were combined with those who reported motel expenses to form the paid overnight segment.

<sup>7</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.

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.

## Results

### Visits

Based on the VSP survey data, 27% of park entries were classified as day trip visits by either local residents or visitors from outside the region, and the remaining 73% were classified as overnight visits including an overnight stay in the local region (Table 2). The average visitor group size ranged from 2.9 to 3.7 people across the four segments with an average visitor group of 3.6 people.<sup>8</sup> The average length of stay in the park and the local region on overnight trips was 2.1 nights. Forty-four 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, 2012

Characteristic	Segment				All visitors
	Local	Day trip	Paid overnight	Other OVN	
Visitor segment share (park entries)	8%	19%	50%	23%	100%
Average visitor group size	2.9	3.7	3.6	3.5	3.6
Length of stay (days or nights)	1.0	1.0	2.0	2.1	2.1
Re-entry rate (park entries per trip)	1.0	1.0	1.1	1.1	1.1
Percent primary purpose trips	100%	49%	42%	27%	44%

The 2,496,726 recreation visits in 2012 were allocated to the four 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 entries were estimated based on the number of days the respondent reported visiting the park, with the assumption that visitors entered the park once per day. The 2,496,726 recreation visits represented 654,865 visitor group trips (Table 3).

**Table 3.** Recreation visits and visitor group trips by segment, 2012

Measure	Segment				All visitors
	Local	Day trip	Paid overnight	Other OVN	
Recreation visits	199,738	474,378	1,248,363	574,247	2,496,726
Visitor group trips	67,336	126,828	310,883	149,819	654,865
Percent of visitor group trips*	10%	19%	47%	23%	100%

\*Segment percentages do not sum to 100% due to rounding.

<sup>8</sup> Visitor group size reported herein is based on the number of people covered by expenditures reported in the VSP surveys.

## Visitor Spending

The VSP surveys collected data about expenditures of visitor groups inside the park and within 30 miles of the park.<sup>9</sup> Spending averages were computed on a visitor group trip basis for each segment. The average visitor group spent \$344 on the trip inside the park and in the local region (Table 4). On a visitor group trip basis, average spending was \$33 for day trips by local residents and \$76 for day trips by non-local visitors. Visitor groups who paid for overnight stays spent an average of \$627 on their trips. Visitor groups spent about 9% of their total spending inside the park and 91% outside the park.

**Table 4.** Average spending by segment , 2012 (dollars per visitor group per trip)

Expenditures	Segment				
	Local	Day trip	Paid overnight	Other OVN	All visitors*
<b><u>Inside Park</u></b>					
Local transportation	2.28	0.77	0.25	1.57	0.86
Admission & fees	8.50	16.80	22.35	17.15	18.66
<u>Souvenirs &amp; other expenses</u>	<u>6.08</u>	<u>17.99</u>	<u>13.39</u>	<u>5.73</u>	<u>11.77</u>
<b>Total Inside Park</b>	<b>16.87</b>	<b>35.57</b>	<b>35.99</b>	<b>24.44</b>	<b>31.30</b>
<b><u>Outside Park</u></b>					
Motels	0.00	0.00	244.38	0.00	116.01
Camping fees	0.00	0.00	2.51	0.00	1.19
Restaurants & bars	8.53	16.41	127.41	35.16	72.58
Groceries & takeout food	0.00	2.26	17.89	14.25	12.19
Gas & oil	2.75	9.24	66.33	17.35	37.53
Local transportation	1.79	1.01	11.81	4.98	7.12
Admission & fees	0.61	9.43	80.49	18.07	44.23
<u>Souvenirs &amp; other expenses</u>	<u>2.75</u>	<u>2.12</u>	<u>40.56</u>	<u>9.71</u>	<u>22.17</u>
<b>Total Outside Park</b>	<b>16.43</b>	<b>40.48</b>	<b>591.37</b>	<b>99.52</b>	<b>313.03</b>
<b>Total Inside &amp; Outside Park</b>	<b>33.30</b>	<b>76.04</b>	<b>627.35</b>	<b>123.96</b>	<b>344.33</b>

\*Weighted by percent visitor group trips.

The relative standard error at a 95% confidence level for the overall spending average is 10%. A 95% confidence interval for the overall visitor group spending average is therefore \$344 plus or minus \$33 or between \$311 and \$377.

On a per night basis, visitor groups paying for overnight lodging spent \$314 per night in the local region (Table 5). The average reported per-night motel expense was \$122.

<sup>9</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, 2012 (dollars per visitor group per night)

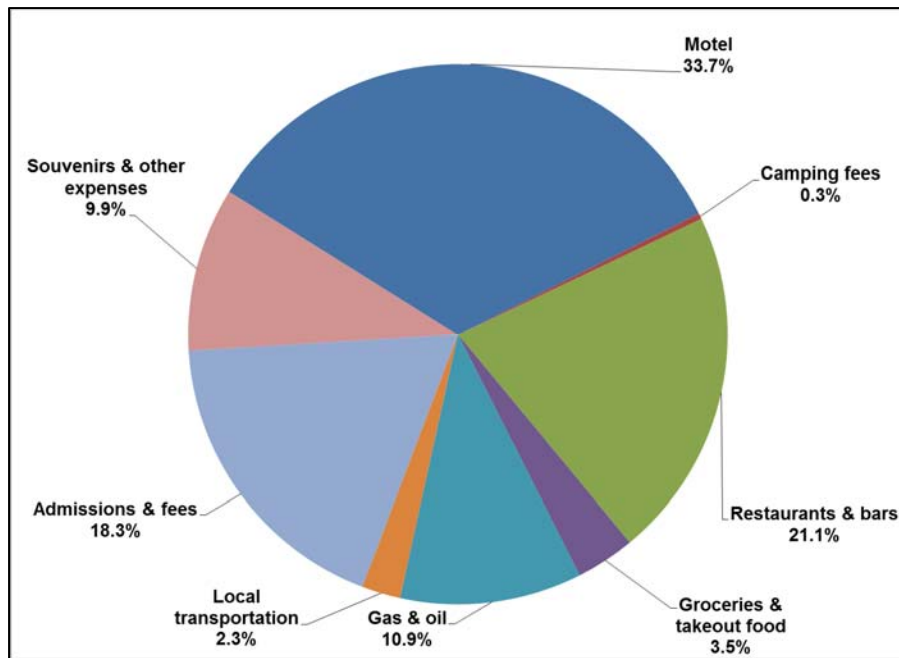
Expenditures	Segment	
	Paid overnight	Other OVN
Motels	122.48	0.00
Camping fees	1.26	0.00
Restaurants & bars	63.85	16.94
Groceries & takeout food	8.97	6.87
Gas & oil	33.24	8.36
Local transportation	6.04	3.15
Admission & fees	51.54	16.97
<u>Souvenirs &amp; other expenses</u>	<u>27.04</u>	<u>7.44</u>
<b>Total per visitor group per night</b>	<b>314.43</b>	<b>59.74</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. Jefferson NEM visitors spent a total of \$225.5 million in the local region in 2012 (Table 6). Visitors who stayed overnight and paid for accommodations accounted for 86% of the total spending. Motel expenses represented 33.7% of the total spending, and restaurant & bar expenses represented 21.1% (Figure 1).

**Table 6.** Total visitor spending by segment, 2012 (thousands of dollars)

Expenditures	Segment				
	Local	Day trip	Paid overnight	Other OVN	All visitors
<b><u>Inside Park</u></b>					
Local transportation	154	98	78	235	564
Admission & fees	573	2,131	6,948	2,570	12,222
<u>Souvenirs &amp; other expenses</u>	<u>410</u>	<u>2,282</u>	<u>4,162</u>	<u>858</u>	<u>7,711</u>
<b>Total Inside Park</b>	<b>1,136</b>	<b>4,511</b>	<b>11,188</b>	<b>3,662</b>	<b>20,497</b>
<b><u>Outside Park</u></b>					
Motels	0	0	75,973	0	75,973
Camping fees	0	0	779	0	779
Restaurants & bars	575	2,082	39,608	5,267	47,531
Groceries & takeout food	0	287	5,562	2,135	7,984
Gas & oil	185	1,172	20,621	2,599	24,577
Local transportation	120	128	3,670	746	4,664
Admission & fees	41	1,197	25,022	2,708	28,967
<u>Souvenirs &amp; other expenses</u>	<u>185</u>	<u>269</u>	<u>12,610</u>	<u>1,455</u>	<u>14,519</u>
<b>Total Outside Park</b>	<b>1,106</b>	<b>5,134</b>	<b>183,845</b>	<b>14,910</b>	<b>204,995</b>
<b>Total Inside &amp; Outside Park</b>	<b>2,242</b>	<b>9,644</b>	<b>195,033</b>	<b>18,572</b>	<b>225,492</b>
Segment Percent of Total*	1%	4%	86%	8%	100%

\*Segment percentages do not sum to 100% due to rounding.



**Figure 1.** Jefferson NEM visitor spending by category, 2012

Because visitors would come to the region whether or not the park existed, not all visitor spending can be attributed to the park. Fifty-six percent of visitor groups did not make the trip primarily to visit Jefferson NEM. 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 \$164.0 million in visitor spending was attributed to park visits (Table 7). This represented 73% of the overall visitor spending total.

**Table 7.** Total spending attributed to park visits, 2012 (thousands of dollars)

Expenditures	Segment				All visitors
	Local	Day trip	Paid overnight	Other OVN	
Motels	0	0	53,854	0	53,854
Camping fees	0	0	552	0	552
Restaurants & bars	0	1,550	28,049	3,347	32,946
Groceries & takeout food	0	213	3,942	1,329	5,485
Gas & oil	0	872	14,617	1,617	17,107
Local transportation	154	193	2,679	699	3,725
Admission & fees	573	3,022	24,685	4,255	32,535
<u>Souvenirs &amp; other expenses</u>	<u>410</u>	<u>2,482</u>	<u>13,101</u>	<u>1,763</u>	<u>17,755</u>
<b>Total Attributed to Park</b>	<b>1,136</b>	<b>8,332</b>	<b>141,479</b>	<b>13,010</b>	<b>163,958</b>
Percent of Spending Attributed to the Park	51%	86%	73%	70%	73%
Percent of Attributed Spending	1%	5%	86%	8%	100%

## Economic Impacts of Visitor Spending

The economic impacts of Jefferson NEM visitor spending on the local economy was estimated by applying visitor spending to a set of economic ratios and multipliers in MGM2 representing the economy of the seven-county region—St. Louis, St. Louis City, St. Charles, and Jefferson counties in Missouri and Monroe, St. Clair, and Madison counties in Illinois.<sup>10</sup> Economic ratios and multipliers for the region were estimated using the *Impact Analysis for Planning (IMPLAN) Professional software* (version 3, MIG, Inc. 2008) with 2010 data.<sup>11</sup> Multipliers were updated to take into account price changes from 2010 to 2012 (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 was 1.89. Every dollar of direct sales to visitors generated another \$0.89 in secondary sales through indirect and induced effects.<sup>12</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.

---

<sup>10</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>11</sup> See Appendix C: Economic Ratios and Multipliers for the region.

<sup>12</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.

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

Using all visitor spending and including direct and secondary effects, the \$225.5 million spent by park visitors generated \$403.2 million in sales, which supported 4,496 jobs in the local region (Table 8). These jobs paid \$132.1 million in labor income, which was part of \$230.0 million in value added to the region.<sup>13</sup>

**Table 8.** Impacts of all visitor spending on the local economy, 2012\*

<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	75,973	848	21,348	42,577
Camping fees	779	8	387	450
Restaurants & bars	47,531	915	16,582	25,334
Groceries & takeout food	41,189	799	14,587	25,949
Gas & oil	5,228	135	2,711	4,075
Local transportation	2,020	37	1,076	1,508
Admission & fees	5,481	83	2,223	3,820
Souvenirs & other expenses	11,115	215	5,437	8,499
Wholesale trade	5,530	32	2,618	4,384
<u>Local production of goods</u>	<u>17,974</u>	<u>13</u>	<u>1,363</u>	<u>3,958</u>
<b>Total Direct Effects</b>	<b>212,821</b>	<b>3,086</b>	<b>68,332</b>	<b>120,555</b>
<u>Secondary Effects</u>	<u>190,333</u>	<u>1,410</u>	<u>63,787</u>	<u>109,475</u>
<b>Total Effects</b>	<b>403,154</b>	<b>4,496</b>	<b>132,119</b>	<b>230,030</b>

\*Note: Impacts of \$225.5 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 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 Jefferson NEM reduces the overall impacts by about 27% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$164.0 million spent by park visitors and attributable to the park generated \$292.7 million in sales, which supported 3,283 jobs in the local region. These jobs paid \$96.3 million in labor income, which was part of \$167.6 million in value added to the region.

<sup>13</sup> 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, 2012\*

<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	53,854	601	15,133	30,181
Camping fees	552	6	274	319
Restaurants & bars	32,946	635	11,493	17,560
Groceries & takeout food	32,535	631	11,522	20,497
Gas & oil	3,725	96	1,932	2,903
Local transportation	1,388	25	739	1,036
Admission & fees	3,815	58	1,547	2,659
Souvenirs & other expenses	8,878	172	4,342	6,788
Wholesale trade	4,099	24	1,941	3,250
<u>Local production of goods</u>	<u>12,749</u>	<u>10</u>	<u>1,042</u>	<u>2,899</u>
<b>Total Direct Effects</b>	<b>154,539</b>	<b>2,258</b>	<b>49,966</b>	<b>88,092</b>
<u>Secondary Effects</u>	<u>138,201</u>	<u>1,026</u>	<u>46,340</u>	<u>79,533</u>
<b>Total Effects</b>	<b>292,741</b>	<b>3,283</b>	<b>96,306</b>	<b>167,624</b>

\*Note: Impacts of \$164.0 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. Jefferson NEM itself employed 180 people in FY 2010 with a total payroll including benefits of \$10.6 million.<sup>14,15</sup> Including secondary effects, the local impacts of the park payroll in FY 2010 were \$5.0 million in sales, 221 jobs, \$12.1 million in labor income, and \$13.4 million value added (Stynes 2011).

## Combined Economic Impacts

The combined impacts to the region of visitor spending attributable to the park and NPS payroll were \$297.7 million in sales, which supported 3,504 jobs with labor income of \$108.4 million, which was part of a total value added of \$181.0 million.

<sup>14</sup> 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).

<sup>15</sup> This number of employees at Jefferson NEM includes only NPS employees and not concessionaire employees. The effects of concessionaire employees' spending on the local economy are accounted for as induced effects of visitor spending.



## 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 (2012). 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 the number of days visiting the park on their trip that respondents reported in the VSP visitor survey.

Spending averages are derived from the 2012 Jefferson NEM VSP visitor survey (Manni et al. 2013). Estimates from the survey are subject to sampling errors, measurement errors, and potential seasonal biases. The overall spending average is subject to a sampling error of 10%.

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 visiting the local region for more than 7 nights (1 case) or with total spending greater than \$1,786 (24 cases; the mean 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. To extrapolate to annual totals, it was assumed that the sample represented visitors throughout the year.

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 2010. Employment multipliers were updated to 2012 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 56% of visitor groups to Jefferson NEM 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.





## Literature Cited

- BLS (U.S. Bureau of Labor Statistics). 2012. Local Area Unemployment Statistics. <http://www.bls.gov/lau/>. Data retrieved on March 20, 2013.
- Manni, M., J. Gramann, Y. Le, and S.J. Hollenhorst. 2013. Jefferson National Expansion Memorial Visitor Study, Summer 2012. Natural Resource Report NPS/NRSS/EQD/NRR—2013/661. National Park Service, Fort Collins, Colorado.
- MIG, Inc. 2008. IMPLAN Professional Version 3.0. Minnesota IMPLAN Group: Stillwater, MN.
- National Park Service Public Use Statistics Office. 2012. Visitation Database. <http://www2.nature.nps.gov/stats/>. Data retrieved on March 19, 2013.
- Stynes, D. J. 2011. Economic Benefits to Local Communities from National Park Visitation and Payroll, 2010. NPS/NRSS/EQD/NRR—2011/481. National Park Service, Fort Collins, Colorado.
- Stynes, D. J., D.B. Propst, W. Chang, and Y. Sun. 2007. NPS Money Generation Model – Version 2 (MGM2). <http://mgm2impact.com/MGM2Y2011.xls> (with price indices updated to 2012).
- USCB (U.S. Census Bureau). 2012. American FactFinder. <http://factfinder2.census.gov/faces/nav/jsf/pages/index.xhtml>. Data retrieved on March 20, 2013.



## 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	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: <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.
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.

<b>Term</b>	<b>Definition</b>
Total effects	<p>Sum of direct, indirect and induced effects.</p> <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	<p>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.</p>
Visitor group	<p>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.</p>
Wholesale margin	<p>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.</p>

## Appendix B: Expenditure Sector Assignments

Tables B1 and B2 show expenditure categories visitors were asked to estimate in the Jefferson NEM VSP questionnaires for summer and winter, respectively. Some expenditure categories were combined and renamed for MGM2 analysis.

**Table B1.** Expenditure categories in Jefferson NEM 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	X	X	Admissions & fees
Restaurants and bars		X	Restaurants & bars
Groceries and takeout food		X	Groceries & takeout food
Gas and oil (auto, RV, boat, etc.)		X	Gas & oil
Other transportation expenses (rental cars, taxis, auto repairs, but NOT airfare)	X	X	Local transportation
Admission, recreation, entertainment fees	X	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 sectors 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		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	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, Jefferson NEM region, 2012

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	10.70	0.28	0.56	1.47	1.98	18.09	0.64	1.15
Camping fees	9.82	0.50	0.58	1.43	2.16	18.89	0.92	1.30
Restaurants & bars	18.30	0.35	0.53	1.39	1.92	24.91	0.67	1.09
Groceries & takeout food	17.05	0.53	0.75	1.26	1.96	24.43	0.87	1.34
Gas & oil	11.64	0.41	0.70	1.32	1.89	18.49	0.72	1.25
Local transportation	22.99	0.52	0.78	1.18	1.83	29.16	0.81	1.27
Admission & fees	18.84	0.35	0.63	1.35	1.89	25.69	0.67	1.18
Souvenirs & other expenses	18.38	0.49	0.76	1.25	1.88	25.19	0.80	1.31
Local production of goods	1.04	0.09	0.23	1.37	1.57	4.13	0.23	0.52
Wholesale trade	5.50	0.47	0.79	1.22	1.84	11.94	0.78	1.31

Source: IMPLAN (MIG, Inc. 2008) updated to 2012.

### 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 10.7 jobs in motels. Fifty-six percent of motel sales are value added, including 28% that goes to wages and salaries of motel employees. That means 44% 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 44% spent on purchases by the motel starts the rounds of indirect effects.

**Multiplier effects:** There is an additional 47 cents of indirect sales in the region for every dollar of direct motel sales (type I sales multiplier = 1.47). Total secondary sales are 98 cents per dollar of direct sales, which means 47 cents in indirect effects and 51 cents in induced effects. An additional 7.4 jobs are created from secondary effects of each million dollars in motel sales (18.1

total jobs – 10.7 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 36% (64%-28%), and the secondary effects on value added for each dollar of motel sales are 59% (115%-56%). Including secondary effects, every million dollar of motel sales in the region yields \$1.98 million in sales, which supports 18.1 jobs. Those jobs pay \$640,000 in labor income, which is part of the overall value added of \$1,150,000.



The Department of the Interior protects and manages the nation's natural resources and cultural heritage; provides scientific and other information about those resources; and honors its special responsibilities to American Indians, Alaska Natives, and affiliated Island Communities.

NPS 366/121564, July 2013

**National Park Service**  
**U.S. Department of the Interior**



---

**Natural Resource Stewardship and Science**

1201 Oakridge Drive, Suite 150  
Fort Collins, CO 80525

[www.nature.nps.gov](http://www.nature.nps.gov)