



Impacts of Visitor Spending on the Local Economy: *Grand Teton National Park, 2008*



ON THE COVER

Photograph courtesy of Grand Teton National Park

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Executive Summary

Grand Teton National Park hosted 2.5 million recreation visits in 2008. After adjusting for visitor group size and re-entries into the park, there were 678,578 visitor group trips to the park in 2008. Based on a 2008 Visitor Services Project survey, 25% of these visitor group trips were day trips not including an overnight stay in the surrounding local region.¹ Forty-three percent of the visitor group trips involved an overnight stay in motels, lodges or cabins, 5% inside the park, and 38% outside the park. Fifteen percent of visitor group trips involved camping overnight, 5% inside the park and 10% outside.

Visitors reported expenditures of their group inside the park and within 100 miles of the park. The average visitor group consisted of 2.9 people and spent \$573 in the park and local region. On a visitor group trip basis, average spending in 2008 was \$52 for visitors from the local region, \$106 for non-local visitors on day trips, \$1308 for visitors staying in lodges and cabins in the park, \$374 for visitors camping inside the park, \$1050 for visitors staying in motels or lodges outside the park, and \$528 for visitors camping outside the park. Overall 78% of spending took place outside the park.

Total visitor spending in 2008 within the local region was \$389 million including \$84 million spent inside the park. The greatest proportions of expenditures were for lodging (42%) and restaurant meals and bar expenses (17%). Overnight visitors staying in motels or lodges outside the park accounted for 70% of the total spending.

Only one out of five visitor groups indicated the park visit was the primary reason for the trip to the area. Counting only a portion of visitor expenses if the park visit was not the primary trip purpose yields \$221 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 (IMPLAN) of the local economy. The local region was defined as a two county region including Teton County, Wyoming, and Teton County, Idaho. This region roughly coincides with the 100 mile radius for which spending was reported.

Including direct and secondary effects, the \$221 million in visitor spending attributed directly to the park supports 2,662 jobs in the area and generates \$250 million in output (sales revenues), \$83 million in labor income, and \$147 million in value added.²

A separate study estimated impacts of the park employee payroll on the local economy.³ The park itself employed 264 people in FY 2009 with a total payroll including benefits of \$14.4 million. Including secondary effects, the local impact of the park payroll in FY 2009 was 310 jobs, \$15.9 million in labor income, and \$18.9 million total value added.

¹ Results in this study sometimes differ from those reported in the VSP survey report (Braak et al. 2010) because the current analysis excludes some cases as outliers. See Study Limitations and Error section.

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

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Introduction

Grand Teton National Park (NP), established in 1929, preserves a spectacular landscape of the northern Rocky Mountains, including jagged peaks, pristine lakes and extraordinary wildlife. The park covers 485 square miles in Teton County of northwestern Wyoming. Grand Teton NP received 2.5 million recreation visits in 2008 including 553,735 overnight visits in the park (Table 1).

Table 1. Recreation visits and overnight stays, Grand Teton National Park, 2008

Month	Overnight (OVN) Stays					Total OVN Stays
	Recreation Visits	Concession lodging	Concession camping	Back-country	Misc	
January	42,940	200	0	117	102	419
February	43,991	212	0	40	168	420
March	43,724	57	7	49	178	291
April	39,193	0	0	103	102	205
May	178,458	9,717	16,099	328	419	26,563
June	452,102	47,895	58,286	3,002	347	109,530
July	587,324	60,047	103,574	9,750	363	173,734
August	527,256	56,180	87,428	10,490	505	154,603
September	347,239	36,531	36,276	3,575	380	76,762
October	142,499	3,581	6,633	18	409	10,641
November	42,483	0	0	23	313	336
December	38,778	125	7	26	73	231
Total	2,485,987	214,545	308,310	27,521	3,359	553,735

NPS Public Use Statistics (2008).

The purpose of this study is to estimate the local economic impacts of visitors to Grand Teton NP in 2008. 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.) The local economic region defined for this study includes Teton County, Wyoming and Teton County, Idaho.

This two-county region has a population of 28,489 (USCB 2010), gross regional product of \$2.6 billion (MIG, Inc. 2008), median household income of \$60,627, and family poverty rate of 4.5% (USCB 2010). Real estate establishments, food and beverage businesses, and hotels and motels are the major employers in the region (MIG, Inc. 2008), and the region experienced a 3.0% unemployment rate in 2008 (BLS 2008).

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 a Grand Teton NP Visitor Services Project (VSP) survey (Braak et al. 2010), National Park Service Public Use Statistics (2008), 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 Grand Teton NP July 13-19, 2008 (Braak et al. 2010).⁴ The survey measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a systematic, random sample of 1,044 visitor groups. The response rate was 71%.

Spending and economic impact estimates for Grand Teton NP are based on the 2008 VSP survey. Visitors were asked to report expenditures in the park and within 100 miles of the park. The local region for determining economic impact was defined as a two-county area of Teton County, Wyoming and Teton County, Idaho, which roughly coincides with the area for which visitor spending was reported.

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Seven segments were established for Grand Teton National Park 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 100 miles of the park.

Motel-in: Visitors reporting lodging expenses (lodges or cabins) inside the park.

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

Motel-out: Visitors reporting motel expenses outside the park within 100 miles of the park.

Camp-out: Visitors reporting camping expenses outside the park within 100 miles of the park.

Other overnight (Other OVN): Visitors staying overnight in the area but not reporting any lodging expenses. This segment includes visitors staying in private homes, with friends or relatives, or in other unpaid lodging.⁵

⁴ Results in this study sometimes differ from those reported in the VSP survey report (Braak et al. 2010) because the current analysis excludes some cases as outliers. See Study Limitations and Error section.

⁵ 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 surveys 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 (2008) overnight stay figures.

Results

Visits

Based on the VSP survey and park overnight stay figures, 19% of park entries were classified as day trip visits by either local residents or visitors from outside the area, and 81% were classified as overnight visits including an overnight stay inside the park or in the local region (Table 2). The average visitor group size ranged from 2.4 to 3.2 people across the seven segments with the average visitor group consisting of 2.9 people.⁶ The average length of stay in the local region on overnight trips was 3.1 nights.

Table 2. Selected visit/trip characteristics by segment, 2008

Characteristic	Local	Day trip	Motel- in	Camp- in	Motel- out	Camp- out	Other OVN	All visitors
Visitor segment share (park entries)	7.0%	12.0%	6.0%	6.5%	41.5%	11.0%	16.0%	100%
Average visitor group size	2.4	2.4	3.1	2.8	2.9	3.2	2.9	2.9
Length of stay (days or nights)	1.0	1.0	2.8	3.2	3.1	4.1	2.8	3.1
Re-entry rate (park entries per trip)	1.1	1.1	1.5	1.6	1.4	1.3	1.3	1.3
Percent primary purpose trips	100%	17%	47%	33%	18%	17%	24%	21%

Twenty-one percent of visitor groups indicated that visiting Grand Teton NP was the primary reason for the trip to the area. Fifty-four percent of visitors indicated that visiting Yellowstone NP was the primary purpose of the trip to the area. Other stated reasons were visiting friends and relatives in the area, business, or visiting other area attractions.

The 2.5 million recreation visits in 2008 were allocated to the seven segments using the visit segment shares in Table 2. Since spending is reported for the stay in the area, park entries were converted to trips to the area by dividing by the average number of times each visitor entered the park during their stay. Park re-entry rates were estimated based on the number of entries into the park reported by survey respondents.

Recreation visits were converted to 678,578 visitor group trips by dividing recreation visits by the average visitor group size and park entry rate for each segment (Table 3). Total person trips in 2008 were 1.9 million.

⁶ Visitor group size reported herein is based on the number of people covered by expenditures reported in the VSP surveys.

Table 3. Recreation visits and visitor group trips by segment, 2008

Measure	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
Recreation visits	174,019	298,318	149,159	161,589	1,031,685	273,459	397,758	2,485,987
Visitor group trips	62,694	111,336	31,122	34,838	259,923	67,725	110,942	678,578
Percent of visitor group trips*	9%	16%	5%	5%	38%	10%	16%	100%
Visitor group nights	62,694	111,336	86,450	111,481	797,096	280,574	306,602	1,756,232
Person trips	153,079	270,775	97,756	99,039	752,467	216,207	316,428	1,905,751

*Percentages do not total 100% due to rounding.

Visitor Spending

The VSP visitor survey covered expenditures of the visitor group inside the park and outside the park in the surrounding local region. Spending averages were computed on a visitor group trip basis for each segment. The average visitor group in 2008 spent \$573 on the trip inside the park and in the local region (Table 4). On a visitor group trip basis, average spending was \$52 for day trips by local residents and \$106 for day trips by non-local visitors. Visitor groups staying in lodges and cabins inside the park spent \$1,308 per trip compared to \$1,050 for visitor groups staying in motels and lodges outside the park. Visitor groups camping inside the park spent \$374 on their trips compared to \$455 for visitor groups camping outside the park.

Visitor groups spent about 22% of their total spending inside the park and 78% outside the park. As one would expect, visitor groups staying overnight inside the park spent the majority of their money inside the park, while visitor groups staying outside the park spent most of their money in the surrounding region.

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 \$573 plus or minus \$59 or between \$514 and \$632.

On a per night basis, visitor groups in park lodges or cabins spent \$471 in the local region compared to \$342 per night for visitor groups staying in motels or lodges outside the park (Table 5). Campers spent slightly more per night if staying outside the park (\$127) than if staying inside the park (\$117). The average reported per night lodging expense was \$245 for park lodges or cabins inside the park, \$158 for motels outside the park, and \$26 for camping fees inside the park and \$35 for camping fees outside the park.

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. Grand Teton NP visitors spent a total of \$389 million in the local region in 2008 (Table 6). Overnight visitors staying in motels outside the park account for 70% of the total spending. Lodging expenses represent 42% of the total spending, and restaurant and bar expenses represent 17% (Figure 1).

Table 4. Average visitor spending by segment (\$ per visitor group per trip).

	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors*
<u>Inside Park</u>								
Motel, hotel, cabin or B&B	.00	.00	598.14	.00	15.30	.00	.00	33.29
Camping fees	.00	.00	26.14	78.24	1.90	10.26	.00	6.97
Restaurants & bars	6.66	6.85	163.68	44.97	20.98	14.06	6.39	22.04
Groceries & takeout food	.54	.66	35.53	22.70	7.95	14.45	2.32	7.82
Gas & oil	10.33	2.08	46.08	50.08	7.69	11.83	4.10	10.78
Local transportation	.00	.00	.00	.00	.00	.00	.00	0.00
Admission & fees	8.37	17.84	91.08	33.41	43.84	7.63	6.19	28.16
<u>Souvenirs & other expenses</u>	<u>1.59</u>	<u>7.88</u>	<u>58.39</u>	<u>27.97</u>	<u>17.69</u>	<u>15.12</u>	<u>9.03</u>	<u>15.31</u>
Total Inside Park	27.50	35.30	1019.03	257.36	115.35	73.36	28.02	124.37
<u>Outside Park</u>								
Motel, hotel, cabin or B&B	.00	.00	82.09	.00	469.81	.74	.00	183.79
Camping fees	.00	.00	2.28	3.74	2.94	135.41	.00	14.94
Restaurants & bars	5.72	11.91	79.79	15.74	161.03	50.41	14.69	76.06
Groceries & takeout food	9.91	11.36	15.62	16.49	40.59	59.68	11.56	27.74
Gas & oil	4.66	10.37	25.58	36.07	81.07	100.64	13.92	48.53
Local transportation	.00	22.54	20.52	.00	67.53	24.55	7.60	34.20
Admission & fees	1.42	5.92	28.45	12.75	38.56	27.94	3.08	21.12
<u>Souvenirs & other expenses</u>	<u>3.13</u>	<u>8.70</u>	<u>35.11</u>	<u>31.53</u>	<u>73.34</u>	<u>55.31</u>	<u>25.21</u>	<u>42.68</u>
Total Outside Park	24.82	70.80	289.43	116.32	934.86	454.68	76.06	449.06
Total Inside & Outside Park	52.32	106.10	1308.47	373.68	1050.20	528.04	104.08	573.42

*Weighted by percent of visitor group trips.

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

	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN
Motel, hotel, cabin or B&B	244.88	0.00	158.19	0.18	0.00
Camping fees	10.23	25.62	1.58	35.16	0.00
Restaurants & bars	87.65	18.97	59.35	15.56	7.63
Groceries & takeout food	18.42	12.25	15.83	17.89	5.02
Gas & oil	25.80	26.92	28.94	27.15	6.52
Local transportation	7.39	0.00	22.02	5.93	2.75
Admission & fees	43.03	14.43	26.87	8.59	3.35
<u>Souvenirs & other expenses</u>	<u>33.66</u>	<u>18.59</u>	<u>29.68</u>	<u>17.00</u>	<u>12.39</u>
Total per visitor group per night	471.05	116.78	342.46	127.46	37.66

Table 6. Total visitor spending by segment, 2008 (\$000's).

	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
Inside Park								
Motel, hotel, cabin or B&B	0	0	18,615	0	3,976	0	0	22,592
Camping fees	0	0	814	2,726	493	695	0	4,727
Restaurants & bars	418	762	5,094	1,567	5,453	952	709	14,955
Groceries & takeout food	34	73	1,106	791	2,067	979	257	5,306
Gas & oil	648	231	1,434	1,745	2,000	801	455	7,314
Local transportation	0	0	0	0	0	0	0	0
Admission & fees	525	1,986	2,834	1,164	11,394	517	687	19,107
<u>Souvenirs & other expenses</u>	<u>100</u>	<u>877</u>	<u>1,817</u>	<u>974</u>	<u>4,598</u>	<u>1,024</u>	<u>1,001</u>	<u>10,392</u>
Total Inside Park	1,724	3,930	31,714	8,966	29,981	4,968	3,109	84,393
Outside Park								
Motel, hotel, cabin or B&B	0	0	2,555	0	122,113	50	0	124,718
Camping fees	0	0	71	130	764	9,171	0	10,135
Restaurants & bars	359	1,326	2,483	548	41,854	3,414	1,630	51,614
Groceries & takeout food	621	1,265	486	575	10,549	4,042	1,283	18,820
Gas & oil	292	1,154	796	1,257	21,072	6,816	1,544	32,930
Local transportation	0	2,510	639	0	17,552	1,662	843	23,206
Admission & fees	89	659	885	444	10,024	1,892	342	14,334
<u>Souvenirs & other expenses</u>	<u>196</u>	<u>969</u>	<u>1,093</u>	<u>1,098</u>	<u>19,063</u>	<u>3,746</u>	<u>2,797</u>	<u>28,961</u>
Total Outside Park	1,556	7,883	9,008	4,052	242,990	30,793	8,438	304,721
Total Inside & Outside Park	3,280	11,813	40,722	13,018	272,972	35,761	11,547	389,113
Segment Percent of Total**	1%	3%	10%	3%	70%	9%	3%	100%

*Weighted by percent of visitor group trips.

**Percentages do not total to 100% due to rounding.

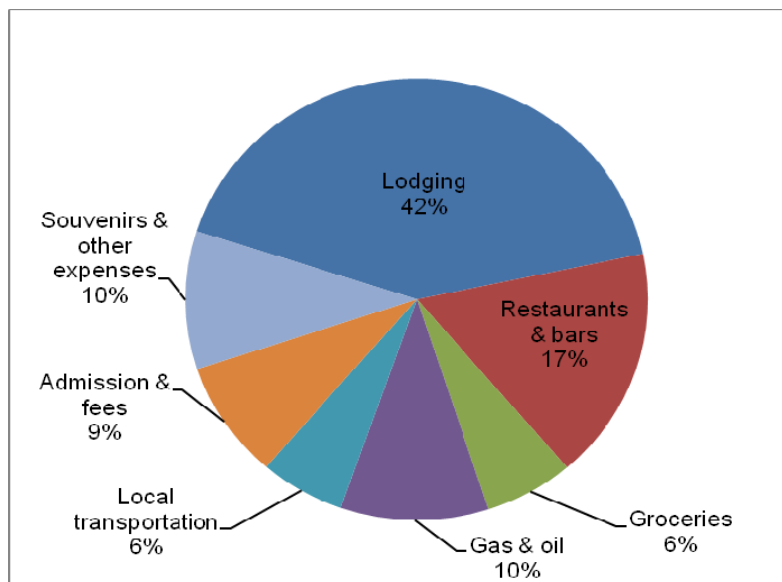


Figure 1. Grand Teton National Park visitor spending by category.

Visitors would still come to the region even if the park did not exist, so not all visitor spending can be attributed to the park. Seventy-nine percent of visitor groups did not make the trip primarily to visit Grand Teton NP. Spending directly attributed to park visits was estimated by counting all spending for trips where 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 outside the park was counted for day trips. All spending inside the park was treated as park-related spending. With these assumptions, a total of \$221 million in visitor spending is attributed to the park visit (Table 7). This represents 57% of the overall visitor spending total.

Table 7. Total spending attributed to park visits, 2008 (\$000's).

	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors*
Motel, hotel, cabin or B&B	0	0	20,309	0	58,253	18	0	78,581
Camping fees	0	0	861	2,796	832	4,068	0	8,557
Restaurants & bars	418	1,541	6,741	1,864	24,056	2,208	1,545	38,373
Groceries & takeout food	34	816	1,428	1,102	6,756	2,465	915	13,516
Gas & oil	648	909	1,962	2,425	11,366	3,308	1,247	21,865
Local transportation	0	1,473	423	0	7,801	611	433	10,742
Admission & fees	525	2,373	3,422	1,405	15,849	1,213	862	25,648
<u>Souvenirs & other expenses</u>	<u>100</u>	<u>1,446</u>	<u>2,542</u>	<u>1,569</u>	<u>13,071</u>	<u>2,402</u>	<u>2,437</u>	<u>23,567</u>
Total Attributed to Park	1,724	8,557	37,688	11,161	137,985	16,294	7,440	220,849
Percent of Spending Attributed to the Park	100%	72%	93%	86%	51%	46%	64%	57%
Percent of Attributed Spending	1%	4%	17%	5%	62%	7%	3%	100%

*Weighted by percent of visitor group trips.

Economic Impacts of Visitor Spending

The economic impacts of Grand Teton National Park 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 two county region.⁷ 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.⁸

Not all visitor spending is 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.

⁷ 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.

⁸ See Appendix B: Economic Ratios and Multipliers for the region.

The tourism output sales multiplier for the region is 1.73. Every dollar of direct sales to visitors generates another \$0.73 in secondary sales through indirect and induced effects.⁹ (See Appendix A: Glossary for further explanation of terms.)

Impacts are estimated based first on all visitor spending and then based on the visitor spending attributed to the park. Including all visitor spending estimates the overall contribution park visitors make to the local region. Including only visitor spending attributable to the park estimates the impact or contribution the park makes to the economy of the local region.

Using all visitor spending and including direct and secondary effects, the \$389 million spent by park visitors supports 4,710 jobs in the local region and generates \$438 million in sales, \$147 million in labor income and \$260 million in value added (Table 8).¹⁰

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 lodging establishments and restaurants.

Using only visitor spending attributable to the park by including only some spending on trips where the primary trip purpose was not to visit Grand Teton NP reduces the overall impacts by about 43% (Table 9; see spending inclusion assumptions in previous section). Including direct and secondary effects, the \$221 million spent by park visitors and attributable to the park supports 2,662 jobs in the local region and generates \$250 million in sales, \$83 million in labor income and \$147 million in value added.

⁹ 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.

¹⁰ 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 8. Impacts of all visitor spending on the local economy, 2008.

Sector/Spending category	Sales (\$000's)	Jobs	Labor Income (\$000's)	Value Added (\$000's)
Direct Effects				
Motel, hotel, cabin or B&B	147,310	1,482	50,575	92,526
Camping fees	14,862	106	3,475	8,910
Restaurants & bars	66,570	1,030	25,298	36,717
Groceries & takeout food	6,104	88	2,610	4,005
Gas & oil	8,975	65	2,762	6,194
Local transportation	23,206	395	10,497	15,020
Admission & fees	33,441	276	7,001	12,330
Souvenirs & other expenses	19,677	316	8,785	13,039
Wholesale trade	2,853	21	878	1,969
<u>Local production of goods</u>	<u>18</u>	<u>0</u>	<u>5</u>	<u>6</u>
Total Direct Effects	323,016	3,779	111,885	190,715
<u>Secondary Effects</u>	<u>114,849</u>	<u>931</u>	<u>35,287</u>	<u>69,449</u>
Total Effects	437,865	4,710	147,172	260,164

Note: Impacts of \$389 million in visitor spending reported in Table 6.

Table 9. Economic impacts of visitor spending attributed to the park, 2008.

Sector/Spending category	Sales (\$000's)	Jobs	Labor Income (\$000's)	Value Added (\$000's)
Direct Effects				
Motel, hotel, cabin or B&B	78,581	791	26,979	49,357
Camping fees	8,557	61	2,001	5,130
Restaurants & bars	38,373	594	14,583	21,165
Groceries & takeout food	3,420	50	1,462	2,244
Gas & oil	4,876	35	1,500	3,365
Local transportation	10,742	183	4,859	6,953
Admission & fees	25,648	212	5,369	9,456
Souvenirs & other expenses	11,783	189	5,261	7,808
Wholesale trade	1,629	12	501	1,124
<u>Local production of goods</u>	<u>11</u>	<u>0</u>	<u>3</u>	<u>4</u>
Total Direct Effects	183,619	2,126	62,518	106,606
<u>Secondary Effects</u>	<u>66,113</u>	<u>536</u>	<u>20,281</u>	<u>40,057</u>
Total Effects	249,732	2,662	82,799	146,663

Note: Impacts of \$221 million in visitor spending attributed to park reported in Table 7.

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 impact of the park's National Park Service (NPS) payroll by applying economic multipliers to wage and salary data to capture the induced effects of NPS employee spending the local economy. Grand Teton National Park itself employed 264 people in FY 2009 with a total payroll including benefits of \$14.4 million. Including secondary effects, the local impact of the park payroll in FY 2009 was 310 jobs, \$15.9 million in labor income and \$18.9 million total value added (Stynes 2011).

Study Limitations and Errors

The accuracy of the MGM2 estimates rests on the accuracy of the three inputs: visits, spending averages, and multipliers. Visits are taken from NPS Public Use Statistics (2008). 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 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 they entered the park.

Spending averages are derived from the 2008 Grand Teton NP VSP visitor survey (Braak et al. 2010). Estimates from the surveys are subject to sampling errors, measurement errors, and potential seasonal/sampling biases. The overall spending averages are subject to sampling errors 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 was filled with zeros. Visitor groups of more than 8 people (22 cases), visiting the local region for more than 7 nights (54 cases), and spending greater than \$5,000 (34 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 during one week in July. To extrapolate to annual totals, it was assumed that this sample represented visitors from the entire 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 2008 local IMPLAN datasets were used for this analysis.

Sorting out how much of the spending to attribute to the park when the park is not the primary motivation for the trip is somewhat subjective. However, since most visitors to Grand Teton NP did not make the trip primarily to visit the park and most spending occurs outside the park, adjustments for non-primary purpose trips may 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	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. I.e., $\text{Direct jobs} = \text{direct sales} * \text{jobs to sales ratio}$ $\text{Direct personal income} = \text{direct sales} * \text{personal income to sales ratio}$ $\text{Direct Value added} = \text{direct sales} * \text{value added to sales ratio}$
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 lodging establishments.
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) by 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 hotel includes wages and salaries paid to employees, their payroll benefits, profits of the hotel, and sales, property, and other indirect business taxes. The hotel's non-labor operating costs such as purchases of supplies and services from other firms are not included as value added by the hotel.
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 survey.
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: Economic Multipliers and IMPLAN Sectors

Table B1. Economic ratios and multipliers for selected tourism-related sectors, Grand Teton NP region, 2008.

Sector	Direct effects			Total effects multipliers				
	Jobs/\$ MM sales	Income /sales	Value added/ sales	Sales I	Sales SAM	JobsII/ MM sales	Income II/ sales	VA II/ sales
Motel, hotel, cabin or B&B	10.06	0.34	0.63	1.20	1.35	12.99	0.45	0.84
Camping fees	7.13	0.23	0.60	1.25	1.37	10.24	0.35	0.82
Restaurants & bars	15.47	0.38	0.55	1.17	1.33	18.04	0.48	0.76
Groceries & takeout food	14.49	0.43	0.66	1.20	1.39	17.48	0.54	0.90
Gas & oil	7.21	0.31	0.69	1.19	1.32	9.65	0.40	0.89
Local transportation	17.00	0.45	0.65	1.10	1.28	19.35	0.54	0.82
Admission & fees	8.27	0.21	0.37	1.33	1.45	12.03	0.35	0.65
Souvenirs & other expenses	16.06	0.45	0.66	1.20	1.39	19.05	0.56	0.91
Local production of goods	5.16	0.31	0.41	1.12	1.24	6.90	0.38	0.56
Wholesale trade	5.64	0.38	0.65	1.16	1.32	8.22	0.48	0.84

Source: IMPLAN (MIG, Inc. 2008).

Brief 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.

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

Using the hotel sector row to illustrate

Direct Effects: Every million dollars in hotel sales creates 10 jobs in hotels. Thirty-four percent of hotel sales goes to wages and salaries of hotel employees and 63% of hotel sales is value added. That means 37% of hotel sales goes to purchase inputs by hotels. The wage and salary income creates the induced effects and the 37% spent on purchases by the hotel starts the rounds of indirect effects.

Multiplier effects: There is an additional 20 cents of indirect sales in the region for every dollar of direct hotel sales (type I sales multiplier = 1.20). Total secondary sales are 35 cents per dollar of direct sales, which means 20 cents in indirect effects and 15 cents in induced effects. An additional 2.9 jobs are created from secondary effects of each million dollars in hotel sales (13.0

total jobs – 10.1 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 hotel sales are 11% (45%-34%), and the secondary effects on value added for each dollar of hotel sales are 21% (84%-63%). Including secondary effects, every million dollar of hotel sales in the region yields \$1.35 million in sales, \$450,000 in income, and \$840,000 in value added.

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

MGM sector	IMPLAN		2007 NAICS
	No.	Name	
Motel, hotel, cabin or B&B	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
Admission & 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).

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