Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2007

Daniel J. Stynes
Department of Community, Agriculture, Recreation and Resource Studies
Michigan State University
East Lansing, Michigan 48824-1222

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Department of Community, Agriculture, Recreation and Resource Studies
Michigan State University

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Executive Summary

Yosemite National Park hosted 3.5 million recreation visits in 2007. After adjusting for re-entries to the park, there were 2.2 million person trips to the area in 2007. Based on the 2005 summer and 2007 winter visitor surveys, 41% of these trips were day trips not including an overnight stay within 50 miles of the park. Forty percent of the trips involved an overnight stay in motels, lodges and cabins, 11% inside the park and 29% outside. Fifteen percent of visitors were camping, 9% inside the park and 6% outside.

The average visitor group consisted of 3.1 people and spent $384 within 50 miles of the park. Visitors reported expenditures of their group inside the park and in the surrounding communities within 50 miles of the park. Forty-one percent of the spending occurred inside the park. On a party trip basis, average spending in 2007 was $78 for non-local day trips, $260 for campers staying inside the park, $366 for campers staying outside the park, $687 for visitors in motels and lodges outside the park and $893 for visitors staying in park lodges or cabins. On a per night basis, visitors staying in motels, lodges or cabins spent $346 if staying inside the park and $310 if staying outside the park. Campers spent $109 per night if staying outside the park and $92 if staying inside. The average per night lodging cost reported by the sample of visitors was $206 for park lodges/cabins, $161 for lodging outside the park and $22 for camping.

Total visitor spending in 2007 within 50 miles of the park was $282 million[1] including $115 million spent inside the park. Forty-four percent of the total spending was for lodging, 20% restaurant meals and bar expenses, 11% gas and oil, 8% groceries and 8% souvenirs. Overnight visitors staying in motels outside the park accounted for 52% of the spending, visitors in park lodges and cabins 27%, campers 12% and day trips 8%.

Three out of four visitors 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 $251 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 the four county region including Madera, Mono, Mariposa and Tuolumne counties. This region roughly coincides with the 50 mile radius for which spending was reported.

[1] Revenues received by the park (park admissions and donations) are excluded. Impacts of spending that accrues to the park are covered as part of park operations.

Including direct and secondary effects, the $282 million spent by park visitors supports 4,743 jobs in the area and generates $340 million in sales, $133 million in labor income and $210 million in value added[2].

The park itself employed 795 people in FY 2007 with a total payroll of $32.7 million. Including secondary effects, the local impact of the park payroll in 2007 was 998 jobs, $38 million in labor income and $42 million total value added. Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 5,741 jobs and $251 million value added. Park operations account for 17% of the employment and value added effects.

[2] 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.

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Introduction

The purpose of this study is to estimate the local economic impacts of visitors to Yosemite National Park (YOSE) in 2007. Economic impacts are measured as the direct and secondary sales, income and jobs in the local area resulting from spending by park visitors. The economic estimates are produced using the Money Generation Model 2 (MGM2) (Stynes and Propst, 2000). Three major inputs to the model are:

1) Number of visits broken down by lodging-based segments,
2) Spending averages for each segment, and
3) Economic multipliers for the local region

Inputs are estimated from the Yosemite NP Visitor Survey, National Park Service Public Use Statistics, and IMPLAN input-output modeling software. 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.

Yosemite National Park and the local region

The local region was defined to encompass a four county area around the park including Madera, Mariposa, Mono and Tuolumne counties in central California.

Yosemite National Park received 3,503,428 recreation visits in 2007 and 1.57 million overnight stays (person nights) in the park (Table 1). There were 836,226 overnight stays in park lodges/cabins and 643,429 overnight says in park campgrounds.

Park visitor studies were conducted at Yosemite NP from July 8-17, 2005 (Littlejohn, Meldrum and Hollenhorst, 2006) and February 2-10, 2008. These studies measured visitor demographics, activities, and travel expenditures. Questionnaires were distributed to a sample of 1,204 visitors in 2005 and 938 visitors in 2008 (Le, Papadogiannaki et. al. 2008). Response rates were 65% and 60%, respectively.

Spending and economic impact estimates for Yosemite NP were estimated for 2005 based on the summer 2005 survey (Stynes, 2007). Estimates are updated here to 2007 using both the summer 2005 and winter 2008 surveys. Summer visitor spending averages, estimated previously, are price adjusted to 2007 and assumed to represent visitors from April through November. Spending averages for winter visitors are estimated using the winter 2008 survey data. Winter spending averages are applied to visitors between December and March.

Table 1. Recreation visits and overnight stays, Yosemite NP 2007

		Overnight stays				
Month	Recreation Visits	Lodge/Cabin	Camp	Back country	Misc	Total OVN Stays
January	99,892	29,729	2,137	649	0	32,515
February	100,941	30,239	3,501	998	0	34,738
March	135,925	41,773	12,056	1,180	90	55,099
April	219,854	63,413	35,787	1,363	454	101,017
May	374,184	78,775	66,782	6,479	1,425	153,461
June	466,054	127,681	97,548	7,080	1,796	234,105
July	543,235	113,326	130,102	10,526	4,424	258,378
August	550,172	115,895	139,435	32,730	6,517	294,577
September	417,882	100,666	89,173	14,053	2,133	206,025
October	298,122	55,440	38,264	501	309	94,514
November	178,846	42,685	24,737	579	30	68,031
December	118,321	36,604	3,907	438	30	40,979
Total	3,503,428	836,226	643,429	76,576	17,208	1,573,439

Source: NPS Public Use Statistics

MGM2 visitor segments

The MGM2 model divides visitors into segments to help explain differences in spending across distinct user groups. Seven segments were established for Yosemite National Park visitors based on reported trip characteristics and lodging expenditures[3]:

Local day trips: Visitors from the local region, not staying overnight inside the park.
Day trips: Visitors from outside the region, not staying overnight within 50 miles of the park. This segment includes day trips as well as pass-through travelers, who may be staying overnight on their trip outside the local region.
Motel-in: Visitors reporting lodging expenses (lodges or cabins) inside the park
Camp-in: Visitors reporting camping expenses inside the park (developed campgrounds).
Backcountry campers: Visitors camping in Yosemite backcountry sites.
Motel-out: Visitors reporting motel expenses outside the park within 50 miles of the park

[3] Visitors reporting multiple lodging types and expenditures were classified based on the highest lodging expense.

Camp-out: Visitors reporting camping expenses outside the park within 50 miles of the park.

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 other unpaid lodging.

The visitor surveys were used to estimate the percentage of visitors from each segment as well as spending averages, lengths of stay and party sizes for each segment. Segment shares from the survey were adjusted to be consistent with park overnight stay figures. As the sample size for backcountry visitors was small, this segment was grouped with the "other overnight" segment when estimating spending.

Based on the visitor survey and park overnight stay figures, 25% of park visits (entries) were classified as day trips, and 75% were classified as overnight trips including an overnight stay in the local area (Table 2). The average spending party ranged from 2.5 to 3.4 people across the seven segments with the average visitor party consisting of 3.1 people. The average length of stay in the area on overnight trips was 2.6[4].

Seventy-four percent of visitors indicated that visiting the park was the primary reason for the trip to the area. Other stated reasons were visiting friends and relatives in the area, business or visiting other area attractions.

Table 2. Selected visit/trip characteristics by segment, 2007

Characteristic	Day trip	Motel-in	Camp-in	Back country	Motel-out	Camp-out	Other OVN
Visit segment share (park entries)	4.9%	20%	11.5%	10.1%	39%	10%	5%
Average party size	2.5	3.0	3.3	3.4	3.0	3.2	2.8
Length of stay (days/nights)	1.0	1.0	2.6	2.8	2.2	3.3	3.4
Re-entry rate (park entries/trip)	1.1	1.0	1.4	1.6	2.2	2.3	2.3
Percent primary purpose trips	100%	64%	80%	84%	75%	76%	39%

The 3,503,428 recreation visits in 2007 were allocated to the seven segments using the visit segment shares in Table 2. Segment shares from the survey were adjusted slightly to be consistent with park overnight stay figures. Since spending is reported for the stay in the area, park visits (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

[4] These figures vary slightly from the VSP reports due to omission of outliers. Some visitors listing motels or campgrounds as lodging types did not report any lodging expenses and are classified here in the other OVN category.

rates were estimated based on the number of nights spent in the area for those staying overnight outside the park.

Recreation visits were converted to 733,853 party trips by dividing recreation visits by the average party size and park entry rate for each segment (Table 3). Total person trips in 2007 were 2.2 million. Total visitor spending is estimated by multiplying the number of party trips from each segment by the average spending estimated in the two surveys.

Table 3. Recreation visits and party trips by segment, 2007

Segment	Recreation visits	Person trips	Party visits/trips	Percent of party trips	Percent of overnight trips
Local day trip	171,668	159,512	63,589	9%	
Non-Local day trip	700,686	695,852	234,685	32%	
Motel-in	402,894	279,664	83,921	11%	19%
Camp-in	353,846	227,994	67,369	9%	15%
Motel-out	1,366,337	634,409	212,194	29%	49%
Camp-out	332,826	142,966	44,101	6%	10%
Other OVN	175,171	77,287	27,994	4%	6%
Total	3,503,428	2,217,684	733,853	100%	100%

The segment mix based on party trips is somewhat different than based on park visits (entries) as visitors staying outside the park enter the park more times than those staying inside the park and visitors on day trips only enter once. Forty-one percent of visitor parties are classified as day trips and 29% are staying in motels and other commercial lodging outside the park. Twenty-three percent of visitor parties are staying overnight inside the park compared to 35 percent staying outside. Park lodges and cabins account for 13% of visitor parties, while 10% of visitor parties are staying in park campgrounds.

Visitor spending

The visitor survey covered expenditures of the travel party inside the park or within 50 miles of the park. Spending averages were computed on a party trip basis for each segment. The average visitor group in 2007 spent $384 on the trip, excluding park admission fees[5]. On a party trip basis, average spending was $78 for day trips, $893 for

[5] The summer and winter spending averages are lower than those reported in VSP study reports due to the omission of some outliers, treatment of missing spending data, and adjustments for oversampling of overnight visitors relative to day trips. Although spending averages for all segments increased between 2005 and 2007, the overall spending average decreased by $10 due to changes in the visitor segment mix associated with separate analysis of winter visitors. That is, the percentages of day trips and campers were reduced when the winter sample was included.

visitors in park lodges or cabins, and $260 for park campers (Table 4). Visitors staying in motels, cabins, lodges or B&B's outside the park spent $687 on their trip and those camping outside the park spent $366 (Table 4).

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

Spending Category	Local day trip	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
Spending Inside Park								
Motel, hotel cabin or B&B	0.00	0.00	511.96	0.00	0.00	0.00	0.00	58.55
Camping fees	0.00	0.00	8.49	60.92	1.24	0.00	0.00	6.92
Restaurants & bars	8.17	15.52	139.51	29.71	27.46	26.80	22.15	34.75
Groceries, take-out food/drinks	2.91	5.44	31.25	30.41	10.68	14.32	6.17	12.54
Gas & oil	0.89	3.38	24.62	13.59	7.29	21.66	6.64	8.88
Local transportation	0.00	0.06	8.79	25.20	1.57	1.84	0.00	3.90
Amusements	11.35	3.16	20.53	4.36	8.92	15.55	4.43	8.42
Souvenirs	6.44	14.02	42.46	36.89	23.93	34.17	16.33	22.88
Spending Outside park								
Motel, hotel cabin or B&B	0.00	0.00	19.63	0.00	357.77	0.00	0.00	105.70
Camping fees	0.00	0.00	0.00	1.96	0.80	74.66	0.00	4.90
Restaurants & bars	1.59	9.00	13.35	8.31	99.54	18.56	59.89	37.49
Groceries, take-out food/drinks	1.31	3.86	18.39	7.98	26.43	33.09	42.98	15.46
Gas & oil	7.49	18.62	24.64	20.94	50.91	63.62	59.29	32.15
Local transportation	0.00	2.46	25.72	15.77	39.24	45.97	0.24	19.29
Admissions & fees	0.31	0.94	0.21	1.16	12.91	4.92	4.21	4.65
Souvenirs and other expenses	0.00	1.87	3.83	2.82	18.73	10.98	6.91	7.70
Grand Total	**40.46**	**78.33**	**893.38**	**260.02**	**687.41**	**366.13**	**229.22**	**384.17**
Total in park	29.76	41.57	787.60	201.08	81.09	114.33	55.71	156.84
Total outside park	10.70	36.76	105.78	58.95	606.32	251.80	173.51	227.33

Note: Annual spending figures are weighted averages of the summer and winter spending averages. See Appendix C for comparisons of summer and winter visitors.

About 41% of the spending was inside the park, 59% outside. As one would expect, visitors staying overnight inside the park spent the majority of their money inside the park, while visitors staying outside the park spent most of their money in surrounding communities. A higher percentage of camper's spending is on groceries, while visitors staying in lodges, cabins and motels spend more on restaurant meals.

The sampling error at a 95% confidence level for the overall spending average is 10%. A 95% confidence interval for the overall visitor spending average is therefore $384 plus or minus $38 or between $346 and $422.

On a per night basis, visitors in park lodges or cabins spent $346 in the local region compared to $310 per night for visitors staying in motels or lodges outside the park. Campers spent slightly more per night if staying outside the park ($109 per night) than inside the park ($92). The average reported per night lodging expense was $205 for park lodges or cabins, $161 for motels outside the park, and $22 for camping fees inside or outside the park (Table 5).

Table 5. Average spending per night for visitors on overnight trips ($ per party per night)

Spending Category	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN
Motel, hotel cabin or B&B	205.97	0.00	161.09	0.00	0.00
Camping fees	3.29	22.14	0.92	22.31	0.00
Restaurants & bars	59.23	13.38	57.18	13.55	24.40
Groceries, take-out food/drinks	19.24	13.51	16.71	14.16	14.62
Gas & oil	19.08	12.16	26.20	25.48	19.61
Local transportation	13.37	14.43	18.38	14.28	0.07
Admissions & fees	8.04	1.94	9.83	6.11	2.57
Souvenirs and other expenses	17.94	13.98	19.21	13.49	6.91
Total per party per night	**346.16**	**91.54**	**309.52**	**109.39**	**68.18**

Total spending was estimated by multiplying the number of party trips for each segment by the average spending per trip and summing across segments. Yosemite visitors spent a total of $282 million in the local area in 2007 (Table 6). Overnight visitors staying in motels outside the park account for 52% of the total spending, visitors in park lodges and cabins 27% and campers 12%. Lodging expenses represent 44% of the total spending, restaurants and bars 20%, and gas and oil 11%. Groceries, local transportation and souvenirs each account for between 6% and 8% of the total (Figure 1).

Table 6. Total visitor spending by segment, 2007 ($ Thousands)

Spending Category	Local day trip	Non-local day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
Spending inside park								
Motel, hotel cabin B&B	0	0	42,964	0	0	0	0	42,964
Camping fees	0	0	712	4,104	263	0	0	5,079
Restaurants & bars	519	3,642	11,708	2,002	5,826	1,182	620	25,499
Groceries, take-out	185	1,276	2,623	2,048	2,266	631	173	9,202
Gas & oil	56	792	2,066	915	1,547	955	186	6,518
Local transportation	0	13	738	1,698	334	81	0	2,864
Amusements	722	742	1,723	294	1,892	686	124	6,183
Souvenirs	409	3,291	3,563	2,485	5,079	1,507	457	16,791
Spending outside park (within 50 miles)								
Motel, hotel cabin B&B	0	0	1,647	0	75,917	0	0	77,565
Camping fees	0	0	0	132	169	3,293	0	3,593
Restaurants & bars	101	2,113	1,120	560	21,123	819	1,676	27,511
Groceries, take-out	83	907	1,544	538	5,609	1,459	1,203	11,342
Gas & oil	476	4,370	2,068	1,411	10,802	2,806	1,660	23,593
Local transportation	0	577	2,158	1,063	8,326	2,027	7	14,158
Admissions & fees	20	221	18	78	2,739	217	118	3,410
Souvenirs	0	438	322	190	3,974	484	194	5,601
Grand Total	**2,573**	**18,383**	**74,973**	**17,517**	**145,865**	**16,147**	**6,417**	**281,874**
Total in park	1,893	9,756	66,096	13,546	17,207	5,042	1,560	115,100
Total outside park	680	8,627	8,877	3,971	128,658	11,105	4,857	166,775
Segment of Total (%)	1%	7%	27%	6%	52%	6%	2%	100%

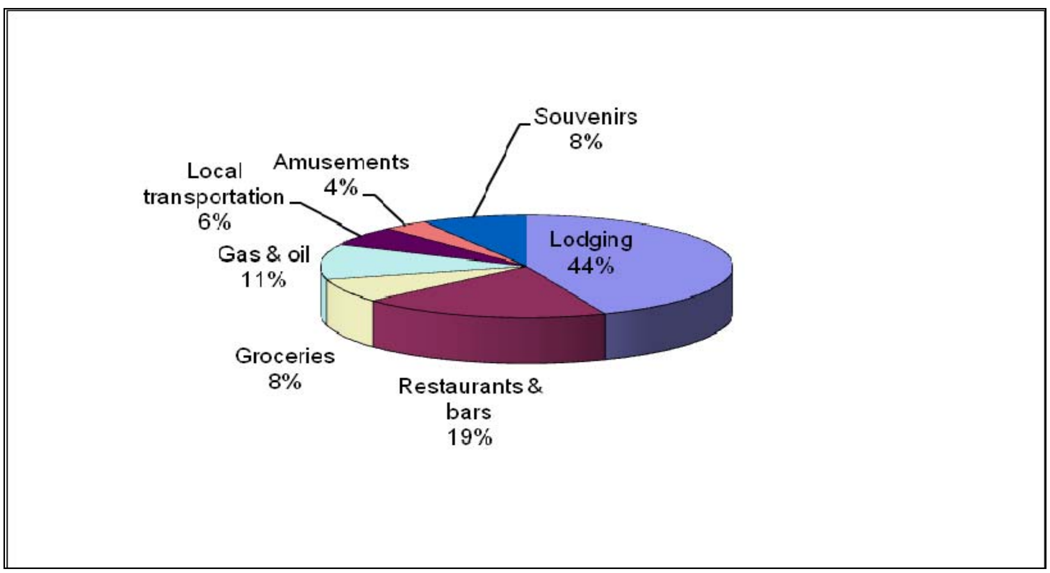

Figure 1. Yosemite National Park visitor spending by spending category

Not all visitor spending would be lost to the region in the absence of the park, as some visitors did not make the trip primarily to visit the park. 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 $251 million in visitor spending is attributed to the park visit (Table 7). This represents 89% of the overall visitor spending total.

Table 7. Total spending attributed to park visits, 2007 ($000s)

Spending Category	Local day trip	Non-local day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
Motel, hotel cabin or B&B	0	0	44,344	0	61,640	0	0	105,984
Camping fees	0	0	712	4,219	400	2,688	0	8,018
Restaurants & bars	620	5,372	12,647	2,488	22,976	1,850	1,896	47,849
Groceries, take-out food/drinks	269	2,018	3,916	2,516	6,819	1,822	1,088	18,449
Gas & oil	533	4,371	3,798	2,141	10,318	3,245	1,449	25,855
Local transportation	0	486	2,546	2,621	7,094	1,736	5	14,488
Admissions & fees	742	923	1,738	362	4,116	863	214	8,956
Souvenirs and other expenses	409	3,650	3,832	2,650	8,305	1,902	604	21,354
Total attributed to park	**2,573**	**16,819**	**73,533**	**16,997**	**121,668**	**14,107**	**5,256**	**250,953**
Percent of spending attributed to the park	100%	91%	98%	97%	83%	87%	82%	89%

Economic impacts of visitor spending

The economic impacts of Yosemite National Park visitor spending on the local economy are estimated by applying the spending to a set of economic ratios and multipliers representing the economy of the four county region. Economic ratios convert spending to the associated jobs, income and value added in each sector[6]. Multipliers for the region were estimated with the IMPLAN system using 2001 data[7]. The tourism sales multiplier for the region is 1.44. Every dollar of direct sales to visitors generates another $ .44 in secondary sales through indirect and induced effects[8].

Impacts are estimated based first on all visitor spending (Table 6) and then based on the visitor spending attributed to the park (Table 7). Including direct and secondary

[6] 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

[7] Economic ratios and multipliers for the region are reported in Appendix B. Job ratios are adjusted to 2007 based on changes in the job to sales ratios in national models.

[8] 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.

effects, the $282 million spent by park visitors[9] supports 4,743 jobs[10] in the area and generates $340 million in sales, $135 million in labor income and $210 million in value added (Table 8).

Table 8. Economic significance of visitor spending, 2007.

Sector/Spending category	Direct sales $000's	Jobs	Labor income $000's	Value added $000's
Motel, hotel cabin or B&B	120,529	1,310	52,571	85,357
Camping fees	8,672	81	1,260	3,019
Restaurants & bars	53,011	970	23,934	27,025
Admissions & fees	9,593	224	3,542	5,943
Local transportation	17,022	489	7,886	8,916
Grocery stores	5,198	81	2,316	3,094
Gas stations	6,715	50	3,163	4,134
Other retail	11,196	227	5,253	7,344
Wholesale trade	1,608	71	745	842
Local production of goods	413	0	1	2
Total direct effects	233,956	3,505	100,671	145,676
Secondary effects	106,516	1,238	34,630	63,991
Total effects	340,472	4,743	135,301	209,667

Note: Impacts of $282 million in visitor spending from Table 6.

Labor income covers wages and salaries, including payroll benefits and incomes of sole proprietors. Value added is the preferred measure of the contribution 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. The largest direct effects are in lodging establishments and restaurants.

Excluding some spending on trips where the primary trip purpose was not to visit Yosemite NP reduces the overall impacts by about 10% (Table 9).

[9] Revenues received by the park (park admissions and donations) are excluded in estimating visitor spending impacts as the impacts resulting from park revenues are covered as part of park operations.
[10] Job estimates declined from 5,281 in 2005 in spite of increased spending. This is due in part to declining job to sales ratios and also to changes in the MGM2 model procedures to adjust job to sales ratios over time. Beginning in 2007, job to sales ratios are adjusted from 2001 values based on the percentage changes in national job to sales ratios for each sector. Prior to 2007, adjustments were based on consumer price indices.

Table 9. Economic impacts of visitor spending attributed to park visits, 2007.

Sector/Spending category	Sales $000's	Jobs	Labor income $000's	Value added $000's
Direct Effects				
Motel, hotel cabin or B&B	105,984	1,152	46,227	75,057
Camping fees	8,018	75	1,165	2,791
Restaurants & bars	47,849	875	21,603	24,393
Admissions & fees	8,956	209	3,307	5,549
Local transportation	14,488	416	6,712	7,589
Grocery stores	4,667	73	2,080	2,778
Gas stations	5,766	43	2,716	3,550
Other retail	10,677	217	5,009	7,003
Wholesale trade	1,453	64	673	761
Local production of goods	371	0	1	2
Total direct effects	208,230	3,126	89,494	129,473
Secondary effects	94,812	1,101	30,821	56,961
Total effects	303,042	4,227	120,315	186,433

Note : Impacts of $251 million in visitor spending from Table 7.

Impacts of park operations

The park itself employed 795 people in FY 2007 with a total payroll of $32.7 million. Including secondary effects, the local impact of the park payroll in 2007 was 998 jobs, $38 million in labor income and $42 million total value added. Including both visitor spending and park operations, the total impact of the park on the local economy in 2007 was 5,741 jobs and $251 million value added. Park operations account for 17% of the employment and value added effects.

Study limitations and error

The accuracy of the MGM2 estimates rests on the accuracy of the three inputs: visits, spending averages, and multipliers. 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 nights in the area for visitors staying outside the park and based on official park overnight stay figures for visitors staying inside the park.

Spending averages are derived from the 2005 and 2008 Yosemite NP Visitor Surveys. 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. Cases reporting large party sizes (> 8 people), long stays (>7 nights) or spending greater than $5,000 were omitted from the analysis (see Appendix B for details).

The sample only covers visitors during a single week in July for summer visitors and one week in February for winter visitors. To extrapolate to annual totals, it was assumed that the summer sample represented visitors from April thru November and the winter sample represented visitors from December thru March.

Multipliers are derived from an input-output model of the local economy using IMPLAN (MIG., Inc. 1999). 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 509 sectors based on the NAICS system. The most recent local IMPLAN datasets available for this analysis were 2001. It was therefore assumed that most multipliers have remained stable thru 2007. Employment multipliers were adjusted to take into account price changes. Local job to sales ratios were adjusted from 2001 to 2007 based on the percentage changes in national job to sales ratios between 2001 and 2006 and then adjusted to 2007 based on consumer price indices. Visits are taken from NPS public use statistics.

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 Yosemite NP made the trip primarily to visit the park and quite a bit of spending occurs inside the park, adjustments for non-primary purpose trips only has a small effect on the overall spending and impact estimates.

REFERENCES

MIG.Inc. IMPLAN Professional Version 2.0. Minnesota IMPLAN Group: Stillwater, MN.

Le, Y, Papadogiannaki, E., Holmes, N. and Hollenhorst, S.J. 2008. Yosemite National Park Visitor Study, Winter 2008. Visitor Services Project Report #198. Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit.

Littlejohn, M.A., Meldrum, B.H. and Hollenhorst, S.J. 2006. Yosemite National Park Visitor Study. Spring 2005. Visitor Services Project Report #168. Moscow, ID: National Park Service and University of Idaho, Cooperative Park Studies Unit.

National Park Service Public Use Statistics Office. 2007. Visitation DataBase. http://www2.nature.nps.gov/stats/. Data retrieved on October 15, 2008.

Stynes, D. J., Propst, D.B., Chang, W. and Sun, Y. 2000. Estimating National Park Visitor Spending and Economic Impacts: The MGM2 model. May, 2000. Final report to National Park Service. East Lansing, Michigan: Department of Park, Recreation and Tourism Resources, Michigan State University.

Stynes, D.J. 2007. Impacts of Visitor Spending on the Local Economy: Yosemite National Park, 2005. Department of Community, Agriculture, Recreation and Resource Studies, Michigan State University: East Lansing, MI.

Appendix A: Definitions of Economic Terms

Term	Definition
Sales	Sales of firms within the region to park visitors.
Jobs	The number of jobs in the region supported by the visitor spending. Job estimates are not full time equivalents, but include part time positions.
Labor income	Wage and salary income, sole proprietor's income and employee payroll benefits.
Value added	Labor income plus rents and profits 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 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.
Direct effects	Direct effects are the changes in sales, income and jobs in those business or agencies that directly receive the visitor spending.
Secondary effects	These are the changes in the economic activity in the region that result from the re-circulation of the money spent by visitors. Secondary effects include indirect and induced effects.
Indirect effects	Changes in sales, income and jobs in industries that supply goods and services to the businesses that sell directly to the visitors. 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 the 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.
Total effects	Sum of direct, indirect and induced effects. ▪ 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.

Appendix B: Multipliers

Table B1. Multipliers for selected tourism-related sectors, Yosemite NP region, 2007

	Direct effects			Total effects multipliers				
Sector	Jobs/ MM sales	Personal inc/sales	Value Added /sales	Sales I	Sales II	JobsII/ MMsales	IncII/ sales	VA II/sales
Hotels and motels	10.87	0.44	0.71	1.18	1.43	16.08	0.58	0.96
Other accommodations	9.39	0.15	0.35	1.37	1.50	15.64	0.31	0.65
Food svc & drinking places	18.29	0.45	0.51	1.18	1.44	23.61	0.59	0.77
Amusements	23.39	0.37	0.62	1.22	1.45	29.25	0.52	0.88
Automotive repair	10.10	0.22	0.50	1.21	1.36	14.40	0.34	0.69
Transit & gd. Pass. Transp.	28.74	0.46	0.52	1.22	1.49	35.90	0.63	0.81
Sporting goods manf	5.17	0.15	0.21	1.31	1.44	9.75	0.30	0.44
Misc manf.	8.09	0.20	0.29	1.24	1.38	12.12	0.32	0.49
Food and beverage stores	15.67	0.45	0.60	1.24	1.52	22.21	0.62	0.90
Gasoline stations	7.44	0.47	0.62	1.23	1.52	14.02	0.65	0.93
General merch. stores	20.31	0.47	0.66	1.20	1.49	26.42	0.63	0.95
Wholesale trade	7.91	0.38	0.66	1.16	1.38	12.95	0.51	0.89

SOURCE: Input-output model of four county region economy (Madera, Mariposa, Mono and Tuolumne counties) estimated with the IMPLAN system.

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 and salaries
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 II is the usual Type II sales multiplier = (direct + indirect + induced sales)/ direct sales
Sales I captures only direct and indirect 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 11 jobs in hotels. Forty-four percent of hotel sales goes to wages and salaries of hotel employees and 71% of hotel sales is value added. That means 29% of hotel sales goes to purchase inputs by hotels. The wage and salary income creates the induced effects and the 29% spent on purchases by the hotel starts the rounds of indirect effects.

Multiplier effects: There is an additional 18 cents of indirect sales in the region for every dollar of direct hotel sales (type I sales multiplier = 1.18). Total secondary sales is 43 cents per dollar of direct sales, which means 18 cents in indirect effects and 25 cents in induced effects. An additional 5.2 jobs are created from secondary effects of each million dollars in hotel sales (16.1 total jobs – 10.9 direct jobs per $million). These jobs are scattered across other sectors of the local economy. Similarly, secondary income is 14% of each dollar of hotel sales (58%-44%) and secondary value added is 25% (96%-71%). Including secondary effects, every million dollar of hotel sales in the region yields $1.43 million in sales, $580,000 in income, and $960,000 in value added.

Appendix C. Comparison of winter and summer visitors

There are some differences in spending and trip characteristics between the summer and winter samples. Winter visitors are less likely to be camping and include higher percentages of local residents, day trips and visitors staying in park lodges. Winter visitors have smaller party sizes, shorter lengths of stay in the area, and fewer park re-entries. Spending patterns do not vary significantly between summer and winter visitors, other than differences due to shorter stays and a different segment mix.

Table C1. Visitor segment mix and conversion factors, summer vs winter

Characteristic	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
Summer								
Segment share	4%	18%	14%	11%	39%	10%	4%	100%
Average party size	2.5	3.0	3.5	3.4	3.0	3.3	2.7	3.1
Length of stay (days/nights)	1.0	1.0	2.7	2.8	2.2	3.3	3.5	2.3
Re-entry rate (park entries/trip)	1.0	1.0	1.5	1.6	2.2	2.4	2.4	1.8
Percent primary purpose trips	100%	61%	79%	84%	73%	75%	35%	73%
Winter								
Segment share	8%	27%	24%	3%	29%	2%	8%	100%
Average party size	2.6	2.6	2.7	2.7	2.9	2.4	3.0	2.8
Length of stay (days/nights)	1.0	1.0	2.2	3.0	2.1	3.4	2.4	1.8
Re-entry rate (park entries/trip)	1.4	1.1	1.2		1.8		1.4	1.3
Percent primary purpose trips	100%	79%	82%	100%	86%	100%	72%	84%

Note – Sample sizes for winter campers are small so results for these segments should be interpreted cautiously.

Table C2. Average visitor spending by segment, $ per party per trip in 2007 dollars, summer

	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	All visitors
In park								
Motel, hotel cabin or B&B	0.00	0.00	523.11	0.00	0.00	0.00	0.00	73.24
Camping fees	0.00	0.00	10.04	61.19	1.24	0.00	0.00	8.43
Restaurants & bars	8.26	16.05	133.49	28.82	26.04	27.63	19.19	37.77
Groceries, take-out	2.94	5.61	33.84	30.65	11.41	14.71	6.73	14.68
Gas & oil	0.92	2.96	28.60	13.54	7.45	22.33	7.10	10.43
Local transportation	0.00	0.00	9.04	25.89	1.72	1.90	0.00	4.73
Amusements	11.32	2.60	19.58	4.06	6.97	16.03	2.15	7.35
Souvenirs	6.50	14.12	43.60	37.74	24.51	35.00	17.44	25.43
Outside park								
Motel, hotel cabin or B&B	0.00	0.00	23.65	0.00	371.42	0.00	0.00	117.60
Camping fees	0.00	0.00	0.00	1.90	0.91	74.32	0.00	5.35
Restaurants & bars	1.60	9.52	14.64	8.01	100.75	17.50	63.29	39.67
Groceries, take-out	1.33	3.67	20.43	8.23	26.94	33.38	46.90	16.42
Gas & oil	7.73	18.50	23.30	20.68	50.63	63.05	64.12	33.06
Local transportation	0.00	2.44	28.15	16.14	41.10	47.40	0.00	22.32
Admissions & fees	0.31	0.77	0.00	0.89	13.69	5.07	4.84	5.01
Souvenirs	0.00	1.82	3.89	2.69	18.95	11.01	7.27	8.18
Grand total	**40.91**	**78.05**	**915.36**	**260.42**	**703.73**	**369.32**	**239.02**	**429.66**
Total in park	29.94	41.33	801.29	201.89	79.33	117.59	52.61	168.28
Total outside park	10.97	36.71	114.07	58.53	624.40	251.72	186.41	247.61
Spending per day/night	40.91	78.05	344.36	91.84	313.55	110.39	68.29	188.85

Table C3. Average visitor spending by segment, $ per party per trip, winter 2007-8

	Local	Day trip	Motel-in	Camp-in	Motel-out	Camp-out	Other OVN	Total
In park								
Motel, hotel cabin or B&B	0.00	0.00	457.49	0.00	0.00	0.00	0.00	110.93
Camping fees	0.00	0.00	0.94	52.10	1.23	0.00	0.00	2.14
Restaurants & bars	7.73	11.94	168.91	58.50	36.92	0.00	41.93	60.36
Groceries, take-out	2.78	4.29	18.62	22.50	5.77	1.50	2.42	8.41
Gas & oil	0.75	6.16	5.17	15.00	6.23	0.00	3.55	5.46
Local transportation	0.00	0.43	7.55	3.00	0.62	0.00	0.00	2.21
Amusements	11.53	6.94	25.17	14.00	21.95	0.00	19.67	17.08
Souvenirs	6.13	13.40	36.87	9.50	20.11	7.43	8.93	19.85
Outside park								
Motel, hotel cabin or B&B	0.00	0.00	0.00	0.00	266.42	0.00	0.00	76.12
Camping fees	0.00	0.00	0.00	4.00	0.00	85.80	0.00	1.84
Restaurants & bars	1.50	5.53	7.06	18.00	91.47	53.00	37.09	33.99
Groceries, take-out	1.25	5.18	8.46	0.00	23.01	23.60	16.73	11.90
Gas & oil	6.33	19.47	31.16	29.50	52.76	82.00	27.00	32.95
Local transportation	0.00	2.60	13.85	4.00	26.79	0.00	1.82	11.97
Admissions & fees	0.31	2.09	1.23	10.00	7.68	0.00	0.00	3.37
Souvenirs	0.00	2.21	3.55	7.00	17.23	9.84	4.55	7.14
Grand total	**38.29**	**80.23**	**786.03**	**247.10**	**578.21**	**263.17**	**163.67**	**405.71**
Total in park	28.90	43.16	720.73	174.60	92.84	8.93	76.49	226.44
Total outside park	9.39	37.07	65.30	72.50	485.37	254.24	87.18	179.28
Spending per day/night	38.29	80.23	356.71	82.37	280.16	77.40	67.15	132.78

Note – Sample sizes for winter campers are small so results for these segments should be interpreted cautiously.