

Impacts of Visitor Spending on the Local Economy: Denali National Park and Preserve, 2008



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Executive Summary

Visitor spending and local economic impacts are estimated for Denali National Park and Preserve (Denali NPP) for 2008 using the Money Generation Model (MGM2). Spending and visit estimates are made by triangulating across several sources including NPS public use statistics, local room taxes and employment data, as well as published rates for rooms, tours, car rentals, and other expenses. A park visitor survey in 2006 is used to estimate the mix of visitors between day trips and overnight trips and those using campgrounds or hotel/cabins inside or outside the park. The survey also provides estimates of average party sizes, lengths of stay in the area, and primary transportation modes to reach the park.

As the different data sources vary considerably in coverage and accuracy, some judgment must be used in reconciling inconsistencies and filling gaps in the available data. Spending estimates are based on 400,000 visitors in 2008. There is some uncertainty over the number of visitors due to potential double counting of some park visitors, other park visitors who may not be counted, and to what extent visitors to the area who do not actually enter the park should be included. The official visit count for 2008 was 432,309. Since the spending and economic impact estimates use linear models, results are readily adjusted to reflect different estimates of the number of visitors defined as person trips to the area.

Based on the 2006 visitor survey and other sources, it is estimated that roughly 56% of park visitors are staying in hotels, lodges or cabins in the Kantishna area or outside the park. Twelve percent are camping, split evenly between inside and outside the park and 29% are not staying overnight in the local area. The average party size is about 2.5 and the average length of stay for overnight visitors is 2.7 nights.

Total spending of park visitors in the local area in 2008 is estimated at \$155 million including \$52 million on lodging, \$24 million on restaurant meals/bar expenses, \$17.7 million on tours and \$51 million on transportation.

Economic impacts of this spending on the Denali region (including Denali Borough and the South Denali region of Mat-su borough) was 1,449 jobs, \$44 million in labor income and \$69 million value added. Expanding the regional scope to the State of Alaska increases the overall impact to 2,319 jobs, \$77 million in labor income and \$126 million in value added. The additional activity stems from car rentals, bus and rail revenues associated with travel to Denali NPP and much larger secondary effects as the visitor spending circulates within the state economy. Including additional nights in Anchorage and Fairbanks immediately prior to or after the trip to Denali NPP adds another 441 jobs to the Alaska economy. Counting other spending by non-resident visitors on their extended stays in Alaska would, of course, greatly increase the impact estimates, but this spending is not directly attributed to Denali NP visits. The state tourism impact estimates provide the broader picture of the economic contribution of tourism to the state economy.

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Introduction

The purpose of this study is to document the local economic impacts of visitors to Denali National Park and Preserve in 2008. 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 a variety of sources including the 2006 Denali NPP Visitor Services Project (VSP), 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, personal income, jobs and value added in the region.

Estimates of spending by visitors to Denali NPP are derived by triangulating across a number of different data sources. These sources are not entirely consistent, requiring some judgment in choosing estimates for particular parameters. The MGM2 model is used to estimate spending and impacts. Results are partially validated against secondary economic data for Denali and Mat-Su Boroughs including room taxes, tour revenues, and estimates of sales, income and employment from government sources.

Number of Visitors

The official NPS recreation visit estimate for Denali NPP in 2008 was 432,309 (Table 1). This estimate is derived by summing counts at several locations including the Talkeetna Ranger Station, and a number of park tours and shuttles (NPS, 2002). An error was recently discovered in the adjustment for park visitors who do not take tours. It was estimated in an earlier survey that a quarter of visitors at the park entrance area did not take a tour. Counting procedures added a fourth of the tour count to the visit estimate to account for these visitors. The correct adjustment is 33%. With this correction, the visit estimate for 2008 is 457,000.

The NPS recreation visit estimate is based on counts of daily entries to the park for purposes of recreation. The count rule is that only one entry per individual per day is reportable, so some visitors may be counted more than once, although this double counting does not appear to be significant for Denali, as very few visitors will take more than one tour. However, when asked how many times during their trip they had entered the park in the 2006 VSP survey, over half of the visitors reported more than one entry. The average number of entries per visitor was 1.47 per trip. Visitor perceptions of entries to the park however, may not coincide with locations where

they are actually counted and/or visitors may not be aware of the actual park boundary in relation to the primary lodging and service area in the Nenana River Canyon, which is just outside and north of the park entrance area and easily accessible by foot or bike. Therefore, self-reported entries are likely underestimated. However, due to the emphasis that Denali's public use statistic visitor model places on bus ridership past Mile 15, it is likely that entrance area only duplicates have little influence on current or past visit estimates and therefore total visitation estimates are likely not affected by the multiple entries by an individual per day phenomena.

Colt and Fay (2008) estimated 538,395 non-resident visitors to the Denali NPP region in 2006 based on the Alaska Visitor Statistics Program (AVSP). This estimate likely includes many who visit the Denali area without being officially counted as park visitors, but it does not include visits by Alaska residents. The summer 2006 VSP survey of park visitors estimated that only 5% of Denali park visitors were Alaska residents. This figure may be low given the survey sampling locations emphasis on tour-related (non-independent) travelers, as well as limited (one week), mid-summer, sampling times. This coupled with the fact that a greater proportion of off-season visits are by Alaska residents likely resulted in a low estimate of Alaska resident visitors by the 2006 VSP.

The NPS count of visits to the park was 415,935 in 2006, 23% lower than the AVSP estimate¹. We can derive other estimates of visits using parameters from the VSP at Denali NPP in 2006. For example, 46% of visitors in the 2006 survey reported arriving by train. Based on 165,969 train arrivals in 2008, this would put visits to Denali at 368,820. However, as stated above, the survey was conducted during a single week and sampling locations were chosen based on judgment and limited. Since one of the locations was the train station, the sample may not be representative of all visitors to Denali. Based upon comparisons of actual train visitor arrivals over the last decade to total estimated visits, we suggest that roughly 35% of park visitors arrive by train, putting 2008 visitor counts at 474,000.

We will use 400,000 person trips as our initial estimate of distinct visitors. This assumes some double counting of visits in the NPS Public Use Statistics, but does not include visitors to the Denali and South Denali regions who do not enter the park to be counted as a visitor. From the various estimates it appears highly likely that 2008 park visits fall between 400,000 and 500,000.

¹ The difference is 18% if we correct the park visit estimate for the error in estimating the number of visitors not taking tours.

Table 1. Recreation Visits and Overnight Stays, Denali NP 2008

Month	Recreation Visits	Overnight stays				Total OVN Stays
		Lodge/Cabin	Camp	Backcountry	Misc	
January	351	0	0	18	0	18
February	702	0	0	0	0	0
March	918	0	0	0	0	0
April	1,959	0	0	308	0	308
May	27,773	0	0	12,608	0	12,608
June	114,888	0	14,481	11,596	624	26,701
July	129,762	0	18,415	4,124	491	23,030
August	119,541	0	17,053	2,940	508	20,501
September	35,623	0	10,452	27	219	10,698
October	521	0	0	0	0	0
November	114	0	0	0	0	0
<u>December</u>	157	0	0	0	0	<u>0</u>
Total	432,309	0	60,401	31,621	1,842	93,864

Visitor & Trip Characteristics

To estimate spending, we put visits on a party-night basis (party day for day trips) as the travel party is generally the spending unit and spending depends considerably on length of stay in the area. It is also useful to break visitors down into distinct segments that help explain differences in spending, especially distinguishing day trips from overnight stays. MGM2 further breaks overnight visitors down into lodging types, taking advantage of park overnight stay figures for those staying inside the park, and where available, hotel room nights, taxes, or receipts for lodging outside the park.

The 2006 visitor survey is the best source for estimating the mix of visitors across lodging types and average party sizes and lengths of stay, keeping in mind that the sample may not be completely representative and we must assume the mix of visitors has not changed substantially since 2006. Table 2 gives estimates of the segment mix, party size and length of stay from the 2006 visitor survey.

Table 2. Selected Visit/Trip Characteristics by Segment, 2008

Characteristic	Day Trip	Kantishna	Camp- in	Back country	Motel- out	Camp- out	All Visitors
Segment share	26%	4%	13%	4%	47%	5%	100%
Average Party size	3.07	2.80	2.79	2.00	2.80	2.70	2.85
Length of stay (days/nights)	1.00	2.19	3.31	3.20	2.44	2.57	2.09
Re-entry rate (park entries/trip)	1.49	1.46	2.00		2.04	2.17	1.80

The segment shares vary slightly from those reported in the Visitor Services Project (VSP) report for Denali (Meldrum et. al. 2007) due to handling of outliers and computing the all visitor estimates as a weighted average across segments based on our adjusted segment mix. Cases with party sizes greater than 7 or lengths of stay more than 10 were omitted in computing the averages.

Segment shares were adjusted to be consistent with park overnight stay counts and to reassign cases with unknown lodging types. The visitor survey appears to have over-sampled campers staying inside the park and would likely under-sample day trips, as these visitors have fewer chances of being selected. In 2008, the park reported 60,401 person nights in park campgrounds, 31,621 person nights in backcountry sites and 1,842 miscellaneous overnight stays (Table 1).

Our final estimates classify 29% of visitors as on day trips, 6% in lodges at Kantishna, 50% in other motels, lodges or cabins outside the park and about 12% camping, split about evenly between in-park and outside (Table 3).

The party size estimates from the Denali NPP VSP are significantly higher than those from the AVSP surveys. Colt and Fay cite an average party size of 2.4 for overnight trips and 2.2 for day trips based on AVSP. The VSP survey yields an overall average of 2.85 people per party and over 3.0 for day trips. On the other hand, lengths of stay for overnight trips are much lower in the VSP survey than the 2.9 nights cited by Colt and Fay. These parameters (especially length of stay) significantly influence spending estimates, as spending is obtained by multiplying average spending per party per night times the number of party nights. The higher party sizes and lower lengths of stay reported by the VSP effectively reduces the calculated total party nights and results in a lower total spending estimate than was arrived at using the AVSP estimates.

We roughly split the difference between the AVSP and VSP party size estimates yielding an overall average of 2.5. Similarly, lengths of stay are increased for the motel outside the park segment, assuming that some visitors may not have counted extra nights in the South Denali area.

Table 3. Adjusted Visit/Trip Characteristics by Segment, 2008

Characteristic	Day Trip	Kantishna	Camp- in	Back country	Motel-out	Camp- out	All Visitors
Adjusted segment share	29%	6%	6.5%	2.5%	50%	6%	100.00%
Average Party size	2.50	2.50	2.70	2.00	2.50	2.70	2.51
Length of stay (days/nights)	1.00	2.19	3.31	3.20	2.70	2.57	2.22

For estimating spending, the critical information is the total number of party nights, which is a function of total visits, the percentages of visits of each type, and the average party size for each type. Party nights are calculated for each segment in Table 4 based on 400,000 person trips. These trips are distributed to the six segments using the adjusted segment shares in Table 3 and then converted to party nights by dividing by the average party size and multiplying by length of stay. Note that errors in any of these parameters may either cancel out or multiply errors in the estimates of party nights. Using these parameters we estimate total party nights to be 354,107.

Table 4. Recreation Visits and Party Trips by Segment, 2008

Measure	Day Trip	Kantishna	Camp-in	Back country	Motel-out	Camp-out	All Visitors
Person Trips	116,000	24,000	26,000	10,000	200,000	24,000	400,000
Party trips	46,400	9,600	9,630	5,000	80,000	8,880	159,510
Percent of party trips	29%	6%	6%	3%	50%	6%	100%
Party nights	46,400	21,046	31,861	16,000	216,000	22,800	354,107
Percent of party nights	13%	6%	9%	5%	61%	6%	100%
Percent of overnight trips		8%	9%	4%	71%	8%	100%

Spending Averages

The park visitor survey did not measure spending. Many visitors are on package tours and extended trips in Alaska, making it difficult to isolate spending in the Denali area. We therefore used an engineering approach to generate spending profiles on a party night basis for each segment. The engineering approach identifies the mix of goods and services required to generate the “visit,” and then assigns a cost to each item. Rates for rooms, campsites, car rentals, train and bus fares, and various tours were obtained from posted rates and inquiries to selected businesses.

Averages were estimated by segment for lodging, meals, groceries, sporting goods and other retail purchases (Table 5). Transportation expenses, including auto fuel were estimated in total rather than by segment based on the percentages of visitors in the VSP survey reporting arrivals by air, train, bus, rental or private car and the associated fares or rates.

Table 5. Denali NP Visitor Spending by Segment (\$ per party per day/night), 2008

CATEGORY	Day Trip	Kantishna	NPS Camp	SEGMENT		
				Back country	Motel-Out	Camp-Out
Motel, hotel cabin or B&B	0.00	350.00	0.00	0.00	200.00	0.00
Camping fees	0.00	0.00	20.00			35.00
Restaurants & bars	60.00	100.00	20.00	15.00	80.00	50.00
Tours	30.00	50.00	30.00	0.00	50.00	50.00
Groceries, take-out food/drinks	15.00	15.00	20.00	10.00	10.00	20.00
Sporting goods	1.21	1.73	1.03	3.00	3.00	1.39
<u>Souvenirs/ other</u>	<u>15.93</u>	<u>29.94</u>	<u>10.65</u>	<u>10.73</u>	<u>10.73</u>	<u>28.47</u>
Total	122.14	546.66	101.68	38.73	353.73	184.86

Note: Excludes transportation expenses which are estimated separately below.

Estimates of overall tour spending are based on reported sales for the scenic and sightseeing transportation sector for Denali Borough and average tour spending from the AVSP survey. IMPLAN reports \$13.4 million in sales for the scenic and sightseeing transportation sector in 2008 for Denali Borough (IMPLAN sector 338). There is another \$17.7 million in scenic transportation sales in Matanuska-Susitna Borough. If we assume about 25% of the Mat-Su activity is associated with Denali visitors, we get a total tour sales figure of \$17.7 million for the Denali area. Another approach is to use the AVSP average tour spending of roughly \$52 per

party night (53.79 for Denali-Cantwell-Healy and 50.69 for Talkeetna) as reported in Colt and Fay (2008). Multiplying this average by the total party nights also yields a figure of \$17.7 million.

Total spending is estimated by multiplying the spending averages by the number of party nights by each segment and summing across segments. Denali visitor spending excluding transportation expenses is estimated at \$104 million in 2008 (Table 6).

Table 6. Total Visitor Spending by Segment, 2008 (\$000s)

	Day Trip	Kantishna	NPS Camp	Back country	Motel- Out	Camp- Out	Day Trip	Pct
Lodge, hotel, cabin	0	7,366	0	0	43,200	0	50,566	49%
Camping fees	0	0	637	0	0	798	1,435	1%
Restaurants & bars	2,784	2,105	637	240	17,280	1,140	24,186	23%
Tours	1,392	1,263	956	0	12,960	1,140	17,711	17%
Groceries	696	316	637	160	2,160	456	4,425	4%
Sporting goods	56	36	33	48	647	32	852	1%
Other retail	<u>739</u>	<u>630</u>	<u>339</u>	<u>172</u>	<u>2,318</u>	<u>649</u>	<u>4,847</u>	<u>5%</u>
Grand Total	5,667	11,716	3,239	620	78,565	4,215	104,022	100%
Segment Percent of Total	5%	11%	3%	1%	76%	4%	100%	

Note: Does not include transport expenses of \$43.152 million estimated below.

Spending on lodging amounts to roughly \$52 million. Based on room taxes, we estimate room sales for Denali Borough to be \$41 million in 2008. Adding \$12 million estimated by Colt and Fay in 2006 for South Denali within Mat-Su Borough yields \$53 million. This assumes that all lodging in Denali Borough represents sales to park visitors. IMPLAN reports \$83 million in sales for lodging sectors in Denali borough in 2008; however, this figure includes other retail, tour, and restaurant sales in lodging establishments, not just room revenues.

Transportation expenses are estimated separately for visitors in the aggregate by estimating the quantity purchased and multiplying that by an average rate on a per-person or per-party trip basis. For example, based on the VSP survey 18% of visitors arrived by private car and another 18% by rental car. We therefore multiplied 36% times the estimated total party trips to obtain 57,423 auto trips. At \$100 in fuel per trip, this yields \$5.742 million in gas purchases, some of which may be made outside the local region. Total transportation expenses come to \$50.7 million.

Table 7. Estimates of Transportation Expenses to Denali, 2008

Transportation	Pct of arrivals	Quantity	Units	Rate	Total (\$000's)
Auto fuel	36%	57,423	party/trip	100.00	5,742
Rail	45%	180,000	person trip	200.00	36,000
Bus	13%	52,000	person trip	80.00	4,160
Air		3,500	person trip	550.00	1,925
Car rentals	18%	28,712	party trip	100.00	2,871
Total					50,699

Adding transportation expenses to the other expenses tallied in Table 6, yields total spending of \$154.7 million (Table 8). Most of the transportation expenses, however, do not accrue to businesses in the local area.

Table 8. Total Spending by Denali NP Visitors, 2008 (\$000's)

	SEGMENT						Total
	Day Trip	Kantishna	NPS Camp	Back country	Motel-Out	Camp- Out	
Motel, hotel, cabin	0	7,366	0	0	43,200	0	50,566
Camping fees	0	0	637	0	0	798	1,435
Restaurants & bars	2,784	2,105	637	240	17,280	1,140	24,186
Tours	1,392	1,263	956	0	12,960	1,140	17,711
Groceries,	696	316	637	160	2,160	456	4,425
Auto Fuel							5,742
Rail transp.							36,000
Car rentals							2,871
Bus Trans.							4,160
Air transp.							1,925
Sporting goods	56	36	33	48	647	32	852
<u>Other retail</u>	<u>739</u>	<u>630</u>	<u>339</u>	<u>172</u>	<u>2,318</u>	<u>649</u>	<u>4,847</u>
Total	5,667	11,716	3,239	620	78,565	4,215	154,721

Impacts on the Region

Economic impacts can be estimated by applying the total spending to an input-output model or set of multipliers for the area. There are some complications as some of the spending by Denali visitors occurs outside the local region. Car rentals, rail, bus, and airfares mostly accrue to firms in Anchorage or Fairbanks. With IMPLAN, we can estimate models for Denali Borough itself for Denali and Mat-Su combined, or for the State of Alaska.

The Denali Borough job to sales ratios tend to be lower than the statewide ratios. Generally job to sales ratios are higher in rural areas due to smaller scale firms and more part time jobs. In this case, the large scale hotels associated with tour operators and highly seasonal nature of the activity yield lower job to sales ratios in the Denali region than statewide. In particular, the jobs to sales ratio for hotels in the Denali region are 20% less than the statewide ratio.

Since secondary effects within the local region will be minimal and may not be estimated very accurately in IMPLAN anyway, we recommend focusing on the direct effects at the local level and estimating secondary effects statewide. Table 9 gives the IMPLAN estimates of job to sales, income to sales, value added to sales and the type II sales multipliers for key tourism sectors. While the Denali Borough income and value added ratios are similar to the state figures, job to sales ratios are slightly lower than the state level, with the exception of the scenic transportation sector. This may be explained by the fact that IMPLAN includes transportation support services within this sector.

Table 9. Economic Ratios for Denali Borough and the State of Alaska

Sect #	Sector name	Denali Borough				State of Alaska			
		Jobs/\$ MM sales	Labor Income/ Sales	Value added /sales	Sales Mult. Type I	Jobs/\$M M sales	Labor Income/ Sales	Value added/ sales	Sales Multiplier Type SAM
324	Grocery Stores	12.10	0.43	0.66	1.03	12.92	0.43	0.66	1.53
326	Gasoline stations	9.27	0.30	0.69	1.03	8.32	0.30	0.69	1.44
328	Sporting goods,	15.25	0.39	0.65	1.03	18.20	0.39	0.64	1.52
329	General retail	12.79	0.46	0.68	1.03	13.88	0.46	0.68	1.53
332	Transport by air	4.09	0.22	0.29	1.03	3.58	0.28	0.37	1.83
336	Gd. passenger transp.	18.48	0.45	0.63	1.03	20.96	0.43	0.61	1.55
338	Scenic transp. & trans. support svcs	26.24	0.69	0.89	1.03	12.25	0.69	0.89	1.51
362	Car rentals	0.00	0.00	0.00	1.03	5.77	0.22	0.46	1.54
410	Amusement & recreation	7.69	0.23	0.40	1.03	8.53	0.20	0.35	1.63
411	Hotels and motels	10.67	0.34	0.62	1.03	12.78	0.33	0.61	1.53
412	Other accomod.	5.01	0.24	0.62	1.03	6.85	0.24	0.62	1.47
413	Food & drinking places	13.00	0.40	0.59	1.03	15.80	0.37	0.54	1.50
414	Auto repair					11.01	0.39	0.57	1.46

Impacts are estimated using the State of Alaska (Table 10) and Denali Borough (Table 11) economic ratios and multipliers. Direct effects are estimated using the Denali region ratios since these sales are primarily to firms in the local region. We only include retail and wholesale margins on retail purchases, assuming most goods purchased by visitors are not made in the Denali region. There will be a small amount of additional activity in manufacturing sectors within the Alaska economy from sales of goods produced in Alaska, but we are not able to estimate the purchases of local goods.

Direct impacts on the State of Alaska from spending directly associated with spending in the Denali region or on transportation to the region are about 1,600 jobs, \$52 million in labor income and \$80 million in value added. With a statewide sales multiplier of 1.6, total impacts including secondary effects throughout the state are 2,319 jobs and \$126 million in value added. Most of the direct effects accrue to the Denali region (including Denali Borough and the South Denali area in Mat-Su Borough).

Focusing on the local area economy, it is assumed that none of the car rental sales accrue to the local area and 15% of the rail revenue supports local jobs and income. The economic ratios and multipliers for the Denali Borough are used to estimate local employment and income effects (Table 11). Secondary effects are, of course, much lower when restricted to the Denali region.

Table 10. Economic Impacts of Visitor Spending On Alaska Economy - 2008

Sector/Spending category	Direct Sales \$000's	Jobs	Labor Income \$000's	Value Added \$000's
Motel, hotel cabin or B&B	50,566	540	17,188	31,510
Camping fees	1,435	7	350	890
Restaurants & bars	24,186	314	9,647	14,220
Tours	17,711	465	12,302	15,777
Air transp.	1,925	8	427	558
Rail transp.	36,000	147	7,985	10,441
Car rentals	2,871	17	635	1,335
Grocery stores	1,120	14	483	744
Gas stations	1,281	12	380	884
Other retail	4,446	67	2,002	2,948
<u>Wholesale Trade</u>	<u>1,086</u>	<u>7</u>	<u>402</u>	<u>695</u>
Total Direct Effects	142,621	1,597	51,802	80,001
<u>Secondary Effects</u>	<u>85,799</u>	<u>722</u>	<u>25,592</u>	<u>45,921</u>
Total Effects	228,420	2,319	77,394	125,922
Multiplier	1.6	1.5	1.5	1.6

Note : Uses Denali region ratios for the direct effects and Alaska statewide multipliers for secondary effects. Wholesale trade activity is assumed to be outside the local area.

Table 11. Economic Impacts of Visitor Spending on the Denali Region

Sector/Spending category	Direct Sales \$000's	Jobs	Labor Income \$000's	Value Added \$000's
Motel, hotel cabin or B&B	50,566	540	17,188	31,510
Camping fees	1,435	7	350	890
Restaurants & bars	24,186	314	9,647	14,220
Tours	17,711	465	12,302	15,777
Air transp.	1,925	8	427	558
Rail transp.	5,400	22	1,198	1,566
Car rentals	0	0	0	0
Grocery stores	1,120	14	483	744
Gas stations	1,281	12	380	884
Other retail	4,446	67	2,002	2,948
<u>Wholesale Trade</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>
Total Direct Effects	110,940	1,449	43,977	69,097
<u>Secondary Effects</u>	<u>1,123</u>	<u>42</u>	<u>1,421</u>	<u>2,319</u>
Total Effects	112,063	1,491	45,398	71,416
Multiplier	1.01	1.03	1.03	1.03

Note : Uses Economic ratios and multipliers for Denali Borough. Car rentals and wholesale trade are excluded and 15% of total rail revenues are assumed to support local jobs and income.

Comparison with Alaska Employment Statistics

The Alaska employment program estimates there were 1,059 jobs and 28.9 million in wages in the Accommodations and Food Service sectors for Denali Borough in 2008. If we assume similar ratios for facilities in South Denali, the total jobs would be 1,369 and total wages \$37.4 million. Reducing these totals by 15% for sales not to Denali visitors, would yield 1,164 jobs and \$31.7 million wages in accommodations and food services. This compares to 861 jobs and about \$27 million in labor income in the accommodations and food service sectors that is associated with Denali NPP visitor spending. The Alaska employment figures include some jobs in lodging establishments associated with retail or tour sales, while the MGM2 estimates do not. The IMPLAN estimates of labor income include payroll benefits while the Alaska employment data are just wages and salaries.

Alternative estimates. If we instead use the 538,395 visits to the Denali region reported by Colt and Fay from AVSP data, total spending of park visitors in the Denali area is \$187 million resulting in 2,580 total jobs in Alaska including 1,878 direct jobs primarily in the Denali region. Since the model is linear, a 35% increase in visits (compared to 400,000) yields a 35% increase in spending and all impact measures.

One could also argue to include one or more extra nights of spending in Fairbanks or Anchorage as most non-resident visitors will spend a night coming or going that could be attributed to the Denali visit. If we count one extra night of spending for three quarters of the park visitors (at \$200 per party per night), this adds about \$24 million to the spending estimate and an additional 411 Alaska jobs, mostly in hotels and restaurants.

Table 12. Denali Borough Employment, 2008

	Leisure	Arts, Entertainment & Recreation	Accommodation & Food Svcs.
January	242	12	230
February	246	12	234
March	270	14	256
April	311	10	301
May	1,916	151	1,765
June	2,582	211	2,371
July	2,759	242	2,517
August	2,731	238	2,493
September	2,063	165	1,898
October	281	17	264
November	202	11	191
December	198	9	189
Annual Average Jobs	1,150	91	1,059
Total Wages (\$000's)	30,983	2,097	28,885

SOURCE: (QCEW) Quarterly Census of Employment and Wages

Limitations and Research Recommendations

The accuracy of the impact estimates rest on the reliability of the park visit counts, visitor characteristics (segment mix, party size, length of stay), spending averages and regional economic ratios and multipliers. The MGM2 spreadsheet model provides a template for putting these pieces together to estimate overall visitor spending and the associated jobs, income and value added.

A count of the number of visitors is the most important piece and this remains difficult to pin down precisely. Our investigations corrected one error in the counting procedures, but additional questions remain about the extent of double counting of some visitors and accounting for others who may not be counted. Estimates of non-resident visitors to the area from the Alaska visitor Statistics Program (AVSP) are higher than the counts of visitors to the park, presumably because some visitors to the area do not enter the park or are not counted. One plausible reason for the higher AVSP visitor numbers is that many visitors travel exclusively to the South Denali/Talkeetna area and/or up and down the George Parks Highway or Alaska Railroad corridors, which are outside the park proper, but are very closely associated with the park. This may result in a perception (especially among non-Alaskans) that they have visited Denali NPP when in fact they have not entered the park boundary. Given that the Denali NPP already has some facilities and staff in this area (e.g. Talkeetna Ranger Station) and plans for additional ones, it may make sense to include some proportion of these visitors as Denali visits.

Economic impacts can be estimated just for those who enter the park or for all visitors to the area. Further work should be carried out to refine visit counting procedures at the park, including ways to triangulate across different sources and methods. Accurate and up-to-date estimates of average party sizes and lengths of stay in the area are important.

Visitor surveys are critical to understanding visitor characteristics and trip patterns including visitor spending. The 2006 VSP study measured most of the important variables, but the sample does not appear to be entirely representative of all visitors, given the sampling constraints. Campers and those arriving by train appear to be over-represented while Alaska resident visitors may be under-represented. The reason for the discrepancies between the VSP survey and AVSP survey in terms of average party sizes and lengths of stay are unclear, given that the majority of visitors are from out-of-state.

The 2006 VSP survey did not measure spending apparently due to the complexities of handling package tours and other issues. The engineering approach worked reasonably well here, although wide variations in lodging and tour rates across different providers, seasons, and types still pose challenges to determining overall average rates for rooms and tours.

Given the fact that the vast majority of lodging, restaurant, tour, and retail sales in the area is attributable to Denali visitors, reported economic activity for the borough is a reasonable indicator of the park's impact. However, here too, there are difficulties due to where businesses are classified for the purposes of economic reporting and the fact that quite a bit of activity spills over into Mat-Su Borough and South Denali.

MGM2 uses IMPLAN economic ratios and multipliers for the region and the State of Alaska. Visitor spending is estimated in spending categories that may not exactly match the way that

IMPLAN defines sectors. For example, IMPLAN's scenic transportation and sightseeing sector (# 338) is used to represent spending on various tours, but IMPLAN includes transportation support services in this sector. This likely explains the significant difference in job to sales ratios for this sector between Denali Borough (which is mostly tours with high jobs to sales ratios) and the State of Alaska (which includes many more transportation support services with much lower job to sales ratios).

Since the majority of Denali visitors are on extended trips to Alaska, many purchasing package tours, one cannot cleanly separate out expenses directly attributable to the Denali NPP visit. Spending that takes place outside the Denali region does not impact the local economy. Concerns have also been expressed about how much of the visitor spending may be taken out of the Denali or Alaska economies by tour companies. The IMPLAN multipliers attempt to estimate these leakages.

Since the local economy is quite limited, the vast majority of secondary effects of visitor spending accrue to the broader state economy. For that reason, we use Alaska state multipliers to capture these effects. There are also additional impacts on the Alaska economy from visitor spending outside the Denali region. Some of these expenses can be attributed to the Denali visit, e.g. car and RV rentals, transportation expenses, and for many, an extra night stay in Anchorage or Fairbanks. It is not clear how many trips to Alaska would not be made in the absence of opportunities to visit Denali, but the park is clearly one of the most important stops on any Alaska trip.

Most other National Parks in Alaska pose similar problems for estimating visitor spending and economic impacts. The approach we have taken for Denali will likely be the model for these other parks. Local knowledge about visitor use patterns and businesses that serve park visitors is always important in making estimates of visitor impacts, but this is particularly the case in Alaska.

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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.
Personal income	Wage and salary income, sole proprietor's income and employee payroll benefits.
Value added	Personal 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.