

The Economic Impact of Off-Highway Vehicles in Iowa

Prepared for the
Iowa Off-Highway Vehicle Association

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Executive Summary

- There were 41,135 registered OHVs in 29,663 Iowa households in 2007 and an estimated 63,348 OHV riders in Iowa.
- The estimated current value of OHVs and related assets in Iowa is over \$266 million. In 2007, expenditures on new OHV-related assets were over \$41.2 million.
- Iowa OHV users spend an estimated \$86.4 million per year on OHV equipment and activities. \$80.1 million is spent in Iowa. \$6.3 million is spent on trips out of state.
- OHV-owning households most frequently make day trips in the vicinity of their homes. 77% of respondents indicated this was their most frequent use of OHVs. Over 56% of riders utilize public lands and multi-use trails.
- On average, Iowa OHV families report 11 special outings a year. About 40% indicate they take weekend or longer trips with their OHVs. 41 % of OHV owners report making an average of 1.7 out-of-state trips annually for recreation purposes.
- In-state OHV expenditures (\$80.1 million) generate an estimated \$45.9 million in additional transactions within the Iowa economy, resulting in an estimated total of \$126 million in transactions or sales, \$33.7 million in personal income, and 1,200 jobs.
- Capturing the \$6.3 million that Iowa OHV users spend out-of-state has the potential of providing an additional \$10 million in total transactions, \$2.7 million in additional household income, and 94 jobs.

Introduction

Riding OHVs is a favorite outdoor recreation activity for thousands of Iowans in all parts of the state. In 2007, there were 41,135 registered OHVs in Iowa in 29,663 households. This is about 1.4 machines per OHV-owning household and is equivalent to 13.7 registered OHVs for every 1,000 Iowa residents.

As a response to the number of OHVs registered in the state, the Iowa State OHV Association (IOHVA) is making a strong effort to increase the resources that Iowa's state and local governments invest in multi-use recreational trails and improvements. As the state increases its promotion of recreational opportunities in Iowa, it makes sense to expand the development of year-round recreational trails. The IOHVA believes that this is good for Iowa and good for Iowa's OHV users.

Methodology

As part of this effort, the IOHVA has commissioned this study of recreational OHV activities by Iowa residents. This study was undertaken in two parts. First, a random survey of registered OHV owners was completed. With information from the survey, a profile of Iowa OHV users was developed. This profile includes OHV owner and operator characteristics, OHV usage, investments in OHVs and related assets, and annual expenditures on OHV activities. Usage and expenditure information was designed to capture estimates of both in-state and out-of-state operations/expenditures.

Between November 23, 2007 and January 9, 2008, the research team surveyed a random sample of 150 registered OHV owners as part of this study. The team mailed survey forms to a randomly drawn sample of 1,000 OHV-owning households in Iowa. Thirty-four (34) forms were returned as undeliverable and we received 150 usable responses. We asked survey participants to identify all the OHVs they owned, personal characteristics and OHV use, investment, and annual expenses.

For the second part of the study, the survey-based profile information was analyzed using IMPLAN, an economic input-output model, to estimate

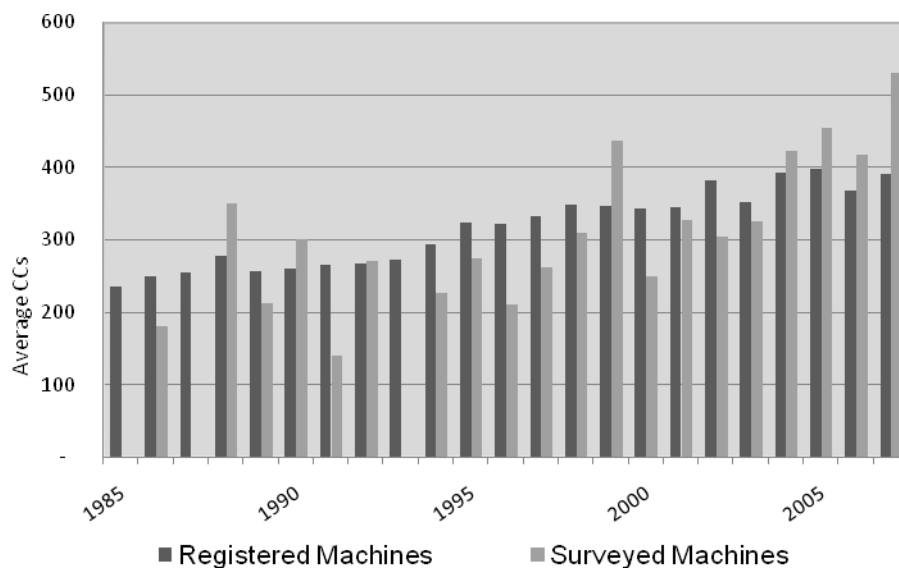
- How much income and employment within Iowa is related to in-state OHV activities by Iowa residents
- How much income and employment would be retained within Iowa if the current out-of-state OHV activities took place within the state.

The results of these inquiries are then combined with regional and national information to evaluate the economic potential of developing new OHV and/or year-round multi-use trails in the state.

Registered OHVs

The 41,135 registered OHVs in Iowa have an average engine displacement of 365 cubic centimeters (cc's). This is consistent with reports that, nationwide, OHVs in the 400cc range are the most popular. Figures 1 and 2 show the average size of registered OHVs by model year and by county. They show a clear trend towards bigger OHVs, with the range running from about 220 cc's for the 1985 model year to about 400 cc's for 2005 model year registrations.

Figure 1. Average CC per Model Year



Survey Responses

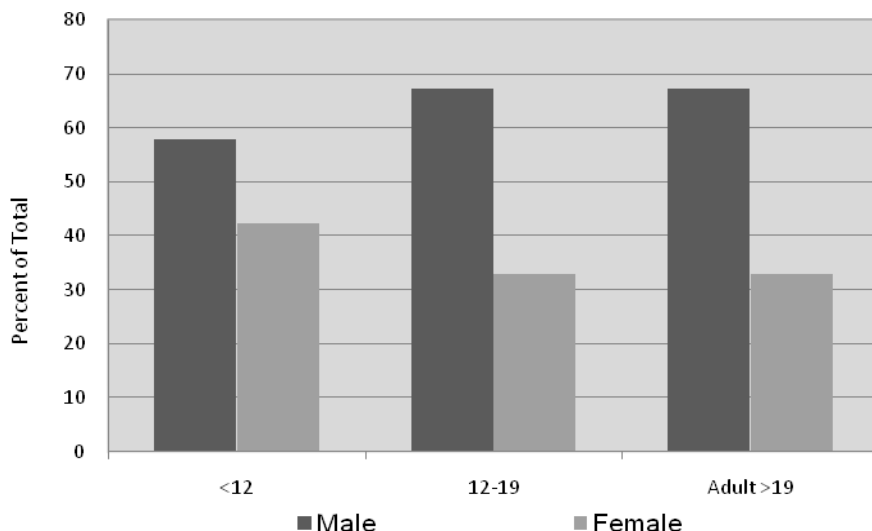
The survey responses identified 258 OHVs, or 1.7 machines per responding family which is slightly higher than the 1.4 machines per household indicated by the registration data.

The geographical distribution of those OHVs by age and size are displayed in Figures 1 and 2 with the corresponding distributions of registered OHVs in Iowa. The distributions show that survey respondents provide a good representation of the registered population. These comparisons are displayed in Figures 1 and 2. The average displacement of survey-identified OHVs is 364 cc, which, again, is consistent with state registrations information.

Demographics

The 150 survey respondents identified 378 riders by age and sex, for an average of 2.52 riders per respondent family. The survey results indicated 1.7 machines per household which implies 1.54 riders per machine. Applying this 1.54 figure to the 41,135 registered OHV base in Iowa generates an estimate of 63,348 OHV riders in Iowa.

Figure 6. Distribution of Riders by Age and Sex



The percentage distribution of surveyed riders by age and sex is shown in Figure 6. Overall, 66% of identified riders in the survey are male and 34% are female. Over 36% of riders are

under the age of 40. Respondents indicated that, on average, their families had owned OHVs for 9 years. The age distributions of individual riders identified, coupled with length of family ownership, indicate that OHV is predominantly a family sport for Iowa residents.

Respondents were almost evenly split by in-town and rural residences (52.5% to 47.5%). Of the rural residents, the average reported land holding was 195 acres with the size ranging between 2 and 1,650 acres.

Figure 7. Distribution of Riders by Educational Attainment

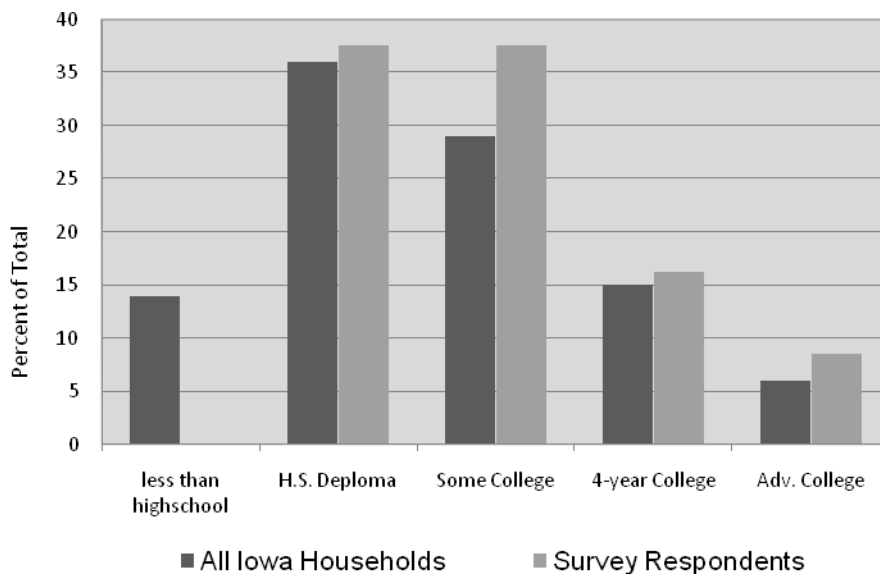
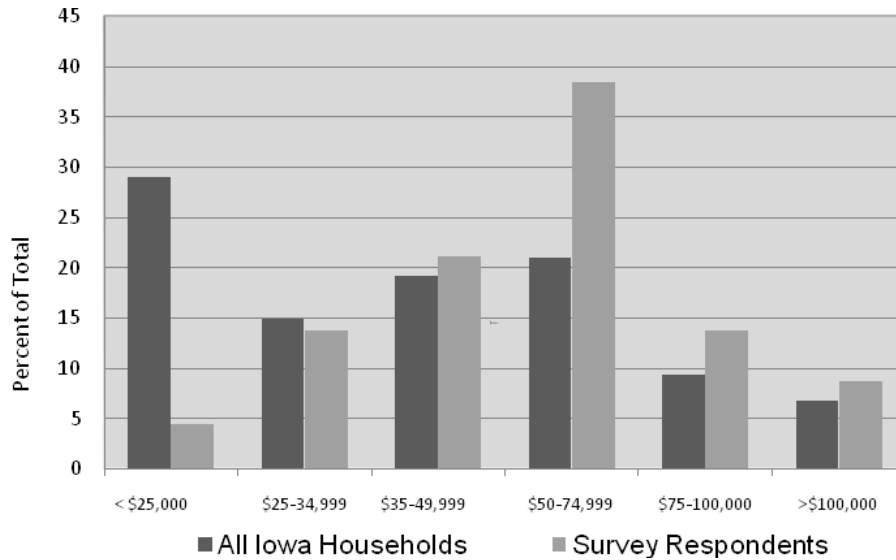


Figure 7 shows the educational attainment of those making decisions regarding household OHV investments and activities. Figure 8 shows the distribution of household income for survey respondents. Each figure gives comparable information for the entire Iowa population from the 2000 Census. Overall, the survey shows that OHV households compare quite favorably with the entire population in terms of both education and income. Nearly 25% of primary OHV decision makers have a four-year college or advanced degree. None of the respondents indicated they did not have a high school diploma.

The percentage of OHV households in all income categories above \$35,000 exceeds that of the total population. In all categories below \$35,000, OHV families surveyed are underrepresented relative to the population as a whole.

Figure 8. Distribution of Respondents by Household Income



OHV Use

Surveyed households indicated that they use their OHV for special outings an average of 14 times per year. Multiplied by an estimated 29,663 OHV households in the state, this gives an estimate of 415,200 trips per year by Iowa OHV users. Some significant facts about surveyed OHV-owning household usage include:

- 56% ride on public lands
- 42% utilize multi-use trails
- 52% have visited an Iowa OHV park

Given these responses, we extrapolated that

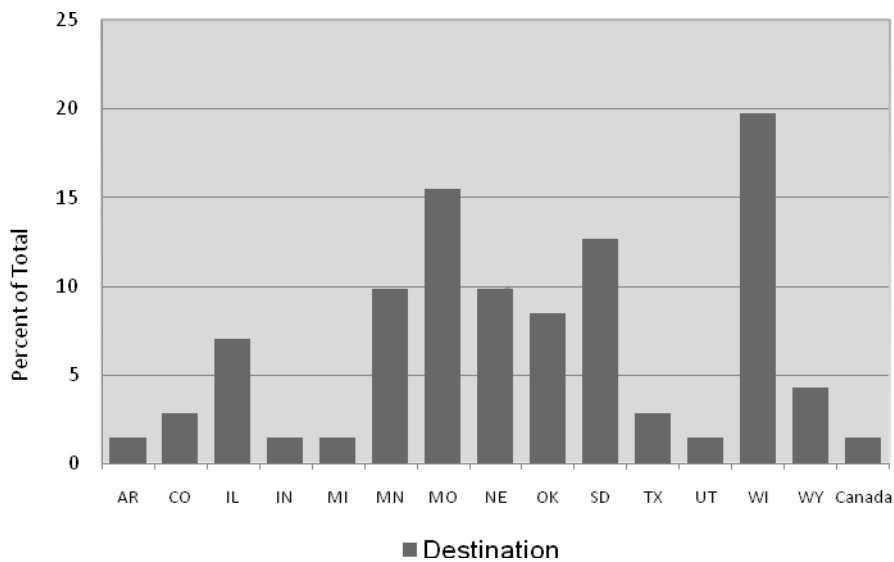
- 35,475 Iowa OHV riders utilize public lands (.56 * 63,348 riders)
- 26,290 Iowa OHV riders utilize multi-use trails (.415 * 63,348 riders)
- 33,068 Iowa OHV riders have used an Iowa OHV park (.522 * 63,348 riders)

Respondents also indicate that they regularly transport their machines to riding areas and that longer periods of riding time are necessary to justify driving those longer distances. The amount of riding time needed to justify the transporting ranged from 1 hour to 150 hours. On average, respondents reported:

- 4.4 hours of riding to travel 50 miles
- 7.0 hours of riding to travel 100 miles
- 13.4 hours of riding to travel 200 miles
- 25.7 hours of riding to travel 300 or more miles

The survey responses indicate that the average out-of-state OHV excursion is 2.5 days long. Figure 9 shows the percentage distribution of out-of-state destinations. The states bordering Iowa are the most popular destination for Iowa OHV owners with Wisconsin being the most frequently visited.

Figure 9. Distribution by Out-of-State Destinations



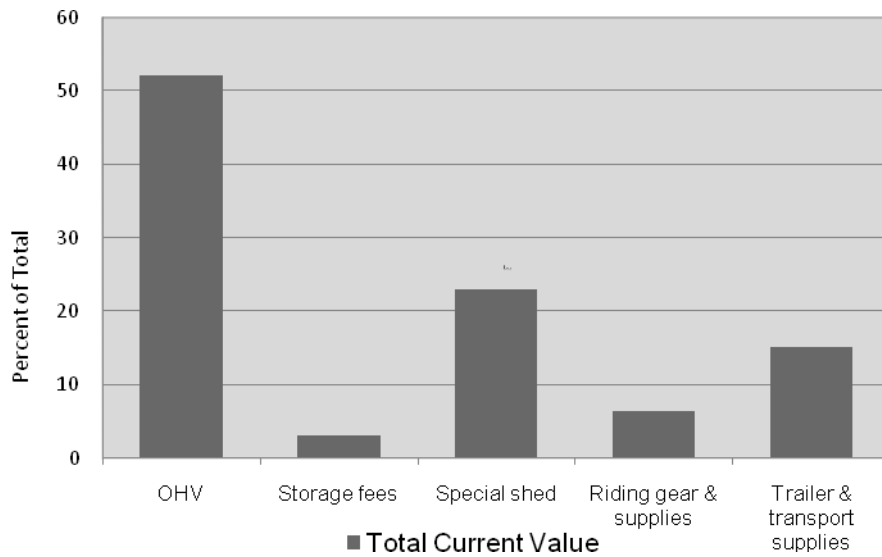
OHV-related Assets and Expenditures

Survey responses indicate that OHV owners have significant investments in their equipment. The average respondent household had OHVs and OHV-related assets with an estimated

current value of \$11,116, or \$6,463 on a per machine basis. This suggests that, statewide, OHVs and related assets have a current value of nearly \$265.9 million (Appendix A). These assets would include OHVs, trailers, covers and shelters specifically for machines and trailers, and special tools for OHV maintenance. This data is presented in greater detail in the table in Appendix A.

In 2007, survey respondents spent an average of \$1,001, or \$1,700 per household, per machine to purchase additional assets. These numbers are adjusted to reflect that only a fraction of the households purchased new OHV-related assets in 2007. Twenty-five percent (25%) of households reported new OHV purchases at an average value of \$5,300. Twenty-seven percent (27%) of households reported new trailers, with an average value of \$1,386. Extrapolating these percentages for all OHV-owning households in the state suggests new asset purchases of \$41.2 million statewide in 2007. The percentage distribution of value for these newly purchased assets is presented in Figure 10.

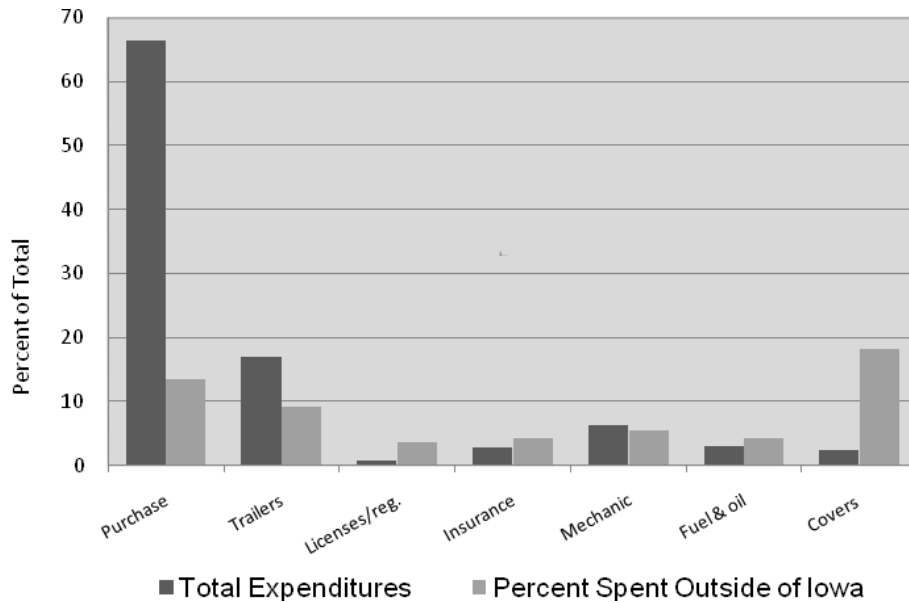
Figure 10. Additional Related OHV Assets



Operating and maintaining OHV involves considerable expenditures for fuel, lubricants, parts and mechanical, registration and insurance. Excluding the asset purchases in Fig 10, the additional annual per machine costs to own and operate is about \$605, or about \$1,028 per

OHV owning household, based on our survey. On a statewide basis this would aggregate to about \$24.9 million. The percentage distribution of these costs is presented in Figure 11.

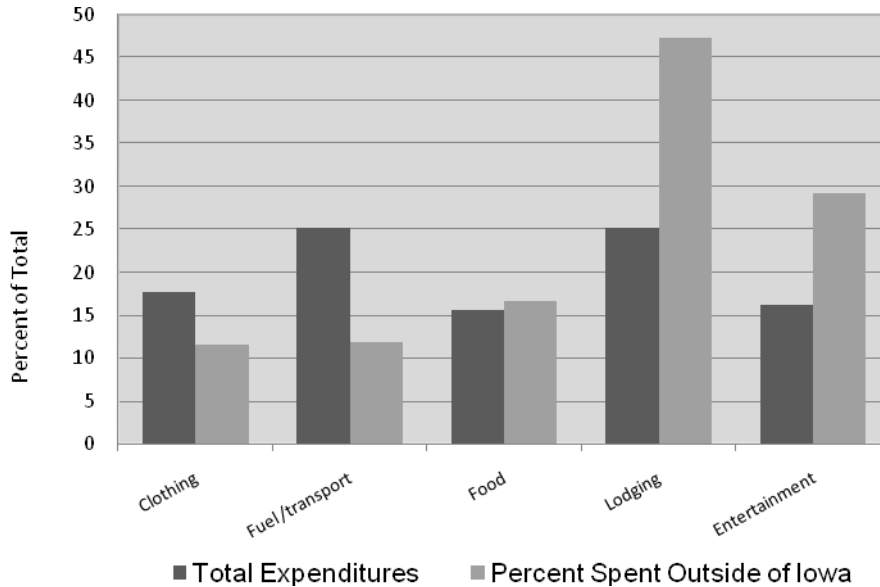
Figure 11. Operations and Maintenance Expenditures



While many OHV owners, especially rural residents, report using on their land or a neighbor’s land, a sizeable portion indicate they make special trips to use their OHVs. Using OHV for special recreational purposes involves another set of special expenditures and purchases such as driving to a recreation area and spending on meals and lodging. These expenses are reported in this section. Since not all owners transport their vehicle to recreation sites, our statewide figures are adjusted to account for the percentages of people who do.

Of households reporting expenses for out of town excursions, the average household spent \$248 per year on lodging, \$428 on food and entertainment, and \$283 on clothing and special purchases. The distribution of these expenditures is presented in Figure 12. These figures aggregated to statewide totals suggest that \$20.4 million is spent annually on recreational outings with OHVs. Our survey also indicated that about 15% of this travel-related spending occurred on out-of-state trips with the OHVs (Appendix A).

Figure 12. OHV Travel-Related Expenditures



The Bottom Line

The bottom line estimate is that Iowa OHV owners spent a total of \$86.4 million in 2007. 7.3% of this, or \$6.3 million, was spent outside of the state. Out-of-state expenditures were higher for lodging and entertainment than they were for purchases of assets. This at least partially reflects the fact that OHV activities that occur outside of the state are more expensive than the same OHV activities in-state because of the added cost of transportation, meals and lodging.

Estimated Economic Impacts

We estimated the economic impacts on the basis of two scenarios. In scenario 1, the effects of expenditures made within Iowa were evaluated to provide an estimate of impacts associated with current spending. Scenario 2 considers what would happen if OHV recreation opportunities in Iowa are improved. In this scenario, we assume that improvements would attract all of the out-of-state expenditures back to Iowa to generate

economic impacts here. For both of these scenarios, we estimated the effect of these expenditures on:

- the total value of economic transactions in the Iowa economy
- the overall level of household income in the Iowa economy
- the number of jobs in the Iowa economy

These estimates were derived with the help of the IMPLAN input-output (I-O) model described in Appendix C. The results in this model incorporate the full range of linkages to the OHV industry including input purchases and the multiplier effects associated with consumer related purchases by people involved with providing sales and service to OHV owners. The detail tables for the two scenarios are included in Appendix B.

Overall, an estimated \$126 million of gross sales transactions in Iowa for 2007 are directly or indirectly related to the Iowa OHV industry, implying an output or gross sales multiplier of 1.6 (\$126 million ÷ \$80.1 million). These are shown in Tables 1a, 2a and 3a of Appendix B. \$18.7 million of these effects are “indirect,” meaning that they represent the wholesale or supply transactions that support the businesses directly patronized by OHV operators. Nearly \$27.2 million of these effects are “induced,” meaning that they are the result of personal purchases (the payroll-retail loop) made by the workers (payroll recipients) in the businesses that directly serve OHV riders or support and supply those businesses.

Table 1b translates these effects from OHV purchases into personal or household income. The dollar values in Table 1b are substantially smaller than those in Table 1a, because personal income is only one of the components supported by the sales transactions. Even so, Table 1b shows that the personal income component is \$23.05 million of the \$80.1 million in “direct” OHV expenditures (Table 1b Column 1). Added to \$4.5 million in “indirect” and \$6.2 million “induced” personal income, this gives a total personal income component effect of over \$33.7 million in the form of payrolls resulting from OHV expenditures and the back-office transactions that support these expenditures. This implies an income multiplier of 1.47.

Similarly, Table 1c translates these expenditure and income effects into an estimate of the number of jobs in the Iowa economy that are tied to OHV expenditures that are made within

the state. This estimates a total of 1,200 jobs (858 direct and 342 secondary jobs implying a 1.4 multiplier).

The tables show that while the “direct” expenditure effects are concentrated in the service and trade sectors, the subsequent secondary impacts estimated by the model show effects that are widely distributed across all sectors of the economy. This reflects the interdependence of all sectors in the industrial supply chain that serves the OHV operator.

The results of scenario 2 are presented in Tables 2a, 2b and 2c of Appendix B. These results represent the potential economic effects to the Iowa economy if all the reported expenditures by Iowa OHV users were to occur in Iowa. Under the assumptions of this scenario, the economic impacts are larger. The initial direct spending of \$86.4 million generates total spending of \$136 million in Table 2a. If this level of spending would occur in Iowa, a total of almost \$36.4 million in personal income (Table 2b) and 1,294 jobs (Table 2c) are supported by OHV expenditures.

The difference between estimates generated in scenarios 1 and 2 are rooted in the \$5.3 million that Iowa OHV users spend outside of Iowa. Adding this to transactions made within the state results in estimated increases of \$10 million in total transactions, \$2.7 million in personal income, and 94 jobs in the Iowa economy. Capturing the full extent of these changes would require convincing Iowa OHV users not only to stay in state, but also to increase their riding activities. The increased riding is necessary because riding near home is certainly less expensive than out-of-state excursions. Even if recreational OHV riding did not increase, the savings from being able to do more riding locally would improve their economic well being. This would also have an effect upon the economy. In short, while fully capturing this spending in Iowa is unlikely, it represents a target of economic development and tourism potential for improved OHV amenities in Iowa.

Policy Responses

Our survey was also an opportunity to ask OHV owners for their opinion on a number of policy issues. It appears that the IOHVA has a fairly low profile among OHV owners as only 4% of the respondents are members, and only 25% have visited their website. About 22% have

attended a safety class, although slightly more, 33% are interested in one. Only 8% would be interested in becoming a safety instructor. Perhaps the most interesting result is that over two thirds (69%) of owners were willing to see a \$10 increase in registration fees if those monies would be used for trail improvements.

Table 1. Responses to Policy Questions

Category	Percentage		Response (count)		
	Yes	No	Yes	No	Total
IOHVA member	4%	96%	6	133	139
Visit IOHVA website	25%	75%	35	104	139
Local club member	10%	90%	14	127	141
Support \$10 registration increase	69%	31%	95	43	138
Attend safety class	22%	78%	31	110	141
Interested in class	33%	67%	33	68	101
Become an instructor	8%	92%	11	120	131
Adequate trail information	55%	45%	46	38	84

Summary

We conducted a survey of OHV owners in November and December 2007 to identify OHV owner and operator characteristics, OHV usage, investments in OHVs and related assets, and annual expenditures on OHV activities. In 2007, there were 41,135 registered OHVs in 29,663 households in Iowa or about 13.7 registered OHVs for every 1,000 Iowa residents. This represents about 1.4 machines per OHV-owning household and includes 63,348 OHV riders in Iowa.

The survey results indicate that OHV owners are generally better educated and have higher incomes than Iowans at large. OHV-owning households most frequently make day trips in the vicinity of their homes. Seventy-seven percent (77%) of the respondents indicated this was their most frequent use of OHVs. Over 56% of riders utilize public lands and multi-use trails.

On average, Iowa OHV families in our survey report 11 special outings a year. About 40% indicate they take weekend or longer trips with their OHVs. 41% of the surveyed OHV owners

report making an out-of-state trip for recreation purposes. The number reported ranged from 1 to 35 with an average of 1.74.

Currently, the estimated value of OHVs and related assets in Iowa is over \$266 million. In 2007, the expenditures on new assets were over \$41.2 million. Iowa OHV users spend an estimated \$86.4 million per year on OHV equipment and activities. \$80.1 million is spent in Iowa. \$6.3 million is spent on trips out of state.

These direct OHV expenditures generate significant economic benefits in Iowa. In-state OHV expenditures (\$80.1 million) generate an estimated \$45.9 million in additional transactions within the Iowa economy, resulting in an estimated total of \$126 million in transactions or sales, \$33.7 million in personal income, and 1,200 jobs.

Iowa OHV owners also spend about \$6.3 million on recreation outside of Iowa. If we were able to capture that \$6.3 million within Iowa, it would have the potential of providing an additional \$10 million in total transactions, \$2.7 million in additional household income, and an additional 94 in-state jobs.

Appendix A – Survey Expenditure Data

Categories	Per Machine Survey			Statewide Totals (\$1,000s)		
	Total	Out-of-State	In-State	Total	Out-of-State	In-State
Current Average Related Assets Values						
OHV	\$5,583			\$229,675		
Storage fees	\$5			\$215		
Special shed	\$172			\$7,095		
Riding gear & supplies	\$214			\$8,821		
Trailer & transport supplies	\$488			\$20,053		
Total Related Assets	\$6,463			\$265,860		
Operation & Maintenance Expenditures						
Purchase of OHVs	\$772	\$15	\$757	\$31,763	\$620	\$31,143
Trailers	\$220	\$3	\$217	\$9,062	\$133	\$8,929
Licenses, registration fees	\$35	\$1	\$35	\$1,458	\$30	\$1,428
Insurance	\$133	\$3	\$130	\$5,487	\$131	\$5,356
Mechanic and dealer charges and parts	\$276	\$8	\$268	\$11,370	\$340	\$11,030
Fuel, oil, lubricants, and other fluids (OHV only)	\$136	\$3	\$133	\$5,608	\$136	\$5,472
Covers for trailer or OHV	\$9	\$0	\$9	\$369	\$3	\$366
Membership in OHV organization	\$23	\$0	\$23	\$960	\$0	\$960
Total Operation & Maintenance	\$1,606	\$34	\$1,572	\$66,078	\$1,394	\$64,684
Related Personal Expenses						
OHV clothing, helmets, boots, gloves, etc.	\$87	\$12	\$75	\$3,563	\$482	\$3,081
Fuel and fluids for personal transportation to OHV activities	\$156	\$23	\$133	\$6,408	\$938	\$5,470
Food and beverages purchased as part of OHV activities	\$82	\$13	\$70	\$3,385	\$525	\$2,859
Lodging expenses incurred as part of OHV activities	\$71	\$45	\$58	\$4,241	\$1,843	\$2,398
Entertainment on OHV outing	\$47	\$28	\$40	\$2,767	\$1,140	\$1,627
Total Related Personal Expenses	\$442	\$120	\$375	\$20,364	\$4,928	\$15,436
Total Expenditures	\$2,049	\$154	\$1,948	\$86,442	\$6,322	\$80,120

Appendix B – IMPLAN In-State Impact Detail Tables

Table 1a. Output Impact of In-State OHV-Related Expenditures

Sectors	Direct Impact	Business-Related Indirect Impact	Consumer-Related Induced Impact	Total Impact
Agriculture & Mining	\$0	\$166,478	\$328,262	\$494,741
Utilities	\$0	\$1,039,490	\$762,118	\$1,801,608
Manufacturing	\$0	\$3,305,661	\$2,735,406	\$6,041,068
Transportation & Warehousing	\$0	\$1,089,926	\$593,406	\$1,683,331
Wholesale & Retail Trade	\$27,822,443	\$2,505,425	\$5,084,026	\$35,411,894
Finance, Insurance & Real Estate	\$8,964,509	\$3,670,505	\$3,446,242	\$16,081,255
Professional Services	\$0	\$5,363,189	\$7,077,356	\$12,440,545
Other	\$43,332,481	\$1,565,024	\$7,180,808	\$52,078,315
Total	\$80,119,433	\$18,705,698	\$27,207,622	\$126,032,755

Table 1b. Income Impact of In-State OHV-Related Expenditures

Sectors	Direct Impact	Business-Related Indirect Impact	Consumer-Related Induced Impact	Total Impact
Agriculture & Mining	\$0	\$11,035	\$25,371	\$36,406
Utilities	\$0	\$220,688	\$145,101	\$365,788
Manufacturing	\$0	\$471,768	\$301,206	\$772,973
Transportation & Warehousing	\$0	\$396,292	\$190,795	\$587,087
Wholesale & Retail Trade	\$8,334,510	\$725,998	\$1,488,563	\$10,549,070
Finance, Insurance & Real Estate	\$2,892,191	\$682,358	\$654,668	\$4,229,217
Professional Services	\$0	\$1,584,908	\$2,475,864	\$4,060,771
Other	\$11,820,611	\$411,733	\$891,476	\$13,123,820
Total	\$23,047,311	\$4,504,779	\$6,173,043	\$33,725,133

Table 1c. Jobs Impact of In-State OHV-Related Expenditures

Sectors	Direct Impact	Business-Related Indirect Impact	Consumer-Related Induced Impact	Total Impact
Agriculture & Mining	0	1	2	2
Utilities	0	4	2	6
Manufacturing	0	9	6	15
Transportation & Warehousing	0	10	5	14
Wholesale & Retail Trade	324	24	57	405
Finance, Insurance & Real Estate	58	21	17	95
Professional Services	0	42	70	112
Other	476	20	54	551
Total	858	130	211	1,200

Table 2a. Output Impact of Total OHV-Related Expenditures

Sectors	Direct Impact	Business-Related Indirect Impact	Consumer-Related Induced Impact	Total Impact
Agriculture & Mining	\$0	\$179,614	\$354,165	\$533,781
Utilities	\$0	\$1,121,515	\$822,255	\$1,943,771
Manufacturing	\$0	\$3,566,508	\$2,951,255	\$6,517,762
Transportation & Warehousing	\$0	\$1,175,931	\$640,231	\$1,816,161
Wholesale & Retail Trade	\$30,017,884	\$2,703,126	\$5,485,201	\$38,206,211
Finance, Insurance & Real Estate	\$9,671,890	\$3,960,141	\$3,718,182	\$17,350,211
Professional Services	\$0	\$5,786,393	\$7,635,823	\$13,422,217
Other	\$46,751,803	\$1,688,519	\$7,747,439	\$56,187,763
Total	\$86,441,577	\$20,181,746	\$29,354,549	\$135,977,873

Table 2b. Income Impact of Total OHV-Related Expenditures

Sectors	Direct Impact	Business-Related Indirect Impact	Consumer-Related Induced Impact	Total Impact
Agriculture & Mining	\$0	\$11,906	\$27,373	\$39,278
Utilities	\$0	\$238,102	\$156,550	\$394,652
Manufacturing	\$0	\$508,994	\$324,973	\$833,968
Transportation & Warehousing	\$0	\$427,563	\$205,851	\$633,414
Wholesale & Retail Trade	\$8,992,178	\$783,286	\$1,606,024	\$11,381,487
Finance, Insurance & Real Estate	\$3,120,411	\$736,202	\$706,328	\$4,562,940
Professional Services	\$0	\$1,709,972	\$2,671,232	\$4,381,202
Other	\$12,753,363	\$444,223	\$961,822	\$14,159,408
Total	\$24,865,951	\$4,860,247	\$6,660,151	\$36,386,349

Table 2c. Jobs Impact of Total OHV-Related Expenditures

Sectors	Direct Impact	Business-Related Indirect Impact	Consumer-Related Induced Impact	Total Impact
Agriculture & Mining	0	1	2	2
Utilities	0	4	2	6
Manufacturing	0	10	6	16
Transportation & Warehousing	0	11	5	15
Wholesale & Retail Trade	350	26	61	437
Finance, Insurance & Real Estate	62	22	18	103
Professional Services	0	45	75	121
Other	514	22	58	594
Total	926	140	228	1,294

Appendix C - Documentation

About the IMPLAN Input-Output Model

The traditional indicators which economists use for measuring the economic importance of an activity include the size of its workforce and payroll, its capital investment and its local purchase of goods and services. Economists call these the 'direct expenditures' or 'direct effects'.

Direct effects refer to the operational characteristics (employment, payroll, sales) of the sectors that we studied. Indirect effects measure the value of supplies and services that were purchased directly by the sector from businesses and firms within the region. Induced effects occurred when workers in the direct and indirect industries spent their earnings on goods and services from other vendors within the region. Induced effects are also often called 'household effects'. The total economic impact effect is the aggregate of the direct, indirect, and induced effects. It is the total effect on the economy of transactions that are attributable to the direct economic activity of the sectors.

But the workers and the vendors who receive those direct expenditures don't bury them in a mattress. They will spend some of the money, save some of it and thus begins the journey by which the dollars travel through many hands before they finally leave the economic region. Economists call this phenomenon the 'multiplier effect'. The multiplier factor is calculated by dividing the sum of the direct, indirect and induced effects by the direct effect.

The multiplier effect for any economy or industry is examined using an 'input-output analysis'. The tool was devised by the 1973 Nobel Prize winning economist Wassily Leontief. It uses a matrix that measures inter-industry relations in an economy, and shows how the output of one industry becomes the input for another. The most widely used regional input-output economic impact tool is the IMPLAN model developed and distributed by Minnesota IMPLAN Group, Inc. (MIG). According to MIG, the model is currently in use by more than 1,000 public and private institutions.

Mechanics of the Input-Output Model

An input-output model is essentially a generalized accounting system of a regional economy that tracks the purchases and sales of commodities between industries, businesses, and final consumers. Successive rounds of transactions stemming from the initial economic stimulus (such as a new plant or community business) are summed to provide an estimate of direct, indirect, induced (or consumer-related) and total effects of the event. The impacts are calculated using the IMPLAN Input Output modeling system, originally developed by the US Forest system and currently maintained by the Minnesota IMPLAN Group.

The model is capable of providing many types of reports on regional data and interactions among sectors. For economic studies, several of the more important indicators are: 1) total output, 2) personal income, 3) value added, and 4) jobs.

- Total output for most industries is simply gross sales. For public institutions we normally include all public and private spending, all direct sales and subsidies received in order to isolate the economic value of their output.
- Personal income includes the wages and salaries of employees, along with normal proprietor profits.
- Value added or contribution to state gross domestic product is the measure of the economic product that an industry or collection of industries produce. It is simply the payments that are made to labor (wages and salaries), business owners (proprietors or simple partnerships), investors (paid as interest, dividends, or rents), and the indirect tax payments made to government that are part of production activity.
- Jobs, the fourth measure, represent the number of positions in the economy, not the number of employed persons.

We also get detailed breakdown of this data into direct, indirect, induced, and total economic effects. Direct effects refer to the operational characteristics of the firm that we are studying. Indirect effects measure the value of supplies and services that are provided to the direct firm by industries in the region. Induced effects accrue when workers in the direct and indirect

industries spend their earnings on goods and services in the region. Induced effects are also often called household effects. Total effects are the sum of direct, indirect, and induced effects. They are the total of transactions attributable to the direct activity that we are measuring.

The term multiplier is also often used when referring to economic effects or economic impacts. A multiplier is simply the total effects divided by the direct effects. It tells how much the overall economy changes per unit change in the direct effects (a dollar of output, a dollar of personal income, a dollar of value added, or a job). Multipliers help us to anticipate the potential change in the regional economy attributable to a change in direct activity in a particular industry. Firms with strong linkages to area supplying businesses or that pay relatively high earnings may yield high multipliers. Firms that are otherwise not connected strongly locally or that pay lower than average wages will have lower multipliers. Urban areas with their more developed economies have, on the average, much higher multipliers than rural areas.

The research staff for this study employed the latest version of the IMPLAN model, modified by staff at Iowa State University to calibrate the magnitude of these secondary impacts in Iowa.

About the Research Team

Strategic Economics Group has been serving businesses and government in Iowa and the Midwest since 2001 as the region's only locally owned economic research consulting firm. In addition to both state and local governmental entities, our clients have included American Home Mortgage Corporation, Catholic Health Initiative, Chamber Alliance, Des Moines Area Community College, Drake University, Federal Reserve Bank of Chicago, Greater Dallas County Development Alliance, Greater Des Moines Partnership, Hubbell Realty, Iowa Area Development Group, Iowa Association for Business and Industry, Iowa Association of Electric Cooperatives, Iowa Association of Realtors, Iowa Credit Union League, Iowa Department of Economic Development, Iowa District Export Council, Iowa Farm Bureau Federation, Iowa Legislature, Iowa Student Loan Liquidity Corporation, Iowa Utility Association, Mediacom Communications, Mid-American Energy, OpportunityIowa, Principal Financial, Project Destiny,

StrategicAmerica, Treasurer of Iowa, Urban Caucus, U.S. Small Business Administration and the West Metro Regional Airport Authority.

Daniel Otto is a Senior Economic Analyst with Strategic Economic Group and Professor of Economics at Iowa State University in Ames, Iowa. Otto's specialty areas have included community and rural economic development, economic impact analysis, and government finance economics.

His recent activities have included economic development workshops, analysis of community facilities and services, income and employment, economic impact studies, and workshops on public policy issues for rural areas. He has also worked with developing data bases, economic forecasting, and input-output modeling activity.

Harvey Siegelman is the President and Senior Economic Analyst with Strategic Economics Group. Prior to forming this research-based consulting firm, Siegelman had served for two decades as the State Economist of Iowa and as an Adjunct Professor of Economics at Drake University in Des Moines, Iowa. Harvey's specialty areas have included project management, economic development and strategic planning, state and local government finance and macroeconomic analysis. Prior to his appointment as State Economist, he was a health care planner, a labor market analyst and an economics professor.