

OREGON MANDATORY ALL-TERRAIN VEHICLE SAFETY EDUCATION PROGRAM DEVELOPMENT

Identify Oregon-Specific
Class I and Class III
ATV Safety Issues

Determine Best Practices
in ATV Safety Education

Conducted by

Oregon State University

for

Oregon Parks and Recreation Department

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IDENTIFY OREGON-SPECIFIC CLASS I AND CLASS III ATV SAFETY ISSUES

In 2006, the Oregon Parks and Recreation Department (OPRD) contracted with the research team at Oregon State University (OSU) to conduct an assessment of the Class I (three and four-wheel ATV's) and Class III (dual sport or dirt motorcycles) All-Terrain Vehicle (ATV) Safety Program and determine the feasibility of implementing mandatory training for operators of ATVs and off-highway motorcycles. Based on the results of this study and continued efforts by OPRD to advance ATV safety, the 2007 Oregon legislature passed SB101, establishing mandatory training requirements for operators of Class I and Class III ATVs.

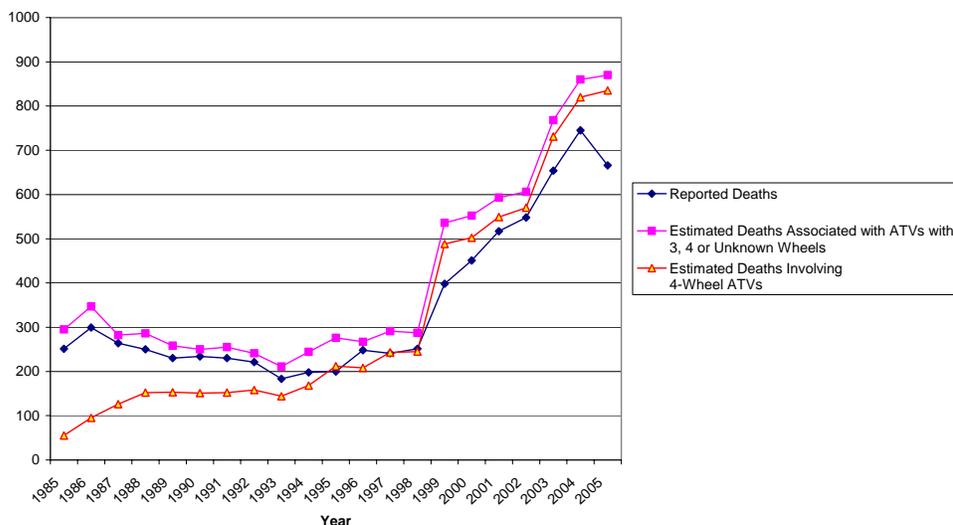
Following passage of SB101, OPRD contracted with OSU to develop a safety training curriculum to prepare Oregon ATV users to obtain permits to ride for recreational purposes on public lands. As a preliminary step in laying the foundation for curriculum development, the research team revisited national and Oregon-specific data to determine what, if anything, had changed since the 2006 study¹. The research team reviewed the most current death and injury data from the Consumer Product Safety Commission (CPSC), as well as information gathered from sources within Oregon, to compile a picture of the current ATV death and injury statistics.

Additionally, the research team conducted interviews and surveyed law enforcement agencies, OPRD personnel, the United States Forest Service (USFS) and Bureau of Land Management (BLM) for additional input on specific Class I and III ATV safety issues. The research team made efforts to gather input from rangers and law enforcement personnel from all areas of the state in order to develop a broad perspective of the ATV safety problem. The findings follow.

Class I and Class III ATV Safety Issues Revealed by Accident Data

The 2006 assessment found ATV-related deaths (Class I) on the rise, and that trend persists, as shown in Table 1. Although the CPSC continues to collect data on deaths and injuries for the years 2003–2006, preliminary numbers and the associated estimates indicate a steady increase in ATV-related deaths and injuries nationally (2005 numbers are not complete).

Table 1
CPSC Annual Estimates of Class I ATV-Related Fatalities 1985-2005,
 Based on Fatality Data Available as of December 31, 2006

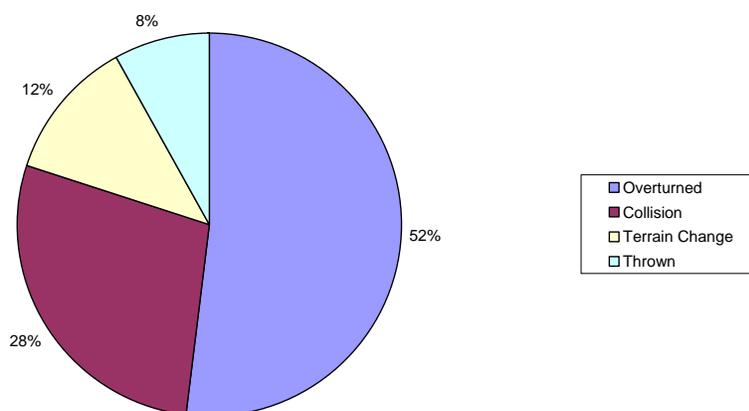


¹ Assessment of State of Oregon Off-Highway Vehicle Safety Program; June 12, 2006; Oregon State University for Oregon Parks and Recreation Department

The Oregonian, during the period of May 11–16, 2007, published a four-part series on Class I ATV accidents, injuries and death.² The series highlighted the persistent problem in ATV crashes, and featured a description of each ATV-related death in Oregon and southwest Washington from January 2004 to May 3, 2007. The *Oregonian* report shows a continued problem with deaths and injuries involving children on full-sized Class I ATVs. This trend is confirmed by the CPSC data gathered from death certificates, showing that 80% of ATV-related deaths of children under age 16 involved collisions or the ATV overturning. Oregon-specific data collected by the research team support the CPSC's conclusions, matching the national statistics for the under-16 age group.

The 2006 Assessment recommended for OPRD to prescribe clear, realistic, and enforceable size/fit requirements for youths on Class I ATVs. This recommendation is further supported in these data.

Table 2
OREGON CLASS I ATV-RELATED DEATHS BY TOP INCIDENT TYPE
<16 AGE GROUP
1/1/82 - 12/31/04

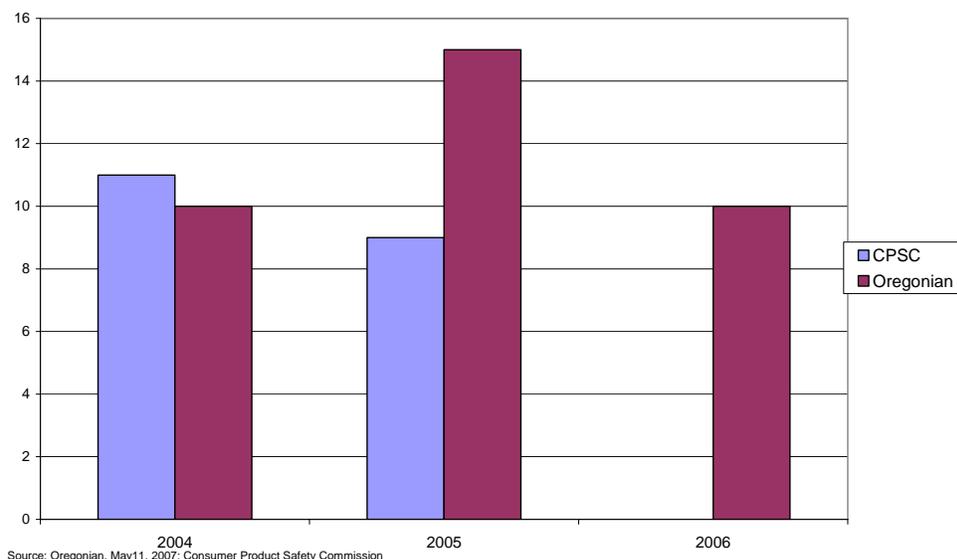


Source: U.S. Consumer Product Safety Commission, OPRD

The research team found the *Oregonian* reports to be more comprehensive, timely and accurate than CPSC, as shown in Table 3 comparing CPSC and *Oregonian* data. The differences are due to the length of time it takes CPSC to get the data. The research team encourages OPRD to develop a comprehensive crash reporting system whereby accurate and timely information can be obtained and evaluated. (See Appendix A, CPSC 2006 Annual Report of Class I ATV-Related Deaths and Injuries.)

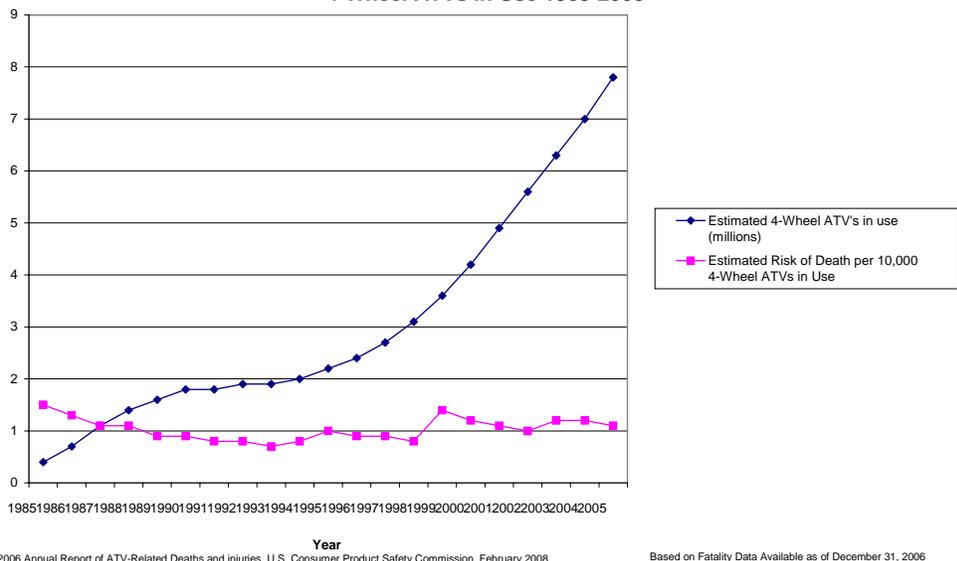
² *The Oregonian*, Manning, Walth and Goldsmith, May 11–16, 2007
<http://blog.oregonlive.com/oregonianatv/>

Table 3
Oregon CLASS I ATV-Related Deaths 2004-2006

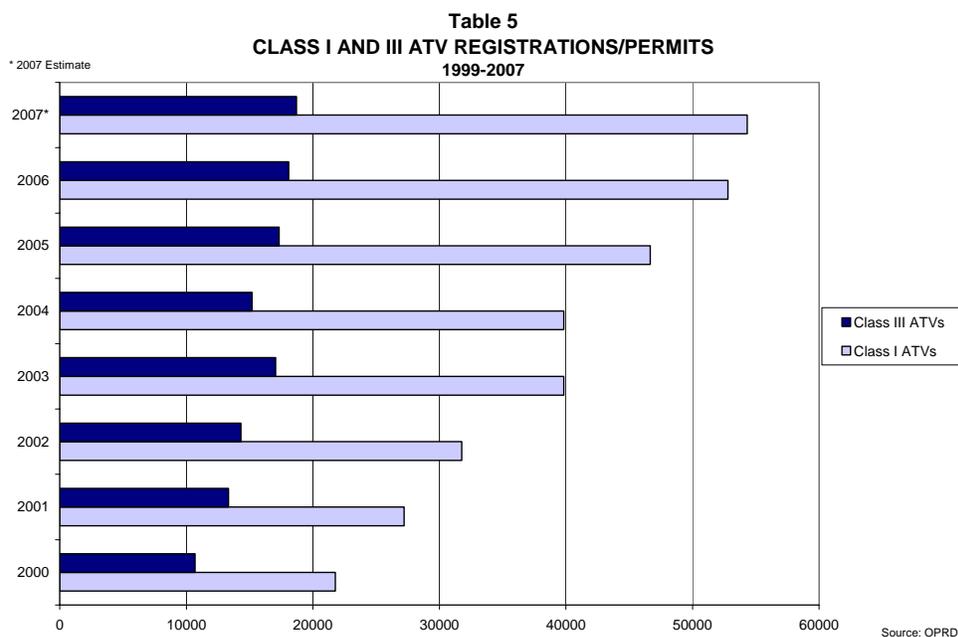


ATV popularity continues to grow, as shown in Table 4. Also shown are the CPSC ATV-usage data, which indicate that the estimated risk of death per 10,000 4-wheel ATVs in use fell slightly from 2004 to 2005 (from 1.2 deaths per 10,000 to 1.1 deaths per 10,000 in the preliminary data).

Table 4
CPSC Annual Estimates of Class I ATV Use and Risk of Death per 10,000 4-Wheel ATVs in Use 1985-2005



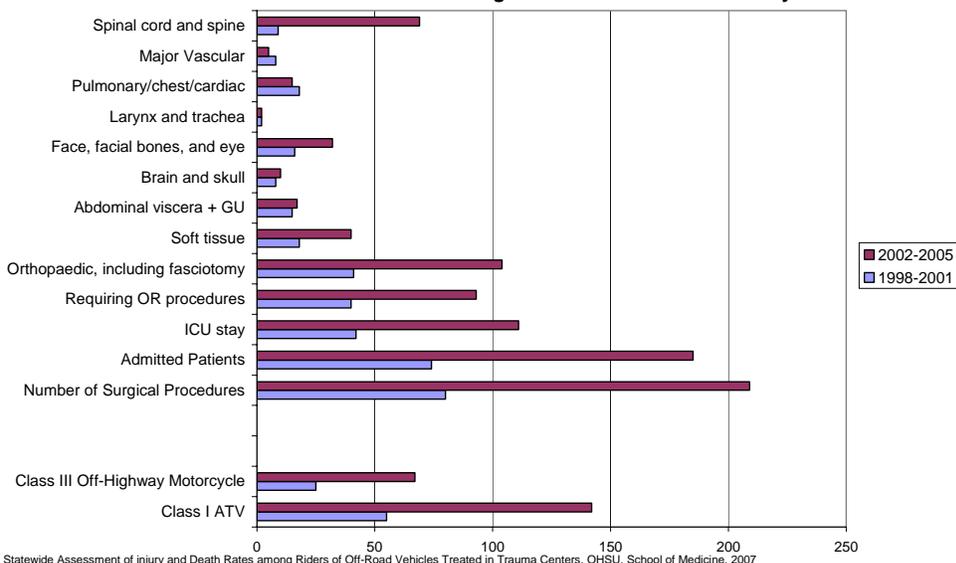
The rising rates of injuries and death are mirrored in the growth in Class I and III ATV registrations and permits, as reported by OPRD and shown in Table 5. Note the recent growth in Class I sales outpace Class III sales by almost 3 to 1.



The Oregon Health & Science University, School of Medicine, in a report published by the American College of Surgeons in 2007³, cites an alarming increase in the number of both ATV and off-highway motorcycle riders requiring treatment in Oregon’s trauma centers. The trauma center data indicate that the number of ATV-related injuries in Oregon more than doubled during the time periods that were studied. The report concludes, “*Surgeons need to join a coalition of health care providers, citizens and public officials to implement a comprehensive injury-prevention response to this epidemic.*” Table 6 provides a comparison of OHSU patients injured in ATV (Class I) and off-highway motorcycle (Class III) crashes during the periods 1998–2001 and 2002–2005. Note ATV injuries lead off-highway motorcycles by more than 2 to 1 (See Appendix B, Statewide Assessment of Injury and Death Rates among Riders of Off-Road Vehicles Treated at Trauma Centers.)

³ Statewide Assessment of Injury and Death Rates among Riders of Off-Road Vehicles Treated at Trauma Centers, Mullins, Brand, Lenfesty, Newgard, Hedges, Ham, Oregon Health & Science University, School of Medicine, Portland, Oregon

Table 6
Early and Later Years Comparison of Patients Injured in
Off-Road Vehicles Treated at Oregon Health Sciences University



Summary

This statistical information shows that the number of ATV-related accidents and injuries is continuing to increase over time. Although the CPSC ATV-usage data indicate that the estimated risk of death per 10,000 4-wheel ATVs in use fell slightly from 2004 to 2005 (from 1.2 deaths per 10,000 to 1.1 deaths per 10,000 in the preliminary data), the death and injury toll is trending steadily upward.

Overturns and collisions continue to predominate as the cause of Class I ATV-related deaths among the under-16 age group. Additionally, the number of incidents involving children on adult-sized ATVs continues to be of concern (see Table 2). The 2006 assessment report called for OPRD to prescribe clear, realistic, and enforceable size/fit requirements for youths on ATVs. That recommendation remains valid today.

Injuries sustained from crashes involving ATVs and off-highway motorcycles that are treated in Oregon trauma centers have more than doubled during the period from 1998–2001 to 2002–2005.

Class I and Class III ATV Safety Issues

The 2006 assessment identified Class I and III ATV safety issues among law enforcement and public land managers. This report reviews those findings and surveys the law enforcement and public land manager communities to identify safety status and to examine emerging safety and use trends.

In 2006, law enforcement and public land managers cited excessive speed, lack of helmets and inexperience/lack of training as the top three safety issues affecting ATV use. All respondents shared the opinion that awareness, education and enforcement were the best means of effecting safe ATV use.

In developing up-to-date information for the 2008 curriculum development project, the research team created a list of questions specifically for law enforcement personnel and public land managers (see Appendix C, Law Enforcement Questions). The questions were oriented toward discovering enforcement issues, recordkeeping issues and OHV safety issues. OSU's Steve Garets attended the two-day ATV Grant Workshop on January 23 and 24, 2008, at the Oregon State Fairgrounds and conducted focus groups with the law enforcement personnel and public land managers who attended (see Appendix D, ATV Grant Workshop Attendees and Minutes).

Following the January meetings, the research team conducted an e-mail survey of selected workshop attendees. Additionally, the research team expanded the list of individuals who were sent e-mail surveys in order to ensure that law enforcement officers and public land managers from all areas of the state had the opportunity to provide input (see Appendix E, Law Enforcement Contacts).

In order to further inform the research team regarding ATV and off-highway motorcycle-related management and enforcement issues and to compare management and safety issues with similar recreation areas outside Oregon, project coordinator Bob Reichenberg interviewed the following public land managers and law enforcement representatives:

- Andy Zilke, District Superintendent,
Oceano Dunes State Vehicle Recreation Area (SVRA), California
- Reynaldo Monge, Assistant Superintendent,
Oceano Dunes SVRA, California
- Bill Finch, Medford BLM

Oceano Dunes, formerly Pismo Dunes, is located on the California Central Coast and hosts nearly two million visitors per year. The officers who patrol this area investigate about 300 accidents per year.

A telephone interview was conducted with Bill Finch, currently with the Medford BLM office. Mr. Finch formerly patrolled Imperial Dunes, a BLM ATV recreation area in Southern California near El Centro. He was able to provide information relative to the issues he encountered at that dunes area. He also informed the research team about issues regarding ATV and off-highway motorcycle use in the Medford area.

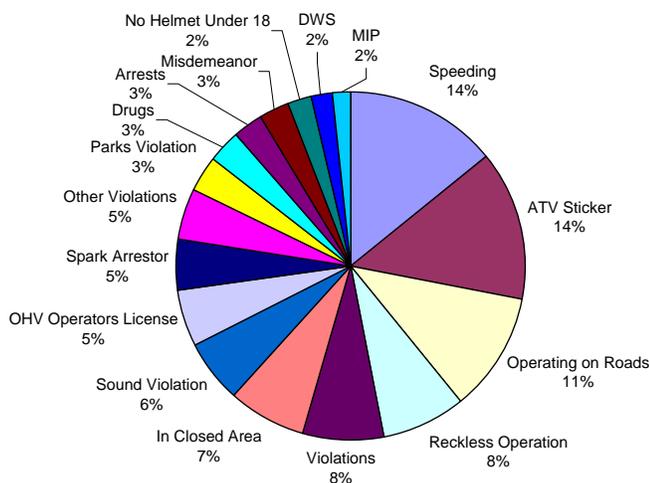
The input received as a result of the focus groups, surveys and interviews revealed many common elements in ATV crashes. It also revealed several area and terrain-specific problems that should be considered in developing the ATV Safety Program.

The common elements cited in the majority of ATV crashes investigated by our respondents were:

- Too much speed for conditions – “overspeed,” “too much speed for sight distance,” “reckless and careless operation”
- Lack of proper safety gear
- Operating on roadways
- Carrying passenger on single-person vehicles
- Operating under the influence of alcohol and/or drugs
- Youth operating full-size ATVs
- Unfamiliar with surroundings

A summary of violations from the Law Enforcement Reports submitted monthly to OPRD (Table 7) clearly indicates a lack of rider awareness and accountability as major factors. The predominant violations that are cited include: speeding, reckless and careless operation, operating on roadways, lack of flags and lack of ATV permits.

Table 7
Summary of OPRD Law Enforcement Reports 2005-2007
All Violations >1%



Source: OPRD Law Enforcement Report: Summary Terrain Types - Sand, Desert, Forest

Interviews, input from respondents and the research team’s survey of news articles indicate that rider attitudes toward safe behaviors underlie most accidents. In dunes areas, the safety problem is exacerbated when large numbers of ATVs operate in restricted areas such as Oregon’s Sand Lake Recreation Area and California’s Oceano Dunes and Imperial Dunes Recreation Areas. Safety and law enforcement issues seemed quite consistent between the Oregon Dunes and other similar recreation areas. (See Appendix F, Safety and Law Enforcement Comments)

Summary

The data continue to point to irresponsible/irrational behaviors of ATV operators as the predominant cause of ATV-related deaths and injuries. Too much speed for conditions and overriding sight lines are cited as major causes of deaths in the dunes areas and on forest service roads. Exhibition riding, arrogant attitudes and a “party atmosphere” seem to be more of a problem in the dunes areas than in other types of terrain.

Information provided to the research team from feedback from ATV Grant workshops, interview and surveys consistently points to accident factors that relate to attitudes, awareness and accountability rather than lack of basic riding skill sets. Careless and reckless operation, not applying good judgment, being unaware of the riding environment and risks, arrogance and false sense of security are the common themes.

Conclusions

A lack of basic skills obviously has some part in the ATV-related deaths and injuries among those operators in the under-16 age group. It appears, however, from the data collected by the research team, that lack of adult supervision and rider responsibility, along with the use of adult-size ATVs, are the major causes of ATV-related deaths and injuries among youths. Active involvement of the user community in support of training and education is necessary to effectively treat this population.

Further, the preponderance of data points to risk taking attitudes/practices (speed, overriding sight lines, reckless operation, riding on public roads), lack of accountability, and lack of awareness as the primary factors in deaths and accidents among older ATV operators. The on-line training curriculum should focus on strongly reinforcing these themes.

Recommendations

The research team strongly recommends that the training program be developed with the aim of creating a shift in attitudes and accountability among ATV operators. The program must also create an awareness of safety issues within the ATV community and heavily involve the ATV community in the safety effort. No training program that focuses only on basic skills can have a significant affect on the problems that have been revealed in this study.

- Target the on-line training toward developing safe, responsible riding behaviors.
- Incorporate land-use and environmental issues into the material to reinforce responsible riding behaviors.

- Investigate adopting the Minnesota program model for hands-on training with heavy involvement of ATV clubs, volunteer instructors and Trail Ambassadors to support the goals of the safety effort.
- Integrate the on-line (Web-based) training and the hands-on component to provide consistent treatment of topics and safe riding principles.
- Develop youth size/fit guidelines.

DETERMINE BEST PRACTICES IN ATV SAFETY EDUCATION

As a preliminary step in curriculum development, the research team revisited national and international data to determine what curriculum changes have been made in known programs over the past two years. The research team also conducted a renewed search to determine what new programs may have emerged since the 2006 study.

Training providers within the ATV community were queried for information and for referrals to additional contacts in the field. Additionally, the research team contacted educators, educational researchers and curriculum developers to gather information about the current best practices in training and education. Based on preliminary information and the data from the 2006 study, the research team made a special effort to reach out to researchers and educators who are involved in efforts to change human behaviors, attitudes and perceptions through education and training.

Conduct a Survey of ATV and Off-Highway Motorcycle Education and Training Practices

In developing up-to-date information for the 2008 curriculum development project, the research team created a list of questions specifically for ATV trainers and training programs (see Appendix G, Interview Questions for Best Practices in Training). The questions were oriented toward discovering the factors that guided development of the curricula and/or revisions; whether attempts have been made to affect attitudes and perceptions; if any attempts have been made to evaluate the effectiveness of the training effort.

The research team contacted the five state ATV safety programs that were highlighted in the 2006 assessment report: Maine, Minnesota, North Dakota, Utah and Wisconsin. Additionally, the research team sent the questionnaire to the Canada Safety Council.

Project coordinator Bob Reichenberg conducted telephone interviews with ATV Safety Institute (ASI) Vice-President Tom Yeager and with MariAnn Koloszar of the Oregon State Marine Board.

The questionnaire was also sent by e-mail to a number of private off-highway motorcycle training programs and to known experts in the ATV/off-highway motorcycle field (see Appendix H, ATV and off-highway motorcycle Contacts).

Replies to the survey are as follows:

ATV Safety Institute

According to ATV Safety Institute (ASI) Vice-President Tom Yeager, no revisions have been made to the ASI curricula in the past two years. The ATV manufacturers have made no effort to evaluate the effectiveness of the program. According to Mr. Yeager,

ASI records show 30 active employees (ATV instructors) in Oregon. A total of 73 instructors are listed, but the additional 43 individuals are assumed to be employees of state or national agencies who conduct training only for agency personnel.

ASI records claim a total of 1,712 individuals were trained in Oregon in 2006 and an additional 1,705 were trained in 2007. Records provided by OPRD indicate that 283 individuals were trained in 2006 and an additional 213 were trained in 2007. The research team has no means of resolving the discrepancy in these totals.

MSF DirtBike School

ASI Vice-President Tom Yeager said that to his knowledge there have been no changes or revisions to the Motorcycle Safety Foundation (MSF) curricula in the past two years. MSF records show a total of 11 employees (DirtBike instructors) in Oregon. A total of 15 instructors are listed, but the additional 4 individuals are assumed to be employees of state or federal agencies who conduct training only for agency personnel.

MSF records claim a total of 208 individuals were trained in Oregon in 2006 and an additional 180 were trained in 2007. OPRD was unable to provide the research team with off-highway motorcycle training numbers.

Maine

No information has been received from the Maine Department of Inland Fisheries and Wildlife.

Minnesota

The Minnesota program, which the research team recommended as an example of best practices in ATV training in 2006, has undergone major revisions (see Appendix I, Minnesota Training Materials). The research team's review of the materials indicates, however, that the basic approach to training has not changed since the 2006 version.

North Dakota

No information has been received from North Dakota.

Utah

According to Ann Evans, OHV Education Specialist, Utah is presently revising their ATV training program. They plan to move to a classroom-only program to expand the scope and market penetration of ATV training. There are also plans to coordinate with other western states to produce an ATV safety video. Ms. Evans will be contacting John Lane regarding this cooperative venture. In 2007, Utah passed legislation requiring supervision for those riders under the age of 18 who do not have a driver's license.

Wisconsin

Gary Eddy, Snowmobile and ATV Administrator for the Wisconsin Department of Natural Resources, reported that the program is currently working with Kalkomey

Enterprises to revise their ATV student manual. Wisconsin is working toward a Web-based study and testing program based on the Kalkomey student manual. The department plans to have the online program operational by April.

Canada Safety Council

The Canada Safety Council (CSC) continues to approve the ASI program for hands-on ATV training. We have not been able to determine at this point whether the CSC has attempted to produce another ATV awareness CD since *Ride Like a Pro* was released (See Appendix 18 of the 2006 study).

Oregon State Marine Board

A telephone interview with MariAnn Koloszar confirmed that the Marine Board has not conducted an evaluation of program effectiveness. Anecdotal information and a lower rate of boater fatalities along with a lower number of alcohol-related citations indicate that the program may be having a positive effect but is difficult to measure due to lack of detailed records and data. This program is currently in its sixth year of implementation and approximately 189,000 Boater Education Cards have been issued.

Summary

It is clear from information gathered by the research team that little has changed in the ATV/off-highway motorcycle training community since the 2006 assessment. The availability of ASI and MSF training in Oregon has not increased. The number of instructors is essentially static and training numbers have not increased significantly.

Although some other state ATV/off-highway motorcycle safety programs have made revisions to their training materials or are in the process of making revisions, there has not yet been any effort to evaluate program effectiveness. No known programs have made significant efforts to affect rider attitudes, perceptions or accountability.

Techniques for delivering ATV/off-highway motorcycle safety training have not changed even though the statistics indicate that the current approaches have not been effective

Conduct a General Survey of Current Education and Training Practices

In collecting up-to-date information for the 2008 curriculum development project, the research team created a list of questions specifically for the education and training community (see Appendix J, Interview Questions for Best Practices in Educational Technology and Curriculum Development). The questions were oriented toward discovering research and training techniques to guide development of the OPRD ATV Training curricula. The questions focus on resources and techniques for improving perception, improving decision-making skills and changing attitudes.

The research team contacted individuals and organizations that were discovered through Web searches, interviews and professional referrals (see Appendix K, Contacts for Education and Training Survey).

Information gathering is ongoing for this portion of the project. Many of the individuals and organizations who were contacted have requested additional time to complete the survey. Several of the contacts provided further referrals that are being followed at this time.

One time-proven model for instructional design that was recommended to the team is the U.S. Military's Inter-service Procedures for Instructional Systems Development (ISD). This model has been in use for over 25 years and is utilized by many institutions other than the military. Although there are many approaches to the process, the basic model is simple to understand and easy to use. Essentially, it is a series of systematic steps that lead to producing a successful training program.

Most ISD approaches contain five major phases (see Table 8)⁴. The first four phases (analysis, design, development and implementation) generally occur in sequence. Information gathered in one phase informs the development of the following phase. The fifth phase, evaluation, applies continuous feedback throughout the model.

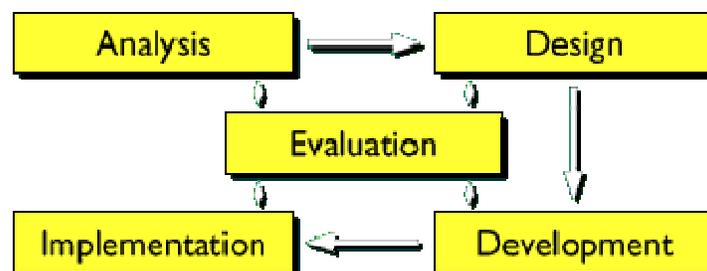


Table 8. The Instructional Systems Development (ISD) model

⁴ Clark, D. R. (2004), Instructional System Design Concept Map. Retrieved March 1, 2008 from <http://nwlink.com/~donclark/hrd/ahold/isd.html>

It is critical to the success of the program(s) that the evaluation process be continuous. This applies during the development process as well as after implementation to assure that the program objectives are being met.

The partial information that the research team has received to date indicates that many entities are becoming aware of the need for training programs to address operator perceptions and attitudes. It is clear, however, that initiatives to design such materials are still in their infancy.

All of the information received so far indicates the need for new approaches to making training effective. Today's training audience has grown up with technology in their personal lives. They want and expect to use technology to get information, communicate and solve problems. The Internet is the biggest influence in our lives. It has shrunk the world in which we live.

Video and television have trained our minds to perceive and interpret information quickly and be ready to absorb the next piece of information. Even outside of television and video, the presentation of commercial products moves at an unprecedented pace.

Computer games are becoming a highly visible topic of educational research. Their power rests in their interactive nature and their ability to engage and absorb the audience. The best games create a state of mind characterized by deep focus, high levels of creativity, and emotional engagement. These states are highly desirable conditions for deep learning.

Contrary to common perceptions of games as trivial, abstract, and purely for entertainment, instructional games can be designed to recreate a realistic and complex performance environment, incorporating cognitive, physical, and emotional demands.

Taking ATV and Off-Road Training to the next level requires us to recognize how brain research is pointing the way to how people learn. Visual research is laying the foundation for new and effective ways to teach riders to recognize hazards. Technology has shown that people are bombarded with information but have the ability to absorb information quickly. Gaming instruction is leading the way to creating educational programs that keep students engaged and focused. They also can provide repetition to form and develop good habits and attitudes.

Summary

The information the research team has received to date indicates the following:

- The U.S. Military's Inter-service Procedures for Instructional Systems Development (ISD) model is a time-tested system for instructional design. This could be a valuable model in assisting the development process.

- While training alone can affect behaviors, it is important to note that affecting attitudes over time will require a comprehensive effort. Motivational campaigns, strict enforcement of laws and regulations, appeals to personal morality and ethics and strong stakeholder involvement in the process are all critical elements.
- Few entities have attempted to measure the effectiveness of any kind of training. This is seen as a critical weakness in applied training systems.
- For perception training, modern computer technology provides an opportunity for trainers to simulate the situations in which their students must eventually perform.
- Gaming technology should be explored as a potentially rich environment for effective training.
- Web-based technologies are only as good as the content that is designed. As one respondent so aptly stated, "We can distribute bad instruction more effectively and efficiently than ever before."

Conclusions

Based on information received by the research team, it is evident that skills training alone cannot have the desired effect of reducing OHV deaths and injuries. Hands-on training for OHVs is, in general, the easiest kind of training to design and deliver, but it's not been proven effective in reaching the masses. This report and the 2006 Assessment show that the lack of basic skills training does not appear to be a prominent factor in ATV-related deaths and injuries.

- The research team should continue to investigate approaches and methods for delivering training that can affect operator attitudes and perceptions.
- Some of the most potentially effective training technologies lie in the field of computer gaming.
- The training program should focus heavily on instilling positive operator attitudes toward safe ATV operation.
- The program must include ongoing evaluation of the safety training effort.

Recommendations

- Following completion of the online component, investigate and develop an interactive curriculum design.

- Explore the application of computer gaming technology to the Web-based interactive training, especially for youth.
- The ATV community must be heavily involved in supporting the safety training effort. The program cannot be successful without a supportive culture of safety and responsibility that the ATV community can provide.
- The program must adopt a comprehensive approach to involving OPRD, law enforcement, public land managers and the entire ATV community in the safety training effort.
- Develop a method for evaluating the effectiveness of the safety program.