

**Report on Off-Road Vehicle Incidents including All-Terrain  
Vehicles**

**In The State of Maryland**



**The Maryland Institute for Emergency Medical Services Systems  
(MIEMSS)**

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## Executive Summary

The 2007 Joint Chairmen's Report requested that MIEMSS "...report...on the number of off-road vehicle accidents in Maryland, including a break-out for accidents specifically related to all-terrain vehicles, that resulted in emergency room, hospital and trauma center visits, the extent to which those visits involve children, the State costs associated with such injuries, and recommendations to reduce the incidence of such injuries including a review of policies in other states." The request for the report grew out of proposed 2007 legislation (HB 261/SB 482) that required ATV operators and passengers under age 16 to wear a helmet; the House bill received an unfavorable report in committee, and the Senate bill was withdrawn.

Background: Off-road vehicles are motorized vehicles intended for use on different types of unpaved terrain and other off-highway / off-road surfaces. All-terrain vehicles (ATVs) are off-road vehicles that are designed to travel on four low-pressure tires; ATVs have a seat for the operator to sit or straddle and handlebars for steering. During the 1980's, there were increasing numbers of injuries and deaths reported nationwide that were associated with ATVs. These concerns led to a 10-year consent decree that required ATV distributors in the U.S. to address certain safety issues; the agreement expired in 1998. During the ten-year consent-decree period, there was a reduction in the rate of ATV-related injury and death throughout the U.S. Since the end of the consent-decree period, however, the medical literature has reported escalating numbers of ATV-related injuries and deaths, and increased risk of death and injury for children and adolescents.

Maryland's Current Law. The Department of Natural Resources (DNR) regulates the operation of ATVs on DNR-controlled state land; ATV operation on non-DNR land is not currently addressed in Maryland's statutes or regulations. ATV use on state forest land requires DNR registration and a permit. ATV operators and passengers on DNR land are required to wear helmets and operators are required to wear eye protection. ATV operators on state land are to have a: 1) drivers license; or 2) learners permit and be with licensed driver; operators who are children  $\geq 12$  years of age must be with parent / guardian who has a valid driver's license. To date, DNR reports issuing 2,584 permits during CY07.

Injuries / Deaths in Maryland. According to Maryland death certificate data, there have been 12 deaths during CY01 – CY06 period that were associated with ATV related crashes. Deaths under age 16 were a 9-year old who was riding as an ATV passenger and a 13 year old ATV driver. During 2007 to date, three children in Maryland have died in ATV-associated incidents: a 12-year old, an 8-year old and a 2-year old. The Health Services Cost Review Commission outpatient data set indicates that during the CY01 – CY06 period, over 9,000 individuals were treated and released in Maryland hospital emergency departments for injuries sustained from off-road vehicles (which includes ATVs); approximately one-third of these outpatients were aged 15 or less. HSCRC inpatient data set shows that an additional 1,027 patients were treated in the emergency department and admitted to the hospital during the CY01 – CY06 period; one-quarter of these patients were aged 15 or less. The Maryland State Trauma Registry data indicates that during CY01 – CY05, there were 911 patients with ATV-related injuries who were treated in Maryland trauma centers. Of the trauma center patients where helmet / no helmet use was known, approximately 2/3 of the patients were not wearing a helmet at the time of the incident.

State Laws. Regarding state ATV laws, 42 states (including Maryland) have some ATV registration, equipment and / or operator requirements. Five (5) states currently have no ATV registration, equipment or operator requirements; two (2) states only require ATV registration, and one (1) state requires only that ATVs be equipped with a muffler. Most states have specific requirements for ATVs to be equipped with certain features (e.g., lights, muffler). Thirty-three (33) states identify some age limitations on ATV operation, at least on public land / parks. Twenty-one (21) states require safety education / rider education courses for certain types of ATV operators. Thirty-two (32) states have some sort of helmet requirement for ATV operators, passengers or both. Eight (8) states require eye protection such as goggles or protective glasses for ATV use. North Carolina is the first state to revise their laws in accordance with the Model State ATV Legislation (see below).

MIEMSS Recommendations to Reduce the Incidence of ATV-Related Injuries. There are “...unreasonable risks of injury and death associated with all terrain vehicles...”<sup>1</sup> and the risks are higher for children and adolescents. An ATV Safety Task Force, comprised of interested parties, should be convened to develop a consensus approach for possible changes in Maryland laws that may help reduce the risks associated with ATVs. As a starting point, the Task Force should review the Model State ATV Legislation developed by the Specialty Vehicle Institute of American, an ATV-industry trade association. Potential actions that may help mitigate such risks include:

- (1) implementing registration requirements for ATVs that would permit accurate tracking of the number of ATVs owned in Maryland and provide a focal point for dissemination of safety materials to ATV owners;
- (2) requiring ATV owners and operators to meet certain safety standards, e.g., completion of nationally recognized training and safety education courses;
- (3) making more broadly applicable the requirements for ATV operation that are currently limited to DNR-regulated land;
- (4) restricting or limiting ATV use among certain age groups, e.g., restricting adult-sized ATV to those at least 16 years of age;
- (5) requiring uniform recordkeeping and reporting of ATV-related injuries; and
- (6) public awareness efforts to improve knowledge of the risks associated with ATV operation, and, in particular, of the dangers to children and adolescents.

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<sup>1</sup> Consumer Product Safety Commission . Standards for All Terrain Vehicles and Ban of Three-Wheeled All Terrain Vehicles; Notice of Proposed Rulemaking. 71 Federal Register 154, pp. 45903-45962, August 10, 2006.

## **Introduction**

During the 2007 Session of the Maryland General Assembly, two bills were introduced specific to all-terrain vehicle (ATV) operators and passengers. House Bill 261 “Motor Vehicles – All Terrain Vehicles – Helmet Requirement” proposed to amend the Transportation Article to add a section defining ATVs and to require (ATV) operators and passengers under age 16 to wear a helmet that met the Motor Vehicle Administration’s requirements for motorcycle helmets. HB 261 received an unfavorable report in committee, and the cross-filed Senate version of the bill (SB 482) was withdrawn.

Subsequently, the 2007 Joint Chairmen’s Report requested that MIEMSS “...report...on the number of off-road vehicle accidents in Maryland, including a break-out for accidents specifically related to all-terrain vehicles, that resulted in emergency room, hospital and trauma center visits, the extent to which those visits involve children, the State costs associated with such injuries, and recommendations to reduce the incidence of such injuries including a review of policies in other states.” This report is responsive to that request.

## All Terrain Vehicle Background and History

Off-road vehicles are motorized vehicles intended for use on different types of unpaved terrain and other off-highway / off-road surfaces. All terrain vehicles (ATVs) are off-road vehicles that are designed to travel on four low-pressure tires; ATVs have a seat for the operator to sit or straddle and handlebars for steering. Certain ATVs are designed for use by one operator with no passenger, while others are designed to be used by one operator and one passenger in a configuration where the passenger straddles a seat behind the operator. ATVs also come in varying sizes and with varying engine sizes. Adult-size ATVs with engines over 90 cubic centimeters (“cc”) can reach speeds over 60 mph and weigh hundreds of pounds<sup>2</sup>. According to the Specialty Vehicle Association of America, a non-profit trade association sponsored by the ATV industry, the ATV industry has recommended the size of the ATV be suited to the age of the rider: only individuals age 16 and older should be allowed to ride ATVs with engines over 90 cubic centimeters (“cc”), and youths younger than that age should be limited to ATVs with smaller engines.<sup>3</sup> ATVs can cost upwards of \$2,000. A 2004 survey indicated a median suggested retail price was about \$5,000 for adult ATVs and \$2,300 for youth ATVs; internet sales of non-U.S. distributors indicate average prices of \$1,340 for adult ATVs and \$630 for youth-sized ATVs<sup>4</sup>.

ATVs were first marketed in the U.S. in the early 1970’s and became popular for recreational and occupational (e.g., farming; construction) use.<sup>5</sup> During the 1980’s, concern grew about the safety of ATVs because of increasing injuries and deaths nationwide. At the urging of the Consumer Product Safety Commission (CPSC), the Department of Justice (DOJ) filed suit against major ATV distributors in 1987, alleging that: (1) although ATVs appeared to be relatively safe, in reality, they were complex machines that required a high degree of skill for safe operation; (2) the ATV industry failed to warn potential ATV users about the hazards associated with ATVs; and (3) as a result, young and inexperienced drivers had a high risk of injury. In 1988, final consent decrees between DOJ and five ATV distributors were approved<sup>6,7</sup>.<sup>8</sup> The consent decrees included agreements that the ATV industry would:

- Stop the sale of new 3-wheeled ATVs. Three-wheeled ATVs were found to have less lateral stability which resulted in a significantly higher injury risk.
- Implement a nationwide rider’s safety program. Because of a statistical finding that inexperienced drivers had a significantly higher risk of injury than more experienced drivers,

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<sup>2</sup> See <http://www.atvsafety.gov>

<sup>3</sup> Specialty Vehicle Institute of America. Special Report November 2006. Irvine, CA.

<sup>4</sup> Consumer Product Safety Commission. Standards for All Terrain Vehicles and Ban of Three-Wheeled All Terrain Vehicles; Notice of Proposed Rulemaking. 71 Federal Register 154, pp. 45903-45962, August 10, 2006.

<sup>5</sup> According to the Specialty Vehicle Institute of America, there are more than 7 million ATVs in the U.S. Specialty Vehicle Institute of America. Special Report Summer 2007. Irvine, CA.

<sup>6</sup> U.S. v. American Honda Motor Co., Inc., Yamaha Motor Corp., USA, U.S. Suzuki Motor Corp, Kawasaki Motors Corp, USA, et al. Civil Action 87-3525. U.S. District Court for the District of Columbia. Final Consent Decree. April 28, 1988.

<sup>7</sup> U.S. v. Polaris Industries, L.P, et al. Civil Action 87-3525. U.S. District Court for the District of Columbia, Final Consent Decree. April 28, 1988.

<sup>8</sup> Rodgers GB. All-Terrain Vehicle Injury Risks and the Effects of Regulation. *Accid. Anal. & Prev.* 25(3), pp. 335-346, 1993.

buyers of new ATVs and their immediate family members were offered free training; a financial inducement of \$50 cash or a \$100 savings bond was offered to buyers who took the free training.

- Develop voluntary standards to make ATVs safer. Safety standards included configuration requirements (e.g., control switches; mechanical suspension systems), speed limitations for youth models with engines less than 90 cubic centimeters (“cc”), parking brakes, and some stability requirements.
- Implement more stringent age recommendations. The ATV industry agreed to affirmatively represent that (1) ATVs with engine sizes of 70 cc up to and including 90 cc should be used only by those aged 12 and older; and (2) ATVs with engine sizes of 90 cc or greater should be used only by those at least 16 years of age.
- Implement a multimillion dollar public awareness campaign and provide extensive safety warnings to past and future ATV buyers. These included vehicle warning labels, warnings in owner manuals, direct mail warnings sent to ATV buyers, and a media safety awareness campaign.

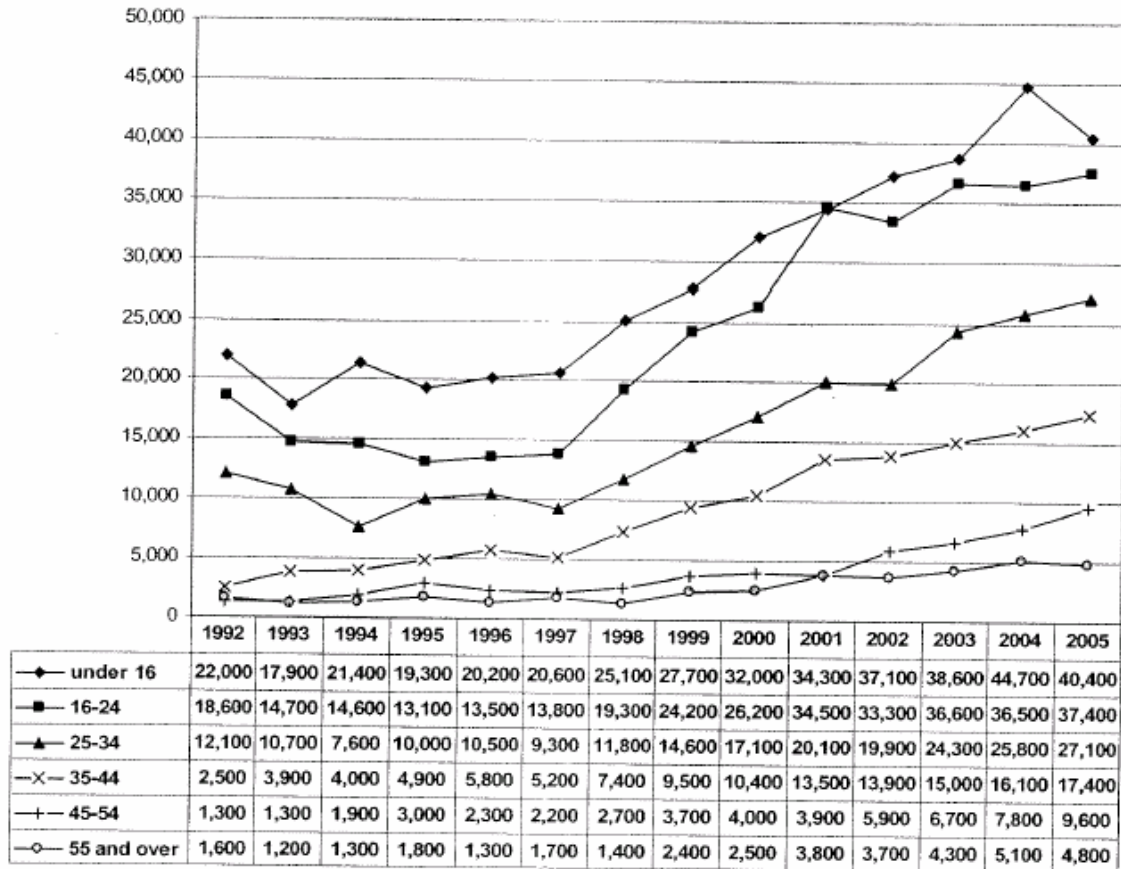
The consent agreement remained in effect for ten years; it expired on April 28, 1998, although five distributors and two others agreed to continue most of the consent decree elements through voluntary actions. During the ten-year consent-decree period, there was a general reduction in the rate of injury and death throughout the U.S. Since the expiration of the consent decree, however, nationally, there has been an increase in ATV-associated injuries and deaths. Between 1998 to 2005, the estimated national number of deaths associated with ATVs increased about 86% and estimated nonfatal injuries requiring ED treatment increased more than 60%; of the deaths, 26% were under 16 years of age.<sup>9, 10</sup> Figure 1 reproduces a Consumer Product Safety Commission table showing national annual data by age group for ATV-related injuries treated in hospital emergency rooms since 1992.

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<sup>9</sup> Consumer Product Safety Commission. 2005 Annual Report of All-Terrain Vehicle (ATV)-Related Deaths and Injuries / Amended. Washington, D.C. March 8, 2007.

<sup>10</sup> Consumer Product Safety Commission. Consumer Product Safety Review. Pp. 5 – 7. Spring 2007.

Figure 1: Annual ATV-Related National Injury Estimates  
 ATVs with 3, 4 or Unknown Number of Wheels  
 1992-2005<sup>11</sup>



Source: National Electronic Injury Surveillance System, U.S. Consumer Product Safety Commission.  
 Columns may not add to annual totals due to rounding.

Also since the end of the consent-decree period, the medical literature has reported escalating numbers of ATV-related injuries and deaths<sup>12 13</sup>, and increased risk of death and injury for children and adolescents<sup>14 15 16 17</sup>. One national study estimated that ATV drivers aged 15 or

<sup>11</sup> Consumer Product Safety Commission, Division of Hazard Analysis. 2005 Annual Report of ATV Deaths and Injuries Amended. Released November 2006; amended February 2007. Washington, D.C. Injury estimates are generated from CPSC's National Electronic Injury Surveillance System, a probability sample of US hospitals with 24-hour emergency rooms and more than six beds. The same report indicates that from 1982 – 2005, Maryland had a total of 53 ATV-related deaths to the CPSC.

<sup>12</sup> Phrampus, ED, Shultz BL, Saladino RA. Injuries Associated with All-terrain vehicles: A new epidemic. *Clinical Pediatric Emergency Medicine*. 6, 2005, pp. 57 - 61.

<sup>13</sup> Fonseca AH, Ochsner MG, Bromberg WJ, Gantt, D. All-terrain Vehicle Injuries: Are they dangerous? A 6-year experience at a Level I trauma center after legislative regulations expired. *The American Surgeon*, 71, 937-940, 2005.

<sup>14</sup> Killingsworth JB, Tilford JM, Parker JG, Graham JJ, Dick RM, Aitken ME. National Hospitalization Impact of Pediatric All-Terrain Vehicle Injuries. *Pediatrics* 115 (3), March 2005, pp. 316-321.

<sup>15</sup> Cvijanovich NZ, Cook LJ, Mann NC, Dean JM. A population-based assessment of pediatric all-terrain vehicle injuries. *Pediatrics* 108, pp. 631-635, 2001.

under are nearly four (4) times as likely as older drivers to be injured<sup>18</sup>. Factors that may be associated with such increased risk for children and adolescents include lack of physical strength, cognitive abilities and motor skills needed to operate an ATV.<sup>19</sup> Additionally, there are safety issues associated with the mechanical operation of the ATV that may contribute to increased risks. From 2005 to October 2007, product recalls affecting more than 700,000 ATVs have been issued because of problems indicating a variety of manufacturing, assembly, or other safety hazards<sup>20</sup>.

In August 2006, the CPSC voted to issue a proposed rulemaking on all-terrain vehicles that would make mandatory some provisions of the voluntary action plans and also proposed to formally ban the manufacture and distribution of three-wheel ATVs.<sup>21</sup> In its notice of proposed rulemaking, the CPSC noted that there had been a significant number of new entrants into the ATV market since the consent decree, many of them located outside of the U.S. New entrants are not subject to consent decree requirements, and companies located outside of the U.S. can be difficult to regulate. A recent study supported by the Specialty Vehicle Institute of American concluded that at least some of the new market entrants had failed to comply with the pre-existing voluntary standards.<sup>22</sup> The proposed rule was intended "...to address the unreasonable risks of injury and death associated with all terrain vehicles..." and included "...requirements concerning the mechanical operation of ATVs, requirements for providing safety information about operating ATVs and requirements for certification, testing, and recordkeeping..."<sup>23</sup> The proposed rule went on to state that:

"...ATVs are...high-speed motorized vehicles that require repeated practice to drive proficiently. Operating an ATV is somewhat comparable to operating other complex motorized vehicles. ATVs have top speeds approaching that of automobiles on highways, yet have as little protection from oncoming objects as a motorcycle. Even at relative low speeds (20 – 30 mph) they can take as much skill to operate as an automobile because the operator requires: (1) situational awareness to negotiate unpaved terrain with both eye-level hazards (trees, other ATVs) and trail-level hazards (ditches, rocks, hidden holes); and (2) quick judgments including not only steering, speed and braking, but also terrain suitability, weight shifting and other active riding behaviors..."<sup>24</sup>

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<sup>16</sup> Rodgers GB, Adler P. Risk factors for all-terrain vehicle injuries: A national case-control study. American Journal of Epidemiology, 153, pp 1112 – 1118, 2001.

<sup>17</sup> Smith LM, Pittman MA, Marr AB, Swan K, Sing S, Akin SJ et al. Unsafe at any age: A retrospective review of All-Terrain vehicle injuries in Two Level I trauma centers from 1995 to 2003. Journal of Trauma, 58 (4), 783-788, April 2005.

<sup>18</sup> Ibid.

<sup>19</sup> Shults RA, Wiles SD, Vajani J, Helmkamp. JC. All-Terrain vehicle-related nonfatal injuries among young riders: United States 2001 – 2003. Pediatrics 116, pp. 608 – 612, 2005.

<sup>20</sup> See <http://www.atvsafety.gov/atvrecalls/html>

<sup>21</sup> Consumer Product Safety Commission. Standards for All Terrain Vehicles and Ban of Three-Wheeled All Terrain Vehicles; Notice of Proposed Rulemaking. 71 Federal Register 154, pp. 45903-45962, August 10, 2006.

<sup>22</sup> Statement Re: Compliance with All-Terrain Vehicle Standards by The Specialty Vehicle Institute of America to the Senate Commerce, Science and Transportation Committee – Subcommittee on consumer Affairs, Product Safety and Insurance. June 6, 2006. Washington, D.C.

<sup>23</sup> Ibid., p. 45903.

<sup>24</sup> Op cit. p. 45909.



The deadline for comments on the proposed rule was December 2006; to date, no final action has been taken on the proposed rule.

## Maryland's Regulation of ATVs

The Department of Natural Resources (DNR) regulates the operation of ATVs on DNR-controlled state land; ATV operation on non-DNR land is not currently addressed in State statutes or regulations. ATV use on state forest land requires DNR registration and a permit. ATV operators and passengers on DNR land are required to wear helmets and operators are required to wear eye protection. ATV operators on state land are to have a: 1) drivers license; or 2) learners permit and be with licensed driver; operators who are children  $\geq 12$  years of age must be with parent / guardian who has a valid driver's license. Accidents are to be reported to the Maryland Department of Natural Resources (DNR); DNR indicates that it has received very few accident reports. To date, DNR reports issuing 2,584 permits for off-road vehicles to date during CY07 and 2,590 during CY06.

## Maryland's ATV Statistics

Case Identification. Following the methodology of a recent national study regarding ATVs, the International Classification of Diseases, 9<sup>th</sup> and 10<sup>th</sup>, Clinical Modification codes for External Cause (E-Codes) were chosen for case identification<sup>25</sup>. All three of the available databases, Vital Statistics Multiple Cause Death file, Health Services Cost Review Commission (HSCRC) inpatient and outpatient files, and the Maryland Trauma Registry (MTR) incorporate this variable. E-Codes are an internationally accepted means to identify injury etiologies. Having this "selection criteria" across the three data resources enable an assessment of relative incidence, trend analysis, and preventive considerations.

The 821 E-Code rubric is defined as non-traffic accident involving off-road motor vehicle. Codes include breakage of part of, fall from, hit by, overturning of, run over or dragged by, thrown against, some part of or object in, collision with: animal (being ridden) (-drawn vehicle), another off-road motor vehicle (except snow vehicle), other motor vehicle (not on public highway), fixed or movable object. The four specific E-Codes utilized for case selection were:

ICD-9-CM E-Codes	ICD-10-CM E-Codes	Description
V86.5	E821.0	Driver of motor vehicle other than motorcycle
V86.6	E821.1	Passenger of motor vehicle other than motorcycle
V86.7	E821.8	Other specified person
V86.9	E821.9	Unspecified person

Deaths. Maryland Death Certificate, Multiple Cause data from Vital Statistics indicate 12 deaths in Maryland associated with ATVs or other off-road vehicle from during calendar years 2001

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<sup>25</sup> Helmkamp, J. Death and Injury Resulting from ATV and Bicycle Crashes: A 5-year comparison of National Prevalence and Cost Estimates among Children and Adults. Published On-line September 2007. Available at <http://www.hsc.wvu.edu/icrc/pdf/HelmkampALFSummary%20Report~Final%207.25.07.pdf>

through 2006. Deaths shown below were selected from the Multiple Cause file for ICD-10-CM External Cause (E-Codes) V86.5, V86.6, V86.7, and V86.9 "...[o]ccupant of special all-terrain or other motor vehicle designed primarily for off-road use, injured in transport accident..."<sup>26</sup> inclusion only:

Table 1: Maryland Death Certificate Data

	Total # Off-Road Vehicle Deaths	# Drivers Deaths	# Passenger Deaths	# Unspecified Occupant Deaths *
CY 2001	3	1	0	2
CY 2002	1	1	0	0
CY 2003	0	0	0	0
CY 2004	0	0	0	0
CY 2005	4	3	1	0
CY 2006	4	1	0	3

Source: Maryland Vital Statistics.

\* "Unspecified occupant" indicates that based on information available, no conclusive determination could be made whether the individual was the driver or passenger.

Maryland death information for 2007 is not yet available; however, media reports indicate three (3) ATV-associated deaths of children in Maryland to date during 2007. An 8-year old boy died when the ATV on which he was riding with an adult crashed into a tree; the child was wearing a helmet at the time of the crash. A 2-year old boy who was wearing a helmet died when the child-sized ATV he was operating overturned on him; reports indicate that the ATV the child was riding was designed for children 6 to 12 years of age. A 12-year old boy was apparently killed when riding a stolen ATV-like vehicle at a construction site and the vehicle overturned.

Hospital Data. The HSCRC outpatient and inpatient data sets were analyzed for information on patients treated for off-road vehicle injuries. By regulation, hospitals are required to submit data in a standardized format. These patient data include patient demographics, hospital services rendered, associated hospital charges, descriptions of injury or illness and outcome. Cause of injury data were generated using International Classification of Diseases 9<sup>th</sup> Revision Clinical Modification (ICD-9-CM) external cause of injury codes (E-codes) consistent with those used in a recently published report focusing on such injuries.<sup>27</sup> The E-Codes used for off-road vehicle injuries (E821.0, E821.1, E821.8, and E821.9) are defined as a "non-traffic accident involving other off-road vehicle". "Off-road vehicle" is a motor vehicle of special design, to enable it to negotiate rough or soft terrain or snow; however, E821 excludes snow mobiles and accidents on

<sup>26</sup> The Multiple Cause file is reviewed by nosologist review of the death certificate file and code for the underlying cause(s). ICD-10-CM diagnoses are used in their reporting of 1 to 20 causes. The selection of V865, V866, V867, and V869 were chosen as comparable ICD-9-CM E codes.

<sup>27</sup> Helmkamp, J. Death and Injury Resulting from ATV and Bicycle Crashes: A 5-year comparison of National Prevalence and Cost Estimates among Children and Adults. Published On-line September 2007. Available at <http://www.hsc.wvu.edu/icrc/pdf/HelmkampALFSummary%20Report~Final%207.25.07.pdf>

public highways involving off-road motor vehicles.<sup>28</sup> That is, “off-road vehicle” is defined to include, but not be limited to, all-terrain vehicles; snow mobiles are excluded.

The HSCRC inpatient and outpatient data sets are mutually exclusive. That is, patients are counted either as outpatients or inpatients; for example, an outpatient initially seen in an emergency department who is subsequently admitted to the hospital is counted only as an inpatient, not as both an outpatient and an inpatient. Data from the Maryland State Trauma Registry on trauma center patients are a subset of either the inpatient or outpatient data sets.

Outpatient Treatment of Off-Road Vehicle Injuries. The Health Services Cost Review Commission (HSCRC) outpatient data base provides information on care provided in the hospital outpatient setting; records included in this analysis are confined to patients treated in emergency departments. Other outpatient environments, such as hospital clinics, were not captured in this analysis. Table 2 shows the number of patients treated whose principle diagnosis indicated that they had sustained injuries associated with off-road vehicles from CY 2001 through CY 2006. Off-road vehicles are defined to include all-terrain vehicles; snow mobiles are excluded. Over the period, 9,000 individuals were treated in Maryland hospital emergency departments for injuries sustained from off-road vehicles.

Table 2: Outpatients involving off-road vehicles (including ATV)

	# outpatients who were off-road vehicle drivers	# of outpatients who were off-road vehicle passengers	# outpatients off-road vehicle “other / unspecified”	Total
CY 2001	904	91	274	1,269
CY 2002	1,077	87	307	1,471
CY 2003	959	95	320	1,374
CY 2004	1,183	95	361	1,639
CY 2005	1,187	81	353	1,621
CY 2006	1,310	116	257	1,683
Total	6,620	565	1,872	9,057

Source: Maryland Health Services Cost Review Outpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Approximately one-third of the outpatients treated in Maryland hospital emergency departments for injuries involving off-road vehicles are aged 15 or less. See Table 3.

<sup>28</sup> Medicode. Hospital and Payer International Classification of Diseases, 9<sup>th</sup> Revision; Clinical Modification Sixth Edition. Medicode Publications, Salt Lake City, 1998.

Table 3: Ages of Outpatients involving off-road vehicles (including ATV)

	0 – 15 years of age	16 – 55 years of age	56+ years of age	Total
CY 2001	362	859	48	1,269
CY 2002	516	932	23	1,471
CY 2003	415	922	37	1,374
CY 2004	520	1,074	45	1,639
CY 2005	508	1,065	48	1,621
CY 2006	510	1,138	35	1,683
Total	2,831	5,990	236	9,057

Source: Maryland Health Services Cost Review Outpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Inpatient treatment of off-road vehicle injuries. Table 4 shows the number of patients whose injuries were from off-road vehicles who were admitted to Maryland hospitals from CY 2001 through CY 2006. Off-road vehicles are defined to include, but not be limited to, all-terrain vehicles; snow mobiles are excluded. Over the six-year period, over 1,000 individuals were admitted to Maryland hospitals for treatment of injuries sustained from off-road vehicles; this represents roughly 10% of all those injured in off-road vehicles.

Table 4: Hospital admissions involving off-road vehicles (including ATV)

	# hospital admissions who were off-road vehicle drivers	# hospital admissions who were off-road vehicle passengers	# hospital admissions who were off-road vehicle “other / unspecified”	Total
CY 2001	124	14	17	156
CY 2002	106	14	13	133
CY 2003	122	17	20	159
CY 2004	165	24	26	215
CY 2005	170	20	18	208
CY 2006	129	11	16	156
Total	817	100	110	1,027

Source: Maryland Health Services Cost Review Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Slightly more than two-thirds of the patients admitted for treatment for injuries involving off-road vehicles were between the ages of 16 and 55; one-quarter (25%) of the patients admitted were aged 15 or less. See Table 5.

Table 5: Ages of admitted patients involving off-road vehicles (including ATV)

	0 – 15 years of age	16 – 55 years of age	56+ years of age	Total
CY 2001	48	102	6	156
CY 2002	30	98	5	133
CY 2003	31	112	16	159
CY 2004	49	142	24	215
CY 2005	50	138	20	208
CY 2006	50	96	10	156
Total	258	688	81	1027

Source: Maryland Health Services Cost Review Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

The most frequent principle diagnoses for these inpatients were concussion with loss of consciousness (unspecified duration); traumatic pneumothorax and hemothorax; and fracture of tibia and fibula. Additionally, the overall anatomical distribution of primary inpatient injuries for the study period was:

Head	26%
Lower Limb	23%
Upper Limb	13%
Internal	12%
Spinal	6%
Superficial	6%
Open Wounds	5%
Unspecified	5%
Chest	2%
Pelvis	2%

Maryland State Trauma Registry. MIEMSS maintains the Maryland State Trauma Registry which is comprised of detailed information on patients treated at each of the state’s 9 adult trauma centers and 2 pediatric trauma centers. Maryland State Trauma Registry includes information on patients treated and released, as well as those who were admitted. Efforts were made to eliminate double-counting that might have otherwise resulted from inter-hospital transfers among trauma centers. Registry data includes specific pull-down variable selections for the identification of the study population. These records were subjected to in-depth review. Records were viewed to see exactly what types of off-road motor vehicles were included and how ATV's were described in the injury text field of the Maryland State Trauma Registry. The injury descriptions for ATV's were “ATV”, “All Terrain Vehicle”, “4-wheeler” or “3-wheeler”. Records could then be included if the injury text field contained any of these four descriptions. Before being included, each record with one of these descriptions was reviewed to ensure that it was indeed a legitimate case for inclusion – i.e., it was not a pedestrian hit by an ATV, etc.

Registry data from calendar years 2001 through 2005 indicates increasing numbers of ATV-associated injury patients being treated in the state’s trauma centers.<sup>29</sup> See Table 6.

Table 6: Age ranges of patients involved in ATV crashes who were treated in Maryland trauma centers by calendar year

Ages	1-4	5-11	12-15	16-24	25-44	45-64	65+	Unkn	Total
CY 2001	0	18	48	42	44	13	0	0	165
CY 2002	1	15	30	43	49	5	0	0	143
CY 2003	2	8	28	59	59	9	2	1	168
CY 2004	2	24	40	77	56	16	5	0	220
CY 2005	1	21	43	54	70	20	6	0	215
Total	6	86	189	275	278	63	13	1	911

Source: Maryland Trauma Registry 2007.

Trauma registry data indicates that of the trauma center patients where helmet / no helmet use was known, approximately 2/3 of the patients were not wearing a helmet at the time of the incident. See Table 7.

Table 7: Helmet usage of trauma center patients injured in ATV crashes by calendar year

	Helmet	No Helmet	Not Valued	Total
CY 2001	50	91	24	165
CY 2002	47	69	27	143
CY 2003	48	101	19	168
CY 2004	67	134	19	220
CY 2005	66	116	33	215
Total	278	511	122	911

Source: Maryland Trauma Registry, 2007.

Twenty-two percent (22%) of ATV patients treated at MD trauma centers had lengths of stay of 2 to 3 days, while 15.8% had lengths of stay ranging from 4 to 7 days. Over half of the patients had a stay of one day or less. See Table 8.

<sup>29</sup> Trauma registry data for 2006 was incomplete at the time the analyses were conducted.

Table 8: Length of Stay for Patients involved in ATV crashes treated at MD trauma centers by calendar year

Length of Stay	CY2001	CY2002	CY2003	CY2004	CY2005	Total
0 days	1	0	0	2	1	4
1 day	104	65	83	114	126	492
2 to 3 days	31	32	43	47	49	202
4 to 7 days	18	31	33	38	24	144
8 to 14 days	7	7	6	10	9	39
15 to 21 days	1	4	1	4	2	12
22 to 28 days	3	0	1	2	1	7
Over 28 days	0	4	1	2	3	10
Unknown	0	0	0	1	0	1
Total	165	143	168	220	215	911

Source: Maryland Trauma Registry, 2007.

Approximately 19% of ATV patients treated at MD trauma centers tested positive for alcohol. See Table 9.

Table 9: Blood Alcohol Level by Calendar Year for Trauma Center Patients Involved in ATV Crashes

Blood Alcohol Level	CY 2001	CY 2002	CY 2003	CY 2004	CY 2005	Total
Negative	56	64	61	95	92	368
Positive	30	25	27	43	45	170
Undetermined	79	54	80	82	78	373
Total	165	143	168	220	215	911

Source: Maryland State Trauma Registry, 2007.

Note: A patient's blood alcohol level is "undetermined" if: 1) the test was not performed, 2) the test was performed but the results were not recorded, or 3) if it is unknown if the test was performed.

### **Hospital Charges and Sources of Payment Associated with Off-Road Vehicle Accidents in Maryland**

The HSCRC outpatient and inpatient data sets include hospital charges, which would also include trauma centers, for patients who are treated and released from emergency departments or admitted to the hospital.

Inpatient charges. Table 10 shows the number of incidents, average, and total charges reported in the HSCRC inpatient dataset for calendar years 2001-2006. The number of incidents has fluctuated from year to year increasing in CY 2004 and CY 2005 and then decreasing again in 2006. The total charges from CY 2001 to CY 2006 increased by 66%, however, even though the number of incidents was the same for both years.



Table 10: Inpatient Charges

	Number of Incidents	Average Charge per Incident per Year	Total Charges per Year
CY 2001	156	\$ 6,811	\$1,062,448
CY 2002	133	\$ 6,732	\$ 895,414
CY 2003	159	\$ 9,784	\$1,555,717
CY 2004	215	\$ 9,566	\$2,056,602
CY 2005	208	\$ 7,253	\$1,508,522
CY 2006	156	\$11,356	\$1,771,475

Source: Maryland Health Services Cost Review Commission. Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Inpatient Primary Payer Source. The HSCRC Data set includes payer source information. For years 2001-2006, HMOs accounted for the highest percentage of primary payment type (nearly 24%) followed by commercial insurance at about 18%, Self Pay (16.5%), Blue Cross (10.6%), Medicaid (6.62%), Medicaid HMO (6.91%), and Medicare (4.97%). The total combined percentage of inpatients with Medicaid as a primary payer account for 13.53% of the patients in the HSCRC dataset. Additional potential costs to the state may be calculated by looking at patients with Workman’s Compensation, however the percentage for total patients with Workman’s Compensation as primary payer source is only 2.82%. Further, removing those cases involving state workers injured while riding ATVs at work would show a very small percentage that could be attributed to costs to the state. See Table 11.

Table 11: Inpatient Primary Payer Source

	CY 2001	CY 2002	CY 2003	CY 2004	CY 2005	CY 2006	Total	% Total
Medicare	6	3	10	20	7	5	51	4.97
Medicaid	9	10	10	18	13	8	68	6.62
Blue Cross	23	13	20	23	19	11	109	10.61
Comm. Insur.	32	32	32	35	32	21	184	17.92
Other Gov	0	2	0	2	1	1	6	0.58
Work Comp	7	6	5	5	3	3	29	2.82
Self Pay	17	18	31	40	32	31	169	16.46
Charity	1	0	0	1	0	0	2	0.19
Other	1	0	0	2	1	1	5	0.49
HMO	45	32	32	45	56	36	246	23.95
Medicaid HMO	7	5	7	12	21	19	71	6.91

Medicare HMO	0	0	0	0	1	0	1	0.10
BC-NCA	3	2	3	6	7	6	27	2.63
BC-other	5	10	9	6	15	14	59	5.74
TOTAL	156	133	159	215	208	156	1027	100.00

Source: Maryland Health Services Cost Review Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Using combined Medicaid and Medicaid HMO as the primary payer sources that may be attributed to potential direct costs to the state, the total primary payer charges for 2001-2006 for inpatients are \$1,219,682 (13.78%) out of a total \$8,850,178. See Table 12.

Table 12. Inpatient Charges by Primary Payer Source

Primary Payment ('01 to '06)	Total Charges	Total Cases	Average Charge	% Total
Medicare	\$393,605.09	51	\$7,717.75	4.45%
Medicaid	\$703,133.94	68	\$10,340.21	7.94%
Title V		0		
Blue Cross	\$925,108.88	109	\$8,487.24	10.45%
Comm. Insurance	\$1,698,839.69	184	\$9,232.82	19.20%
Other Gov't	\$67,182.67	6	\$11,197.11	0.76%
Workmen's Comp.	\$322,045.19	29	\$11,105.01	3.64%
Self Pay	\$1,345,721.48	169	\$7,962.85	15.21%
Charity	\$17,070.90	2	\$8,535.45	0.19%
Other	\$18,155.50	5	\$3,631.10	0.21%
Comm. HMO	\$2,041,808.01	246	\$8,300.03	23.07%
Medicaid HMO	\$516,547.92	71	\$7,275.32	5.84%
Medicare HMO	\$3,812.35	1	\$3,812.35	0.04%
BC - NCA	\$212,934.17	27	\$7,886.45	2.41%
BC - Other St.	\$584,212.06	59	\$9,901.90	6.60%
Unknown		0		
Total	\$8,850,177.85	1027	\$8,617.51	100.00%

Source: Maryland Health Services Cost Review Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Outpatient Charges. Table 13 shows the number of incidents, average, and total charges reported in the HSCRC outpatient dataset for injuries associated with off-road vehicles during calendar years 2001-2006. The number of incidents in the HSCRC database fluctuated from CY 2001-2006 with an overall increase in calendar year 2006 of 33%. Average charges per incident per year and total charges per year continued to increase. The total charges from CY 2001 to CY 2006 increased by 86%. See Table 13.

Table 13: Outpatient Charges

	Number of Incidents	Average Charge per Incident per Year (rounded)	Total Charges per Year
CY 2001	1,269	\$359	\$455,368
CY 2002	1,471	\$366	\$538,815
CY 2003	1,344	\$409	\$561,379
CY 2004	1,639	\$410	\$671,742
CY 2005	1,621	\$450	\$729,801
CY 2006	1,683	\$504	\$848,294

Source: Maryland Health Services Cost Review Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

**Outpatient Primary Payer Source.** The HSCRC Data set also shows primary payer source information. For years 2001-2006, HMOs accounted for the highest percentage of primary payer type (25%) followed by self-pay (22%), commercial insurance (18%), Blue Cross (13%), Medicaid HMO (9%). Medicaid and Medicare each accounted for approximately 2%. The total combined percentage of outpatients with Medicaid as the primary payer source is approximately 11%. See Table 14.

Table 14 Outpatient Primary Payer Source

	CY 2001	CY 2002	CY 2003	CY 2004	CY 2005	CY 2006	Total	% Total
Medicare	23	12	22	26	24	29	136	1.51
Medicaid	14	22	21	41	22	34	154	1.70
Title V	0	0	0	0	2	0	2	0.03
Blue Cross	201	234	175	191	168	187	1,156	12.76
Comm. Insur.	250	292	254	295	281	277	1,649	18.20
Other Gov	8	9	25	17	22	26	107	1.19
Work Comp	26	19	21	30	21	18	135	1.49
Self Pay	250	305	306	354	345	409	1,969	21.72
Charity	1	0	0	1	6	6	14	0.16
Other	2	2	2	1	11	15	33	0.37
HMO	359	366	336	426	414	367	2,268	25.03
Medicaid HMO	86	123	107	133	165	196	810	8.94
Medicare HMO	0	1	1	1	2	0	5	0.06
BC-NCA	12	29	24	40	43	46	194	2.15
BC-other	35	57	79	81	93	73	418	4.61
Unknown	2	0	1	2	2	0	7	0.08
TOTAL	1,269	1,471	1,374	1,639	1,621	1,683	9,057	100

Source: Maryland Health Services Cost Review Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Using combined Medicaid and Medicaid HMO as the primary payer sources that may be attributed to potential direct costs to the state, the total primary payer charges for 2001-2006 for outpatients are \$305,497 (10.11%) out of a total \$3,805,398.17. See Table 15.

Table 15 Outpatient Charges by Primary Payer Source

Primary Payment ('01 to '06)	Total Charges	Total Cases	Average Charge	% Total
Medicare	\$71,317.71	136	\$524.39	1.87%
Medicaid	\$79,263.55	154	\$514.70	2.08%
Title V	\$377.91	2	\$188.96	0.01%
Blue Cross	\$453,383.50	1,156	\$392.20	11.91%
Comm. Insurance	\$697,453.22	1,649	\$422.96	18.33%
Other Gov't	\$46,198.11	107	\$431.76	1.21%
Workmen's Comp.	\$60,765.91	135	\$450.12	1.60%
Self Pay	\$871,270.10	1,969	\$442.49	22.90%
Charity	\$8,362.31	14	\$597.31	0.22%
Other	\$14,527.98	33	\$440.24	0.38%
Comm. HMO	\$929,942.33	2,268	\$410.03	24.44%
Medicaid HMO	\$305,417.97	810	\$377.06	8.03%
Medicare HMO	\$3,244.64	5	\$648.93	0.09%
BC - NCA	\$79,273.36	194	\$408.63	2.08%
BC - Other St.	\$182,132.86	418	\$435.72	4.79%
Unknown	\$2,466.71	7	\$352.39	0.06%
<b>Total</b>	<b>\$3,805,398.17</b>	<b>9057</b>	<b>\$420.16</b>	<b>100.00%</b>

Source: Maryland Health Services Cost Review Inpatient Data Set. Analysis prepared by MIEMSS Quality Management September 2007.

Direct inpatient and outpatient hospital charges for which the State of Maryland, through Medicaid and Medicaid HMO, is the primary payer totaled \$1,525,179 over the CY01 – 06 period. These charges represent 12.05% of the total charges (inpatient / outpatient) for these injuries.

Information on hospital charges does not reflect all associated injury costs. Cost information from the Children's Safety Network: Economic and Data Analysis Resource Center was also reviewed. The Center calculates ATV injury associated costs according to overall economic costs and includes:

Productivity (work loss) costs include wages, fringe benefits, and household work for adults. It is the present value of a lifetime's worth of wage and household work that children will be unable to do as adults if they are killed or permanently disabled, including fringe benefits.

Quality of Life costs place a dollar value on the pain, suffering, and lost quality of life that children and their families experience due to death and injury.

The Center tracks ATV-related fatalities in Maryland and estimates the costs associated with each of these incidents. The estimated non-medical costs of fatality in year 2005 dollars are as follows: \$1,697,090 in work loss; and \$2,857,435 quality of life costs. The estimated non-medical costs of non-fatal hospital admitted injuries in Maryland in year 2005 dollars are as follows: \$86,891 in work loss; and \$281,478 quality of life costs.<sup>30</sup>

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<sup>30</sup> Children's Safety Network Economics & Data Analysis Resource Center Pacific Institute for Research and Evaluation. Electronic transmission. September 10, 2007.

## **Review of States' Regulations of All-Terrain Vehicles**

Generally, state regulation of all-terrain vehicles can encompass the broad categories of requirements for: vehicle registration, ATV equipment and operator requirements. A summary of all the ATV requirements by state as of 2006 / 2007 is included at Appendix A.

Five (5) states currently have no ATV registration, equipment or operator requirements: Alabama, Hawaii, Louisiana, South Carolina and North Dakota. Illinois and Oklahoma only require ATV registration, and Oklahoma's requirement applies only if the ATV is to be operated on roads or highways. Georgia only requires that ATVs be equipped with a muffler. The remaining 42 states have more extensive registration, equipment and operator requirements. The remainder of this discussion will focus on the characteristics of these 42 states.

### **Registration Requirements**

Thirty-three (33) of the 42 states that regulate ATVs require some type of ATV registration either through motor vehicles or through natural resources administrations, or both. Most states provide ATV access to park or state-owned public land, and such registration provides the initial structure needed to obtain such access. Registration fees are generally low, i.e., less than \$25. Some states include exemptions from registration requirements for ATV use confined solely private property.

The State of Maryland's regulation of all-terrain vehicles is confined to ATV use only on Department of Natural Resources land. See Natural Resource Article § 5-209 and COMAR 08.01.03. There is no requirement for MVA registration at the present time.

### **ATV Equipment**

Most states have specific requirements for ATVs to be equipped with certain features and for passengers and riders to wear certain gear for safety purposes. Many states limit such requirements to ATVs that are to be used on public land; additionally, some states provide exemption from certain requirements when the ATV is used on private property, such as that owned or leased by the ATV owner or the parent / guardian of the ATV user.

Lights. Thirty-five (35) of the 42 states that regulate ATVs require that the ATV be equipped with a headlight, and 34 states also require a tail light. Most states specify that the lights must be in use between sunset and sunrise. Nevada requires lights only for on-highway use. By regulation, ATV operation on Maryland DNR land requires at least one head light and one red tail light that are operational between sundown and sunrise.

Muffler. Thirty-four (34) of the 42 states require that ATVs be equipped with a muffler or other equipment to dampen engine noise. A total of 19 of these states have set maximum sound level limits for ATV operation. These limits range from 96 decibels measured at a distance of 20 inches to 82 decibels measured at 50 feet. Maryland regulations provide that off-road vehicles manufactured after July 1, 1976 have a noise limit of 84 decibels at 50 feet.

Spark Arrestor. Twenty-four (24) of 42 states require that ATVs be equipped with a spark arrestor. Spark arrestors are not required in Maryland.

Helmets. Thirty-two (32) states have some sort of helmet requirement for ATV operators, passengers or both. Six (6) states require helmets for ATV drivers only, while 26 states require helmets for drivers and passengers. Of these 26 states, 14 states limit the driver and passenger helmet requirement to individuals under the age of 18. Another state, Florida, requires helmets for those under 16. The remaining 11 states require helmets for all ATV drivers and passengers. By regulation, Maryland ATV operators and passengers on DNR lands must wear protective headgear; however, ATV informational material distributed for at least one state forest indicated that headgear was only required for ATV operators.<sup>31</sup>

Eye Protection. Eight (8) states require eye protection such as goggles or protective glasses for ATV use. Two of these limit the requirement to individuals who are under 18 years of age, and another limits the requirement to those under 16 years of age. By regulation, Maryland ATV operators on DNR lands must have an eye protection device or a windscreen.

### **Operator Requirements**

Minimum Operator Age. Thirty-three (33) states identify some age limitations on ATV operation, at least on public land / parks. For example, Iowa limits ATV operation use under age 12 to use as part of a safety course that is being conducted under the direct supervision of the safety course instructor and the child's parent / guardian; Oregon prohibits ATV use on public land by children under age 7. Utah prohibits public land use by children under age 8, but provides an exception for the child's participation in a race if the child is under parent / guardian supervision and as long as emergency medical services (EMS) personnel and ambulances are on the premises and immediately available. In Maryland, an ATV operator on State forest land must have a driver's license or a learner's permit and be accompanied by a person with a driver's license; or be at least 12 years of age and accompanied by a parent / guardian who has a driver's license.

Safety education / Rider education. Twenty-one (21) states require safety education / rider education courses for certain types of ATV operators. For example, Wisconsin requires ATV drivers born after January 1, 1988 to complete a rider education / safety education course unless the ATV is used solely on parent / guardian land. Arizona's education course, which includes vehicle safety and environmental ethics, may be ordered for ATV drivers that have committed safety violations. North Carolina requires completed of a safety education course if an individual is born after January 1, 1990, and the course must be approved or sponsored by the All-Terrain Vehicle Safety Institute. In Utah, a safety education course is required for individuals under 18 who do not have a driver's license, and the individual's parent / guardian must attend at least the first hour of any ATV classroom session, as well as all applicable modules. Maryland has no safety course requirement.

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<sup>31</sup> See "Potomac-Garrett State Forest ORV Trail Guide". Department of National Resources. Page 2.

## **Conclusions and Recommendations to Reduce the Incidence of ATV-Related Injuries**

According to the Consumer Product Safety Commission, there are “...unreasonable risks of injury and death associated with all terrain vehicles...”<sup>32</sup> Medical literature has documented that these risks are higher for children and adolescents. Risks are increased under certain circumstances: for example, according to the ATV Safety Institute, almost 90 percent of youth ATV-related injury incidents occur when a youth is operating an adult-sized ATV, i.e., engine size greater than 90 cubic centimeters<sup>33</sup>. Despite an apparent need, there has been a lack of federal action by the Consumer Product Safety Commission to promulgate certain regulations for the ATV industry that might increase safety and decrease the risks of injury or death. Even assuming such action may occur at an undefined future time, however, the Commission has noted that “states and localities have a critical role to play in any strategy to address the risk of injury and death associated with ATVs.”<sup>34</sup>

Maryland’s laws focus on ATV use on state land controlled by the Department of Natural Resources. The increasing number of off-road vehicle and ATV associated injuries, coupled with the very low number of incidents reported to DNR, suggests that a significant amount of ATV use in Maryland – as well as a significant number of ATV-associated injuries – may be occurring on private, as opposed to public, land. This cannot be confirmed at the present time, however, since ATV use on private land is not subject to the same requirements that are in place for ATV use on DNR-controlled land.

MIEMSS recommends that an ATV Safety Task Force, comprised of interested parties, be convened to develop a consensus approach for improvements in Maryland laws that may help reduce the risks associated with ATVs. Potential actions that may help mitigate such risks include: (1) implementing registration requirements for ATVs that would permit accurate tracking of the number of ATVs in Maryland and provide a focal point for dissemination of safety materials to ATV owners; (2) requiring ATV owners and operators to meet certain safety standards, e.g., completion of nationally recognized training and safety education courses; (3) making more broadly applicable the requirements for ATV operation that are currently limited to DNR-regulated land; (4) restricting or limiting ATV use among certain age groups, e.g., restricting adult-sized ATV to those at least 16 years of age; (5) requiring uniform recordkeeping and reporting of ATV-related injuries; and (6) increasing public awareness efforts to improve knowledge of the risks associated with ATV operation, and, in particular, of the dangers to children and adolescents.

As an initial focal point, the Task Force should review the Model State ATV Legislation developed by the Specialty Vehicle Institute of America (SVIA).<sup>35</sup> Among other things, the model legislation calls for states to implement a comprehensive ATV safety education and training program, which provides for the hands-on training of ATV operators, for states to

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<sup>32</sup> Consumer Product Safety Commission. Standards for All Terrain Vehicles and Ban of Three-Wheeled All Terrain Vehicles; Notice of Proposed Rulemaking. 71 Federal Register 154, pp. 45903-45962, August 10, 2006.

<sup>33</sup> All-Terrain Vehicle Safety Institute. Summer Safety Alert, May 26, 2006. Irvine, CA.

<sup>34</sup> Consumer Product Safety Commission. *Op cit.*, page 45915.

<sup>35</sup> The SVIA is a non-profit trade association based in California whose members include Artic Cat, Bombardier, Honda, John Deere, Kawasaki, Suzuki and Yamaha.



require all ATV operators on public lands to have a safety certificate, and for a prohibition on carrying passengers on ATVs. The components of the model legislation should be reviewed not only for applicability to ATV use on public lands, but also as to their suitability to operation of ATVs on private land. The State of North Carolina used the SVIA model legislation as a basis for their ATV laws.

Appendix A  
Summary of State Laws

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# ATV Requirements by State

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comment
Alabama	No	No	None	No	No	No	No	No	None	No	No	
Alaska	Not for ATV	No	<14 on public land need direct supervision of <u>≥21</u>	No	No	No	No	No	None	No	No	
Arizona	Yes if <18 for driver & rider	Yes if <18 for driver	No minimum	Education course may be ordered for driver with safety violations	No	Yes	No	Yes	None	On state & federal lands	No if operating on unpaved road in unincorporated area	Education course includes vehicle safety & environmental ethics
Arkansas	No	No	< 12 needs direct adult supervision unless on land owned by parent or on private land with permission	No	No	After sunset	After sunset	Yes	None	Yes	No	

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comments
<b>CA</b>	Required for driver & rider	No	< 14 on public land must have adult supervision and be taking a safety class, have a safety certificate, or be supervised by adult with a safety certificate	< 18 on public land, must be taking a safety class, have a safety certificate, or be supervised by adult with a safety certificate	No	After sunset	After sunset	Yes	96 dBA @ 20 inches	Yes	Yes	Very detailed and specific requirements for ATV safety training programs
<b>Colorado</b>	No	No	< 10 no public road uses; ≥10 no public road use unless has driver's license or under immediate supervision of person with driver's license	No	No	After sunset	After sunset	Yes	82-84 dBA @ 50 feet	Yes	Yes	No

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comments
<b>CT</b>	No	No	No if <12; if 12-16 need safety course certificate and supervision by <u>≥18</u> who has completed safety course	Required if < 18	No	Yes, if engine > 90 cc	Yes, if engine > 90 cc	Yes	No excessive or unusual noise	No	Yes	ATV use on state land also requires certificate from Com'r of Environ. Protection
<b>Delaware</b>	Yes for driver & rider if 3-wheel OHV	No	<12 OK if direct supervision by <u>≥18</u> or on parent's land	Yes	No	After sunset	After sunset	Yes	88 dBA at 60% throttle @ 50 feet	Yes	Yes	
<b>Florida</b>	Yes if <16 for driver & rider	Yes if <16	No minimum	No	No	No	No	No	None	No	Yes	
<b>Georgia</b>	No	No	No minimum	No	No	No	No	Yes	None	No	Yes	
<b>Hawaii</b>	No	No	No	No	No	No	No	No	None	No	No	

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comments
<b>Idaho</b>	Yes if <18 for driver & rider if on public land	No	No minimum	No	No	No	No	Yes	96 dBA @ 20 inches	Yes	Yes	
<b>Illinois</b>	No	No	No	No	No	No	No	No	None	No	Yes	
<b>Indiana</b>	No	No	<14 needs adult supervision unless on land of parent / guardian	No	Only for use on public highway	After sunset	After sunset	Yes	None	No	Yes	
<b>Iowa</b>	No	No	12-15 need safety certificate & supervised by adult with license/safety certificate; <12 only as part of safety course under direct supervision of instructor and parent.	Required for ATV riders <18	Only for farm use on roads	After sunset	After sunset	Yes	86 dBA @ 50 feet	No	Yes	No passengers allowed on ATV

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Vehicle Title
<b>Kansas</b>	No	No	No minimum	No	No	After sunset on public roads	After sunset on public roads	No	None	No	No	
<b>KY</b>	Yes for operator	Not required	Under 16 may operate 90 cc or less; under 12 may operate $\leq$ 70 cc w/adult	No	No	After sunset if on road	After sunset if on road	Yes, if on road	None	No	No	
<b>LA</b>	No	No	No	No	No	No	No	No	None	No	Yes	
<b>Maine</b>	Required if under 18	Not required	On public land, if <15, need adult supervision If < 10, prohibited on public land	Yes if >9 and < 16 unless use on own land or at safety training site. If <16 must attend training with parent	No	Yes	Yes	Yes	96dBA @ 20 inches	Yes	Yes	



State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arres-tor	Registration Needed	Comments
<b>MD</b>	Yes for driver & rider on DNR land	Yes for driver on DNR land	On DNR land, need 1) drivers license or 2) learners permit <u>and</u> be with licensed driver. $\geq 12$ must be with parent / guardian who has valid drivers license	No	No ATV operator permit needed	On DNR land, after sunset	On DNR land after sunset	Yes	84 dBA @ 50 feet	No	See comments	Regulated as “Off-road vehicle” through DNR regulations. See Natural Resources Art §5-209 and COMAR 08.01.03  3-wheeled vehicles OK on State ORV trail if registered as on-road vehicle  Accidents reported to DNR if death, injury or property damage >\$100
<b>MASS</b>	Yes for driver & rider	No	No use <10; 10-12 OK if adult supervision + used at operator’s home. 12-14 OK if directly supervised by $\geq 18$	No	No	Yes	Yes	Yes	103 dBA @ 20 inches	No	Required except if used on land owned by ATV owner	

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comments
Michigan	Yes for driver & rider	Yes for driver & rider	<12 no ATV use, except ≥10 OK if on parent's land; < 16 no 3-wheel ATV use + need direct adult supervision	Required if < 16	No	After sunset	After sunset	Yes	94 dBA @ 20 inches	Yes	ATV must be licensed	
MINN	Yes for <18 driver on public land	No	10 -12 on public land ≤90 cc engine if w/ adult; ≤12 to <16 need safety certificate <u>and</u> be with ≥18 who has valid driver's license	Yes if born > 7- 1 -87 if operating on public lands. Must be at least 12 to obtain safety certificate	No	Yes	Yes	Yes	99dBA @ 20 inches	Yes	Yes	If violate ATV laws, may be required to complete safety course. Specified safety course content, including: machine safety, control of machine, operating procedures, ATV laws and rules, code of ethics, safety hazards, & environmental issues.  ME must examine bodies if death from ORV

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arres-tor	Registration Needed	Comments
<b>MS</b>	Yes for driver	No	≥ 6 or < 21 needs Waiver Consent signed by parent	No	No	No	No	No	None	No	No	Regulated within context of Dept of Wildlife, Fisheries & Parks
<b>MO</b>	If <18 required for driver & rider	No	<16 needs either adult supervision or use on family land	No	No	Yes	Yes	Yes	None	Yes	Yes	
<b>Montana</b>	If <18, required for highway	No	12-16 on forest develop. road must have safety course certificate and be with licensed driver	Course is approved by Dept. Fish, Wildlife & Parks	Only for use on roads	No	No	No	None	No	Yes	
<b>Nebraska</b>	No	No	No minimum	No	No	After sunset	After sunset	Yes	Yes	Yes	No	Must report accident if death or needs physician treatment

State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comments
Nevada	Yes for highway use	No	If <16 on designated highway, city or county may require supervision by ≥18	No	No	On highway	On highway	On highway	None	No	No	
NH	Yes if <18 for driver & rider	Yes if <18	On public land, if <14 must be w/ ≥18 with either driver's license or safety course. If ≥12, must complete safety course or have driver's license	Required if ≥12 and unlicensed	≥ 12 must have safety certificate or drivers license	1/2 hr. after sunset to 1/2 hr before sunrise	1/2 hr. after sunset to 1/2 hr before sunrise	Yes	96 dBA @ 20 inches	Yes	Yes	Regulated under "Fish & Game"  ≥18 traveling with <14 is legally response for OHRV operation  Safety course may be used to mitigate damages  Implied consent for drug / alcohol testing for ATV driver
New Jersey	Yes for driver & rider	No	Under 16 limited to ≤90 cc; under 14 prohibited on public lands	Required if under 18	Liability insurance required	After sunset	After sunset	Yes	None	No	Yes	

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<b>New Mexico</b>	Yes, for operator & rider if under 18	Required if under 18	< 10 need adult supervision and age-appropriate size-fit ATV;  10-18 need adult supervision and if ≤13 need motor cycle license and safety permit; or if ≤15 need driver's license, permit, or provisional license and safety permit	Required if under 18	No	If visibility is < 500 ft	When visibility is < 500 ft	No	96 dBA @ 20 inches	Yes	Yes	
<b>New York</b>	Yes for driver & rider	No	< 16 need adult supervision either by parent/guardian or ≥18 with ATV safety certificate	Required if ages 10 - 16	Liability insur. required	After sunset	After sunset	Yes	None	Yes	Yes	Specific crash reporting req'd

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<b>North Carolina</b>  <b>Note:</b> <b>NC law is based upon SVIA Model Laws</b>	Yes for driver	Yes for driver	<8 prohibited; <12 only ATVs of $\leq 70$ cc*; <16 only ATVs of $\leq 90$ cc*; <16 need continuous visual supervision by $\geq 18$ Exemption from requirement if ATV purchased prior to 8-15-05	Required if born after 1-1-90	Not required	After sunset	After sunset	Yes	None	Yes	No	Exemption for farming, hunting or trapping activities.  Safety course must be approved or sponsored by All-Terrain Vehicle Safety Institute
<b>North Dakota</b>	< 18 for driver and rider	No	$\geq 12$ OK if completed safety course & possess certificate	Required for $\geq 12$	<16 need operators license or permit unless on family land	Yes	Yes	Yes	None	No	Yes	

State	Helmet	Eye protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comments
Ohio	No	No	<16 no operation except on private property unless with $\geq$ 18 with license; 12-16 on public land need licensed adult to be present	No	Yes	After sunset	After sunset	Yes	96dB A @ 20 inches if made after 1/1/06	No	Yes	Specific accident reporting required
OK	No	No	No minimum	No	No	No	No	No	None	No	No, unless used on roads / highways	
Oregon	Required if <18 for driver & rider	No	Class I ATV: need drivers lic., operator permit or lic. adult present Class III ATV: <7 no use on public lands; 7-12 needs ATV operator permit & lic. adult present; $\geq$ 12 needs drivers license., operator permit <u>or</u> licensed adult.	Required for permit	Yes if not licensed	After sunset	After sunset	Yes	99dB A @ 20 inches	Yes on public lands	Yes	

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<b>PA</b>	Yes for driver & rider on highway	No	< 8 no use on public land; 8 & 9 restricted to ≤70cc; 8-15 need: 1) direct supervision of safety instructor; 2) use on parent's private land; or 3) safety certificate	Required if <16, but <10 not eligible for safety certificate	No	After sunset	After sunset	Yes	99 dBA @ 20 inches	No	Required unless used solely on land leased or owned by ATV owner	
<b>Rhode Island</b>	Yes for driver & rider	No	No	No	No	After sunset	After sunset	Yes	None	No	Yes	Must report if death or injury with incapacitation >72 hrs or damage >\$100
<b>South Carolina</b>	No	No	No minimum	No	No	No	No	No	No	No	No	
<b>South Dakota</b>	No	No	No minimum	No	No	No	No	No	No	No	No	Note: ATV may be licensed as motorcycle; if so, no use on highway and must have helmet / eye protection



State	Helmet	Eye Protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration	Comments
<b>TENN</b>	If < 18 driver and rider on public land	Yes if on designated trails	No minimum	No	No	No	No	Yes	None	Yes	Yes	By rule, trail riders need: helmet, heavy shoes, protective clothing and eye protection
<b>Texas</b>	Yes	Yes	< 14 need adult supervision	Required	No	After sunset	After sunset	Yes	None	Yes	Yes	Safety certificate for <14 requires actual operation during course
<b>Utah</b>	Required on public land if under 18 for driver & rider	No	< 8 no use on public land, but may be in race if under adult supervision & EMS & ambulance on premises. Anyone operating ATV on public land must: 1) be directly supervised by of safety instructor during course; 2) have safety certificate; or 3) have driver's license.	Required if no drivers license	Required if not certified	After sunset	After sunset	Yes	None	Yes	Yes	Safety course instructors must be certified.  <18 must have parent/guardian attend at least first hour of any classroom session and all applicable skills modules.

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<b>Vermont</b>	No	No	< 12 no use except if: 1) on land owned by parent; 2) written permission of owner; or 3) under direct supervision by $\geq 18$ .  If <18, no use unless 1) on land owned by parent; 2) taking safety course + direct supervision by teacher; or 3) certificate from another state	Required if under 18	No	After sunset	After sunset	Yes	82 dBA @ 50 feet	Yes	Yes	Specific accident reporting required.
<b>Virginia</b>	Yes for driver	No	$\leq 16$ no use on public land except 12-16 may operate 70-90cc ATVs	No	No	No	No	No	None	No	No	

State	Helmet	Eye protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration	Comments
WA	Yes on non-highway road for driver & rider unless on own land	No	If <13, no use on or across highway or non-highway road except on designated road with supervision by ≥18 with drivers license	No	No	After sunset	After sunset	Yes	86 dBA @ 50 feet	Yes	Use permit required	
West Virginia	Required if rider or passenger is under 18	No	If passenger < 18 then operator must be > 18 or have a Level Two Intermediate driver's license or equivalent.	Required if rider is under 18 unless ATV is operated on a private or public recreational trail or area which has in place a safety program	Operator license is not required except when the operator is < 18 and has a rider <18	After sunset	After sunset	Yes	None	Yes	No	

State	Helmet	Eye protection	Minimum Operator Age	Rider education certificate	Operator License	Head light	Tail light	Muffler	Max Sound Level	Spark Arrestor	Registration Needed	Comments
WI	Yes for driver and rider if <18 unless 1) <u>≥12</u> and traveling to hunt / fish; 2) for farm use; or 3) for use on land under family control	No	<12 use is prohibited unless exceptions apply	Required if $\geq 12$ and born on or after 1/1/88 unless: 1) on land owned by parents; 2) if 12 – 16 OK to have certificate from another state	No	After sunset and on roads	After sunset and on roads	Yes	96 dBA @ 20 inches	Yes	Yes	
WY	Required if minor is driver or rider on streets / highway	No	None on trails; need driver's license for public streets / highways	No	Yes: on public street / highway, need driver's license with motor cycle endorsement	Yes, on public street / highway	Yes, on public street / highway	Yes, on public street / highway	102 db @ 20 inches on public street / highway	Yes on public street / highway	Yes on public street / highway	