

## Haddon Matrix Applied to the Problem of Motor Vehicle Crashes

Phases	Factors		
	Host	Agent/ Vehicle	Physical Environment
<b>Pre-event (Before the crash occurs)</b>	<ul style="list-style-type: none"> <li>• Driver vision</li> <li>• Alcohol impairment</li> <li>• Driver experience/ability</li> </ul>	<ul style="list-style-type: none"> <li>• Maintenance of brakes, tires</li> <li>• Speed of travel</li> <li>• Load characteristics</li> </ul>	<ul style="list-style-type: none"> <li>• Adequate roadway markings</li> <li>• Divided highways</li> <li>• Roadway lighting</li> <li>• Hazardous intersections</li> <li>• Road curvature</li> <li>• Adequate roadway shoulders</li> </ul>
<b>Event (During the crash)</b>	<ul style="list-style-type: none"> <li>• Spread out energy in time and space with seat belt and/or airbag use</li> <li>• Child restraint use</li> </ul>	<ul style="list-style-type: none"> <li>• Vehicle size</li> <li>• Crashworthiness of vehicle—"crush space", integrity of passenger compartment, overall safety rating</li> <li>• Padded dashboards, steering wheels, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Guard rails, median barriers</li> <li>• Presence of fixed objects near roadway</li> <li>• Roadside embankments</li> </ul>
<b>Post-event (After the crash)</b>	<ul style="list-style-type: none"> <li>• Crash victim's general health status</li> <li>• Age of victims</li> </ul>	<ul style="list-style-type: none"> <li>• Gas tanks designed to maintain integrity during a crash to minimize fires</li> </ul>	<ul style="list-style-type: none"> <li>• Availability of effective EMS systems</li> <li>• Distance to quality trauma care</li> <li>• Rehabilitation programs in place</li> </ul>
			<b>Social Environment</b> <ul style="list-style-type: none"> <li>• Public attitudes on drinking and driving laws</li> <li>• Impaired driving laws</li> <li>• Graduated licensing laws</li> <li>• Speed limits</li> <li>• Support for injury prevention efforts</li> </ul>
			<ul style="list-style-type: none"> <li>• Adequate seat belt and child restraint laws</li> <li>• Enforcement of occupant restraint laws</li> <li>• Motorcycle helmet laws</li> </ul>
			<ul style="list-style-type: none"> <li>• Public support for trauma care and rehabilitation</li> <li>• EMS training</li> </ul>

Source: Injury Prevention: Meeting the Challenge. AJPM, 1989; Christoffel T, Gallagher S. Injury Prevention and Public Health, Gaithersburg, MD, 1999.

### Haddon Matrix Applied to the Problem of School Violence by Firearms

	Host (students at school)	Agent/ Vehicle (firearm and bullets)	Physical Environment (school)	Social Environment (school and community norms, policies, rules)
<b>Pre-event</b> (before teen uses weapon)	<ul style="list-style-type: none"> <li>Educate teens about the dangers of carrying guns to school</li> <li>Educate parents about dangers of allowing teens access to guns</li> <li>Teach students to recognize and report student behaviors indicative of possible violent behavior</li> </ul>	<ul style="list-style-type: none"> <li>Modify guns so they are only operable by the owner</li> </ul>	<ul style="list-style-type: none"> <li>Install metal detectors at entrances to schools</li> <li>Eliminate storage places in schools (e.g. lockers) where guns might be kept</li> </ul>	<ul style="list-style-type: none"> <li>Adopt school procedures/policies to notify authorities if a student is suspected of having a gun at school</li> <li>Prohibit gun carrying on school grounds</li> <li>Enforce restrictions on the sale or transfer of handguns to teenagers</li> </ul>
<b>Event</b> (when gun is taken out to be fired)	<ul style="list-style-type: none"> <li>Teach students to take cover when they see guns or hear gunfire</li> </ul>	<ul style="list-style-type: none"> <li>Reduce capacity of weapons to fire multiple rounds quickly</li> <li>Modify bullets to be less lethal</li> </ul>	<ul style="list-style-type: none"> <li>Install alarm systems to call law enforcement as soon as weapons are visible</li> </ul>	<ul style="list-style-type: none"> <li>Have law enforcement officers on duty at school to intervene during fights</li> <li>Develop safety plans to help students move to safety in event of violent episode</li> </ul>
<b>Post-event</b> (after students are shot)	<ul style="list-style-type: none"> <li>Teach students first aid skill</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the capacity of the gun to continue firing</li> </ul>	<ul style="list-style-type: none"> <li>Make school grounds readily accessible to ambulances</li> </ul>	<ul style="list-style-type: none"> <li>Ensure well-trained emergency medical personnel and access to trauma facilities</li> <li>Provide post-event counseling to students, staff and families</li> </ul>

Source: Dr. Carol Runyan, University of North Carolina, Injury Prevention Research Center.

## Haddon Matrix Applied to the Problem of Residential Fires

	Host ( <i>children, elderly, adults in home</i> )	Agent/ Vehicle ( <i>cigarette, matches, appliances, heaters, and upholstered furniture</i> )	Physical Environment ( <i>home</i> )	Social Environment ( <i>community norms, policies, rules</i> )
<b>Pre-event</b> ( <i>before fire starts</i> )	<ul style="list-style-type: none"> <li>Teach children not to play with matches</li> <li>Provide information about fire risk and cooking (loose clothing, long hair, etc., may catch on fire)</li> </ul>	<ul style="list-style-type: none"> <li>Redesign cigarettes so they self-extinguish</li> <li>Automatic shut-off for appliances such as coffee makers.</li> <li>Inspect and clean chimneys, heating systems each year.</li> </ul>	<ul style="list-style-type: none"> <li>Lower flammability of structures</li> <li>Insure adequate emergency escape exits from home</li> </ul>	<ul style="list-style-type: none"> <li>Improve efforts to curb smoking initiation</li> <li>Improve smoking cessation efforts</li> </ul>
<b>Event</b> ( <i>during fire</i> )	<ul style="list-style-type: none"> <li>Teach children to stop, drop and roll</li> <li>Plan and practice a fire escape route with children and adults</li> <li>Teach children not to hide during a fire</li> </ul>	<ul style="list-style-type: none"> <li>Design furniture with materials that are less toxic when burned</li> <li>Design upholstery that is flame resistant</li> </ul>	<ul style="list-style-type: none"> <li>Install smoke detectors</li> <li>Install sprinklers</li> <li>Increase number of usable exits</li> </ul>	<ul style="list-style-type: none"> <li>Pass ordinances requiring smoke detectors and/or sprinkler systems</li> <li>Fund the fire department adequately to provide enough personnel and equipment for rapid response</li> </ul>
<b>Post-event</b> ( <i>after child or person injured by fire</i> )	<ul style="list-style-type: none"> <li>Provide first aid and CPR to all family members</li> </ul>	<ul style="list-style-type: none"> <li>Design heaters with quick and easy shutoff device</li> </ul>	<ul style="list-style-type: none"> <li>Build homes with less toxic building materials</li> </ul>	<ul style="list-style-type: none"> <li>Increase availability of burn treatment facilities</li> </ul>

Source: Dr. Carol Runyan, University of North Carolina, Injury Prevention Research Center.