

VEHICULAR ACCIDENT

HAZARD PROFILE

Description

Disasters that can result from hazards having an element of human intent, negligence, error, or technological failure (for example, of a system) are called man-made hazards. DMA 2000 does not require the consideration of man-made hazards, as these are often already considered by other planning efforts. However, man-made hazards can be included in HMPs, and the Village has determined to include one man-made hazard -- vehicular accidents (including hazardous materials in transit).

Many factors contribute to vehicular accidents, including: equipment failure, poor road conditions, weather, traffic volume, and driver behavior. This hazard is considered important to the Village because it has resulted in numerous injuries and deaths on Village roadways.

Vehicular accidents involving the release of hazardous materials (HAZMAT) onto roadways and surface bodies are also of concern. A HAZMAT can be defined as “a substance or material determined to be capable of posing an unreasonable risk to health, safety or property when transported.” “Unreasonable risk” covers a broad spectrum of health, fire and environmental considerations. These substances include explosives, flammable gases, radioactive/nuclear waste, toxic gases, highly flammable liquids, flammable liquids, flammable solids, substances which become dangerous when wet, oxidizing substances and toxic liquids. An accident involving a vehicle carrying HAZMAT becomes a HAZMAT incident if the HAZMAT leaks, is involved in a fire, or the potential of release, fire or other hazard exists (Campbell, Unknown).

Since HAZMAT is pervasive in commerce and is regularly transported to meet numerous consumer demands and industrial needs, transportation of such material is highly regulated. Because HAZMAT is transported on roadways, railways, waterways and pipelines daily, these areas are considered vulnerable to an accident, spill or release. The U.S. Department of Transportation’s (USDOT) HAZMAT safety program is intended to provide adequate protection against the risks to life and property that may result from a release of HAZMAT in transportation. The key federal office regulating the transportation of HAZMAT is the Office of Hazardous Materials Safety within the Research and Special Programs Administration of the USDOT.

Transportation incidents involving HAZMAT are often more dangerous than those at fixed facilities because the materials involved may be unknown; warning signs may be obscured by rollover, smoke or debris; and knowledgeable operatives may be absent or casualties of the event. These events can occur during the loading, unloading, and transportation or temporary storage of HAZMAT. Two principal events that cause vehicular accidents involving HAZMAT are collision and fire. For road tankers other causes of release may be leaks from valves and from overfilling (Campbell, Unknown).

Of primary concern to the Village are potential losses and damages associated with hazardous material releases that occur during transport in the study region. Such situations could result in the following:

- Impacts to environmental media, including surface water, soil, groundwater, and air from HAZMAT contamination, plus associated cleanup costs;
- Losses and damages to assets such as vehicles and infrastructure from direct exposure to HAZMAT, associated fires, and hazardous mixtures generated during accidents;

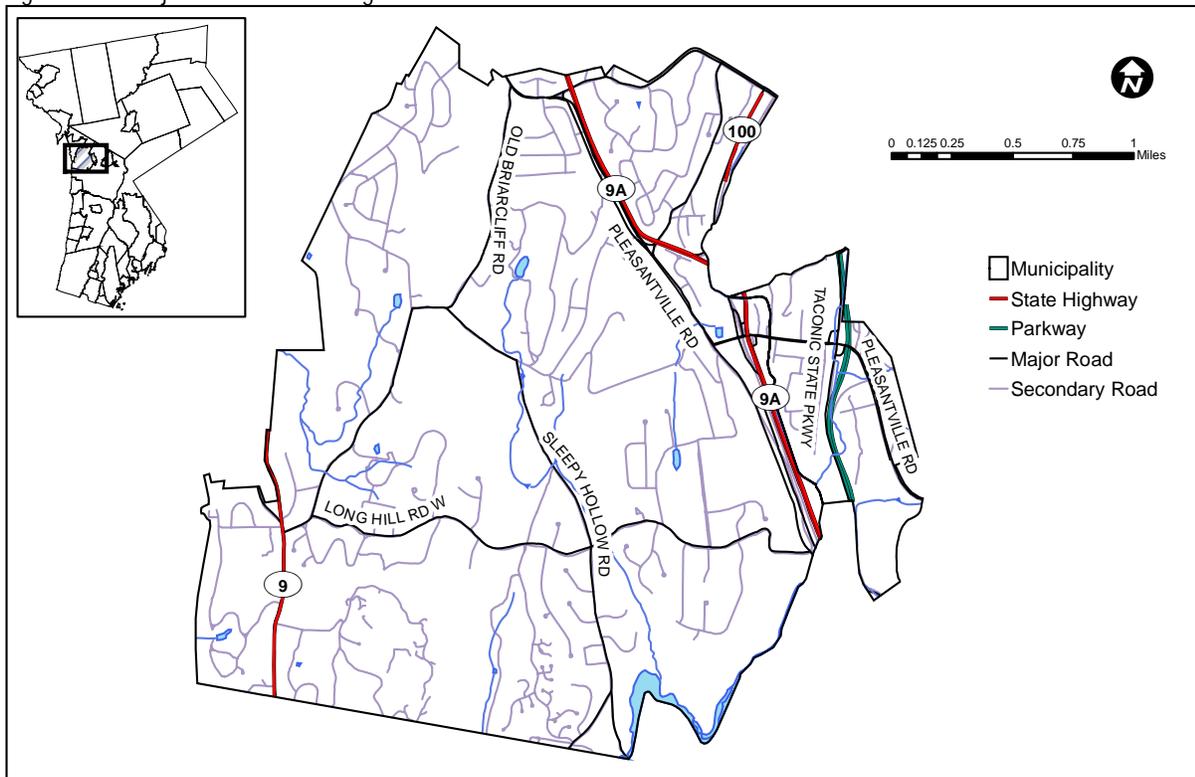
- Increased pressure on public safety infrastructure, such as HAZMAT response teams, police, fire, and rescue personnel, as well as community funds associated with emergency response;
- Disruptions and potentially lengthy delays for motorists following the accidents, and increased traffic on alternative routes and detours.

Location and Extent

A vehicular accident can occur on any traveled roadway in the Village. Figure 5-31 illustrates the major roadways in the Village. Areas of roadway which are difficult to navigate, conducive to accidents, historically accident-prone, adjacent to water bodies, traverse populated or highly traveled areas, are of particular concern. Due to the lack of arterial access to major transportation routes, several state and county roads that traverse the Village receive significant travel; these include: the Taconic Parkway, State Highways Route 9, Route 9A, Route 100, two main county roads [Pleasantville Road (CR# 401 and CR# 4011)], and one main Village road (North State Road). Figure 5-32 shows that Routes 9, 9A and 100 appear to receive the heaviest volume of traffic within the Village.

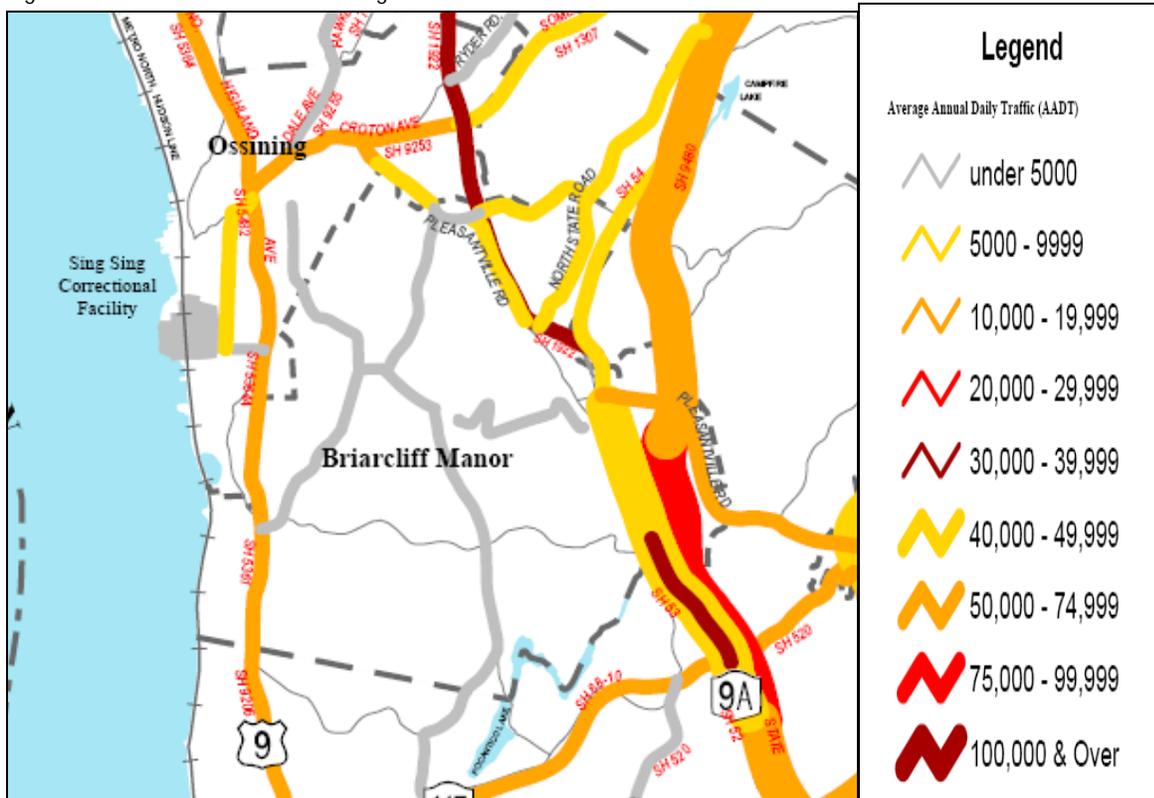
The State Highways Routes 9, 9A and 100 are major transport routes for all types of materials, including HAZMAT that are routed through WC as well as materials being delivered within WC (such as chlorine en route to drinking water treatment plants or nuclear materials en route to Indian Point Power Plant). Many transportation routes pass through residential communities and landscapes. An estimate of the number of trucks that pass through WC and/or the Village hauling hazardous waste and materials is difficult to determine due to under-reporting.

Figure 5-31. Major Roads in the Village of Briarcliff Manor



Source: HAZUS-MH, 2005.

Figure 5-32. Traffic Volume in the Village of Briarcliff Manor



Source: Westchester County Department of Planning, February 2006, "Traffic Volume"

There is no warning time for vehicular accidents. The severity of HAZMAT releases associated with vehicular traffic accidents is directly related to the type, volume, composition, characteristics, and chemical state of the material(s) involved and the type of accident that occurs. Releases of highly hazardous, infectious, radioactive, flammable, corrosive, or toxic industrial chemicals, fuels, or wastes, can result in large, regional impacts if toxic gases or vapors are formed, if surface water is impacted, or if populated areas are nearby. Many reported incidents include the release of small quantities, typically a few gallons, which are contained and cleaned up quickly with little damage to the environment. In other instances, material releases can seep through the soil and eventually into the groundwater, impacting water supplies. Vapors from spilled materials can collect in houses and businesses, creating fire and explosion hazards. Uncontained spills, especially those that impact surface water, can kill or injure plants, fish, and wildlife, and cause damage to their habitats.

The location and characteristics of a spill can determine the amount of time necessary to stabilize a release and minimize the amount of damage that could result to people, assets, and resources of the community.

According to the WC Comprehensive Emergency Management Plan, the WC Department of Emergency Services, with support from other county and state offices, provides support in response to actual or potential discharge or uncontrolled release of oil or HAZMAT. The Village's Fire Chief considers area emergency response capabilities to be excellent. The Village has 100-gallons of fire-suppression foam with additional amounts and resources available through the WC HAZMAT team. The Village has a trailer equipped to perform decontamination in the event of a HAZMAT incident within the Village.

Previous Occurrences and Losses

The New York State Department of Transportation (NYSDOT) Safety Information Management System provides a summary report of intersection and non-intersection accidents at specific mile markers of major roadways throughout NYS. Ms. Ingrid Richards, Assistant Manager of the Village, obtained all accident data for the Village in the Freedom of Information Law Request FMO-06-001249. A NYSDOT Accident Database query for accidents along Routes 9, 9A and 100 was reviewed to determine if any reported accidents resulted in a HAZMAT release in the Village. Complete accident data was only made available for the period between December 31, 2002, and December 31, 2005. The mile markers along these major roads that are within the Village include:

- Route 9: 9, 8703, 2107 (most southern) to 9, 8703, 2118 (most northern)
- Route 9A: 9A, 8703, 2122 (most southern) to 9, 8703, 2144 (most northern)
- Route 100: 100, 8701, 4097 (most southern) to 100, 8701, 4106 (most northern)

According to the database, approximately 227 accidents occurred along these roadways within the Village, with the most occurring along Route 9A near mile markers 9A, 8703, 2130 (Pleasantville Road); 9A, 8703, 2136 (N. State Street); and 9A, 8703, 2143 (Chappaqua Road). The types of accidents included overturned vehicles and/or collisions with motor vehicles, guardrails, animals (for example, deer), bridge structures, trees, road signs, utility poles, lighting structures as a result of irresponsible driving, poor weather conditions, poor lighting conditions (dawn/dusk, day, night), malfunctioning traffic control devices, animal crossings, or poor road conditions. A summary of intersection and non-intersection accidents along Routes 9, 9A and 100 are presented in Table 5-24.

Table 5-24. NYSDOT Vehicular Accident Data for the Village of Briarcliff Manor (December 31, 2002 and December 31, 2005)

Major Roadway	Total Accidents	Total Fatalities	Total Injuries	Most Common Reason for Accident
Route 9	47	2	33	Daylight conditions (for example, sun glare)
Route 9A	168	1	85	
Route 100	12	0	9	

Source: NYSDOT, Safety Information Management System. Notes: Includes intersection and non-intersection accidents.

Of all accidents reported along these roadways between December 31, 2002 and December 31, 2005, no accident appeared to result in the release of HAZMAT or require HAZMAT response support within the Village boundaries.

Monetary losses and/or impacts associated with the aforementioned releases have not been made available or calculated. Most of these incidences were addressed in a timely manner and are classified as closed cases.

According to the New York State Department of Environmental Conservation (NYSDEC) - Spill Incident Database (1978 – 2006), the following HAZMAT spills have occurred in the Village:

1. Spill No. 9004187 - A spill occurred along Rt. 9 in Scarborough on July 16, 1990. Seventy five (75) gallons of diesel fuel was released, resulting in an impact to nearby soils. The release was caused by a commercial vehicle in a traffic accident along the roadway.
2. Spill No. 9011823 - A spill occurred on Rt. 9 at the Sleepy Hollow Country Club on February 11, 1991. Fifty (50) gallons of No. 2 fuel oil was released from a tank truck as a result of an equipment failure. The release impacted nearby soils.

3. Spill No. 9503630 - A spill occurred within the roadway near 245 Scarborough Road on June 23, 1995. An unknown amount of an unknown petroleum product was released which resulted in an impact to nearby soils. The release was caused by an equipment failure from a commercial vehicle.
4. Spill No. 9904493 - A spill occurred at the junction of Route 9A and Pleasantville Road in Briarcliff Manor on July 16, 1999. An unknown amount of an unknown material was released which resulted in an impact to nearby soils. The release was from a commercial vehicle along the roadway.
5. Spill No. 9909399 - A spill occurred at the Scarborough Station of the Metro North Railroad (Hudson Line) on November 2, 1999. An unknown amount of an unknown material was released which resulted in an impact to nearby surface water (Hudson River). The cause of the release was unknown.
6. Spill No. 0000616 - A spill occurred on a Briarcliff Road cross street (Route 9A Southbound) in Briarcliff Manor on April 16, 2000. Fifteen (15) gallons of gasoline was released which resulted in an impact to nearby soils. The release was caused by a tank truck in a traffic accident.
7. Spill No. 0011111 - A spill occurred at the Scarborough Station of the Metro North Railroad on January 10, 2001. An unknown amount of an unknown petroleum product was released which resulted in an impact to nearby soil. The cause of the release was unknown.
8. Spill No. 0409231 – A spill occurred at Route 9A and North State Road on November 17, 2004. One (1) gallon of an unknown petroleum product was released into nearby surface water along the roadway. The release was caused by a commercial vehicle in a traffic accident.

The above spill history indicates that no major incidents have occurred that would impact nearby residents. However, some soil and water impacts have occurred in the past.

Probability of Future Events

The probability of a vehicular accident is a function of the number of vehicles on the road. Similarly, the probability of a vehicular accident involving the release of a hazardous material is a function of the number of vehicles that transport hazardous materials through the Village. Based on historic incident and loss data, a vehicular accident resulting in an injury or fatality is more probable than an accident involving the release of hazardous materials.

This type of hazard is impossible to accurately predict; however, areas prone to accidents can be located and quantified through analysis of historical records and plotted on a Village base map. Certain characteristics that together cause accidents or increase vulnerability to potential accidents can be outlined and areas that may be prone to accidents are identifiable. Based on historical information it is estimated that the Village will continue to have hazardous materials in transit in the same historic magnitude, some of which could result in the release of chemicals that may induce cascade effects such as water supply contamination, soil contamination, human health effects and additional transportation accidents as traffic

Earlier in this section, the identified hazards of concern for the Village were ranked. The NYS Hazard Mitigation Plan conducts a similar ranking process for hazards that affect the State. The probability of occurrence, or likelihood of the event, is one parameter used in this ranking process. Based on historical records and input from the Planning Committee, the probability of occurrence for vehicular accident events (both with and without the release of hazardous materials) in the Village is considered frequent (likely to occur more than once every 5 years).

Vulnerability Assessment

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For vehicular accidents (including hazardous materials in transit), the entire Village has been identified as the hazard area. The following text evaluates and estimates the potential impact of vehicular accidents on the Village including:

- Overview of vulnerability
- Data and methodology used for the evaluation
- Impact, including: (1) impact on life, safety and health of Village residents, (2) general building stock, (3) critical facilities, and (4) economy
- Further data collections that will assist understanding of this hazard over time
- Overall vulnerability conclusion

Overview of Vulnerability

Routes 9, 9A and 100 are heavily trafficked roadways in the Village. These State highways are also major transport routes for all types of materials, including hazardous materials that are routed through WC. Hazardous materials in transit include substances or materials determined to be capable of posing an unreasonable risk to health, safety or property when transported. These routes traverse adjacent to water bodies and through residential communities, making nearby residential population and environment is vulnerable to this hazard.

Data and Methodology

For this hazard, data was obtained from the NYSDEC Spill Incident Database, NYSDOT Safety Information Management System and local town officials.

Impact on Life, Health and Safety

Potential losses from vehicular accidents, including hazardous materials in transit, include human health and life, property and natural resources. Vehicular accidents may result in injury or death to drivers/passengers on the road, the public in the immediate vicinity and emergency services personnel. The number of people exposed depends on population density, both by day and night, and on the proportions located indoors and outdoors. From December 31, 2002 to December 31, 2005, 227 vehicular accidents occurring along the major roadways within the Village resulted in 3 fatalities and 127 injuries (NYSDOT, 2004).

Exposure to hazardous materials (e.g., accumulation of vapors in nearby homes or business from spilled materials) can be severe especially for sensitive populations including children and the elderly. Hazardous material releases also threaten the health and safety of those responding and cleaning up the release.

Impact on General Building Stock, Critical Facilities and the Economy

Due to insufficient data, a full loss estimate was not completed for the vehicular accident hazard.

Additional Data and Next Steps

Based on limited data regarding the probability and potential impact of this hazard, a quantitative loss estimate was not completed for this HMP. With time, the Village will work with appropriate agencies to collect additional data to support mitigation planning and consideration of potential risks and prioritization of mitigation measures for this hazard.

It is recognized that Routes 9, 9A and 100 are State-owned highways and the Village does not have jurisdiction over these routes. It is also recognized that the Village needs to compile and maintain data regarding specific concerns and past losses for this hazard. This data will be included in future revisions of the HMP. Such data should include specific information regarding the damage/loss of life/property/infrastructure, and any data on the potential/actual cost and logistics of responding to such an event.

Studying traffic and potential transportation accident patterns could provide information on the vulnerability of specific road segments and nearby populations. Increased understanding of the types of hazardous materials being transported through the Village will also support mitigation efforts.

To support the analysis of potential mitigation actions, historic hazardous material releases in transit could be studied. Costs to respond to a release, remediate the environment, or repair damaged infrastructure would be useful in studying mitigation options.

Overall Vulnerability Assessment

The Planning Committee rated vehicular accidents as a frequent occurrence (likely to occur once or more every five years) and provided an overall ranking for this hazard as “medium” (Tables 5-4 and 5-7). A release of HAZMAT associated with a vehicular accident in the Village is possible; such events have been documented in the past. While it is not possible to predict when and where a release of HAZMAT will occur, the local Fire Department and County HAZMAT team are generally well-equipped and prepared to respond to such situations. In addition, established emergency procedures are in place, remediation would occur in a timely manner, and any infrastructure would be repaired as needed. However, such events can be costly. In regards to non-HAZMAT vehicular accidents, data indicate that these are frequent occurrences; as traffic increases, the potential for vehicular accidents also can occur. Law enforcement, driver education, and transportation management efforts can help to reduce the potential for accidents. Existing and future mitigation efforts, should continue to be developed and employed to reduce the potential impact of such events and prepare the County and local responders to these situations.