

## **5.4.5 TRANSPORTATION HAZARDS**

This section provides a profile and vulnerability assessment for transportation hazards.

### **HAZARD PROFILE**

This section provides profile information including description, extent, location, previous occurrences and losses and the probability of future occurrences.

#### **Description**

Disasters that can result from hazards having an element of human intent, negligence, error or technological failure 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 as deemed appropriate by the Greater Greenburgh Planning Area. The man-made hazard evaluated for the Planning Area is transportation. Transportation hazards include hazardous materials in transit, vehicular accidents, aviation accidents, at-grade railroad crossings, and flood vulnerable roadways.

A transportation hazard may be defined as a condition created by moving anything by common carrier. Transportation hazards can be divided into two categories: hazards created by the material that is being transported; and hazards created by the transportation medium. Transportation systems available in the Greater Greenburgh Planning Area include air, rail and road. A major accident in each of these transportation systems is possible. All of these systems and supporting transportation resources provide services locally, regionally and nationally.

**Vehicular Accidents:** A vehicular accident is a road traffic incident that usually involves one road vehicle colliding with another vehicle or other road user, such as an animal or a stationary roadside object. A vehicular accident may result in injury, property damage or possibly fatalities. Many factors contribute to vehicular accidents, including: equipment failure, poor road conditions, weather, traffic volume, and driver behavior.

**Hazardous Materials (HAZMAT) in Transit:** A HAZMAT is defined as a substance or material determined to be capable of posing an unreasonable risk to health, safety or property when transported. They come in various forms that can cause death, serious injury, long-lasting health effects and damage to buildings, homes and other property. As stated previously in the HAZMAT definition, unreasonable risk covers a broad range of health, fire, and environmental considerations. HAZMAT substances include explosives, 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. Hazards can occur during production, storage, transportation, use or disposal (Campbell, Date Unknown; FEMA, 2006).

**Aviation Accidents:** According to the International Civil Aviation Organization, an aviation accident is an occurrence with the operation of an aircraft which takes place between the time a person boards the aircraft with the intention of flight to the time the person has disembarked the aircraft. There are three different occurrences that determine an accident, an aviation accident: a person is fatally or seriously injured; the aircraft sustains damage or structural failure; or the aircraft is missing or completely inaccessible. An aviation incident is an occurrence, other than an accident, associated with the operation

of an aircraft which affects or could affect the safety of operation (International Civil Aviation Organization, 2001).

At-Grade Railroad Crossings: At-grade railroad crossings are an intersection of railroad tracks, roads, or walkways at the same level. There is no alternative route to a bridge or tunnel (Answers.com, Date Unknown; West Virginia Department of Transportation, Date Unknown).

Flood Vulnerable Roadways: A flood vulnerable roadway is any public road that has a history of being covered by enough water in a manner that the road surface, markings and edges are not visible to the operator of a vehicle, cyclist or a pedestrian. These conditions can be caused by stream/river flooding, poor drainage along roadways or normal surface runoff. Water on the roadway can be either standing or moving and could also leave debris such as gravel, leaves and sticks on the roadway. Duration of the flooding event can vary from minutes to days (Fifth Planning District Commission, 1999).

### **Extent**

#### **Vehicular Accidents**

There is no warning time for vehicular accidents. Contributing factors for these accidents are typically associated with the driver, vehicle and the environment. Factors associated with the driver include: error, speeding, experience, and blood-alcohol level. Factors associated with the vehicle include: type, condition, and center of gravity. Environmental factors include: quality of the infrastructure, weather, and obstacles. The majority of vehicular accidents are attributed to the driver. Vehicular accidents can have severe effects on those directly involved, as well as effects to others not directly involved. Other effects may include: severe traffic delays, lost sales to businesses, delayed commodity shipments, and increased insurance costs (Cova and Conger, 2003).

#### **HAZMAT in Transit**

HAZMAT incidents may occur at any time, in populated or remote areas of the Greater Greenburgh Planning Area. Multiple incidents may occur simultaneously and all typically require a multi-agency, multi-jurisdictional response. To identify the extent of the hazard in a particular community or region, what types of HAZMAT are stored, handled, processed or transported must be determined (FEMA, 1997).

On average each year, 6,774 HAZMAT events occur in the U.S. Of those events, 5,517 are highway events, 991 are railroad events, and 266 are due to other causes. Transportation of HAZMAT on highways involves tanker trucks or trailers and certain types of bulk-cargo vehicles. Average trip lengths are 28 miles for gasoline trucks and 260 miles for chemical trucks. These trucks are responsible for the greatest number of HAZMAT events (FEMA, 1997).

Natural hazards can contribute to transportation-related HAZMAT events. Severe storms, high winds and fires can worsen conditions surrounding HAZMAT events. This makes it more difficult to contain releases and to mitigate the short and long term effects. These releases create short and long term toxological threats to people, plants and wildlife. Toxic materials affect people through inhalation, ingestion or direct contact with skin (FEMA, 1997).

During transportation, the U.S. Department of Transportation (DOT) classifies HAZMAT in one or more categories: explosive, blasting agent, flammable liquid, flammable solid, oxidizer, organic peroxide, corrosive material, compressed gas, flammable compressed gas, poison, irritating materials, inhalation hazard, etiological agent, radioactive material and other regulated material (FEMA, 1997).

**Aviation Accidents**

Approximately 80-percent of all aviation accidents occur shortly before or during take-off and landing. These are usually said to have been caused by human error. Mid-flight accidents are rare but not unheard of. A survey was conducted on 1,843 plane crashes that occurred between 1950 and 2006. The survey showed that of those 1,843 plane crashes, 53-percent was due to pilot (human) error; 21-percent due to mechanical failure; 11-percent due to weather; eight-percent due to other human error (lack of communication, improper maintenance); 6-percent due to sabotage and terrorism; and 1-percent due to other causes (Krasner, 2009).

Aviation accidents are often devastating incidents that may result in serious injuries or fatalities. The Federal Aviation Administration (FAA) and the National Transportation Safety Board (NTSB) are the agencies responsible for monitoring air travel and investigation accidents. Some of the most common causes of aviation accidents occur as a result of the violation of FAA and NTSB regulations. Some other causes of accidents include, but are not limited to:

- Pilot or flight crew errors – Pilot errors are the number one cause of aviation accidents and account for the highest number of fatalities. Pilots have the responsibility to transport passengers safely from one place to another and follow the FAA and NTSB regulations to better ensure passenger safety. If a pilot or flight crew makes an error, an accident may occur.
- Faulty equipment – Faulty aircraft equipment and/or mechanical features are another common cause of an aviation accident.
- Aircraft design flaws – The manufacturer of an aircraft is responsible for an aviation accident if the structural design is flawed and results in an accident.
- Failure to properly fuel or maintain the aircraft – If any regulations and safety standards set by the FAA or NTSB are violated, an accident may occur.
- Negligence of Federal Air Traffic Controllers – The failure of air traffic controllers to properly monitor the airways is another cause of aviation accidents (Aviation Law News, Date Unknown).

**At-Grade Railroad Crossings**

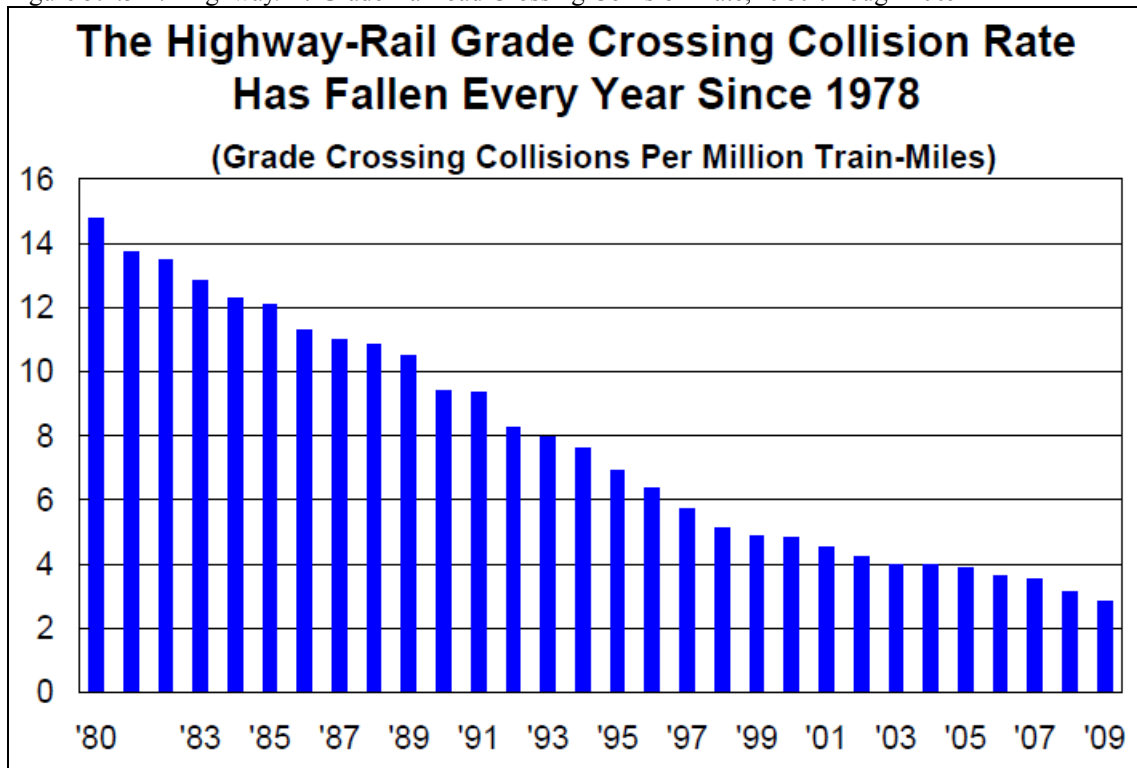
Accidents involving trains and pedestrians or motor vehicles are very severe. A motorist is 30-times more likely to die in a collision with a train than any other type of motor vehicle accident (West Virginia Department of Transportation, Date Unknown).

As of December 2009, there are approximately 136,041 public at-grade crossings in the U.S. In 2009, there were 1,896 incidents at public highway-rail crossings in the U.S. that resulted in 247 deaths and 705 injuries. Also in 2009, 431 people were killed and 343 people were injured while trespassing on railroad rights-of-way and property (U.S. Department of Transportation – Federal Highway Administration, Date Unknown).

For most local road officials, at-grade railroad crossings are the most common exposure to railroads. Such crossings are often a nuisance for both highway and railroad officials. Railroad crossings are a conflict point between two different transportation systems, which have different operating characteristics and different needs (Association of American Railroads, Date Unknown).

Between 1980 and 2009, the number of grade-crossing collisions fell 82-percent (Figure 5.4.5-1). Injuries associated with collision fell 82-percent and fatalities fell 70-percent. The grade crossing collision rate has fallen every year since 1978 (Association of American Railroads, 2010).

Figure 5.4.5-1. Highway/At-Grade Railroad Crossing Collision Rate, 1980 through 2009



Source: Association of American Railroads, 2010

New York State has been a national leader in grade crossing safety, installing full sets of active warning systems, including flashers and gates, at all appropriate public crossings in the State. As a result, New York State has among the lowest crossing accident rates in the country. The State has also been reducing the overall number of at-grade railroad crossings. In 1975, there were over 4,000 public crossings and currently there are only 2,882. Almost three-quarters of those crossings are equipped with active warning devices. Because of this, the occurrence of at-grade crossing accidents in New York State is relatively low. In 2007, there were only 30 accidents on approximately 2,900 public crossings (New York State Department of Transportation, 2007).

### Flood Vulnerable Roadways

See Section 5.4.2 (Flood) for detailed information on the extent for flood and flood vulnerable roadways.

### Location

Transportation hazards are not uncommon in the Planning Area. Transportation systems within the Greater Greenburgh Planning Area include roads, railway and air. Therefore, the location of these transportation hazards can occur anywhere in the Planning Area.

### Vehicular Accidents

A vehicular accident can occur on any traveled roadway in the Greater Greenburgh Planning Area. Areas of particular concern include areas of roads that are difficult to navigate, conducive to accidents, historically accident-prone, adjacent to water bodies, and pass through populated or highly traveled areas.

Most of the roadways in the Planning Area run in a north-south direction, with few roads running east-west. Three major parkways located in the Greater Greenburgh Planning area all run in a north-south direction: the Saw Mill River Parkway, the Sprain Brook Parkway and the Bronx River Parkway. Figure 5.4.5-2 depicts traffic volume in the Greater Greenburgh Planning Area, with the Saw Mill River and Sprain Brook Parkways, Route 287 and Route 87 (New York State Thruway) experiencing the greatest volume.

According to the Planning Committee, the following roadways area areas in need of traffic improvement or traffic safety improvement:

- Jackson and 9A (Unincorporated Greenburgh)
- Dobbs Ferry Road at Knollwood Road (Unincorporated Greenburgh)
- State Road 9A (Village of Ardlsey)



## SECTION 5.4.5: RISK ASSESSMENT – TRANSPORTATION HAZARDS

Figure 5.4.5-2. Traffic Volume in the Greater Greenburgh Planning Area.



Source: Westchester County Department of Planning, 2006

Note: This map shows two-directional Average Annual Daily Traffic (AADT) volumes for interstate highways, parkways, state highways, and touring routes, county roads and selected roadways.

### HAZMAT in Transit

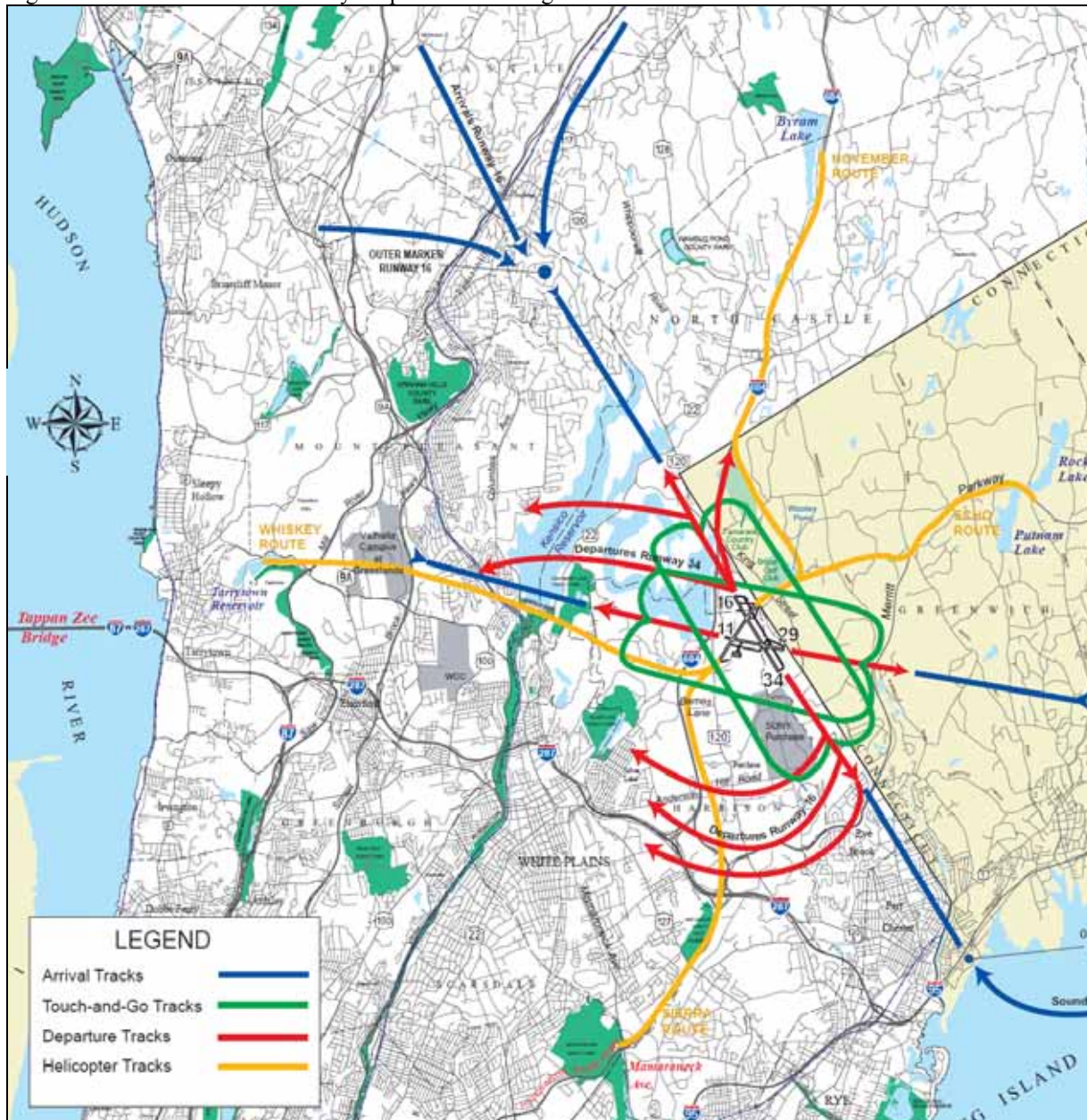
Highways, railways, and commercial or military aviation routes constitute a major threat due to the number of chemicals and hazardous substances, including radioactive materials, transported in vehicles, trains and aircraft. See Figure 5.4.5-2 for the locations of the high traffic routes.

### Aviation Accidents

The Westchester County Airport is designated as a General Aviation Airport and serves primarily corporate aircrafts, light general aviation and helicopters. On average, there are approximately 200,000 takeoffs or landings per year (or 550 per day) at the Westchester County Airport. This Airport also provides limited airline and commuter passenger service, which accounts for approximately 100 scheduled flights each day.

The Westchester County Airport has one main runway and one secondary runway. Approximately 80-percent of takeoffs and landings occur on the main runway and 20-percent occur on the secondary runway. Figure 5.4.5-3 depicts the flight paths at the Westchester County Airport. The Greater Greenburgh Planning Area does not lie directly within the approach and take off zones of the Airport; however, the Planning Area is still exposed to some risk.

Figure 5.4.5-3. Westchester County Airport Aircraft Flight Paths



Source: Westchester County, Date Unknown

### At-Grade Railroad Roadways

The responsibilities for public crossings at grade are shared between the railroad and the road/highway agency. The railroad is responsible for the crossing surface between the out ends of the railroad ties, for the installation of the crossbuck signs where no signals are present, and for the operation and maintenance of the railroad crossing signals and associated control circuitry. The road or highway agency is responsible for warning and regulatory signs on the approaches to the crossing, for pavement markings and for the street or highway approaches outside the end of the railroad ties (West Virginia Department of Transportation, Date Unknown). Figure 5.4.5-3 displays the MTA Metro North rail line that runs north to south along the Hudson River in the Greater Greenburgh Planning Area.



### **Flood Vulnerable Roadways**

According to Unincorporated Greenburgh Floodplain Management and Hazard Mitigation Plan (2001) and various other sources, the following areas and associated roadways are historically flood-prone:

#### **Saw Mill River Watershed:**

- Warehouse Lane and Payne Street (Unincorporated Greenburgh, north of the Village of Elmsford);
- Sawmill River Road at Payne Street and at Beaver Hill (Unincorporated Greenburgh);
- Sawmill River Parkway (Village of Elmsford);
- Route 9A corridor (Village of Elmsford, northern Elmsford);
- Mine Brook confluence;
- Payne Street, Vreeland Avenue, Hayes Street, Newman Avenue (Village of Elmsford, north Greenburgh);
- Lamont Street, Nepperhan Avenue, North Payne and Hayes Street (Unincorporated Greenburgh, north of the Village of Elmsford);
- Babbitt Court (Unincorporated Greenburgh and Village of Elmsford);
- Shelly Avenue, Lytton Avenue, Clements Place, Spencer Court (Unincorporated Greenburgh);
- Rum Brook from Secor Road to Route 100B; Unnamed tributary at Worthington Road;
- Pine Street, between Forest Boulevard and Secor Road (collapsing stream overpass);
- Railroad station (Unincorporated Greenburgh, southeast);
- South Central (Park) Avenue (Unincorporated Greenburgh, southeast); and
- New Central Park Avenue, Underhill Road, White Oak Lane (Unincorporated Greenburgh, southeast).

#### **Hudson River Watershed:**

- Unnamed tributary, Mulligan Lane and Taxter Road areas (Town of Greenburgh, west);
- East and West Sunnyside Lane, Hudson View Park (Village of Irvington);
- Dunham Place, Meadow Way, Harriman Road, Station Road (Village of Irvington); and
- Riverview Road, west of Broadway (Village of Irvington).

#### **Sprain Brook:**

- Jackson Avenue Old Jackson Avenue area (Town of Greenburgh, south)

#### **Bronx River Watershed:**

- New York State Route 199 at Knollwood Road;
- Manhattan Brook confluence
- Kensico Road area (Unincorporated Greenburgh, northeast);
- Troublesome Brook, Route 100 from Mt. Joy Avenue to Route 100A;
- Pipeline Road and White Oak Lane areas;
- Tamarack Trail area;
- Maryton Road and Bronx River Parkway (Unincorporated Greenburgh); and
- Bronx River Parkway at Fenimore Road (Unincorporated Greenburgh, southeast).

According to members of the Planning Committee for each of the municipalities, the following areas and associated roadways are historically flood-prone:

#### **Unincorporated Greenburgh:**

- West Hartsdale Road
- Washington Place
- Stadium Road
- Jackson, Old Jackson and Sprain Avenue
- Route 9A in the area of Beaver Hill
- East Hartsdale Avenue
- Hartsdale Brook in vicinity of East Hartsdale Avenue
- Babbitt Court
- Knollwood Road

### Village of Ardsley:

- Ashford Avenue Bridge over NYS Thruway and Saw Mill Parkway
- Intersection of Sprain Brook and Cross Roads
- Route 9A just north of Revolutionary Road
- King Street

### Village of Dobbs Ferry:

- Beacon Hill Drive and Ashford Avenue
- Washington Avenue

### Village of Elmsford

- Routes 119 and 9A
- Alma Place and Woodside Avenue
- Route 119, Old Road and Robbins Avenue intersection

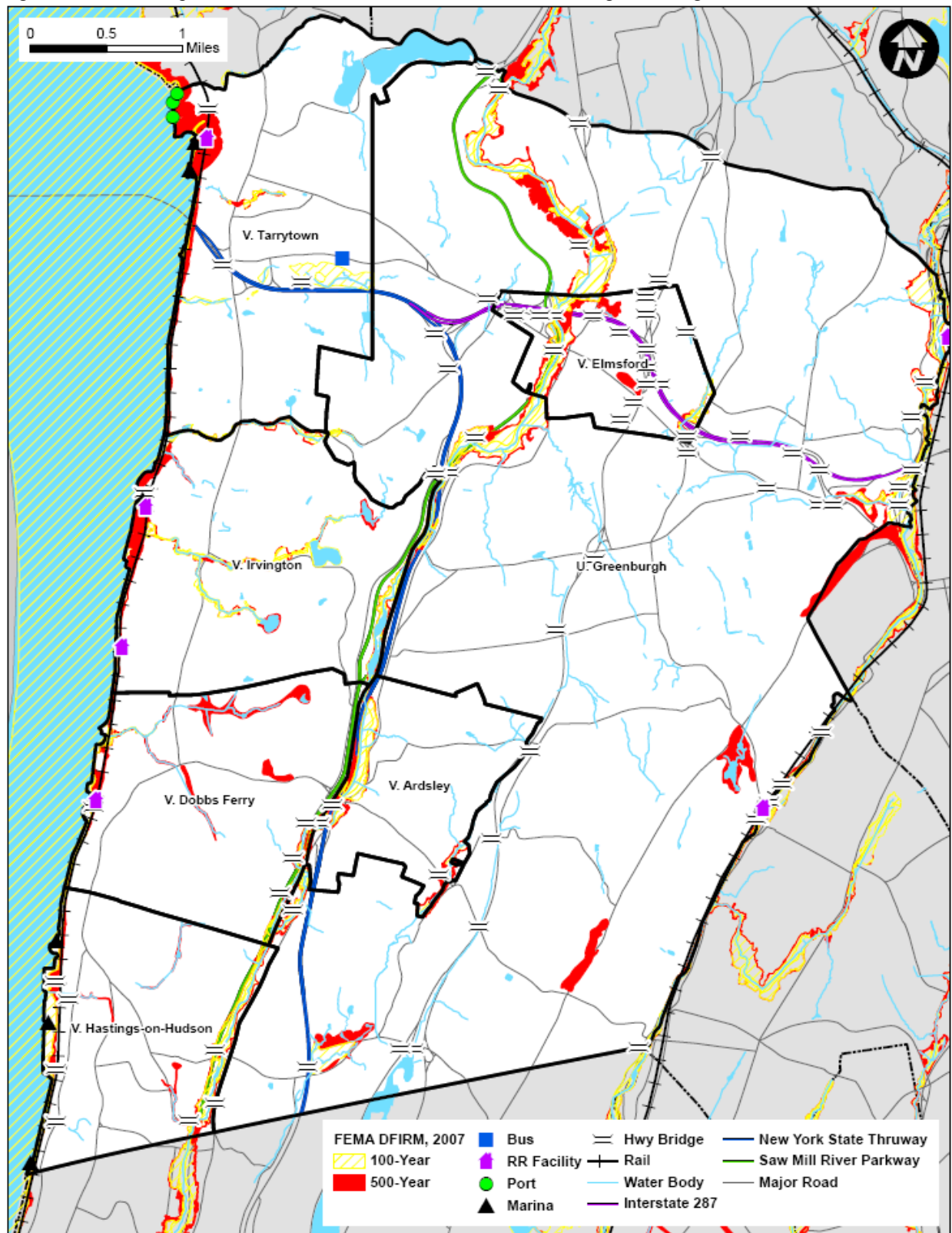
### Village of Irvington

- Intersection of East Sunnyside Lane and Hudson View Park
- East of the intersection of South Buckhout Street and South Astor Street
- Station Road
- Between Station Road and Dows Lane
- Harriman Road between Parkside Way and Dunham Place

### Village of Tarrytown

- Sunnyside Lane area (bordering both the Villages of Tarrytown and Irvington)
- Neperan Road adjacent to Tarrytown Lakes (Skate Shack)
- Benedict Avenue

Figure 5.4.5-4. Transportation Hazard Locations in the Greater Greenburgh Planning Area



Source: FEMA DFIRM, 2007; Input from Planning Committee

## **Previous Occurrences and Losses**

### **Vehicular Accidents**

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 or intersections of major roadways throughout New York State. A Freedom of Information Law Request was submitted to NYSDOT to obtain accident data for the Greater Greenburgh Planning Area. As of the date of the Plan's submittal, a request has not been received.

The New York State Thruway Authority provides a summary of accidents at specific milepost, direction and location along the New York State Thruway. Accident data for the Greater Greenburgh Planning Area was obtained throughout a Freedom of Information Law Request Number F10-0212. A New York State Thruway Authority accident report query for the New York State Thruway was reviewed. Complete accident data was only made available for the period between January 1, 1998 and July 21, 2010.

According to the database, approximately 2,486 accidents occurred along the New York State Thruway within the Planning Area. These types of accidents included with other motor vehicles, malfunctioning motor vehicle, irresponsible driving, poor weather conditions, animals, or poor road conditions, among other types. Of the 2,846 accidents, 82 of them (approximately three-percent) were caused by weather conditions (flooding, snow, rain, ice, etc.).

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.

### **HAZMAT in Transit**

According to the New York State Department of Environmental Conservation (NYSDEC) – Spill Incident Database (1978 – 2010), Table 5.4.5-1 shows the following HAZMAT spills due to traffic incidences or equipment failure of a vehicle has occurred in the Greater Greenburgh Planning Area:



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Table 5.4.5-1. NYSDEC Spill Incident Database for the Greater Greenburgh Planning Area, 1986-2010

Spill Number	Date Reported	Spill Name	Location	Material/Amount Spilled	Cause/Source
8602921	8/2/1986	UPS – NYS Thruway	Ardsley	45 gallons of diesel	Traffic accident
8604468	10/13/1986	Moon Freight – Route 287/Saw Mill River Parkway	Elmsford	100 gallons of diesel	Traffic accident
8606084	12/29/1986	V & C - Beacon Hill Drive	Greenburgh	200 gallons of #4 fuel oil	Equipment failure
8606938	2/11/1987	ATI - Tarrytown Road	Elmsford	30 gallons of diesel	Tank truck
8705227	9/22/1987	Byram Concrete - Ardsley Road	Greenburgh	20 gallons of diesel	Tank failure
8707288	11/24/1987	NY Telephone - 455 Knollwood Road	Greenburgh	20 gallons of #2 fuel oil	Human error
8807885	12/29/1988	Burket Heat - Intersection of 100A & 100B	Greenburgh	20 gallons of #2 fuel oil	Traffic accident
8901999	5/27/1989	Route 9A	Elmsford	50 gallons of unknown petroleum	Equipment failure
8902104	5/31/1989	Texaco - 433 Knollwood Road	Greenburgh	5 gallons of gasoline	Human error
8902356	6/7/1989	Pearl Bilt Transmission - Saw Mill River Road	Elmsford	20 gallons of gasoline	Human error
8906079	9/20/1989	I-287 at Exit 4	Greenburgh	50 gallons of diesel	Traffic accident
8908299	11/20/1989	Route 9A North of 100B	Greenburgh	6 gallons of diesel	Equipment failure
8909488	1/2/1990	Saw Mill River Road - Near Route 119	Elmsford	15 gallons of #2 fuel oil	Equipment failure
9000310	4/9/1990	530 Tarrytown Road	Greenburgh	30 gallons of unknown petroleum	Traffic accident
9003640	6/30/1990	Intersection of Barney and North Stone	Elmsford	15 gallons of gasoline	Traffic accident
9004991	8/6/1990	Side of Old Tarrytown Road	Greenburgh	50 gallons of diesel	Traffic accident
9010454	12/28/1990	Side of Ashford Avenue	Greenburgh	10 gallons of diesel	Traffic accident
9108579	11/12/1991	I-87 Southbound at Mile Post 11	Greenburgh	5 gallons of diesel	Traffic accident
9109579	12/9/1991	Along Forest Blvd.	Ardsley	35 gallons of #2 fuel oil	Equipment failure
9109791	12/13/1991	I - 87 Northbound at Exit 8	Greenburgh	50 gallons of diesel	Traffic accident
9205863	8/20/1992	I-87 near Hudson River	Greenburgh	100 gallons of diesel	Traffic accident
9209579	11/17/1992	Beacon Hill and Ogden Avenue	Dobbs Ferry	50 gallons of #4 fuel oil	Tank truck
9209595	11/18/1992	Mobil Gas Station - 212 Tarrytown Road	Greenburgh	15 gallons of gasoline	Equipment failure
9213566	3/9/1993	Zinger Place	Hastings-on-Hudson	200 gallons of diesel	Traffic accident
9300177	4/4/1993	Knollwood Road	Greenburgh	150 gallons of diesel	Equipment failure
9310038	11/17/1993	Carry-Out Terminal - 109 Fairview Park Drive	Elmsford	20 gallons of diesel	Human error
9403662	6/15/1994	I-87 Southbound - Mile 9.6	Greenburgh	7 gallons of diesel	Equipment failure
9411494	11/29/1994	Roadway near Route 9A, 1/4 mile south of Cedar Lane	Greenburgh	5 gallons of diesel	Traffic accident
9500717	4/18/1995	I-281	Greenburgh	40 gallons of diesel	Traffic accident
9504476	7/14/1995	I-287 Exit 3	Elmsford	100 gallons of diesel	Equipment failure
9506948	9/7/1995	I-287 Westbound	Greenburgh	170 gallons of diesel	Traffic accident
9508665	10/15/1995	Catch Basin - 37 Fulton St.	Greenburgh	30 gallons of diesel	Unknown
9512282	12/31/1995	NYNEX - 40 Washington Ave.	Greenburgh	100 gallons of diesel	Equipment failure
9513056	1/19/1996	Robert Martin Co. - 6 Warehouse Lane	Elmsford	15 gallons #2 fuel oil	Traffic accident
9604475	7/3/1996	Payne Street / Route 9A	Elmsford	5 gallons of antifreeze	Traffic accident
9605461	7/29/1996	Roadway near 1 River Street	Hastings-on-	25 gallons of diesel	Traffic accident

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Spill Number	Date Reported	Spill Name	Location	Material/Amount Spilled	Cause/Source
			Hudson		
9606435	8/19/1996	Easterview Service Center - Old Saw Mill River Road	Greenburgh	5 gallons of transmission fluid	Equipment failure
9608329	10/3/1996	NYS Thruway - Mile 6	Ardsley	70 gallons of diesel	Equipment failure
9609866	11/7/1996	Main Street and Broadway	Hastings-on-Hudson	10 gallons of transmission fluid	Equipment failure
9609971	11/9/1996	Bedell Residence - Winding Farm Road	Ardsley	10 gallons of #2 fuel oil	Equipment failure
9610063	11/12/1996	High Light Auto Service - Route 9A/100C	Elmsford	15 gallons of gasoline	Passenger vehicle
9613548	2/18/1997	Side of road near 1 River St.	Hastings-on-Hudson	10 gallons of diesel	Equipment failure
9614216	3/6/1997	Bourassa Transport - 100 Clearbrook Dr.	Elmsford	100 gallons of diesel	Human error
9703416	6/19/1997	Route 9A and Beaver Hill Road	Elmsford	50 gallons of diesel	Traffic accident
9707621	9/28/1997	Perk Up - 109 Fairview Park Drive	Elmsford	25 gallons of diesel	Equipment failure
9709391	11/12/1997	Tappan Zee Bridge - Mile Post 14	Greenburgh	150 gallons of diesel	Commercial vehicle
9804700	7/15/1998	22 River St.	Hastings-on-Hudson	20 gallons of diesel	Equipment failure
9805693	8/7/1998	Route 9A	Elmsford	10 gallons of gasoline	Traffic accident
9814858	3/15/1999	Route 9 Northbound between Wagner Place and Miniturn St.	Hastings-on-Hudson	8 gallons of transmission fluid	Traffic accident
9900746	4/20/1999	65 Prince Street	Hastings-on-Hudson	40 gallons of gasoline	Tank failure
9902214	5/27/1999	Roadway at Dobbs Ferry Road and Knollwood	Greenburgh	25 gallons of diesel	Traffic accident
9905548	8/8/1999	I-287 Westbound - Route 9A Ramp	Elmsford	40 gallons of diesel	Traffic accident
9907234	9/16/1999	I-287 Westbound - Mile Post 2.0	Greenburgh	90 gallons of diesel	Traffic accident
9911214	12/22/1999	I-287 Eastbound at Exit 4	Elmsford	30 gallons of diesel	Traffic accident
9912285	1/26/2000	Sprain Brook Parkway	Greenburgh	15 gallons of gasoline	Passenger vehicle
9913116	2/17/2000	NYS Thruway	Ardsley	40 gallons of diesel	Traffic accident
9913200	2/21/2000	Route 9A / Junction Blvd.	Elmsford	40 gallons of diesel	Commercial vehicle
10676	12/23/2000	115 Fairview Drive	Elmsford	5 gallons of diesel	Equipment failure
10694	12/26/2000	Mobil Gas Station - 430 Broadway	Dobbs Ferry	30 gallons of gasoline	Traffic accident
12896	3/8/2001	I-287 Eastbound - Roadway near Exit 5	Greenburgh	100 gallons of diesel	Traffic accident
101688	5/14/2001	NYS Thruway	Ardsley	20 gallons of diesel	Equipment failure
102649	6/9/2001	NYS Thruway Northbound - Mile Post 11.3	Greenburgh	20 gallons of diesel	Traffic accident
102893	6/15/2001	Prospero Nursery - 102 Knollwood Road	Greenburgh	25 gallons of hydraulic oil	Traffic accident
102893	6/15/2001	Prospero Nursery - 102 Knollwood Road	Greenburgh	100 gallons of diesel	Traffic accident
103101	6/20/2001	David Learner Associates - 595 W. Heartsdale Ave.	Greenburgh	50 gallons of diesel	Traffic accident
104629	7/31/2001	15 Parkview Park Drive	Elmsford	10 gallons of diesel	Commercial vehicle
104630	7/31/2001	Route 9A / Fairview Park	Elmsford	90 gallons of #2 fuel oil	Equipment failure
105247	8/14/2001	Roadway - Route 9A and Route 119	Elmsford	5 gallons of motor oil	Equipment failure
105407	8/18/2001	I-287 Eastbound	Elmsford	120 gallons of diesel	Traffic accident

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Spill Number	Date Reported	Spill Name	Location	Material/Amount Spilled	Cause/Source
107663	10/26/2001	163 South Central Ave.	Greenburgh	35 gallons of hydraulic oil	Equipment failure
109457	12/26/2001	Coca-Cola - 111 Fairview Park Drive	Elmsford	100 gallons of diesel	Traffic accident
201202	5/2/2002	1-287 Westbound - Mile Post 1.1	Elmsford	10 gallons of waste oil/used oil	Traffic accident
202009	5/25/2002	I-87 Southbound - Mile Post 11.8	Greenburgh	150 gallons of diesel	Traffic accident
209835	12/27/2002	1 South Broadway	Hastings-on-Hudson	10 gallons of #2 fuel oil	Equipment failure
211509	2/20/2003	NYS DOT Yard - Saw Mill River Parkway	Greenburgh	50 gallons of hydraulic oil	Equipment failure
307011	10/3/2003	Havens and Nepperham Ave.	Elmsford	30 gallons of dielectric fluid	Traffic accident
404806	8/2/2004	300 Farm Road	Ardsley	25 gallons of diesel	Traffic accident
405261	8/12/2004	Terminal - 199 Ridgewood Drive	Elmsford	5 gallons of diesel	Equipment failure
409397	11/19/2004	Roadway near 1880 Saw Mill River Road	Elmsford	15 gallons of diesel	Equipment failure
409737	12/1/2004	530 Tarrytown Road	Greenburgh	10 gallons of diesel	Human error
410190	12/13/2004	Taxter Road / Cayuga Lane	Greenburgh	10 gallons of #2 fuel oil	Commercial vehicle
410614	12/26/2004	Roadway near 32 Hayes Street	Elmsford	20 gallons of diesel	Equipment failure
410751	12/31/2004	I-287 Westbound - Exit 2	Elmsford	50 gallons of diesel	Traffic accident
509193	11/1/2005	AKZO - 1 Livingstone Ave.	Dobbs Ferry	25 gallons of #2 fuel oil	Human error
604473	7/21/2006	5 Warehouse Lane	Elmsford	20 gallons of diesel	Equipment failure
608840	11/1/2006	Tower E 61 - South 119th Tarrytown Road	Elmsford	20 gallons of hydraulic oil	Equipment failure
610227	12/8/2006	Commercial Property - 101 Nepperhan Ave.	Elmsford	50 gallons of diesel	Equipment failure
610230	12/8/2006	Brookfield Auto Reckers - Lamont and Haze	Elmsford	50 gallons of diesel	Traffic accident
610473	12/15/2006	I-287 Eastbound - MP 0.7	Greenburgh	25 gallons of gasoline	Commercial vehicle
613336	3/12/2007	Parking Lot - 299 East Main St.	Elmsford	8 gallons of gasoline	Passenger vehicle
702203	5/23/2007	Backhoe	Elmsford	5 gallons of hydraulic oil	Equipment failure
702449	5/29/2007	Roadway near 45 Main Street	Hastings-on-Hudson	50 gallons of hydraulic oil	Equipment failure
705827	8/22/2007	Intersection of Nepperhan Ave. and Paulding St.	Elmsford	100 gallons of unknown petroleum	Traffic accident
800159	4/4/2008	Thaille Industries - 1 South Warehouse Ave.	Elmsford	100 gallons of diesel	Commercial vehicle
810957	1/2/2009	Route 9A and I-287	Elmsford	100 gallons of diesel	Traffic accident
811689	1/26/2009	Coca-Cola bottling plant - 115 Fairview Park Drive	Elmsford	50 gallons of diesel	Traffic accident
813912	3/25/2009	Roadway near 300 Saw Mill River Road	Elmsford	80 gallons of diesel	Traffic accident
910718	1/2/2010	Underground transformer at 152 Broadway	Dobbs Ferry	41 gallons of dielectric fluid	Equipment failure
912406	2/26/2010	Werner Enterprises along I-87 near Mile Marker 5.5	Ardsley	100 gallons of diesel	Traffic accident
912518	3/2/2010	I-87 Northbound Exit 8	Greenburgh	100 gallons of diesel	Traffic accident
912701	3/6/2010	Silvia Lane and Saw Mill River Road	Ardsley	10 gallons of hydraulic oil	Traffic accident
913209	3/17/2010	Intersection of White Plains Road and Route 119	Elmsford	55 gallons of transformer oil	Human error

Source: NYSDEC, 2010



The above spill history indicates that no major incidents have occurred that would impact nearby residents. All spills incidents were closed, meaning that the necessary cleanup and removal actions have been completed and no further remedial activities were necessary (NYSDEC, Date Unknown).

### **Flood Vulnerable Roadways**

**March 6-7, 2011:** Heavy rain fell throughout the day on March 6<sup>th</sup> in the New York Metropolitan Area, bringing almost five inches to some areas. Many river, creeks and streams were flowing out of their banks on March 7<sup>th</sup>. Many rivers in New York and New Jersey crested at moderate to major flood stages (Thompson et al., 2011).

The NWS issued a flood warning on March 6<sup>th</sup> for Westchester County, including the municipalities of Yonkers, White Plains, Tarrytown, Rye, Port Chester, Peekskill, Ossining, North Tarrytown, New Rochelle and Dobbs Ferry (Guzman, 2011).

In Westchester County, flooding closed parts of the Saw Mill, Bronx River, Hutchinson River and Taconic State Parkways. School districts in Bedford, Chappaqua, Hendrick Hudson, Katonah-Lewisboro and Yorktown had delayed openings due to the storm conditions. Power outages were reported in several areas of Westchester County (Ryser, 2011). In the Greater Greenburgh Planning Area, the Saw Mill River Parkway was closed southbound at Exit 22 for Interstate 287 in the Village of Elmsford. Interstate 287 at the ramp for Exit 2 was closed due to flooding in the Village of Elmsford, along with Route 9A, between Route 911 and Payne Street (lohud.com, 2011).

See Section 5.4.2 (Flood) for additional flooding events that occurred in the Greater Greenburgh Planning Area.

### **Probability of Future Events**

Transportation hazards are impossible to accurately predict; however, areas prone to these hazards can be located and quantified through analysis of historical records and plotted on a Town base map. Certain characteristics that together cause these hazards or increase the vulnerability of these hazards can be outlined and areas that may be prone are identifiable.

In Section 5.3, the identified hazards of concern for the Greater Greenburgh Planning Area were ranked. The probability of occurrence, or likelihood of the event, is one parameter used for ranking hazards. Based on historical records and input from the Planning Committee, the probability of occurrence for transportations hazards in the Greater Greenburgh Planning Area is considered frequent (likely to occur within 23 years, as presented in Table 5.3-3).



### VULNERABILITY ASSESSMENT

To understand risk, a community must evaluate what assets are exposed or vulnerable in the identified hazard area. For transportation hazards, the entire Planning Area has been identified as the hazard area. The following text evaluates and estimates the potential impact of transportation hazards on the Greater Greenburgh Planning Area including:

- Overview of vulnerability;
- Data and methodology used for the evaluation;
- Impact, including: (1) impact on life, safety and health, (2) general building stock, (3) critical facilities, (4) economy and (5) future growth and development;
- Further data collections that will assist understanding of this hazard over time;
- Overall vulnerability conclusion.

#### Overview of Vulnerability

Transportation systems available in the Greater Greenburgh Planning Area include rail and road. Hazards associated with transportation can either be created by natural hazards impacting the roadway or rail system, the material being transported, or created by the transportation medium itself.

The MTA-Metro North commuter rail line runs north to south along the Hudson River in the Planning Area. There are heavily trafficked roadways (parkways and secondary roads) used by automobiles and trucks through the Planning Area; some of which experience frequent flooding. These roads are used by residents, commuters and for transporting all types of materials, including hazardous materials. 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 residential neighborhoods, making the nearby residential population and environment vulnerable. A major accident in each of these transportation systems is possible and could impact the Planning Area (minimal to severe).

#### Data and Methodology

For this hazard, data was obtained from the NYSDEC Spill Incident Database and local Planning Area officials. In addition, the Planning Committee has identified roadways within the Planning Area that are vulnerable to other natural hazards (i.e., flood).

#### Impact on Life, Health and Safety

Potential losses from transportation hazards include human health and life, property and natural resources. Vehicular accidents, flooded roadways, a release of hazardous materials in transit, aviation accidents and accidents at public railroad crossings at grade 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.

Vulnerability to a release or spill of hazardous materials depends on the amount and type of material, as well as the location of the release. 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.

The Planning Area is prepared to manage and respond to transportation hazards within the community. The County HAZMAT team is also well-equipped to respond to transportation hazard events.

### **Impact on General Building Stock, Critical Facilities, Economy and Future Development**

Due to insufficient data, a full loss estimate was not completed for the transportation hazard. Loss of roadway use and public transportation services would affect thousands of commuters, employment, day-to-day operations within the Planning Area, and delivery of critical municipal and emergency services. Disruption of one or more of these modes of transportation can lead to the congestion of another, and not only impact the Planning Area but the County and region as a whole.

As discussed in Section 4, areas targeted for future growth and development have been identified across the Planning Area. Increased development in the Planning Area, County and region will contribute to increased road and rail traffic as well as materials transported via roadway.

### **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 Planning Area can 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 the Planning Area needs to compile and maintain data regarding specific concerns and past losses for this hazard. 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 (i.e., location of road closures, map detours, traffic counts, duration of closures and detours; costs to respond, etc.). This data will be included in future revisions of the HMP and can be used to support future mitigation grant efforts (i.e., benefit cost analyses).

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 Planning Area will also support mitigation efforts. By keeping a record of these frequently transported materials, preparatory measures can be made should a release occur. Costs to respond to a release, remediate the environment, or repair damaged infrastructure would be useful in studying mitigation options.

### **Overall Vulnerability Assessment**

The Greater Greenburgh Planning Area has rated the transportation hazard as a “frequent” occurrence (likely to occur within 25 years) and provided an overall ranking for this hazard as “low” (Tables 5.3-3 through 5.3-6). While it is not possible to predict when and where a transportation accident will occur, the local fire departments 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. Mitigation actions have been identified for roadways that frequently flood in the Planning Area. Please refer to the Flood

#### **SECTION 5.4.5: RISK ASSESSMENT – TRANSPORTATION HAZARDS**

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Profile (Section 5.4.2) of this Plan. 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.