

Low Visibility Driving Environment



Florida Highway Patrol Training Academy

Conditions that Can Result in a Low Visibility Driving Environment

- ◉Smoke
- ◉Fog
- ◉“Superfog” - Smoke and Fog mixture
- ◉Heavy rain and wind



Fog

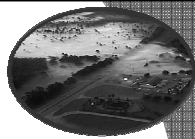
Fog forms when water evaporates from a surface or is added to the air.

As water begins to rise into the air, water vapor rises and bonds with small dust particles in the air. These droplets form fog when the process occurs close to the ground.

Several conditions that need to first:

- relative humidity is near 100%
- air temperature and dew point temperature are close to one another or less than 4°F (2.5°C).

Source: ©2012 About.com. All rights reserved. <http://geography.about.com/od/weather/a/fog-overview.html>



Super Fog

Super fog is a combination of smoke and fog

Smoke and ash from a burn mix with the humidity in the air

Super fog can form as an almost solid wall with visibility reduced to near zero.

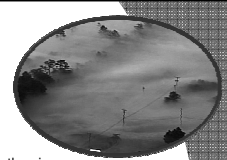
While it most often forms at night, it is usually at its heaviest in the early morning hours before the heat of the sun can burn it off.

It is present most often during the morning rush hour.

It is almost impossible for weather forecasters and scientists to predict.

Super fog can form more than 20 to 30 miles away from the site of the fire.

Source: ©2012 National Safety Council, Inc. All rights reserved. <http://www.nsc.org/traffic-safety/2011/01/01/super-fog/>



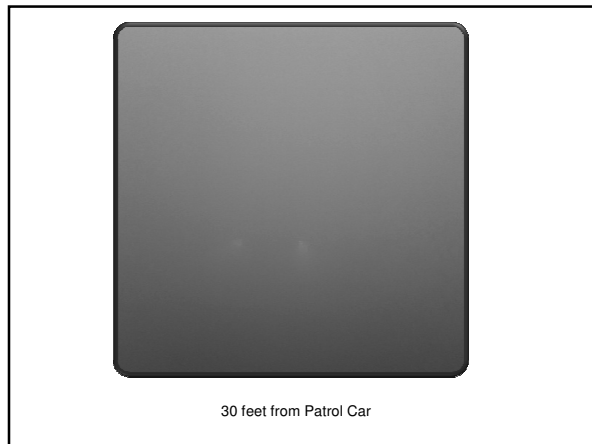

10 feet from Patrol Car

Super Fog

Super fog in Putnam County, Jan 2012, SR 20 east of Gainesville 1 month before the I-75 crashes



20 feet from Patrol Car

Heavy rain/wind

- Reduced visibility
- Hydroplaning risk
- Loss of traction

Recommended Driving Habits

- Before entering an interstate for a night time or early morning commute, listen to local news, weather, and traffic reports. If there are reports of a wild fire or foggy conditions in your local area, consider taking an alternate route and avoid high-speed roadways altogether.
- If you are on an interstate, watch for electronic or "fold-out" signs warning of fog ahead.
- In **foggy conditions, SLOW DOWN!** Most of the major pile-ups occurred because drivers didn't slow down and, once it was too late, they couldn't stop in time to avoid hitting a slow or stalled vehicle ahead.
- Do not use your bright beams. The high beams of your bright lights will reflect off the fog causing increased glare. Use low beams only.
- The lack of any visual references while driving in fog can make it seem like you are going slower than you actually are. Pay attention to your speedometer and **REDUCE YOUR SPEED!**

Recommended Driving Habits

- Avoid lane changes. If you are unable to avoid a lane change, use extra caution before moving over and always use your turn signals.
- Roll down the driver's side window and listen for anything unusual that can warn you of a problem up ahead.
- Do not use your cell phone while driving or engage in any other distracting activities such as eating or playing the radio too loudly. Concentrate 100% on the road conditions around you as far as you possibly can.
- Scan your rear view mirrors for warning of vehicles behind that may be approaching too fast.
- If you are approaching an exit, exit the roadway and use an alternate route.
- If, for any reason, you have to stop, pull off the roadway as far as you possibly can and activate your emergency blinkers. Once you are off the roadway, get out of your vehicle and walk as far away from the roadway as you can. Once you are safely out of your car, you should use your cell phone to call the police or highway patrol and alert them to the conditions.

Source: ©2012 National Safety Commission Inc. All rights reserved - <http://alerts.national-safetycommission.com/2011/05/page-2-fog-conditions-what-to-do/>


Driver Perception and Reaction Time (PRT)

- PRT is defined as the interval between the appearance of some object or condition in the driver's field of view and the initiation of a response.
- If conditions are perfect, the generally accepted PRT is approximately 1.6 seconds
- This does not take into account the mechanical delay, which is the time between when the driver initiates a response and when the vehicle reacts (brakes actually engage, wheels actually turn, etc.)

Average Stopping Distances

Using a perfect world with an undistracted driver with good PRT (1.6 seconds), a vehicle with 100% braking, a good traction/friction (0.71 drag factor), let's calculate approximate stopping distances:

<u>SPEED</u>	<u>Stopping Distance</u>
70 mph	394 feet
65 mph	350 feet
60 mph	309 feet
55 mph	271 feet
50 mph	234 feet
45 mph	200 feet
40 mph	168 feet



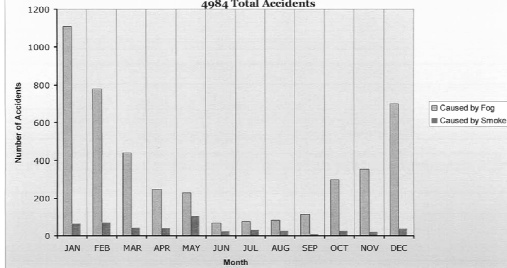
Weather Related Fatal Crashes

Incremental Weather Related Fatal Crashes in United States (2000-2007)

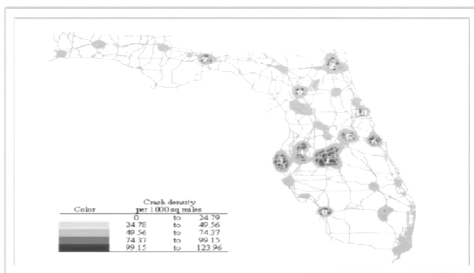
Rank	Rain		Snow		Fog/Smoke	
	State	Fatal crashes	State	Fatal crashes	State	Fatal crashes
1	Texas	1027	Michigan	572	California	380
2	Florida	1403	Pennsylvania	420	Texas	355
3	California	1340	New York	350	Florida	299
4	Pennsylvania	1000	Ohio	316	North Carolina	168
5	North Carolina	1025	Wisconsin	304	Georgia	149
Mean*		447		97		73
S.D.*		428		121		62
Total*		22813		4972		3729

Data queried from Fatality Analysis Reporting System (FARS)
via UCF Visibility Detection Study -
*Statistics for all 50 States, including the District of Columbia and Puerto Rico

1999 - 2008 Accidents Caused By Smoke and Fog
Accidents Per Month
4984 Total Accidents



Fog/Smoke Related Crashes Hot Spot Map



Cluster Analysis of Fog and Smoke Related Crashes in Florida (2003-2007)
via UCF Visibility Detection Study

Role and Responsibilities of Troopers During Significant Road Closures

- If not on the scene of the incident, proceed immediately to the scene so that you can begin to evaluate the situation and take charge as Incident Commander until properly relieved of that responsibility by a member of higher rank;
- Notify RCC and provide as much pertinent information as possible to the Regional Duty Officer so that the CAD incident can be updated (i.e., exact location to include grid coordinates if possible, size of the area affected, presence of fog, smoke or both, proximity of fire, low lying areas, proximity of rivers/lakes/ponds, wind strength and direction, traffic conditions, etc.);
- Attempt to personally notify an on-duty district supervisor and/or Troop Watch Supervisor (TWS) of any major smoke/fog incidents that could lead to significant road closures

Role and Responsibilities of Troopers (Continued)

- If unable to personally make notification, direct the Regional Duty Officer to notify an on-duty district supervisor and/or Troop Watch Supervisor (TWS)
- Ensure the Regional Duty Officer documents the notifications or attempted notifications in the CAD notes
- If unsure that supervisory notification is needed, a supervisor will be notified
- If there is an immediate risk to the safety of the public due to smoke/fog, then immediately attempt to close the roadway if it can be done safely and without jeopardizing your safety

Role and Responsibilities of Troopers (Continued)

- Activate all patrol car emergency lights and set up traffic cones/fusees if available;
- Put on your high visibility traffic safety vest, and take appropriate action to safeguard the public.
- When appropriate and authorized, restore the normal, orderly flow of traffic;
- Monitor the situation and provide timely updates to the on-duty district supervisor and/or TWS, and respective RCC;
- Remain at your post until properly relieved or authorized to leave by higher authority.

Smoke/Fog Incident

- Ensure Trooper is dispatched to the location;
- Notify other FHP units (as appropriate);
- Notify Florida Forest Service;
- Notify Troop Watch Supervisor;
- Notify on-duty District Lieutenant(s) and Sergeant(s);



Smoke/Fog Incident (Continued)

- Obtain a spot weather forecast for the affected area from the National Weather Service;
- Identify current or overnight LVORI levels to determine risk of high LVORI 7 or greater;
- Ensure detour routes established;
- Confirm staffing plan is in place to monitor location & close roadway if needed;
- Ensure safety of the public prior to re-opening of the roadway and monitor as needed;
- Notify local law enforcement agencies

Smoke/Fog Incident (Continued)

- Notify FDOT of possible road closures and signage request (if appropriate);
- Notify Public Affairs Officer and/or Media;
- Notify State Warning Point;
- Ensure completion and distribution of the press release and entries in the FHP Notification and Reporting System;
- Ensure all information concerning incident is entered into CAD.

Closing/Re-opening of Roadway

- Ensure Trooper is dispatched to the location, if appropriate;
- Notify other FHP units (as appropriate);
- Notify local law enforcement agencies; request assistance as needed;
- Notify FDOT, if needed;



Closing/Re-opening of Roadway (Continued)

- Determine detour routes and availability of detour signs;
- Determine the availability of warning signs/barricades and consider staging in case of need;
- Consider roadway characteristics/obstructions – if obstructed due to traffic crash, activate Rapid Incident Scene Clearance (RISC) if available;
- Consider distance of visibility; weather conditions/warnings/advisories (with fog, consider time of day & year);

Closing/Re-opening of Roadway (Continued)

- Consider other ambient conditions present – wildfires, smoke, temperature, hazmat, etc.;
- Geographic considerations / hazard proximately (potential for dense fog to mix with localized smoke from prescribed burns or wildfires)
- Obtain a spot weather forecast and/or LVORI, if appropriate;
- Consider traffic density and the occurrence or possibility of secondary collisions;
- Ensure the safety of the public prior to re-opening the roadway and monitor as needed;
- Notify Public Affairs Officer and/or Media;

Smoke Management Agreement

A. FFS, DOT, AND FHP, having mutual concerns, responsibilities, and duties relating to smoke intrusions from wildfire and prescribed burning on Florida's state highways, desire to cooperate in protecting the lives and property of the citizens of Florida.

B. FFS has the primary responsibility for prevention, detection, and suppression of wildland fires wherever they may occur. FFS shall provide leadership and direction in the evaluation, coordination, allocation of fire suppression resources, and monitoring of wildfire management and protection, in accordance with Sections 590.01 – 590.125, F.S.

C. DOT may place and maintain traffic control devices on Florida's state roads to warn, regulate, or guide traffic in accordance with Section 316.006(1), F.S.

D. FHP has the authority and responsibility to patrol the state highways and regulate, control, and direct the movement of traffic thereon in accordance with Section 321.05(5), F.S.

1. FFS will notify FHP whenever FFS has knowledge that smoke may impact traffic on the state highway system. The information supplied by FFS will include the FFS contact person, state road number, the location of the hazard (which should include visible landmarks, e.g., "south of toll plaza x", or "north of mile marker Y"), and a general description of the incident.