MOUNTAIN DRIVING INFORMATION FOR SMALL VEHICLE AND MULTIFUNCTION BUS OPERATORS

(July, 2009)

Mountain driving presents unique problems and situations that require greater attention to the same driving skills and expertise expected of all operators of school buses and small vehicles. Steep grades, winding roads, blind curves, falling rocks, wildlife, and unpredictable weather can present great potential risk and serious consequences. Other hazards include high winds, sightseeing motorists and bicyclists. The margin for error is reduced and minor mistakes can develop into major problems. Mountain driving requires a high level of concentration and a respect for the terrain.

- Be alert and well rested. Do a personal fitness check. Be aware of your own limitations.
- Inquire about weather and road conditions prior to departure but be aware of sudden weather changes.
- Ensure that the vehicle used is in safe mechanical condition and has all the needed equipment by performing a complete pre-trip inspection prior to departure.

Increase the following distance in inclement weather to accommodate limited visibility and expanded stopping distance.

MAINTAINING CONTROL

The driver must keep the vehicle under control by maintaining a safe road speed (at or below the posted limit). Drivers should maintain control of the vehicle by primarily using the transmission (gearing down) and then using the service brakes.

SPEED CONTROL

Maintaining Vehicle Control with the Transmission and Engine - Engine compression is the first source of braking power. Before coming down a long steep grade, select a gear low enough to maintain a safe speed with engine compression, while minimizing brake use. This is especially important with a standard transmission. You should be aware that an automatic transmission may up-shift even when manually placed in a lower gear if the engine reaches maximum RPM's. If RPM's are too high, it may not be possible to downshift a standard transmission.

Maintaining Vehicle Control With the Brakes - In mountain driving, the force of gravity plays a major role. Gravity will tend to make the vehicle speed up when going down steep grades. The speed of the vehicle must be low enough to prevent brake overuse and avoid overheating.

Brake shoes and pads are designed to push against the brake drum and rotors to slow the vehicle. This action creates friction, which produces heat. While brakes are designed to take a lot of heat they can fail from excessive heat caused by attempting to slow down from too high a speed, too many times, or too quickly.

Brake "fade" (less stopping power) occurs when heat build-up causes the brake lining to glaze or deteriorate at high temperatures. This decreases the effectiveness of the brakes, and in extreme cases, will no longer slow the vehicle. Never exceed a safe controlled speed. The most effective braking method is to firmly apply the brakes to 5 mph below your safe speed, release the brake and allow the vehicle speed to increase. Repeat as needed when vehicle exceeds safe speed.

Effect of Speed on Stopping Distance - Whenever speed is doubled, it takes an average of four times as much distance to stop and the vehicle has four times the destructive power if it crashes.

Effect of Vehicle Weight on Stopping Distance - The heavier the vehicle, the more work the brakes must do to stop it and the more heat they generate.

CURVES

Speed and Curves – Set the vehicle to a safe speed before entering a curve. Never exceed the posted speed limit. Since the posted speed limit is designed for a standard vehicle, road conditions and the weight of your vehicle will determine your safe speed which may be below what is posted. Only accelerate after passing the middle of a curve. Gravity can produce this slight acceleration on downhill curves. Braking in a curve may result in reduced vehicle control.

Lane Position In Curves - Stay centered in the lane to keep a safe clearance on all sides of the vehicle. Watching your and other vehicles lane position will help avoid collisions. Hugging either side reduces margin for error or space needed to avoid hazards such as rocks, soft shoulders, other vehicles, animals, bicyclists or other obstructions.

BACKING

Avoid backing unless there is no other safe alternative. When vehicles meet on a road that is not wide enough for both vehicles to pass safely, the vehicle going downhill must yield the right-of-way by backing up to a wider place or stopping to leave adequate space.

EMERGENCIES

As you drive, always expect the unexpected. In cases of emergencies, always look for areas that can be used to safely slow or stop your vehicle. Sideswiping hillsides, rocks, small trees, or guardrails may be a safer alternative to avoid more serious consequences. Utilize emergency escape ramps or lanes, if available. Hitting wildlife may also be safer than swerving and losing control of your vehicle. Use your best judgment when making decisions in emergency situations.

OTHER CONSIDERATIONS IN MOUNTAIN DRIVING

Passenger Well-Being - When planning a mountain trip, think about your passengers.

- Breaks should be taken as needed where safe pullout areas can be found.

- Motion/car sickness - Have the passenger sit up front with one or more windows open for fresh air. You may need to adjust your driving to accommodate the needs of your passengers.

- Altitude Sickness - Even passengers that live in high altitude areas may suffer from altitude sickness. Make sure they drink fluids, relax and get to a lower altitude as soon as possible.

Bicycles - Bicyclists on the road have the same rights and responsibilities as motor vehicles. Pass only when necessary and only when it can be done in a safe manner. State law requires a three foot separation between bicycles and vehicles on the roadways. It is permitted for vehicles to cross the double yellow line to provide this cushion of safety. Be aware at higher speeds, the tail wind created by vehicles can affect the bicyclist.

Other Motorists – Many motorists are uncomfortable on mountain roads due to fear and may crowd the center of the road. Sightseeing motorists may drift to either side of the roadway or stop abruptly. Be aware of pedestrian traffic in unexpected locations on or off the roadway.

Self Preservation - When driving long distances, you may experience fatigue, illness or minor aches and pains. Safe driving involves smart driving. Pay attention to your body and take measures to remain alert and prevent muscle soreness. <u>The only remedy for fatigue is sleep. Always use your best judgment. Pull over and stop anytime you cannot drive safely.</u>

ADVERSE DRIVING CONDITIONS INFORMATION FOR SMALL VEHICLE AND MULTIFUNCTION BUS OPERATORS

(July, 2009)

There are some general procedures for driving in adverse weather. Before Driving:

1. Check the weather report.
2. Check road conditions prior to departure.
3. When planning your route, consider alternate routes. Be aware of options for safe pullout/stop areas in extreme weather conditions or emergencies.
4. Conduct a thorough pre-trip inspection of the vehicle you will be driving.

Pre-Trip - During inclement conditions, a thorough pre-tip inspection is crucial. Pay special attention to items such as windshield wipers and fluid levels, suspension, tire conditions, defrosters and lights. Also, double check that you have the necessary safety equipment inside the vehicle including an ice scraper, sunglasses/hat, gloves, first aid kit, emergency triangles and an emergency contact list with a communication device (i.e. two-way radio or cell phone).

Speed Control - Driving in inclement weather, it is important to slow the vehicle gradually, avoid aggressive braking or steering and increase following and scanning distance.

Slippery Surfaces - You cannot steer or brake a vehicle unless you have traction. There are some road conditions that reduce traction and require lower speeds. It will take longer to stop and be harder to turn without skidding when the road is slippery. Wet roads can double stopping distance. Reducing speed to accommodate surface conditions is advised.

Identifying Slippery Surfaces - It may be hard to know if the road is slippery. Some common slippery surfaces can be:

- **Shaded Areas** - Shady parts of the roads may remain icy and slippery long after open areas have melted and dried.
- **Bridges** - When the temperature drops, bridges freeze before the road does. Be especially careful when the temperature is close to freezing (32° F).
- **Melting Snow & Ice** – Roads are most hazardous when snow or ice begins to melt. Be extra cautious of packed snow or icy roads when the outside temperature is near the melting/freezing point (32° F).
- **Black ice** - When the temperature is below freezing and the road appears wet, it could be black ice. This is a thin layer of transparent ice that can be found anywhere. Especially prone to this are high-traffic intersections and windswept areas.
- **Hail** – While similar to ice, hail provides a unique set of hazardous circumstances. Hail on roadways can produce an extremely slippery and uneven road surface.

- **Rain** – When it starts to rain, the water mixes with oil and other road grime. This makes the road very slippery. Standing water on the roadway may lead to additional challenges such as hydroplaning.
- **Mud/Mudslides** – Wet, non-paved roads or paved roads where excessive mud is present can be slippery and may be virtually impassable.
- **Other** – Anti-icing and De-Icing materials used on roadways (i.e. gravel, magnesium chloride and salt) are intended to improve traction. However, in some instances they can decrease traction.
- **Hydroplaning** - When water or slush collects on the road, the vehicle can hydroplane. This occurs when tires lose contact with the road and have little or no traction. You may not be able to steer or brake. Control can be regained by releasing the accelerator (and depressing the clutch pedal with a standard transmission). If hydroplaning, do not use the brakes to slow down.

  It does not take a lot of water or high speeds to cause hydroplaning. Excessive speeds in wet road conditions may lead to hydroplaning. Hydroplaning is more likely to occur if tire pressure is low or the tread is worn. Be especially careful driving through puddles. The water is often deep enough to cause hydroplaning.
- **Water on Roadways** - Water on brake drums will reduce braking efficiency. A light application of the brakes can prevent excessive water between the drum and brake pads. During excessively wet conditions or after passing through standing water, it may be necessary to apply the brakes slightly for a short distance to dry them out and restore normal braking.

  Never attempt to drive in flowing water as the depth and force of current is unknown. Dangers may not be visible. There may be debris, downed power lines or the road may be washed out.
- **Snow** - There are different types of snow that provide different levels of traction. The most traction comes from dry granular or very cold snow. Packed snow may provide better traction than freshly fallen snow. As variations in temperatures occur at or near the freezing/melting point (32°F), vehicles will have the least amount of traction. This presents the most dangerous road conditions of ice on snow or snow on ice.

Magnesium Chloride - Used as a de-icer on the highways in the winter. It will coat lights and windows, causing visibility problems. Wash the vehicle soon as practicable, including the underside to prevent corrosion of parts. It may irritate the skin and eyes in some people. When this occurs, wash the affected area with mild soap and water.

Storms – Sudden storms can produce heavy rains, hail, flash flooding and lightning. If in a severe storm in these conditions, especially lightning, you are safest in your vehicle. Avoid touching metal objects or pulling over in high-risk areas (canyons, near power lines or tall trees).

Reduced Visibility – Motorists can expect to experience any and all of the following driving hazards that may result in reduced visibility. Drive at a speed that allows you to stop within a distance you can see.

- Fog
- Sun
- Dust
- Rain
- Snow
- Debris
- Smoke
- Hail/Graupel
- Darkness
- Light variations
- Vegetation
- Terrain

Additional Hints and reminders:

- Check road conditions prior to departure.
- Road shoulders are softer and may provide better traction than a slick roadway. However, the weight of some vehicles may cause these areas to give way. Plow blades typically overshoot the road shoulder leaving a "false shoulder" of snow with little foundation for vehicle support.
- Speed should be conservative when conditions are less than perfect. Maintain a speed that allows you to stop quickly in the event of the unexpected.
- Know your limits and your vehicle's limits. Pull off to a safe location rather than continuing in adverse and unsafe conditions.
- Test traction conditions and braking ability before an emergency presents itself. Do this in a safe location and when no other traffic or hazards are present.
- Excessive heat may cause the asphalt to soften or become slippery.