Topics Covered in this Section

• Mountain Driving Hazards
• Rules of the Road
• Vehicle Emergency Kits
• Winter Weather Driving
• Incidents on the Road
• Altitude Health
• Wildlife
• Marking Hazardous Areas
• Computer Room Freon Cooling System

Make the safe choice...
Mountain Driving Hazards

Driving is **High Risk** for everyone traveling to the observatory. Hazards include:

- Narrow winding mountain roads without shoulders, and poor engineering.
- Blind curves, steep drops, ditches, and culverts with NO guard rails.
- Falling rocks and trees may be in roadway. Rough dirt roads.
- Road crews, graders, loaders, logging trucks at work.
- Large recreation vehicles, hunters, horses, deer, black bears or other large wildlife may suddenly appear.
- Oncoming drivers may cross center line.
- Poor or no visibility due to severe winter or monsoon weather – blizzards, heavy fog / heavy rain.
- Road washouts due to flooding.
- Bad weather such as ice, snow and severe wind storms.

**Drive safely, be prepared, and avoid distractions!**

*Make the safe choice...*
Rules of the Road

- Each vehicle must have an emergency kit with contact sheets, a working MGIO (outdoor) radio, and gate key at all times, regardless of whether it is an LBTO/UA, rental, or personal vehicle.
- Speed Limit 25 MPH, wear seat belts; drive appropriate to the road conditions
- Do not cross the center yellow lines.
- Never pass road maintenance equipment (dirt and snow moving equipment, logging trucks, etc.) without their signal/ok.
- Radio clearance is required before traveling up and down the MGIO access road.
- Approval from the Manager on Duty (call 520-626-1466) is required before driving between MGIO Base Camp and the Observatory during:
  - Dark/night time hours
  - Actual or forecasted inclement weather (snow, ice, wind, rain, etc.)
  - Driving after dark during inclement weather is not permitted.

- Report vehicle problems immediately to the manger on duty.
- Mentoring is available for new drivers (contact your supervisor/sponsor).
- FULL LBTO Vehicle Travel Safety Requirements [M004s00312](#)
- LBTO Safety Manual, Ch. 5.4 Vehicle & Road Safety

Make the safe choice...
Vehicle Emergency Kits

• **LBTO/UA vehicles** are equipped with an emergency kit and a hard-wired MGIO Radio.

• **Rental/personal vehicles**: Grab and Go Kits are available for “self check out” in the receiving area next to the outdoor restroom at MGIO base camp. Put your name, kit ID, check-out & return date on the log.

• Kits contain various equipment, including:
  • Blankets, ponchos, flares, candles, flashlights, tools, snow chains, flat repair tools, first aid supplies, snow supplies, shovel, straps, emergency contacts, and other emergency equipment.

• Always note any items missing to the admin assistant or Manager on Duty ([admin@lbto.org](mailto:admin@lbto.org) or 520-626-1466).
Winter Weather Driving

• Remember, pre-approval from Manager on Duty is required before driving in actual or forecasted winter weather conditions. Call first.

• Nov. 15-Apr. 15 and during actual or forecasted winter weather, vehicles must be equipped with:
  • 4-wheel-drive or all-wheel drive vehicle with 6”+ ground clearance
  • All-weather/terrain tires
  • Chains/tire traction devices on board (these are in emergency kits)
  • Note: Contact your LBTO sponsor if you cannot reserve the approved vehicle. You may have to coordinate a ride with LBTO staff or delay your trip.

• Emergency Kits: Double check the kit and how to use traction devices before you go.

• Once on the Road, drive slowly and be aware of black ice.
• Upon arrival to LBTO, watch for falling ice and park away from the building. Unload your vehicle in the high-bay or under the balcony over-hang to protect from falling ice.

Make the safe choice...
Seat belts save lives...

• Ask our staff...
• An oncoming driver fell asleep and crossed the yellow line, leading to this accident.
• Because of a seat belt, our staff member walked away with a few scrapes and bruised ribs...and a wrecked truck.

Buckle Up! It’s the Law, and UA Policy.

Make the safe choice...
Emergencies on the Road

• Utilizing the MGIO radio, your cell phone and the emergency contact sheets (in the emergency kits), attempt to reach someone in this order:
  1. MGIO Radio (via the “MGIO RPT” channel)
  2. Phone: Dial 911 or UAPD: 520-621-8273 (cell signal strength varies)
  3. Last Resort for Emergencies: On the MGIO Radio, switch the channel to GCSO 1 or 2 and radio for help. This is the Graham County Sheriff’s Office – 911 dispatch.

• Do not put your safety or the safety of others at risk while driving or while involved in an emergency situation.

• In an emergency or vehicle trouble situation, stay calm and stay with your vehicle if it is safe to do so.

• Remember, your safety comes before that of the vehicle, the equipment and of wildlife!

Make the safe choice...
High Altitude Health

See LBTO Document: M004s00320 “High Altitude Health Information”

- LBT is at 10,500 feet. 70% Oxygen equivalent in the atmosphere due to decrease in pressure.
- Being at altitude can result in **Acute Mountain Sickness** (altitude sickness).
  - Headache, dizziness, tiredness, irritability, reduced mental capacity, impaired exertion tolerance, shortness of breath, vomiting.
  - Could result in poor decision-making, accidents, or loss of consciousness, including falls or equipment accidents.
  - Varies from person to person, day to day.
  - Even if symptoms are mild, they can turn quickly.
- Recognize these symptoms in yourself and others.
- Conditions are curable $\rightarrow$ return to lower elevation. If symptoms persist, seek medical help.
High Altitude Health

- Notify the mountain manager immediately of symptoms of altitude sickness.
- Oxygen is available in Tanks at the summit.
- It is possible that the manager sends someone down for their own safety and the safety of others.
  - Depending on the severity, it may not be safe to return.
- Tips for Prevention:
  - Acclimate: Take a ~30 minute break from physical activity when you arrive.
  - Stay hydrated: ½ ounce of water for each pound of body weight, per day.
  - Do not skip meals. Include healthy proteins and complex carbohydrates.
  - Eliminate or limit alcohol consumption.
  - Stay home if you are sick.

Make the safe choice...
High Altitude & Pre-existing Health Conditions

• Traveling to high altitude can complicate some medical conditions, increasing the risk of complications and medical emergencies.
• As a precaution, inform your doctor that you will be working at high altitude and discuss your medical history with them.
• Do some research on your own so that you are informed when you speak with the doctor.
• Please feel free to notify LBT of any potential risks to your health or safety related to working at altitude.
• Since LBT staff are not medical professionals, LBT management may ask for a doctor’s note clearing returns to the mountain following medical situations.

Make the safe choice...
% Blood Oxygen Meters

• Each First Aid Kit contains a blood oxygen (O₂) and heart rate meter.
• Turn it on, and clip it on your finger.
• First number is %O₂, second is your heart rate in beats per minute.
• Try it out. Normal range at rest at 10,500 feet seems to be >85%O₂
• If you are 82% or below at rest, notify the mountain manager and consider taking oxygen. This is a low value at this elevation and may require medical attention.
Wildlife

• Bear, Mountain Lion, Snakes are present.
• Prevention: Make noise, stomp, travel in groups, avoid dawn/dusk, be alert.
• Encounter (extremely rare): Never run, stand upright, arms up, look big, maintain eye contact, speak firmly, back away slowly, do not turn your back or run, always give them a way to escape.
  • You do not want to look like a threat, OR look like prey. Think about this.
• If attacked: Throw stones, sticks, water bottles, anything. Never turn your back. Fight back!
• Report all sightings to mountain manager.

Make the safe choice...
Marking Hazardous Areas

29 CFR 1910.22 & 1910.144

- **Red Danger** tape is used to mark areas with high impact hazards or imminent danger (i.e. fall, shock, chemical/asphyxiation, overhead crane).

- **Yellow Caution** tape is used to mark areas with low impact hazards (i.e. trip hazards, tools on floor, etc.)

- Never cross **Red Danger Tape** without first getting approval from workers inside the area that it is safe to enter.
  - Hazards inside danger tape areas could injure or kill you!
  - This includes the red danger tape used to mark the elevator out of service for Liquid Nitrogen transport.

- You may cross **Yellow Caution Tape** without permission. Use caution.

- If your work generates hazards, you must mark the area with the appropriate tape.

- Clear all area access restrictions and other special considerations with the Manager on Duty first.

- If you need tape, LBTO can provide it.

Make the safe choice...
Computer Room A & B Refrigeration System

• This system contains Freon, which in the highly-unlikely event of a catastrophic (total) release, could displace oxygen, causing asphyxiation.

• There are alarm systems in the Level 2 Control Room that detect a refrigerant leak inside computer rooms A&B. Note: Alarms are set to go off well before concentrations could cause asphyxiation.

• If alarm goes off, be sure the doors to the rooms are closed, and call/wake the Manager on Duty to evaluate and respond. Depending on the severity of the leak, the manager may evacuate the area for further evaluation. (See M004s00310 Section 7).