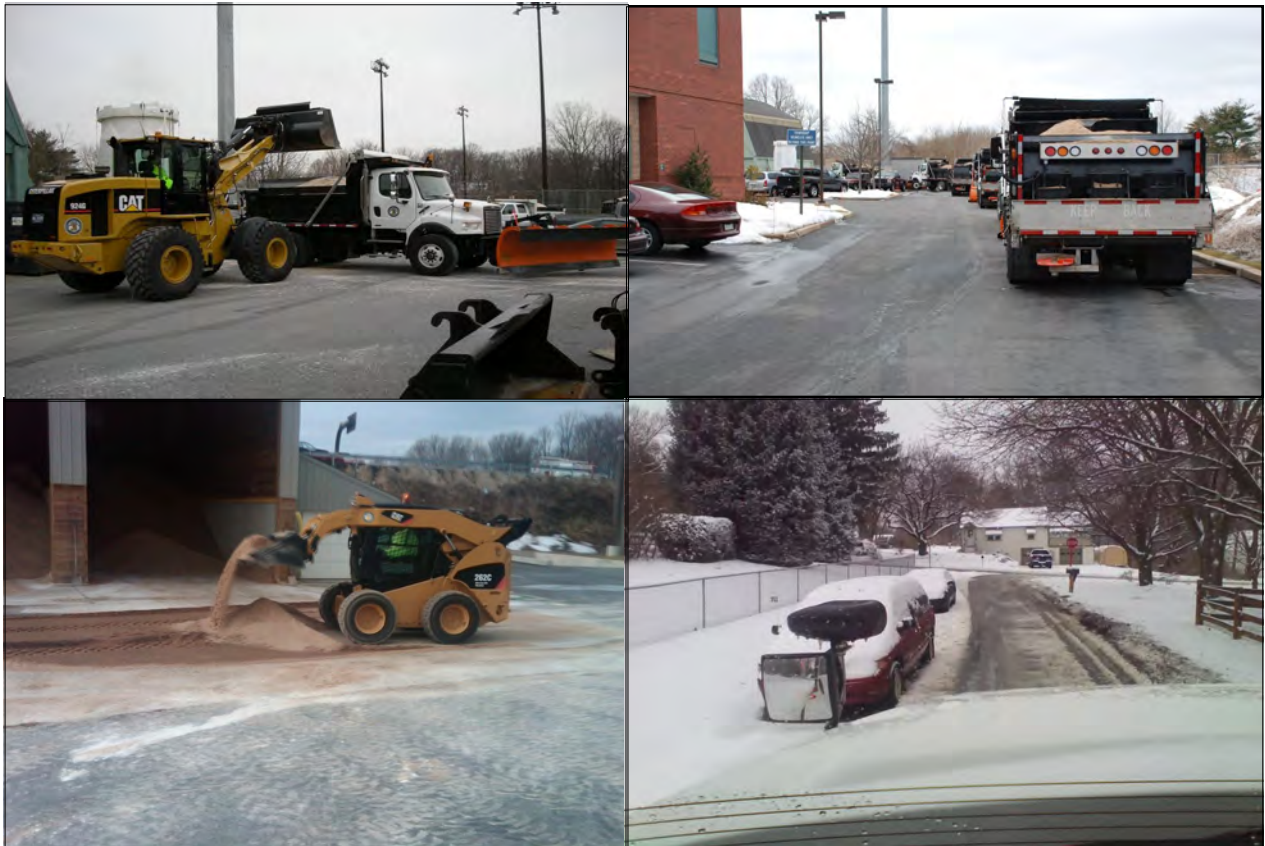




[www.westgoshen.org](http://www.westgoshen.org)

# West Goshen Township Streets Department



Winter Operational Procedures, Snow & Ice Control  
and General Information

## Forward

West Goshen Township strives to provide top level services to our residents, business and commuters. We provide snow and ice services for our 12 square mile Township consisting of 93 road miles and 121 cul-de-sacs. To insure the optimum level of service is provided to our community all operators and equipment is Township owned and staffed. During a winter weather event all Township Departments , Streets, Parks, Sewer, Administration and the Police Department, work in unison to accomplish the goal of keeping the roads safe for travel.

In December of 2011 the Streets Department moved in to our new 40,000 Sq. facility located on the Township Administration Campus. All streets trucks and equipment are housed inside a climate controlled building. Doing this allows us to preload with salt prior to an event. This reduces our response time because our operators can immediately respond to their assigned routes.

Our building also includes offices, kitchen facilities, lockers with showers, bunk rooms and a mechanical repair shop. Our repair shop can make new hydraulic lines, replace cutting edges and it stocks various repair parts to keep the fleet operating throughout an event. Our mechanics are routinely called in with our operators, during storms, in case of a mechanical issue they are ready to quickly return a piece of snow fighting equipment to service.

With the new Streets facility our salt storage has increased to 1,800 tons. We use in an average year 1,200 - 1,400 tons. We now store salt in 2 sheds on our property. The old shed holds 600 tons in one bin. The new shed holds 1,200 tons in 4 separate bins. One bin of approximately 300 tons is reserved for salt pretreated with natural organic deicer. The treated salt is used if low temperatures are forecasted or if we expect surfaces to refreeze. At the end of the winter season we try to empty 2 bins to use for road maintenance materials.

We began our anti icing program following our first trip to the APWA North American Snow Conference in 2008. During the summer we learned the benefits of having a good anti icing program. We followed closely **the example from Iowa DOT's first gravity fed brine units to start with. We cooperatively purchased brine** from a neighboring borough and stored it in a tanker truck from local pool water supplier. During this initial testing faze we proved to the Governing Body that anti icing with brine was an effective and cost saving measure. We included in the plans for our new streets facility our computer controlled brine maker that can manufacture brine at a rate of about 4,000 gallons an hour, we have a 5,000 gallon brine storage tank, 5,000 gallon natural organic deicer tank and a 5,000 storage tank for our super blend. We also now have cooperative agreements with five local Municipalities to manufacture brine and provide it in their storage tanks. The revenue helps us maintain and repair our equipment. We now have four truck mounted 950 gallon brine applicators to slide in our existing trucks. We try to anti-ice during normal working hours prior to an event whenever possible.

Our snow route maps and brine maps are generated by GIS trained members of our Engineering Department. Our plow maps show each individual route assigned to each truck. Each route book has all routes included in it. An operator may be dispatched to cover another route due to a mechanical or personnel problem. On the route map it shows locations of fire hydrants and storm drains for the operator to reference when stock piling snow.

## Forward - Continued

We are currently experimenting with AVL (Automatic Vehicle Locator) technology within the fleet. We just completed a one year trial with one manufacturer. We are evaluating our options, we tried using the system with little success on both operations and maintenance. We are currently installing a new fuel system and as part of that we will have RFID capability for our fleet maintenance. We are looking at options for fleet location software with more accuracy.

As of 2012 we received our first pre-wetting truck into the fleet. We are currently testing its effectiveness and design. We fully anticipate adding another truck in 2013. The truck also has our first automated ground speed controller. Our new specification also includes an air operated controller. We are phasing out our old hydraulic controls in the cab tower.

We have subscribed to a private weather forecasting service for the last seven years. We utilize their forecast for all of our work year round, however it is indispensable for our winter operations. Allowing us with this service have the ability to talk to a meteorologist to discuss timing and precipitation amounts specific for our community. This allows us to accurately call out personnel to fight winter storms.

The Township Emergency Operations Center is located in the Streets Building. The EOC is a self contained room that is in full operation during all storms and natural disasters. We are capable of communicating with all Streets Department trucks and equipment with our own radio frequency, we also have GIS installed on all emergency management computers. Once the EOC is operational with emergency management staff, the residents are able to contact Township personnel for any issues they are experiencing during the storm. The EOC has a direct phone line with the County EOC for all emergencies.

We have just updated our written winter plan to include all of our latest techniques and resources. This plan will now be reviewed and updated on an annual basis.

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## Introduction

The Township of West Goshen's Winter Operational Procedures, Snow & Ice Control Plan was designed to provide the residents and employees of West Goshen an understanding of the organization and execution used in the event of a winter storm.

### Objective

It is the goal of West Goshen Township to maintain mobility on the Township roads. Within 8 - 12 hours after a storm, we strive to have bare and wet pavement.

To achieve this goal, the timing, the length of the snowfall and accumulation must be considered. In an attempt to keep accumulation to a minimum, Township roads could be pre-treated in advance and we will be plowing during the storm. There will be occasions when the pavement and bridge surfaces will be slippery. Drivers must be aware of these conditions and operate their vehicles accordingly.

During a winter event the Public Works Department coordinates its efforts with the West Goshen Police Department and the Emergency Operations Center (EOC) pre and post storm. West Goshen Townships' EOC is in constant contact with the County EOC.

Total miles West Goshen Township is responsible for:

- \* 93 miles of Township roads
- \* 28 miles of State roads
- \* 121 cul-de sac routes
- \* 3 snow emergency routes

This plan contains safety tips and emergency information for West Goshen Township residents and property owners. Included is information from outside resources and the Township. The plan also shows driver routes, plans for various storm conditions and pre-winter readiness.

## Emergency Contact Information

Township	610-696-5266
Police	610-696-7400
Sewer	610-696-0900
PECO	800-494-4000
Aqua	877-987-2782

### Connect-CTY

West Goshen Township has recently implemented connect-CTY service to provide Township officials the ability to communicate with all residents regarding time-sensitive incidents that may include planned and unforeseen public safety matters.

The Connect-CTY service allows Township officials to record, send and track personalized voice messages to thousands of residents, businesses and local agencies in just minutes, through a single phone call. **The Township can also send text messages to cell phones, PDA's, e-mail accounts and TTY/TDD receiving devices for the hearing impaired.**

The Township administrators can target messages to an unlimited number of groups-everything from mobilizing emergency response teams to coordinating efforts with necessary agencies or volunteers.

Residents can opt to provide their complete information (up to three phone numbers and two e-mail addresses) into the secure database and indicate if they have a TTY/TDD device.

### Emergency Operations Center (EOC)

The EOC is a central command and control facility responsible for carrying out the principles of emergency preparedness and emergency management or disaster management functions at a strategic level in an emergency situation.

Non Emergency, Storm Related Issues: If a resident has a storm related issue, they are to check the Township website or call the main number to see if the EOC is activated. If there is no answer call the Police Department. The EOC is not to take the place of a 911 emergency.

We are required to continually review and update our Township Emergency Operations Plan. Some information is required from our residents to help us better prepare for a major emergency in our community.

We need to know if anyone in a residential household requires special assistance in the event of any emergency. Special needs include the following: difficulty walking, hearing or vision impairment, a constant need for oxygen, non-English speaking, or any other problems a resident may have that would make it difficult to evacuate their residence during an emergency.

This information is strictly confidential. This special needs list is maintained in the Chester County Emergency Services Dispatch Center, and the Township's Emergency Management files. This information allows us to quickly direct assistance to persons with special needs during any emergency.

## Most Frequently Asked Questions

Why is brine applied days in advance of a storm?

To slow down the bonding process on our roadways. Less road salt is better for the environment and there is less overtime because brine can be applied during work hours, depending on storm forecasts and timing.

If my lawn was damaged during a snow event will it get repaired?

Yes, in the spring. Please call and leave your address to be added to the repair list.

Why does the brine have an odor?

The natural organic deicer (beet juice) has a slight odor, it is environmentally safe and the odor dissipates when dry. We add 5% to our brine mix to extend application times and effectiveness

**Why doesn't the Township fight every storm the same way?**

With so many variables including snow, sleet and rain, the timing of the event and the temperature (surface and air), each event is handled differently.

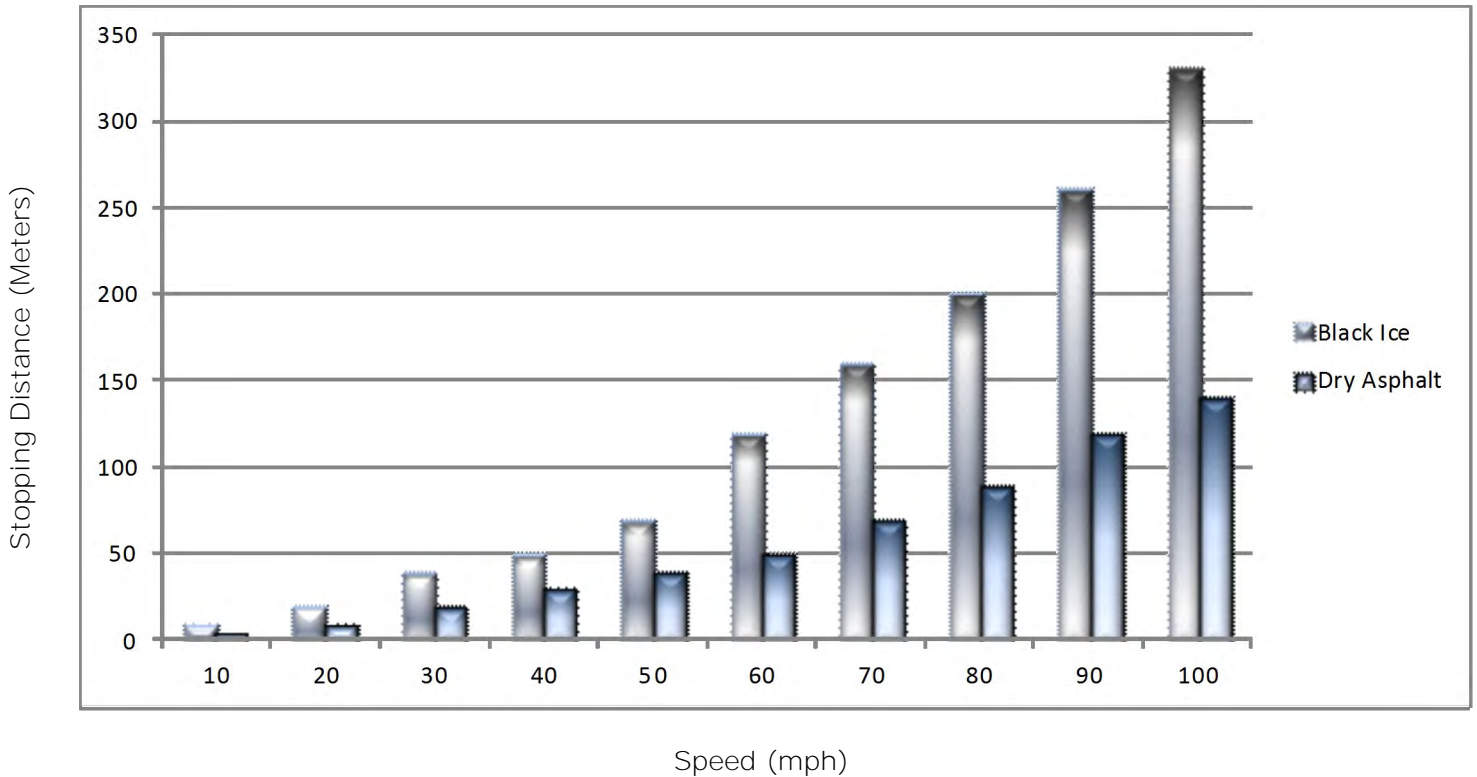
Will the Township replace my mailbox if it is damaged during a snow event?

Yes, if this occurred during an event. The Township will provide a new standard rural black or white mailbox and a wooden post without installation.



Mailboxes come in black or white with the post that is shown. The Township does not install the posts.

## Stopping Distance vs Speed for Dry Asphalt and Black Ice



### Winter Driving Safety Tips

- \* Pull away and accelerate gently and progressively. In slippery conditions such as snow and ice, aggressive acceleration will almost certainly break traction at the driven wheels. The resulting wheel spin can lead to loss of steering control in a front wheel drive (FWD) car, or an over steer slide in a rear wheel drive (RWD). Both of these situations will prevent you from going in the direction you want and can be difficult to recover from.
- \* If you do notice wheel spin (or the traction control systems fighting for grip), don't floor the throttle, instead back off the gas and then reapply smoothly.
- \* Best practice is to keep engine revs low in order to maximize your grip in winter conditions. Keep a constant gentle throttle for best results. Most diesel engines will cruise along nicely in low gears without using any throttle.
- \* Change up sooner rather than later, pull away in second gear if possible, and use the highest practical gear at all times. This reduces the torque at the driven wheels and will therefore reduce the chances of wheel spin – also a useful trick when trying to climb a slippery muddy hill. Keep gear changes as smooth as possible - it will be easy to spin the wheels in most gears when conditions are really bad.
- \* Avoid any sudden driver inputs (such as steering, braking, acceleration or gear changes). You only have a finite level of grip available and you don't want to overload your tires unnecessarily. Driving smoothly will conserve grip, and make you a safer driver.
- \* Brake soon, and gently. Be prepared to ease off the brakes (if you do not have ABS fitted) in order to steer more effectively. Locked wheels cannot steer!
- \* If you do have ABS, you'll be able to tell it has triggered by feeling a pulsing sensation through the brake pedal. If this has occurred do not 'pump' the brakes – rather keep a firm pressure on the pedal for maximum effectiveness. ABS is designed to help you steer as you're slowing down so use this to your advantage and avoid obstacles.
- \* Even if you do have ABS fitted, don't get into the habit of using the system routinely - you'll be able to slow down in a shorter distance if you use *threshold braking (applying brakes before they lock)* techniques.



## Winter Driving Safety Tips - Continued

- \* Always buckle up.
- \* Never drink and drive.
- \* Stay home unless travel cannot be postponed.
- \* Allow extra time to reach your destination.
- \* Prior to winter weather check your vehicle for:
  - \* Tires with good tread.
  - \* Tires rated for winter.
  - \* Inspect and replace wiper blades as needed.
  - \* Fill your gas tank.
  - \* Make sure heater and defroster work.
  - \* Windshield washer reservoir is full.
  - \* Engine anti-freeze is full and rated for winter conditions.
  - \* Make sure all lights work.
- \* Allow extra distance between vehicles.
- \* Keep back 500 feet from municipal plow trucks with flashing lights.
- \* Do not pass a municipal snow plow while the truck is plowing and/or salting.
- \* Turn on headlights to increase visibility.
- \* Remember elevated ramps and bridges freeze first.
- \* Do not use cell phone while driving.
- \* Residents and businesses should not shovel or blow snow onto a public road. This creates a hazard to motorists.
- \* Parents should not allow children to play in roadside snow banks or sled on the roads.
- \* Totally clear snow from entire vehicle prior to driving.
- \* Pennsylvania law imposes severe fines on drivers who fail to clear snow and ice from their vehicles.



# Be Red Cross Ready

## Winter Storm Safety Checklist

Winter storms can range from a moderate snow over a few hours to a blizzard with blinding, wind-driven snow that lasts for several days. Some winter storms are large enough to affect several states, while others affect only a single community. Many winter storms are accompanied by dangerously low temperatures and sometimes by strong winds, icing, sleet and freezing rain.

### Know the Difference

#### Winter Storm Outlook

Winter storm conditions are possible in the next 2 to 5 days.

#### Winter Weather Advisory

Winter weather conditions are expected to cause significant inconveniences and may be hazardous. When caution is used, these situations should not be life threatening.

#### Winter Storm Watch

Winter storm conditions are possible within the next 36 to 48 hours. People in a watch area should review their winter storm plans and stay informed about weather conditions.

#### Winter Storm Warning

Life-threatening, severe winter conditions have begun or will begin within 24 hours. People in a warning area should take precautions immediately.

### What should I do?

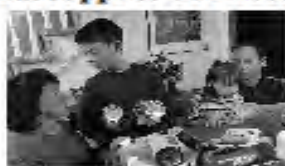


- Dress in several layers of light weight clothing, wear mittens and a hat (preferably one that covers your ears).
- Wear waterproof, insulated boots to keep your feet warm and dry and to maintain your footing in ice and snow.
- Minimize travel. If travel is necessary, keep a disaster supplies kit in your vehicle.
- Listen to a NOAA Weather Radio or other local news channels for critical information from the National Weather Service (NWS).
- Winterize your vehicle and keep the gas tank full. A full tank will keep the fuel line from freezing.
- Insulate your home by installing storm windows or covering windows with plastic from the inside to keep cold air out.
- Maintain heating equipment and chimneys by having them cleaned and inspected every year.
- Bring pets/companion animals inside during winter weather. Move other animals or livestock to sheltered areas with non-frozen drinking water.
- Running water, even at a trickle, helps prevent pipes from freezing.
- All fuel-burning equipment should be vented to the outside and kept clear.

### Cold-Related Emergencies

- Frostbite and hypothermia are two dangerous and potentially life-threatening emergencies. Learn how to care for these emergencies by taking a first aid class.

### What supplies do I need?



- Water—at least a 3-day supply; one gallon per person per day
- Food—at least a 3-day supply of non-perishable, easy-to-prepare food
- Flashlight
- Battery-powered or hand-crank radio (NOAA Weather Radio, if possible)
- Extra batteries
- First aid kit
- Medications (7-day supply) and medical items (hearing aids with extra batteries, glasses, contact lenses, syringes, cane)
- Multi-purpose tool
- Sanitation and personal hygiene items
- Copies of personal documents (medication list and pertinent medical information, proof of address, deed/lease to home, passports, birth certificates, insurance policies)
- Cell phone with chargers
- Family and emergency contact information
- Extra cash
- Baby supplies (bottles, formula, baby food, diapers)
- Pet supplies (collar, leash, ID, food, carrier, bowl)
- Tools/supplies for securing your home
- Sand, rock salt or non-clumping kitty litter to make walkways and steps less slippery
- Warm coats, gloves or mittens, hats, boots and extra blankets and warm clothing for all household members
- Ample alternate heating methods such as fireplaces or wood- or coal-burning stoves

### What do I do after a storm?



- Go to a designated public shelter if your home loses power or heat during periods of extreme cold.
- Avoid driving when conditions include sleet, freezing rain or drizzle, snow or dense fog.
- Before tackling strenuous tasks in cold temperatures, consider your physical condition, the weather factors and the nature of the task.
- Protect yourself from frostbite and hypothermia by wearing warm, loose-fitting, lightweight clothing in several layers. Stay indoors, if possible.
- Help people who require special assistance such as elderly people living alone, people with disabilities and children.
- Check on your animals and make sure that their access to food and water is not blocked by snow drifts, ice or other obstacles. If possible, bring them indoors.

### Caution: Carbon Monoxide Kills

- Never use a generator, grill, camp stove or other gasoline, propane, natural gas or charcoal-burning devices inside a home, garage, basement, crawlspace or any partially enclosed area. Locate unit away from doors, windows and vents that could allow carbon monoxide to come indoors.
- The primary hazards to avoid when using alternate sources for electricity, heating or cooking are carbon monoxide poisoning, electric shock and fire.
- Install carbon monoxide alarms in central locations on every level of your home and outside sleeping areas to provide early warning of accumulating carbon monoxide.
- If the carbon monoxide alarm sounds, move quickly to a fresh air location outdoors or by an open window or door.
- Call for help from the fresh air location and remain there until emergency personnel arrive to assist you.

### Let Your Family Know You're Safe

If your community experiences a severe winter storm, or any disaster, register on the American Red Cross Safe and Well Web site available through [RedCross.org](http://RedCross.org) to let your family and friends know about your welfare. If you don't have Internet access, call 1-866-GET-INFO to register yourself and your family.



For more information on disaster and emergency preparedness, visit [RedCross.org](http://RedCross.org).

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# NOAA - National Oceanic and Atmospheric Administrations

## Glossary

**Warning:** A warning is issued when a hazardous weather or hydrologic event is occurring, is imminent, or has a very high probability of occurring. A warning is used for conditions posing a threat to life or property.

**Watch:** A watch is used when the risk of a hazardous weather or hydrologic event has increased significantly, but its occurrence, location, and/or timing is still uncertain. It is intended to provide enough lead time so that those who need to set their plans in motion can do so.

**Wind Chill Advisory:** The National Weather Service issues this product when the wind chill could be life threatening if action is not taken. The criteria for this warning varies state to state.

**Wind Chill Warning:** The National Weather Service issues this product when the wind chill is life threatening. The criteria for this warning varies state to state.

**Winter Storm Warning:** This product is issued by the National Weather Service when a winter storm is producing or is forecasted to produce heavy snow or significant ice accumulations. The criteria for this warning can vary from place to place.

**Winter Storm Watch:** This product is issued by the National Weather Service when there is a potential for heavy snow or significant ice accumulations, usually at least 24 to 36 hours in advance. The criteria for this watch can vary from place to place.

**Winter Weather Advisory:** This product is issued by the National Weather Service when a low pressure system produces a combination of winter weather (snow, freezing rain, sleet, etc.) that present a hazard, but does not meet warning criteria.

**Snow Advisory:** This product is issued by the National Weather Service when a low pressure system produces snow that may cause significant inconveniences, but do not meet warning criteria and if caution is not exercised could lead to life threatening situations. The advisory criteria varies from area to area. If the forecaster feels that it is warranted, he or she can issue it for amounts less than the minimum criteria. For example, it may be issued for the first snow of the season or when snow has not fallen in a long while.

**Snow Shower:** A snow shower is a short duration of moderate snowfall. Some accumulation is possible.

**Snow Squall:** A snow squall is an intense, but limited duration, period of moderate to heavy snowfall, accompanied by strong, gusty surface winds and possibly lightning (generally moderate to heavy snow showers). Snow accumulation may be significant.

**Blowing Snow Advisory:** Issued when wind driven snow reduces surface visibility, possibly, hampering traveling. Blowing snow may be falling snow, or snow that has already accumulated but is picked up and blown by strong winds.

# NOAA - National Oceanic and Atmospheric Administrations

## Glossary - Continued

**Sleet**: Sleet is defined as pellets of ice composed of frozen or mostly frozen raindrops or refrozen partially melted snowflakes. These *pellets* of ice usually bounce after hitting the ground or other hard surfaces. Heavy sleet is a relatively rare event defined as an accumulation of ice pellets covering the ground to a depth of a 1/2" or more.

**Sleet Warning**: Issued when accumulation of sleet in excess of 1/2" is expected; this is a relatively rare scenario. Usually issued as a winter storm warning for heavy sleet.

**Ice Storm**: An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of a 1/4" or greater.

**Ice Storm Warning**: This product is issued by the National Weather Service when freezing rain produces a significant and possibly damaging accumulation of ice. The criteria for this warning varies from state to state, but typically will be issued any time more than 1/4" of ice is expected to accumulate in an area.



## RIGHT-OF-WAY ISSUES

### **Snow and Ice Removal and Violations -**

§ 70-9 Snow and ice removal.

The owner, occupant or tenant of every property abutting any sidewalk or public walk as described in § 70-7 above shall be required to remove or cause to be removed, for a minimum width of two feet and the entire length of all of said abutting sidewalk or public walk, snow and/or ice thereon fallen or formed, within 48 hours after said snow or ice shall have ceased to fall or be formed. The responsible party shall also cover the sidewalk with cinders, sawdust or similar snow and ice control materials in the event of ice and sleet. Where snow and ice are removed from the sidewalk, it may be placed or piled on the curb side of the sidewalk but shall not be piled or placed in the storm gutter or on the paved cartway.

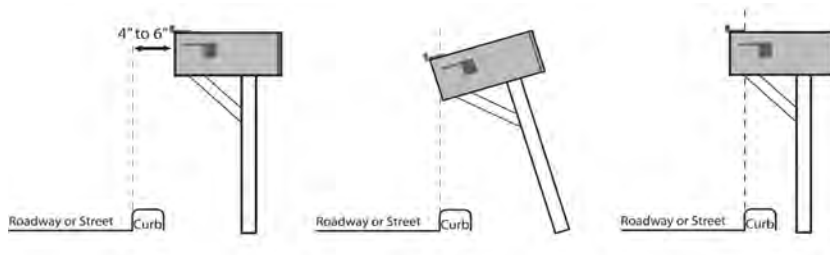
§ 70-10 Notice of violation.

If the owner of any property neglects at any time to perform the duties described in §§ 70-7 and 70-8 above, the Township may serve written notice upon him requiring him to perform the necessary maintenance or repair. The notice shall specify the time by which said maintenance or repair shall be commenced and the time by which it shall be completed. The notice provided for in this section may be served on the property owner by leaving the same at his place of residence or, if such place of residence is unknown to the Township, by posting the same on the abutting property.

§ 70-11 Violations and penalties.

If such property owner fails to comply with the requirements of the notice described in § 70-9 within the time period specified therein, the Township may assess a fine not exceeding \$1,000 for each violation. Each day or part of a day in which any such snow or ice remains after it should be removed shall constitute a separate offense. The notice of assessment of a fine ("fine notice") shall be served on the owner, occupant or tenant by hand delivery or by certified mail, return receipt requested, and regular mail to the postal address of the property abutting the sidewalk. Upon failure of the owner, occupant or tenant to pay the fine within the time period prescribed in the fine notice, an action shall be brought before a District Justice in the same manner provided for enforcement of summary offenses under the Pennsylvania Rules of Criminal Procedure. Each day in which a violation is found to exist shall constitute a separate violation. All fines and penalties collected for violations of this article shall be paid to the Township Treasurer.

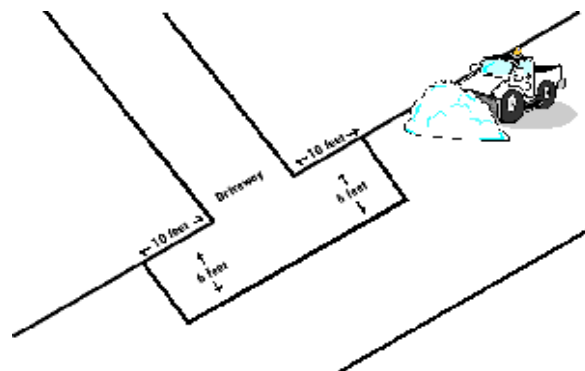
**Mail boxes** - Regrettably, mailboxes may be damaged during snow removal because they are installed close to the road in the right-of-way. Take time to make sure your mailbox is sturdy enough to withstand the weight of snow being pushed into it and keep the front of your mailbox four to six inches behind the curb line to prevent being struck by a plow. (See illustration.) Make sure to clear snow from all walkways, stairs, and paths to mailboxes. For confirmed cases of mailboxes being damaged by plowing operations, West Goshen Township will provide a new standard rural black or white mailbox and a wooden post. Delivery will be made after all snow operations have ceased. Installation and/or repair of the post and/or mailbox is the responsibility of the homeowner. The owner should check the location of their mail box in the fall.



Plow drivers are urged to take precautions to avoid hitting mailbox posts, experience has shown that reduced visibility during a storm makes it difficult for a driver to see a post in time to avoid striking it or pushing it over w/plowed snow.

**Driveways** - During snow removal operations the accumulated window of snow being pushed and carried by the plow inevitably gets deposited to the trucks' right side shoulder and/or ditch along its route. Driveways along the route also get filled in. The Public works Department assumes no responsibility for the removal of snow deposited in Driveways as a result of normal snow removal operations, if this occurs the Township **WILL NOT** clear the Driveway. The Public Works Department cannot provide exact times that a certain road will be plowed and it is not practical to change the angel of the blade to avoid Driveways.

When shoveling your Driveway, leave the last six feet of your Driveway unshoveled until the plowing has ceased. This unshoveled part will allow the snow being pushed by the plow to remain on the plow and not dumped into your Driveway. If you must shovel out your Driveway, clear a six foot area of the road that is directly in front of the mouth of your Driveway. In addition clear an area ten feet before and after the mouth of your Driveway, so that when the plow comes through, it will unload snow that it is pushing in the cleared area and not in the mouth of your Driveway.



**Turf/Landscaping** - Landscaping and lawns, including but not limited to; shrubs, trees, inanimate objects, etc. installed by a property owner within the ROW will be the responsibility of the owner and the owner assumes all risk of damage to such items. Furthermore, the Township cannot reasonably control drift or discharge of snow and/or shoulder materials from the snowplow into roadside ditches and lawns. The Township will not be responsible for the removal/repair of any shrubs, road ornamentation, turf or landscaping, should materials inadvertently cast into adjacent lawn areas by the plow.



## State Roads Maintained by PennDot

Boot Road  
East Marshall  
Fern Hill Road  
Garfield Avenue, Lincoln Ave. to Paoli Pike (Twp. Plows )  
Goshen Road (from North Hills East)  
Greenhill Road (Twp. provides winter maintenance. from Rte. 100 to Phoenixville Pk.)  
Lincoln Avenue  
Montgomery Avenue  
Paoli Pike  
Route 29 - Phoenixville Pike  
Route 100 - Pottstown Pike  
South Five Points Road from Westtown Road. to Little Shiloh ONLY (Twp. Plows)  
South High Street/Wilmington Pike  
Strasburg Road  
Westtown Road  
West Chester Pike - Rt. 3  
Route 322 by-pass

## Private Roads Maintained by Private Owners

Cougar Lane  
Furr Avenue  
Gated Lane (off Taylors Mill Road)  
Honeysuckle Court  
Hydrangea Court  
Hicks Road  
Kimes Lane (off Lincoln Avenue)  
Links Drive  
Llewlyn Circle (off Lincoln Avenue)  
McDermott Drive  
Oak Circle (off Lincoln Avenue)  
Peaceful Lane  
Pine Circle (off Lincoln Avenue)  
Prospect Avenue (North of Paoli Pike)  
South Walnut Street (past the West Chester Inn for one Block)  
Thomas Avenue  
Turner Avenue  
Turner Lane—South from Paoli Pike to West Chester Pike  
E. Washington Street (from Garfield to dead end)  
Wisteria Lane  
Wood Crest Circle (off Lincoln Ave)  
Wrights Lane

### Plowed by Developer

Derry Lane  
Judson Drive  
Lintel Drive  
Olivia Court  
Sorber Drive

### Restricted Parking

Longford Road  
Cork Circle  
Galway Drive

\* The Township is not responsible for plowing private roads, driveways or driveway entrances of accumulated snow.

### Private Roads-Ordinances

From and after the effective date of this article it shall be the duty of the owner of any private road that connects two or more commercial units, two or more industrial units or any combination thereof to commence removal of, at his expense, snow or ice from such private road by snow plowing, snow blowing, cindering or salting, within a period of two hours after the commencement of any fall of snow or accumulation of ice.

Following initial removal of such snow or ice required by §68-2 hereof, it shall be the duty of such owner, during any period of continued snowfall or ice accumulation, to continue to plow, cinder and salt such private road and to maintain such private road in at least the same condition as township roads are maintained during such periods. Specifications for township road maintenance during periods of snow and ice accumulation shall be maintained by and be available from the office of the Township Manager during regular business hours or, in the event of emergency conditions, at any other time from the Township Police Department.

In the event of snow accumulation in excess of one inch or such ice accumulation as, in the opinion of the West Goshen Township Police Department, causes hazardous driving conditions, and noncompliance by the owner of any private road with §§ 68-2 and 68-3 of this article, the Police Department shall notify the owner to remove such snow or ice accumulation as herein required. In conjunction with such notification, it shall be the responsibility of all owners of private roads in West Goshen Township to register with the West Goshen Police Department the name, address and telephone number of such owner or his agent to whom notification is to be given by the Police Department pursuant to this section. Thereafter, telephonic notification or the bona fide attempt thereof by the Police Department shall constitute sufficient notice for the purposes of this article.

In the event that the owner of any private road within the provisions of this article fails, after notice pursuant to § 68-4 hereof, to comply with the provisions of §§ 68-2 and 68-3 hereof, the township may, at its own option, plow, cinder and/or salt such private roads in such fashion as the township shall deem necessary. Such action by the township shall not relieve the owner of penalties for violation of this article. The township may, thereafter, by proper accounting means, compute the cost of such corrective action on its part and either file a lien against the property from which the nuisance was removed or by which it is caused or proceed by civil suit against such owner for collection of such cost.

### Roads Owned By Several Municipalities

Airport Road	West Goshen maintains, plows, etc.
Bolmar Street	<b>from Union north to Gay is West Chester Borough's</b> Portion maintained by W. Goshen is from Union to Concord Road
Ellis Lane	East Goshen maintains, plows, etc.
<b>Goshen Road</b>	<b>from Baylowell Drive to Route 100 is West Chester borough's</b>
Kirkland Avenue	from Pottstown Pike to Chiswick Drive is West Whiteland Twp.'s from Chiswick to 150 ft. over By-pass bridge is W. Goshen Twp.'s. remaining portion of Kirkland to Boot Road is W. Whiteland Twp.
Little Shiloh	Shiloh Road to Westtown is maintained by W. Goshen Twp. South Five Points Road to South Concord maintained by Westtown
Rosedale Ave.	from Church Street Twp. Lin W. Goshen maintains from Church St. east to Franklin Street West Chester Borough maintains



## Operational Resources And Responsibilities

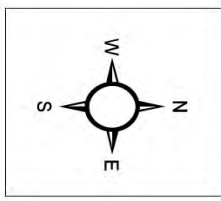
### Equipment

* Large Snow Plow Trucks	10
* Small Snow Plow Trucks	5
* Wheel Loaders	2
* Pick-up Trucks	7
* Utility Trucks	5
* Pre-wet Truck	1
* Backhoes	2
* Skid Steer	1
* Snow Blowers	2
* Anti-icing Brine Tanks	4
* Trackless with plow	1

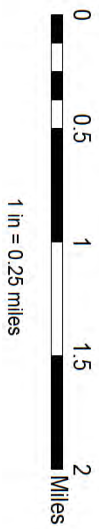
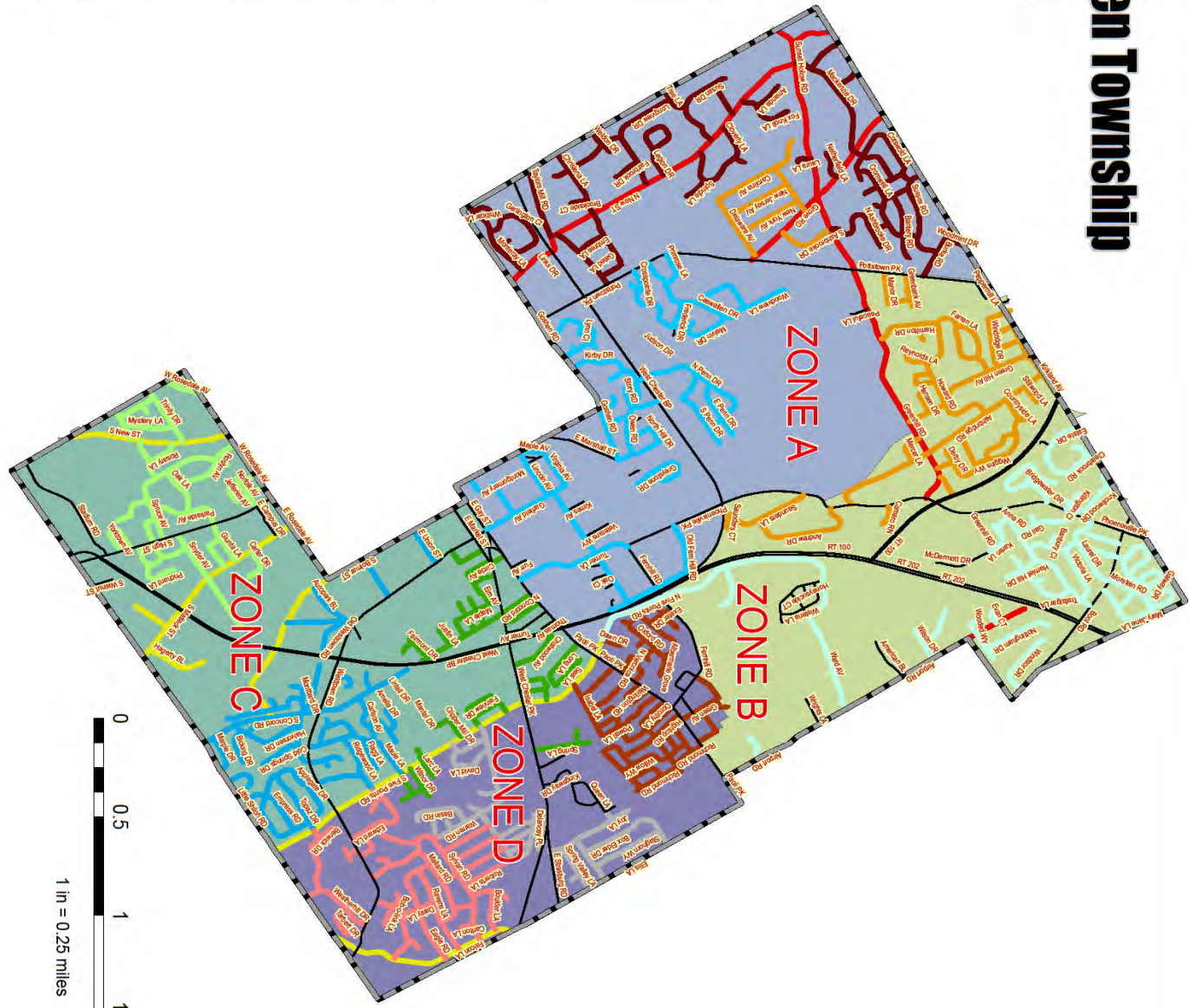
### Personnel

* Public Works Director	1
* Superintendent	1
* Forman	3
* Equipment Operator	1
* Driver/Labors	20
* Mechanics	2
* Emergency Management Coordinator	1

# West Goshen Township Plow Zones



	Plow Zone A
	Plow Zone B
	Plow Zone C
	Plow Zone D
	<b>Plow Route - Truck</b>
	Route N 1 - 114
	Route N 2 - 104
	Route N 3 - 105
	Route N 4 - 118
	Route N 5 - 103
	Route S 1 - 115
	Route S 2 - 200
	Route S 3 - 107
	Route S 4 - 116
	Route S 5 - 202
	Route S 6 - 117
	Route S 7 - 101
	Roads Not Plowed
	Boundary



Plow Truck Assignments and Equipment Allocations

Route	Truck #	Truck#	Truck #
N1	114		
N2	104	309	Road Dept. Backhoe
N3	105	106	
N4	118	204	
N5	103	304	205
S1	115	Sewer Backhoe	
S2	200	201	
S3	107		
S4	116	112	
S5	202	203	
S6	117	300	
S7	101	111	

Plow Routes

Route N1	Truck 114		Route N4	Truck 118
Airport Road	Grubbs Mill Road		Allyssa Circle	Kirkland Avenue
Greenhill Road	N New Street		Andrews Drive	Manor Drive
Grove Road	Sunset Hollow Road		Ashbridge Road	Mercer Lane
			Camero Run Drive	New Jersey Avenue
Route N2	Truck 104		Carolina Avenue	New York Avenue
Amanda Lane	Macelroy Drive		Chiswick Drive	Old Greenhill Road
Bantery Road	Mackensie Drive		Countryside Lane	Pembroke Drive
Brookside Court	Macpherson Drive		Delaware Avenue	Pennsylvania Avenue
Burke Road	Merrit Circle		Derby Drive	Reynolds Lane
Cashel Lane	Monteray Lane		Dogwood Drive	S Ashbrooke Drive
Charlotte Way	N Ashbrooke Drive		Farren Lane	Sandwell Drive
Chrislena Lane	Netherfield Lane		Greenhill Avenue	Saunders Lane
Cloverly Lane	Rock Creek Road		Greenbank Avenue	Saunders Circle
Cotswold Lane	Spindle Lane		Hamilton Drive	Stillwood Lane
Cromwell Lane	Susan Drive		Hansen Drive	Wexford Drive
Embree Lane	Sussex Road		Hidden Hollow Lane	Wiggins Way
Fairbrook Drive	Taylor's Mill Road		Howard Road	Winridge Drive
Fox Knoll Lane	Todd Way		Jessica Lane	
Garlington Circle	Tree Lane			
Harvest Lane	Weldon Drive		Route N5	Truck 103
Laura Lane	Witicar Lane		Anderson Avenue	N Five Points Road
Legion Drive	Woodbridge Way		Anna Road	Nottingham Circle
Locksley Road	Woodmint Drive		Arlington Avenue	Nottingham Drive
Longview Drive			Banbury Circle	Patrice Lane
			Brandywine Parkway	Raleigh Drive
Route N3	Truck 105		Bridgewater Drive	Rockwood Drive
Baylowell Drive	Maple Avenue		Clearbrook Road	Trafalgar Lane
Carol Circle	Melvin Drive		Cork Circle	Victoria Lane
Caswallen Drive	N Crownpointe Lane		Delmar Avenue	Ward Avenue
Collins Drive	N Penn Drive		Edgewater Drive	Wilson Drive
Crosspointe Drive	North Hill Drive		Estate Drive	Windsor Drive
E Chestnut Street	Old Fernhill Road		Evan Court	Winthrop Circle
E Penn Drive	Owen Road		Gail Road	Wooded Way
E Washington Street	Penn Drive		Galway Drive	
Frederick Drive	Perry Drive		Hamlet Hill Drive	
Garfield Avenue	Primrose Lane		James Lane	
Goshen Road	S. Crownpointe Lane		Karen Lane	
Greystone Drive	S Penn Drive		Killington Circle	
James Drive	Story Road		Knollwood Drive	
Kirby Drive	Turner Lane		Laurel Drive Lawrence Drive	
Lincoln Avenue	Virginia Avenue		Longford Blvd	
Lori Circle	W Penn Drive		Longford Road	
Lynn Circle	Woodview Lane		Marlene Drive	
			Mary Jane Lane	
			Mayfair Circle	
			Morstein Road	

Plow Routes - Continued

Route S1	Truck 115		Route S4 - Continued	Truck 116
Falcon Lane	S Matlack Street		Normandy Court	Shaumont Drive
Hagerty Boulevard	S New Street		Old Westtown Road	Stewart Lane
Little Shiloh Road	Snyder Avenue		Pine valley Circle	Topaz Drive
N Five Points Road	W Rosedale		Reims Lane	Toulon Court
S Bolmar Street	Westtown Way		Ridgewood Lane	Ware Circle
S Five Points Road	Willowbrooke Lane		S Concord Road	Wesley Court
Route S2	Truck 200		Route S5	Truck 202
Afton Way	Hightop Road		Cedar Avenue	N Concord Road
Albermarle Grove	Holly Road		Chatwood Avenue	Norma Lane
Berkley Lane	Isabel Lane		Circle Avenue	Orchard Avenue
Brinton Ave	Lotus Lane		Clipper Mill Drive	Patrick Avenue
Brinton Circle	Manley Avenue		Courtney Circle	Prospect Avenue
Cavalier Lane	N Veronica Road		Edkin Avenue	Richfield Avenue
Dawn Drive	Oxford Road		Elm Avenue	Rose Lane
Devonshire Circle	Park Lane		Fairmont Drive	Rue Lane
Dorothy Lane	Plymouth Court		Fairview Drive	S Concord Road
Downing Avenue	Powell Lane		Faustina Drive	Seal Lane
Exeter Drive	Richmond Road		Greenview Drive	Spring Court
Farmington Lane	S Veronica Road		Justin Lane	Spring Lane
Fern Hill Lane	St James Road		Larc Lane	Westerly Way
Gateway Lane	Thistlewood Lane		Lauber Road	Wilnor Drive
Georgia Lane	Wellington Road		Long Lane	Wilson Avenue
Green Avenue	Willow Way		Maple Lane	
			Maule Lane	
Route S3	Truck 107		Morris Road	
Anthony Lane	Parkside Avenue			
Brookwood Road	Pietro Place			
Carter Drive	Pomona Hill Drive		Route S6	Truck 117
Ceredo Avenue	Prichard Lane		Basin Road	Penn Lane
Church Avenue	Rosary Lane		Box Elder Drive	Roberts Lane
E Rhodes Avenue	Roslyn Avenue		David Lane	Schoolhouse Lane
Easter Circle	S Church Street		Delancey Place	Spring Valley Lane
Easter Lane	Sandy Lane		Edwin Circle	Staghorn Way
Franklin Avenue	Sheridan Drive		Elton Circle	Stoneybrook Lane
Giunta Lane	Snyder Avenue		Fowler Drive	Sylvan Road
Jefferies Avenue	Spruce Avenue		Glen Avenue	Valley Circle
Jones Lane	Trinity Drive		Hawthorn Lane	W Warren Road
Lexington Avenue	W Rhodes Avenue		Joy Lane	Warren Road
Mystery Lane	Yorktown Avenue		Meetinghouse Lane	West Chester Pike
Norfolk Avenue				
Oak Lane				
Route S4	Truck 116		Route S7	Truck 101
Amelia Drive	Flagg Lane		Barbara Drive	Ravens Lane
Applegate Drive	Francis Court		Berwick Drive	Roberts Lane
Autopark Boulevard	Hallowell Lane		Bob-O-Link Lane	Rockland Avenue
Bicking Drive	Halvorsen Drive		Boulder Lane	Somerset Place
Carlson Avenue	Joeck Circle		Carlton Lane	Sylvan Road
Cold Springs Drive	Joeck Drive		Daisy Lane	Tanager Lane
E Nields Street	Normandy Court		Eagle Road	Tarbert Drive
E Union Street	Old Westtown Road		Edward Lane	Topaz Drive
Eaches Mill Road	Pine valley Circle		Glen Avenue	Warren Road
Ember Drive	Reims Lane		Hyllwynd Court	Weatherhill Drive
Emily Court	Ridgewood Lane		Hyllwynd Drive	Westbrook Drive
Empress Road	S Concord Road		Mallard Road	Wildwood Avenue
			Midvale Road	Wilson Circle
			Partridge Lane	
			Penn Lane	

## Road Status

Clear: No snow and ice is bonded or accumulated on the road surface. Bare pavement surface is maintained at all times.



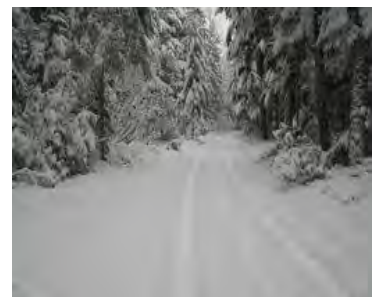
Wet: Bare/wet pavement surface is the general condition. There are occasional areas having snow or ice accumulations resulting from drifting, sheltering, cold spots, frozen melt-water, etc.



Snow and ice covered with wheel tracks exposed: Accumulations of loose snow or slush ranging up to (2 in.) are found on the pavement surface. Packed and bonded snow and ice are not present.



Snow covered: The road is temporarily impassable. This may be the result of severe weather (low visibility, etc.) or road conditions (drifting, excessive unplowed snow, glare ice, accidents, vehicles stuck on the road, etc.)

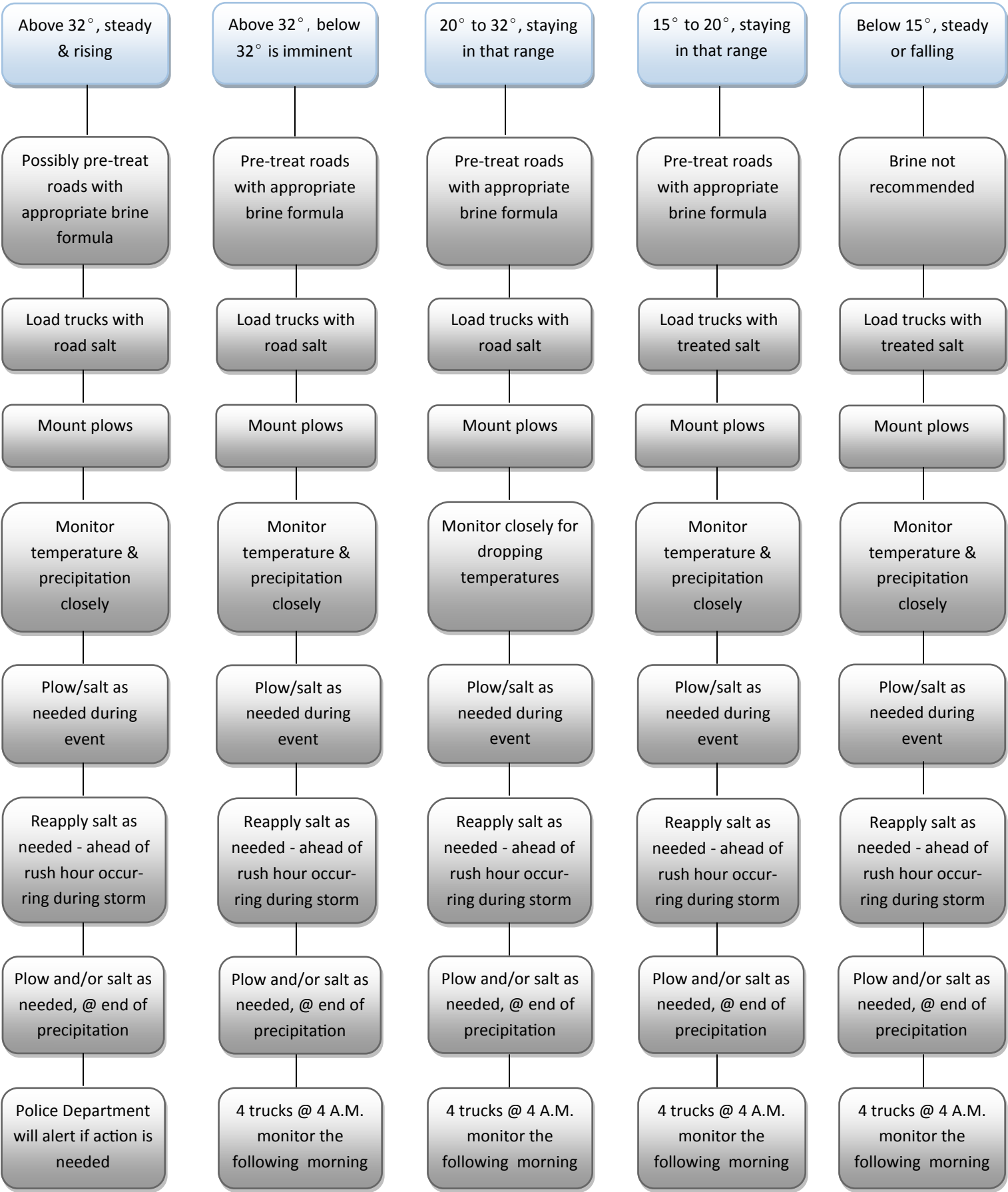


Icy: The pavement is completely covered with packed snow and/or ice. There may be loose snow on top of the icy or packed snow surface.

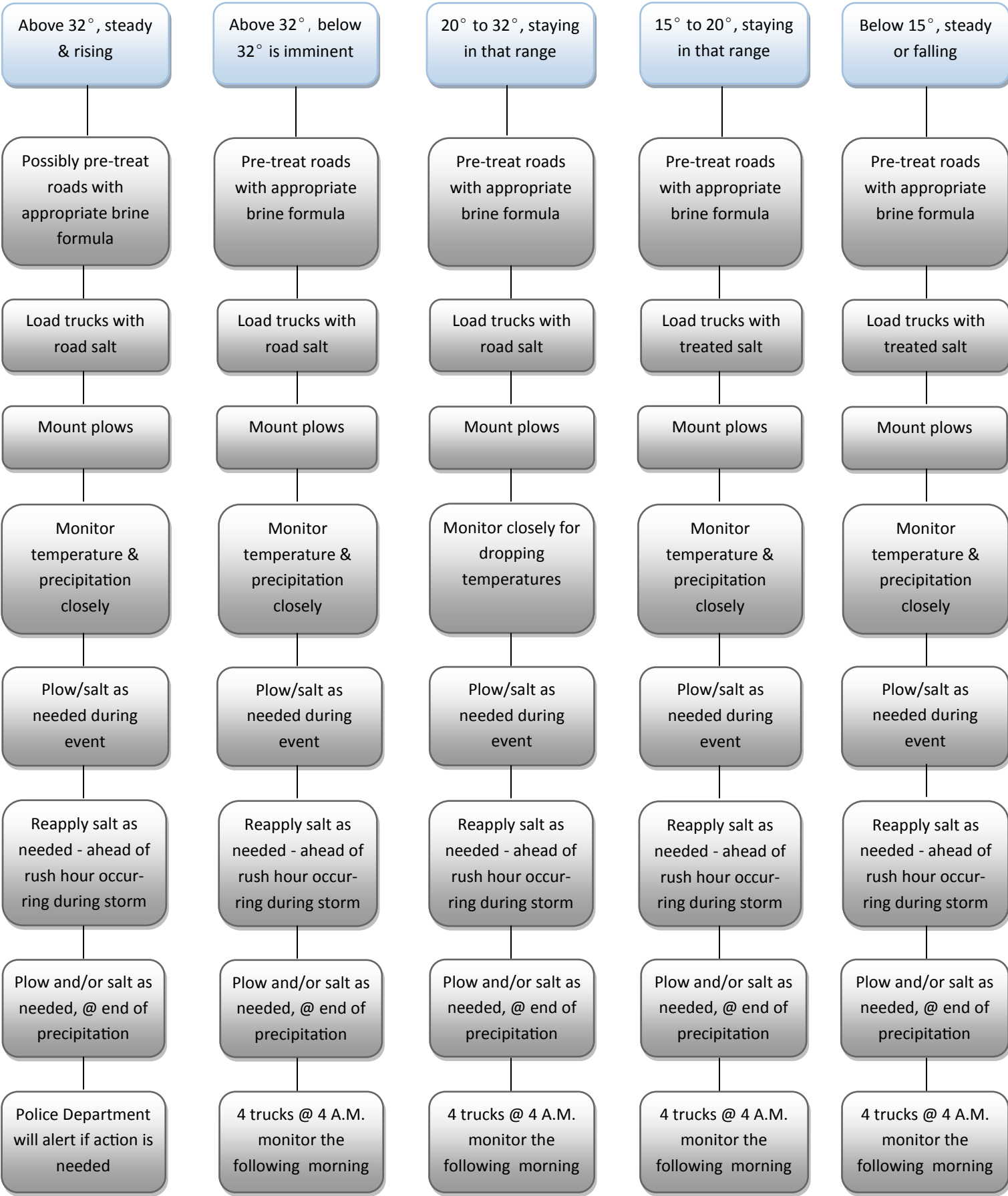




# Light Snow Event - less than 1/2 inch per hour

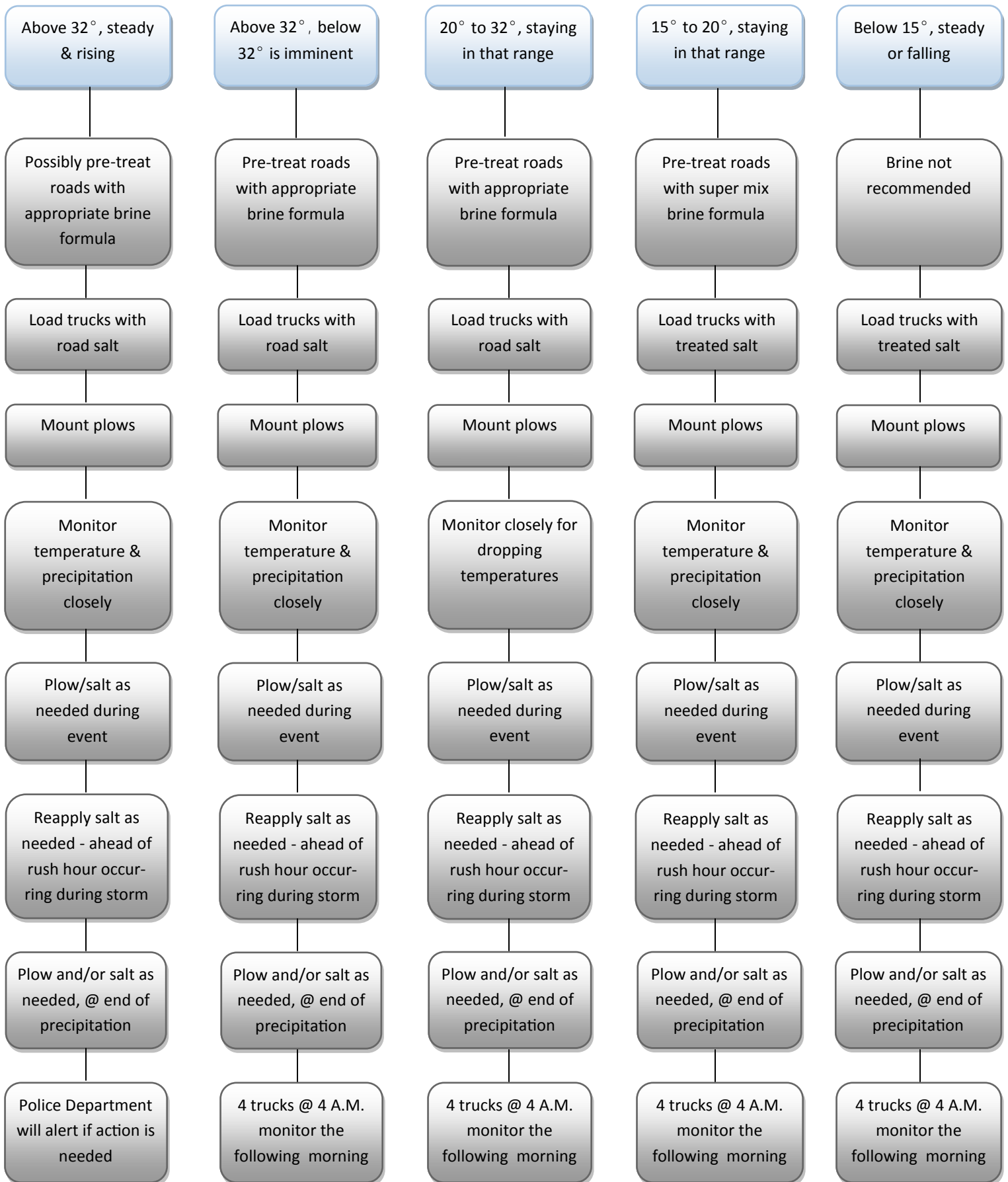


# Light Snow Event - periods of heavier snow

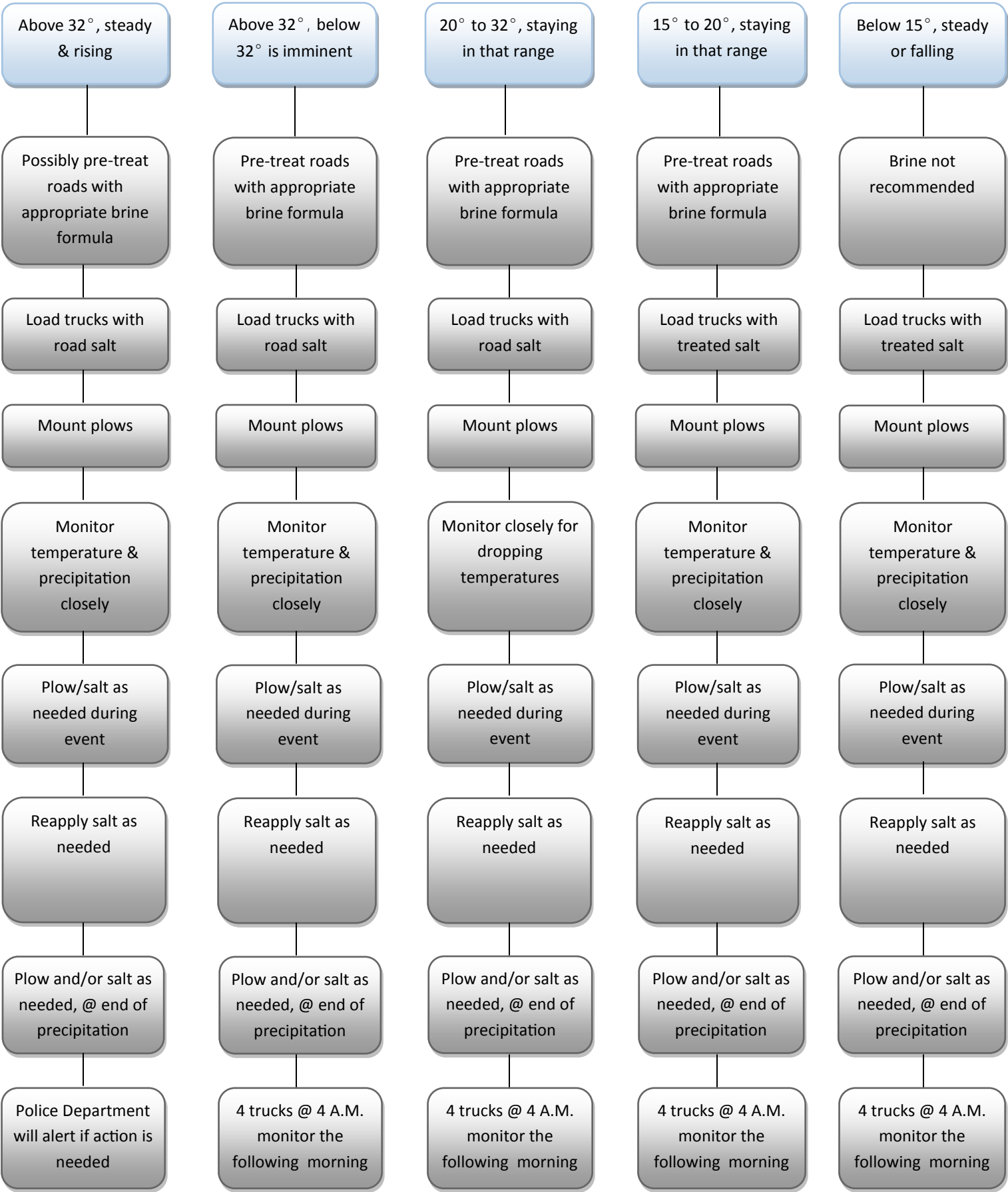




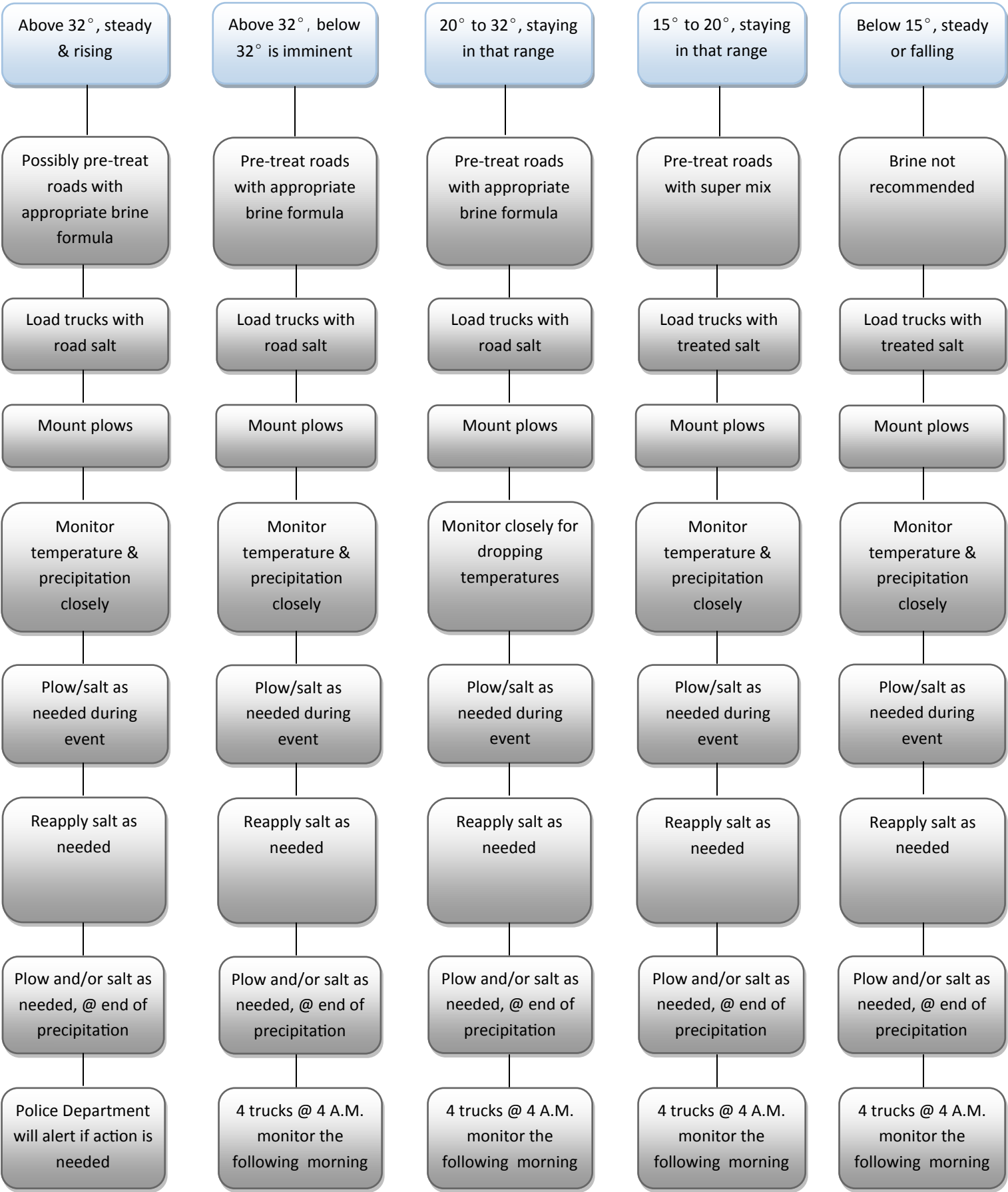
## Moderate/Heavy Snow Event - more than 1/2 inch per hour



# Freezing Rain Event



# Sleet Event



### Storm Preparedness

West Goshen Township trucks are maintained on a regular basis. Yearly, hourly and monthly maintenance is still performed even during winter events. In advance of the winter season:

- \* Plow equipment is checked for kinks and cuts in the hoses. Cutting edges and shoes are checked for wear depth, bolts are tightened, hydraulic fittings are checked and plow markers are attached.
- \* Spreaders and spinners are checked for holes in the skirt and hydraulic lines for leaks.
- \* All snow equipment is put on in advance of a winter event so that the driver knows everything is in good working condition. Doing this also allows the operators to learn how to attach and maneuver any equipment that has been added to the inventory. Drivers must check lights and strobes, chain length, all fluids, plow movement and fuel.
- \* Plows and spreaders are stored so they can quickly be attached to trucks.
- \* If a truck and/or personnel is not available for a weather event, changes will be made to cover the loss.

### During a storm event

Route Priorities: A route classification has been created by West Goshen Township to define operations for main and secondary roads.

Traffic Laws: West Goshen Township employees must abide by all traffic laws. When working during a storm or any other situation some laws must be violated, such as crossing over center lines and backing into traffic flow.

Truck and Equipment Operators: Any vehicles that are disabled or stuck will be reported to the Police Department by the truck operator. Any complaints or concerns by a resident given to an operator must be then directed to the Public Works Department or the Police Department.

Raised Plows: Trucks may be seen during a winter event with their plows up. The operator could be returning for maintenance or fuel, to replenish materials or road salt may have just been applied. Trucks are also dispatched to assist with Emergency Services, or a resident with special needs.

### Post storm

Equipment and inventory:

- \* Clean and check all equipment - to minimize corrosion, trucks and equipment are washed with a salt neutralizer.
- \* Check deicing inventory and reorder as needed.

Inspect infrastructure:

- \* Storm drains.
- \* Roads.
- \* Signs.

Discuss route problems:

- \* Drainage.
- \* Manholes.
- \* Obstacles.

## Materials

Brine = 23.3% road salt brine solution, is used in advance when a snow event is predicted. This prevents snow from bonding to pavement and creating ice. Brine is not effective if the event begins with rain.

Brine Super Mix = 5% natural organic deicer and 95% brine, is used the same as brine with more advantages. With the addition of beet juice, the brine will adhere to the road surface better. Road surfaces can be pretreated further in advance.

Road Salt = 100% Sodium Chloride is used at times when a snow event is very small instead of plowing. In a larger event, it is used to remove residue after plowing.

Treated Road Salt = Approximately 6 gallons of natural organic deicer and one ton of road salt, has the same uses as road salt with more advantages. Less treated road salt is used and does not bounce off the road surface like untreated road salt. (see illustration #2)

Natural Organic Deicer (Beet Juice) = A natural agricultural product that is derived from de-sugared beet molasses. This product is used as an admix with Sodium Chloride at a rate of 6 gallons per ton or less. Beet juice is non toxic to humans and animals.

## Purchasing

To reduce cost, a cooperative bid is done for Sodium Chloride between Westtown, East Goshen and West Goshen Townships. Westtown Township handles the bid information for all three Townships. Each Municipality is responsible for its own purchasing.

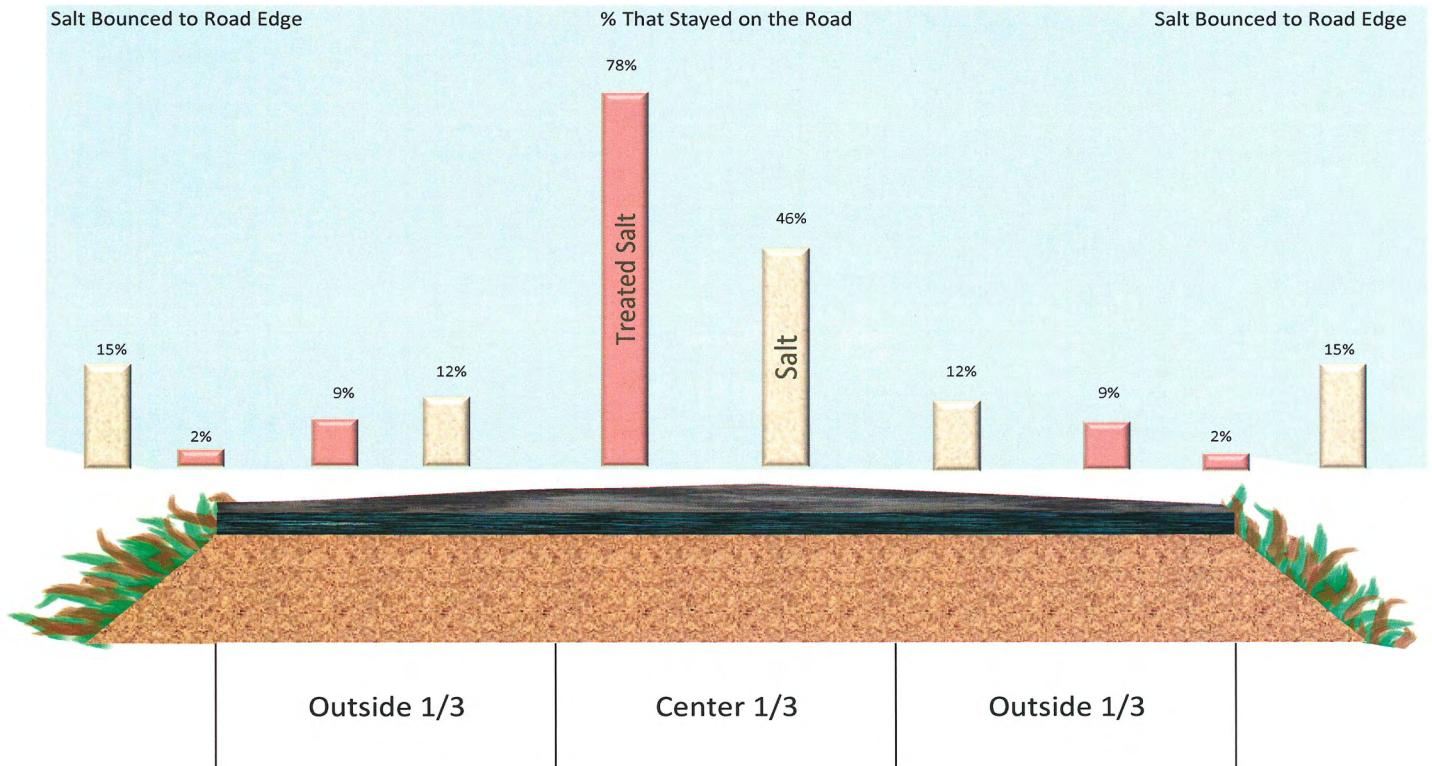
## Storage of Winter Maintenance Materials

- \* 2 salt barns are located on Township property with the capacity of 1,800 tons.
- \* A organic de-icing unit - 23.3% solution that produces 4,000 gallons per hour. (see illustration # 1)
- \* 1 storage tank that can hold 5,000 gallons of natural organic deicer.
- \* 1 storage tank that can hold 5,000 gallons of brine.
- \* 1 storage tank that can hold 5,000 gallons of super-mix - natural organic deicer & brine.

All of these material are kept in a clean and safe environment. Storage units are routinely monitored and circulated.



## Treated Salt vs Salt



### Benefits of Treated Salt:

- \* Safer roads in less time.
- \* Melting action begins immediately.
- \* Road retains more due to less bouncing.
- \* Faster melting at lower temperatures.
- \* Cost Reduction - less material and less treatments.

### Road Salt vs Brine

#### Road Salt

- \* Less costly.
- \* Easier to handle.
- \* Dilutes slower.
- \* Initial skid resistance.

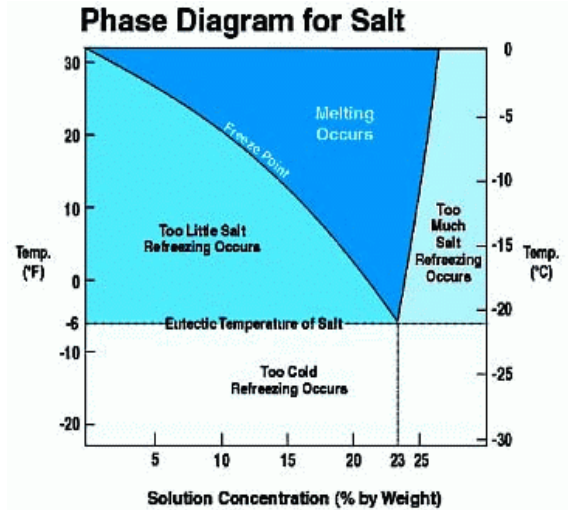
#### Brine

- \* Instant action.
- \* Not displaced by traffic.
- \* Residue remains effective.
- \* Returns road surfaces to normal faster.

### Abrasives not recommended since:

- \* Need to be applied more frequently than salt resulting in additional costs.
- \* Clean-up is required after use.
- \* Easily scatters off the road surface.
- \* Water pollution and air pollution.
- \* No melting action.

Pavement Temperature (°)	Ice Pavement Bond	Application Rate, lb./lm
		Solid & Pre Wet Solid Products
30 to 32	No	150
	Yes	325
25 to 30	No	200
	Yes	400
20 to 25	No	225
	Yes	475
		Use Treated Salt
15 to 20	No	250
	Yes	500
Below 15	No	275
	Yes	600
<b>Recommended Salt Application Rates</b>		



Chemicals are applied to:

- \* Prevent bonding of ice and snow to road surface.
- \* Prevent ice or frost from forming.
- \* Prevent build up of snow pack.
- \* Melt ice that has formed.

Chemicals work by:

- \* Depressing the freezing point of water, turning ice or snow into liquid or slush.
- \* Solid salts dissolve to form brine solution.

Application effectiveness depends on:

- \* Road surface temperature.
- \* Air surface temperature.
- \* Application rate - see application rate chart above.
- \* Concentration - see solution concentration chart above
- \* Moisture.

Brine: mixture of road salt and water

Pre-wetting Salt - adding natural organic deicer and brine:

- \* Reduce salt usage.
- \* Increased deicing efficiency and faster melting action.
- \* Increased safety to motorists.

Anti-icing - pre-treating roads prior to a storm to eliminate ice bonding to the road surface. It allows the Township to use less material per event.

De-icing - Using solid rock salt to melt ice and snow on the road surface.







Brine maker control panel

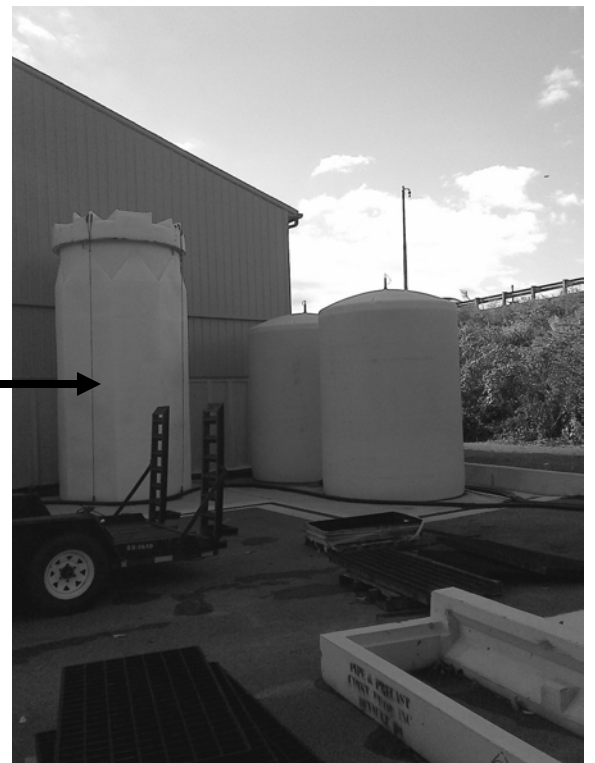


Illustration #1



Salt brine maker

- 1 - 5,000 gallon storage tank for brine
- 1 - 5,000 gallon storage tank for natural organic deicer
- 1 - 5,000 gallon blending tank





120 gallon cab mounted pre-wet liquid holding tank

Stainless steel pre-wet system control box



Under tailgate mounted salt spreader w/pre-wet application spray nozzles

Creating Treated Road Salt



Applying Natural Organic Deicer to Road Salt



Combining Natural Organic Deicer and Road Salt



Illustration #2



### Call In Procedures

- \* Constantly monitor weather - the Township uses a private weather service.
- \* Post 15-day weather report daily on white board that is in the shop for operators to review.
- \* If a weather event is forecasted an hourly report is posted on the white board next to the 15 day report.
- \* The Street Superintendent or the Streets Foreman will notify all departments of a possible winter event involving snow removal and the plan of action.
- \* After hours - **call in's to the Roads, Parks and Sewer Departments will be done by designated personnel.**
- \* Pre-storm alerts will be done by designated personnel, either by text or phone call to have the operators on stand-by and notify the Police Department of the plan.
- \* Operators must respond with in 1 hour of being called in.
- \* If an operator has planned time off during the winter season his/her supervisor will contact the Streets Superintendent or the Streets Foreman. This will allow time to make any changes to truck routes.
- \* When the call-in process is in place the Police Department will also be notified.
- \* Post storm - the Police Department will notify the Streets Superintendent or the Streets Foreman.

### Operator Training

Training courses are offered by the Township to keep operators educated on the latest procedures, techniques and safety.

LTAP - Local Technical Assistant Program.

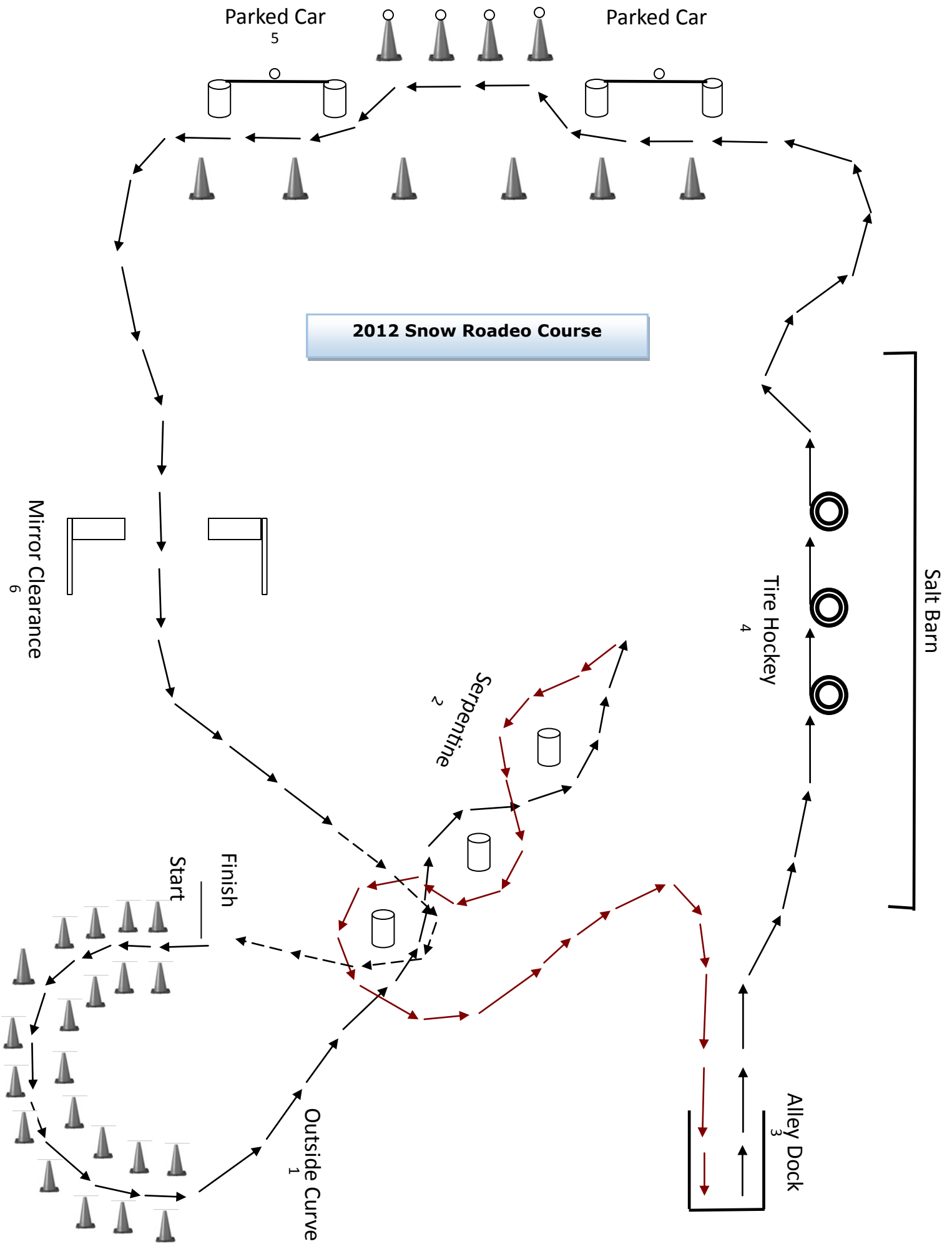
- \* Winter Maintenance
- \* Safe Driver
- \* Equipment and Worker Safety
- \* Work Zone Traffic Control

University of Wisconsin - Managing Snow and Ice Control Operations

APWA - American Public Works Association

PSAT - Penn State Association of Township Supervisors

On-site training - the Snow Rodeo.





## Truck Rodeo

Training Video - Prior to the rodeo, all drivers viewed a training video on driver safety and operations.

Pre-trip Inspection - Within 15 minutes, a driver must inspect a plow equipped truck to find five pre-made faults. **A few examples of this would be: a missing or defective wiper, low fluids, burned out light, etc...**

Safety - All drivers will operate with safety in mind. Seat belts must be worn at all times while on the course.

### Obstacle 1 - Outside Curve

The driver must negotiate the truck through the curve without hitting any cones, this must be done in a continuous motion.

### Obstacle 2 - Serpentine

The truck must go through the cones in a forward motion without hitting any cones. After passing through the three barrels the driver must then continue the obstacle in reverse without hitting any cones. When completed the driver must move to the Alley Dock in reverse.

### Obstacle 3 - Alley Dock

The driver must back the truck into this narrow area without hitting the side barricades. The truck must be backed up as far as possible without hitting the back barricade.

### Obstacle 4 - Tire Hockey

The object is to tap each tire with the plow down and have it land on the designated area.

### Obstacle 5 - Off Set Parking

The parked cars are represented by two barrels and a board. The object is to knock down or touch the four cones in **between the "cars" without hitting the "cars"**. **The cones represent the curb. Tennis balls are placed on both the cones and the "parked cars" so that any contact was obvious.**

### Obstacle 6 - Mirror Clearance

The driver must clear this obstacle without touching the driver or passenger mirror. The obstacle represents tree branches that could be low lying.