

LAND USES AND BEST MANAGEMENT PRACTICES

RESIDENTIAL AND COMMERCIAL DEVELOPMENT

Growth and development can expand opportunities for communities by bringing in new residents, businesses, revenue, and investments. Growth can give a community the resources to revitalize a downtown, refurbish streetscapes, build new schools, and develop vibrant places to live, work, shop, and play. However, with the benefits come challenges. Residential and commercial development has traditionally had impacts on water resources by creating impervious surfaces and compacted soils that increases surface runoff, filter less water, produce pollution, and decrease groundwater infiltration while increasing demand on aquifers. Where and how communities accommodate growth has a impact on the quality of their streams, rivers, lakes, and groundwater. Development that uses land efficiently, protects undisturbed natural lands, and employs green infrastructure practices allows a community to grow while protecting its water resources.

How properties are managed after they are developed can also affect the quality and quantity of water resources. Properties that are managed sustainably can have a positive influence on the health and stability of water while irresponsible behavior will lead to its continued degradation. The following section provides strategies for sustainable development and property management that protects water.

Smart Growth: *Communities should develop and Implement Smart Growth strategies, policies, and ordinances for new construction and re-development in communities that promotes economic development while protecting natural resources and enhancing societal benefits.*

Smart Growth is a widely accepted approach to achieving communities that are socially, economically and environmentally sustainable. Smart Growth promotes a range of development and conservation strategies to help make communities healthier, more attractive, economically stronger, and more socially diverse. Smart growth provides an alternative to conventional development practices that have often led to urban sprawl, traffic congestion, disconnected neighborhoods, and urban decline. The American Planning Association (APA) believes that Smart Growth's "approach to growth and planning can not only deliver dynamic attractive communities with greater choices for consumers but can be a powerful tool for farmland, open space and habitat preservation" ^{L1}. The APA identifies the following as core principles for Smart Growth:

- Efficient use of land and infrastructure
- Creation and/or enhancement of economic value
- A greater mix of uses and housing choices
- Neighborhoods and communities focused around human-scale, mixed-use centers
- A balanced, multi-modal transportation system providing increased transportation choice
- Conservation and enhancement of environmental and cultural resources
- Preservation or creation of a sense of place
- Increased citizen participation in all aspects of the planning process and at every level of government
- Vibrant center city life
- Vital small towns and rural areas

- A multi-disciplinary and inclusionary process to accomplish smart growth
- Planning processes and regulations at multiple levels that promote diversity and equity
- Regional view of community, economy and ecological sustainability
- Recognition that institutions, governments, businesses and individuals require a concept of cooperation to support smart growth
- Local, state, and federal policies and programs that support urban investment, compact development and land conservation
- Well defined community edges, such as agricultural greenbelts, wildlife corridors or greenways permanently preserved as farmland or open space

Smart Growth may include strategies such as infill, brownfield redevelopment, transit oriented development, conservation design, and others. Each of these strategies promotes compact development, protection of natural resources, and low impact development (LID) practices that can protect water resources.

Infill development means reusing underutilized or vacant land located in an existing community. Infill development can help protect water resources by accommodating growth on sites that already have impervious surfaces and existing infrastructure, thus eliminating the need for new impervious cover or the need to disturb new land. Developing infill sites can reduce development pressure on open land (greenfield development) that is providing critical water functions, such as infiltration or groundwater recharge. Therefore redeveloping these infill properties provides a significant opportunity for new growth without degrading water resources. Additionally, by employing LID methods, redevelopment of infill sites can further promote water quality and stormwater management benefits. Communities can encourage infill development through the use of funding incentives or flexible regulations and zoning.

***** Seek out before & after photos of an infill project *****

Brownfield redevelopment is a form of infill that involves properties with real or potential environmental contamination. Brownfields are properties that are or may be contaminated with hazardous substances, pollutants, petroleum or other contaminants. The contaminants pose a barrier to redevelopment so brownfield properties often become eyesores contributing to blight, deteriorated infrastructure, or other challenges in a community. Cleaning up and redeveloping a brownfield property enables infill development, increases the tax base, spurs job creation and often kick-starts revitalization and investment in the surrounding area.

Depending on the property's location, its specific characteristics, and market factors, a brownfield site often can be redeveloped for uses ranging from housing, retail, industrial, or mixed-uses as well as for public and non-profit uses such as parks, recreational areas and municipal facilities. Brownfields redevelopment offers benefits over greenfield development, such as:

- Improving the local environment and protecting water resources by cleaning up, or containing, sources of contamination.
- Moving abandoned or underused properties into beneficial uses.
- Reducing sprawl and preserving greenspace.

Brownfields can be redeveloped by private developers, local governments or through public-private partnerships. However, brownfield redevelopment can be challenging due to the cost to clean up contamination, legal liability, ability to obtain financing, and regulatory compliance. Therefore it is important for communities with brownfield sites to prioritize their redevelopment and train staff to help facilitate the process. Generally, brownfields redevelopment is conducted in one of the following scenarios:

- Private-Led Brownfield Redevelopment: Usually occurs when a property is in a favorable location and a healthy market where the investor anticipates making an acceptable return on the investment.
- Public-Led Redevelopment: Usually occurs when there is little private sector interest and environmental conditions or site factors limit development options.
- Public-Private Partnership Brownfield Redevelopment: Usually occurs when a public entity sponsors the project and provides some initial funding and support, and a private sector developer then funds and manages the redevelopment.

*** Seek out before & after photos of a brownfield project ***

*** Find a community with a successful brownfield redevelopment story for a callout ***

Transit Oriented Development (TOD) refers to the creation of compact, walkable, pedestrian-oriented, mixed-use communities centered around high quality train systems. TOD includes a mix of commercial, residential, office and entertainment located near the train station. Dense, walkable, mixed-use development near transit attracts people and adds to vibrant, connected communities.

Successful TOD depends on access and density around the train station. A TOD is typically located within a ½ mile radius around a central transit stop, which corresponds to the distance someone can walk in 10 minutes at 3 mph¹². This is considered to be the optimal distance people will walk for rail service or amenities. Convenient access to transit fosters development, while density encourages people to use the transit system and nearby businesses. Many cities and villages in McHenry County have stations on Metra's Union Pacific Northwest Line and are ideally suited for TOD. There is a growing market interest for living in communities and neighborhoods where residents can walk and bicycle for their daily trips. With proper planning, and public support, these communities could promote and implement successful TOD projects.

Since development is focused on the ½ mile radius around the train station, TOD encourages infill development and discourages urban sprawl. Benefits of this form of compact development include improved air and water quality, land conservation, improved safety for pedestrians and cyclists, reduced dependence on cars, traffic congestion relief, increased tax base, and reduced outlays for roads. To help promote TOD, municipalities should engage with the community to develop a viable TOD vision that has broad support.

*** Provide a TOD concept plan depicting ½ mile radius ***

Conservation Design employs a combination of creative land planning and innovative stormwater management practices to develop a property while protecting water and natural resources, preserving natural areas and open space, and enhancing wildlife habitat.

Conservation design begins with a thorough review of a development site to evaluate potential green infrastructure elements – such as wetlands, streams, woodlands, and steep slopes. But where the conventional land planning process may search for ways to build through these natural areas – resulting in loss and fragmentation of natural resources – conservation design seeks out creative approaches to preserve and enhance them. A core tool of residential conservation design is "clustering" – i.e., to promote compact development that accommodates the same number of houses onto smaller lots. This results in less fragmentation of natural areas, reduced land grading and associated infrastructure construction, and more functional open space. Preserved open spaces can be enhanced with trail systems that connect to adjacent developments and public trails and open spaces. Effective conservation design also incorporates legal, financial, and ecological management provisions for the long-term protection and stewardship of natural areas within a conservation development.

Another critical aspect of conservation design is to incorporate practices that minimize increases in stormwater runoff and degradation of runoff quality. Projects that incorporate LID designs feature narrower streets, permeable paving, and stormwater best management practices such as bio-swales and rain gardens. Their goal is to maintain natural recharge of rainfall and runoff, thereby protecting groundwater aquifers and providing clean, healthy baseflows to streams and wetlands.

Conservation design is already established in McHenry County and has been integrated into policies and ordinances at the county and municipal level. The City of Woodstock was the first community in McHenry County to adopt conservation design standards as part of its Unified Development Ordinance. The county subsequently adopted conservation design requirements into the McHenry County Unified Development Ordinance based, in part, on the approach taken by Woodstock. More recently, the Village of Algonquin and City of Crystal Lake have incorporated conservation design requirements into their ordinances, largely modeled after the county ordinance. These ordinances require conservation design for development sites that have significant areas of sensitive natural resources such as the presence of wetland, floodplain, woodlands, remnant prairies, or specific types of soil.

Although conservation design promotes compact development and other smart growth principles, conservation design projects often involve greenfield development rather than the infill development that is at the core of smart growth. Therefore, location matters and not every conservation design project should be considered smart growth. The APA Policy Guide on Smart Growth states that *“Special consideration should be given to the location and timing of infrastructure extensions in rural areas so as not to encourage growth that will promote inefficient and unsustainable development patterns; create the need for additional inefficient and costly infrastructure; result in the loss of viable agriculture, forest land, and important natural habitat; create conflicts between agricultural and urban land uses; or ultimately harm the character of the rural community.”*^{L1}

*** Provide graphic of a concept plan illustrating conservation design community. Possibly use Sanctuary from page 33 of GI Plan as callout?) ***

Pollution Prevention: *Residents, business owners, property/business managers should understand how pollution can be generated on their properties or through their actions, and steps they should take to prevent the pollution.*

Household Hazardous Wastes. Many products used every day for tasks such as housework, home improvement, gardening, or car maintenance contain hazardous materials. These hazardous products exhibit one or more of the following characteristic properties: ignitable, corrosive, reactive, or toxic. They are identified by their product labeling and are usually marked with these common signal words: CAUTION, WARNING, DANGER, or POISON. When possible, hazardous products should be completely used up per the label directions. When products can't be used entirely and are expired or unwanted, they become household hazardous waste (HHW). Residents, business owners, property/business managers should understand what constitutes HHW and how to properly dispose of unused hazardous products.

The following is a list of common household hazardous products that might be found in your garage, basement, or other storage space in your home and are accepted at Illinois EPA approved Household Hazardous Waste collection facilities:

Household Cleaning Products

- Drain openers/cleaners
- Oven cleaners
- Tub, tile, shower and toilet cleaners Wood & metal cleaners and polishes

Automotive Fluids

- Gasoline or oil mix
- Motor oil
- Diesel fuel
- Fuel additives
- Carburetor and fuel injection cleaners
- Starter fluids
- Automotive & marine batteries
- Transmission and brake fluid
- Antifreeze

Miscellaneous

- Batteries (no alkaline)
- Mercury thermostats or thermometers
- Fluorescent light bulbs & mercury containing lamps
- Driveway & deck sealers

Lawn & Garden Pesticides

- Herbicides
- Insecticides
- Fungicides
- Fertilizer
- Ant sprays and baits
- Cockroach sprays and baits
- Flea repellents and shampoos
- Mouse & rat poisons and baits
- Mothballs
- Pool chemicals

Workshop/Painting Supplies

- Aerosols
- Adhesives and glues
- Oil or enamel based paint
- Stains and finishes
- Paint thinners
- Paint strippers and removers
- Wood preservatives
- Photographic chemicals
- Mineral spirits and other solvents

Other Flammable Products

- Kerosene
- Home heating oil
- Lighter fluid

*** provide graphic or photo of typical household waste items ***

When improperly stored or disposed, these hazardous materials can harm the environment and public health. Improper disposal of HHW can include pouring them down the drain, on the ground, into storm sewers, or in some cases putting them out with the regular trash. The dangers of such disposal methods might not be immediately obvious, but improper disposal of these wastes can pollute the environment and pose a threat to human health. To ensure proper disposal, take HHW to an Illinois EPA approved household hazardous waste drop off location. There are four (4) permanent HHW drop off locations near McHenry County, which are open to all Illinois residents:

- Rockford: Rock River Reclamation District 3333 Kishwaukee, Rockford, IL Phone: (815) 987-5570
- Naperville: Household Hazardous Waste Drop-Off 156 Fort Hill Drive, Naperville, IL Phone: (630) 420-6095
- Gurnee: The Solid Waste Agency of Lake County (SWALCO) 1311 N. Estes Street, Gurnee, IL Phone: (847) 336-9340
- City of Chicago: Household Chemicals and Computer Recycling Facility 1150 North Branch on Goose Island Phone: 311 or for general info: (312) 744-7672

There are many other opportunities to properly recycle or dispose of electronics, latex paint, batteries, fluorescent bulbs and other materials that can pollute the water Resources. For instance, the McHenry County Department of Health and the Environmental Defenders of McHenry County hold four recycling drives every year. Specific events for batteries and latex paint are also held annually. Additional drop off locations for many materials are also regularly provided at several Townships. Please refer to the McHenry County Green Guide for more information: www.mchenry.edu/greenguide or the Spanish version at www.mchenry.edu/greenguidespanish

Pollution from Vehicles. Vehicles use potential pollutants such as gas, oil, radiator fluid, wiper fluid, batteries, etc, to operate. Potential pollutants such as solvents are also commonly used to clean and maintain them. Even the grime that accumulates on vehicles has high concentrations of pollutants. Because vehicles and these materials are so common and are constantly present on properties, the potential for pollution is great. Here are steps to reduce the potential risk of pollution from vehicles:

- Keep cars tuned up and immediately repair leaks.
- Always properly dispose of fluids, tires and batteries.
- Refer to the McHenry County Green guide for locations to dispose of oil, tires and batteries.
- Clean your vehicle at a commercial car wash that treats and recycles its water. These commercial car washes capture pollutants from vehicles and typically use less water than washing by hand with a hose.
- Try to use your vehicles less. Reduce a few trips each week by walking, bicycling or using public transportation.

*** Provide a photo of oil stain on pavement ***

Coal Tar and High PAH Sealants. Blacktop sealers are the black, viscous liquid that is often applied to asphalt driveways, parking lots, and playgrounds. The sealers are usually applied to protect the asphalt or simply to restore a black, glossy finish to old surfaces. A form of blacktop sealer that is commonly

applied is made from coal tar or coal tar pitch which contain extremely high concentrations of a known carcinogen called polycyclic aromatic hydrocarbon (PAH).

PAHs are a group of chemicals created by heating or burning material that contains carbon. Coal tar is a byproduct of the coking, liquefaction or gasification of coal. Coal-tar pitch is the residue that remains after the distillation of coal tar. PAHs cause cancer, mutations, birth defects, and/or death in fish, wildlife, and invertebrates. Coal tar and other high PAH sealants typically contain 35,000 to 200,000 mg/kg of PAHs. For comparison, used motor oil only contains around 730 mg/kg^{L3}. The PAHs in sealants do not stay in place. Sealant particles flake off with vehicle and foot traffic, snow removal and in sunlight. Particles can blow away or wash into ponds and streams with stormwater. This dust is tracked into homes by people and pets, where potentially carcinogenic dust and PAHs can be inhaled, ingested and absorbed through the skin. Studies have shown that dust in homes next to parking lots with coal tar-based sealants have PAH concentrations 25 times higher than homes next to parking lots without coal tar sealants^{L3}.

Fortunately there are safer alternatives to coal tar based sealers. Asphalt-emulsion sealants have about 1/1,000th the PAHs of coal tar sealants. Asphalt-based sealants are similar in cost and durability to coal tar or high PAH sealants and are widely available in stores and from contractors. While most of the big box home improvement stores have already stopped selling coal tar based sealants, there are many contractors who use coal tar or high PAH sealants. Therefore, only hire contractors who provide a safety data sheet (SDS) to confirm that the sealant they are actually applying is a low PAH (less than 0.1% by weight) sealant that does not contain coal tar. Alternately, people may choose to leave pavement unsealed or replace asphalt with concrete, pavers or surfaces other than asphalt.

Several municipalities in the region have enacted coal tar sealant bans and many government agencies have policies excluding the use of coal tar sealants on government properties. To further protect human health and water resources, all units of government including the county, municipalities and schools should adopt official policies banning the use of coal tar and high PAH sealants. Additionally, Homerule municipalities should consider adopting a ban on coal tar and high PAH sealants that covers all properties in their community.

***** Provide photo of sealant being applied *****

Minimize and Manage Yard Waste in Developed Areas. In a natural environment organic material such as leaves or dead vegetation is constantly recycled as the material decomposes and is broken down into nutrients that can be absorbed by trees and plants. In a developed environment however, nutrients from landscape waste often do not have a chance to be recycled in the same way. Instead stormwater runoff from rain or melting snow flows across lawns and impervious surfaces, rapidly collecting and transporting nutrients, sediment, leaves, grass and other landscape waste into streets and gutters that lead to storm sewers and drainageways. Runoff from the storm sewers is then discharged, untreated, into waterways carrying all of the excess nutrients from the yard waste. When the nutrients get into the waterways it promotes the growth of algae and plants that can reduce the amount of oxygen in the water needed to sustain fish and aquatic life, or contribute to the growth of cyanobacteria “blooms” that can be toxic to people and animals.

Sources of yard waste include grass clippings, leaves, tree and shrub trimmings, and plant materials from vegetable or flower gardens. By weight, grass is usually the largest component averaging half of all yard

waste. Leaves and brush each contribute nearly one quarter. Other landscape materials contribute less than 10 percent. On average, nearly 200 pounds of yard waste is produced per person each year^{L4}.

Communities, businesses and homeowners should reduce the volume of yard waste produced on their property and manage remaining yard waste using landscape methods that prevents excess nutrients from entering waterways. Simple landscaping practices that can minimize or manage yard waste on developed properties include:

- Incorporate more sustainable landscaping practices that use native plants, or grass alternatives to Kentucky Bluegrass, which promotes the natural cycling of nutrients, does not require chemical fertilizers/pesticides, and reduces the need for mowing or additional watering.
- Dispose of leaves and landscape debris by bagging or setting out for curbside collection in accordance with your community's collection procedures.
- Compost yard waste on your property in an area away from wetlands, water bodies, or storm drains.
- Keep paved areas and storm drains clear of leaves or debris.
- Mow cool season turfgrass to 3 inches or more. This height will promote the formation of deeper roots which helps grass absorb water and nutrients, reduce evaporation and conserve water, prevent diseases, and reduce germination of weed seeds.
- Mow grass and leaves with a mulching mower and let them stay on the lawn as natural fertilizer.
- Aerate lawns to increase the rate of infiltration.
- For properties with ponds or water bodies, maintain a buffer of native vegetation along the edge to intercept and filter runoff before it enters the water.
- Only use phosphorus free fertilizers.
- Avoid or minimize the use of chemical pesticides.

*** Provide photo of a person/family raking leaves ***

Pet Waste. Pet waste may contain pathogens such as E.coli, Giardia, Salmonella, Cryptosporidium and Campylobacter that can pose health risks. Pet waste also contains nitrogen and phosphorus that can contribute to nutrient pollution and algal blooms in water bodies. Therefore pet waste should be safely disposed of to prevent negative impacts to people, other animals or the environment, including waterways and groundwater. Safe

- Pet waste, including used kitty litter, should be bagged and disposed of with your household trash
- Bag pet waste when walking your dog and dispose of the bags in a trash container
- Provide, and maintain, easily accessible pet waste stations on all public properties where dog walking is common
- Do not allow pet waste to accumulate on your property where it can cause nuisance conditions or other concerns
- Do not use pet waste to fertilize your vegetable garden as some pathogens can affect the vegetables and cause illness when the vegetables are consumed

- Do not compost pet waste in residential compost piles as the composting process is unlikely to reach temperatures high enough to kill the pathogens found in pet waste
- As an alternative disposal option, consider taking kitty litter waste to a professionally managed organic composting facility

*** Provide photo of a station for plastic bags and pet waste disposal ***

Emptying Pools. Swimming pools are filled with chlorinated water. If this water is discharged directly to surface waters such as lakes, rivers, streams, ponds, and wetlands it can negatively impact waterways and is toxic to fish and other wildlife. Discharging swimming pool water directly into storm drains or drainage ditches can be equally harmful since these storm drains and ditches connect directly to surface waters.

Follow proper steps to safely empty pools and protect water quality:

- De-chlorinate the pool water prior to draining it. Chemicals that will quickly remove chlorine are available through pool and spa care vendors. Carefully follow the directions on the product label.
- Or
- Stop adding chlorine or bromine and leave uncovered in the sunlight for at least 2 days. Test the chlorine level to ensure a safe level of below 0.1 mg/L is reached before draining the water. Drain the pool over a period of several days.
- Direct the drainage ACROSS your lawn, and NOT down your driveway, into a storm drain, or directly to wetlands or other water bodies.
 - Do NOT drain your water onto public property or another person's property.
 - Do NOT drain your water directly into a private septic system.

Residential Snow and Ice Management (see the *Transportation* section for information on snow and ice management for roads and parking lots). Winter weather in McHenry County can produce significant amounts of snow and ice that lead to dangerous conditions on resident's walkways and driveways. The most environmentally responsible way to manage snow is to physically remove it using a shovel, although conditions may require the aid of plows or snowblowers. If conditions are suitable, sand or kitty litter can be put down to provide traction and prevent slipping on ice. In addition to physical removal of snow and providing traction, residents often use chemical deicers such as rock salt to combat icy conditions.

A deicer is a substance that melts or prevents the formation of ice. In their solid form chemical deicers are incapable of melting snow and ice. The solid material actually needs to get wet and form a liquid brine. This liquid brine then lowers the freezing point of water thereby melting snow or ice and preventing a bond from forming between ice and paved surfaces. Chloride is the main chemical component in most common deicers that melt or prevent the formation of ice. While chloride-based deicers have the ability to greatly improve safety on paved surfaces, they also have negative effects on water resources, the environment, vegetation, infrastructure, wildlife, and pets. When snow melts or rain falls chlorides dissolve into the water which then seeps into groundwater or is carried by

stormwater into waterways. Therefore, it is important for everyone to manage snow and ice in ways that maintain safety but minimize the use of deicers.

Deicers are available in several forms. Be aware that **no deicer is environmentally friendly**. All deicers have environmental impacts regardless of what its marketing says. Therefore people should take steps to use deicers responsibly. Know the effective temperature of deicers so you can apply the correct product for the weather conditions and avoid having to repeatedly apply material. Most deicing products will state its effective temperature on the bag or container. Consider the best deicer for your conditions and only use the minimum amount needed. Be careful to only apply deicer on the pavement and avoid over application into vegetation. The following are common deicers:

- Rock Salt or Sodium Chloride (NaCl) is the most commonly used deicer, largely because it is readily available and inexpensive. Rock salt contains the most chloride of these deicers and is only effective in temperatures 15° F or above.
- Calcium Chloride (CaCl) is a hygroscopic material that attracts moisture from its surroundings, thereby speeding the creation of brine to give melting action a fast start. Because it is so effective, less material may be needed, resulting in less pollution. Calcium chloride can be effective in temperatures as cold as -25° F. However, since Calcium chloride costs about three times more than rock salt it is often sold as a blend of both products.
- Magnesium Chloride (MgCl₂) is also a hygroscopic material that attracts moisture from its surroundings. However it is widely reported to be less effective as calcium chloride so more material may be required to achieve the same results. Although it is corrosive and can harm lawns or plants, magnesium chloride is considered by some to be safer for vegetation and pets than other chloride based deicers. Magnesium chloride can be effective in temperatures down to 0° F.
- Calcium Magnesium Acetate (CMA) is considered the least environmentally damaging deicer because it has low toxicity and is biodegradable. However it is considerably more expensive than other deicers, costing up to 20 times more than rock salt. CMA can be effective in temperatures down to 20° F.

Another option to combat ice include the use of liquid “anti-icers”. Liquid anti-icers usually consist of liquid brine solutions (the same as deicers but in liquid form) that are sprayed onto driveways and sidewalks before a snowfall. The liquid brine prevents snow and ice from bonding with the pavement making snow and ice removal easier and reducing the need for repeated applications of deicers. If used properly, the use of liquid anti-icers can reduce the amount of chlorides entering our water. Other liquid anti-icing and deicing products are increasingly being used for roads and parking lots but these are usually cost prohibitive for residential use. Suggested steps to manage snow and ice safely while preventing or reducing environmental impacts include:

- If icy conditions are expected, apply liquid anti-icer before the storm event.
- Physically remove as much snow and ice as possible (shovels are the most environmentally responsible option).
- If conditions allow, apply sand or kitty litter to provide traction if needed.
- Before putting down deicers, remove as much snow as possible. Do not try to burn off the snow using deicers as this wastes material and leads to unnecessary pollution

- Using the best deicer for the conditions, apply the minimum amount of deicer needed to control the formation of ice.
- Using a spreader helps to provide even distribution and reduce over application. Avoid creating clumps or piles.
- Be careful to only apply deicer on paved surfaces, avoiding over application onto vegetation.
- When paved surfaces dry up, sweep up remaining deicer for future re-use.

Footnotes:

L1 <https://www.planning.org/policy/guides/adopted/smartgrowth.htm>

L2 <http://www.designcenterpgh.org/transit-oriented-development.html>

L3 https://www.usgs.gov/mission-areas/water-resources/science/coal-tar-based-pavement-sealcoat-pahs-and-environmental-health?qt-science_center_objects=0#qt-science_center_objects

L4 <http://extensionpublications.unl.edu/assets/pdf/g1855.pdf>

DRAFT