DRIVEWAY PLANNING DISCUSSION DOCUMENT

Introduction -- Denning is updating its land use laws. The codes being considered for refinement include the subdivision regulations, zoning, and local laws covering the siting of telecommunications facilities, manufactured housing, and other land uses.

Subdivision control involves the development of new lots, roads and access to lots (driveways). The subdivision regulations were selected as the first phase of the project to upgrade Denning's land use laws. Therefore, a public outreach meeting on April 12, 2008 will concern aspects of subdivision design and control. There will be future opportunities for public input on the topics scheduled to be taken up during the next phase of the project, mainly proposed modifications to the local zoning law.

This document explains aspects of subdivision control and explores the broad sub-topic 'driveway planning'. It identifies components of driveway design and construction, starting with discussion of subject-specific planning goals for Denning and ending with a review a some of the regulatory techniques under consideration. At the outreach meeting on April 12, 2008 there will be discussion about driveway planning. Specifically, there will be requests for public input on the policy approaches being considered by the Committee to Update Denning's Land Use Codes.

> ***Please note, in addition to driveway planning, the outreach meeting will cover two other broad topics: 'road planning' and 'conservation /environmental planning'. These three subjects overlap. Please see the other discussion documents for information on those topics***

While there are separate discussions planned for the topics roads and driveways, there is a great deal of overlap between the two topics. For instance, road safety is influenced by the spacing and characteristics of the driveways by which cars access and exit the main thoroughfares. Likewise, common driveways, meaning shared driveways that serve more than one lot (multiple dwellings) are often required to be constructed at minor or rural road standards.

The current subdivision regulations were adopted in 1975. These are available for review at Town Hall during normal business hours, as well as on the Town web page at: *http://www.denning.us/*

Comprehensive Plan Context

This project builds on the comprehensive plan adopted in late 2007. The purpose of this project is to make the Town's land use codes consistent with the new master plan. The Plan itself should be consulted in considering policy; however, some summarization is provided here to aid discussion.

Denning is a hilly community with open space character, older roads and mountaintop elevations that are subject to severe storms, and valleys that have potential for hazardous flooding. Denning's Comprehensive Plan 'Vision Statement' (pg. 5) states, in part:

> *"…there should be limited development of new infrastructure with most investment directed to the existing roads and neighborhoods. Going forward, the community should promote development that enhances the scenic beauty of the Town, and is compatible with natural resource capabilities".*

Denning's Plan provides overall goals, including:

- Accommodate new growth within the traditional community settings and specific designated areas. Minimize the conversion of undeveloped land in the remote mountain areas and the outlying areas in favor of careful infill in and adjacent to the valleys and on Red Hill. This will strengthen the community and its sense of place.
- Ensure that development is compatible with natural resources protection by achieving site development where buildings and access are separated from the most sensitive resources.
- Emphasize maintaining and enhancing existing road and stormwater facilities before adding new infrastructure.

Objectives in the Plan, or identified by the Committee to Update Denning's Land Use Codes, specific to driveway and road planning are:

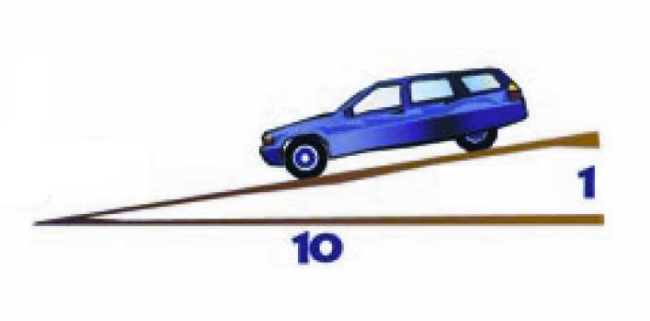
- Provide design standards and graphics of the desired forms of development – pictures and diagrams that describe options and approaches for new road layouts, driveways, curb cuts and drainage systems should recognize the unique features within the Town and define the preferred approach for construction
- Adopt driveway & common driveway standards (See plan section 3.4.3) – clear standards for the development of individual driveways should be adopted to ensure they meet public safety and natural resource protection objectives
- Promote consideration of the desired development form in accordance with the natural resource capabilities. This will ensure that new infrastructure will hold up

over time and perform optimally under extreme weather. Avoid critical resources (natural or cultural) during planning and reconstruction activities

- Limit building on steep slopes
- Limit the areas of physical disturbance as reasonably practicable
- Where suitable, help the community maintain gravel roads
- Describe and promote best management practices for highway drainage management
- Encourage orderly growth and careful outlay of public finance in managing and developing the road network
- Require landowners to carefully plan new roads and driveways and provide for their connection with the existing road network

A main component of built form in Denning is the circulation system, composed of roads, bridges, driveways and the associated drainage systems. Denning's open character and pattern of infrastructure dictates that there should not be all of the types of hard infrastructure laid out in subdivisions within higher density communities. For instance, there does not seem to be a desire for vertical granite curbing installed in streets, or a need for formal paved sidewalks and street lighting. This does not mean that there should be careless planning of new infrastructure. Rather, it points to a need to carefully design and implement very rural character street and driveway layouts and accompanying utilities in a way that fits well with the Town's rural and open space character.

DIAGRAM 1



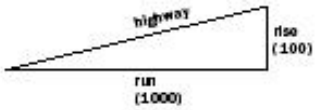
What Is Involved In Driveway Planning & Development?

When planning subdivisions and access to them, the layouts must be safe, durable and consistent with community character. Drainage systems need to be carefully designed. Given harsh winters and heavy rains, there is potential for access driveways to become dangerous because of ice, snow, rain, flooding, power outages, and downed trees. Poor or no maintenance can render a driveway impassable over time. The types of topics involved in developing design guidelines and driveway development standards include:

- Spacing between driveways
- Characteristics of access onto public and private roads
- Minimum and maximum grades
- Clear sight distances (so vehicle operators can see and anticipate possible hazards)
- Safe stopping distances (so a vehicle does not slide out into a road)
- Apron characteristics
- Driveway width
- Minimum driveway length
- Street number labels
- Routine maintenance of vegetation

Since driveway development involves alteration of the landscape, it also involves potential to alter drainage patterns on a site.

DIAGRAM 2



TOPICS FOR DISCUSSION

TOPIC 1: Grade

What is driveway or road grade -- the grade, according to MacMillan Mathematics, is a measure of incline or slope. The amount of grade indicates how much a road is inclined from the horizontal. For example, if a section of drive is perfectly flat and level, then its grade along that section is zero. However, if a section is steep, then the grade along that section will be expressed as a number, usually a percentage, such as 12 percent.

A six (6) percent (%) grade would be a six foot vertical rise in 100 horizontal feet of road. If you draw a 100 inch long horizontal line, then at one end of the line you draw a vertical line 6 inches long, and then draw a line joining the top of the 6 inch high line to the opposite end of the 100 inch line you'd have a 6% grade (slope) on the line you drew.

DIAGRAM 3

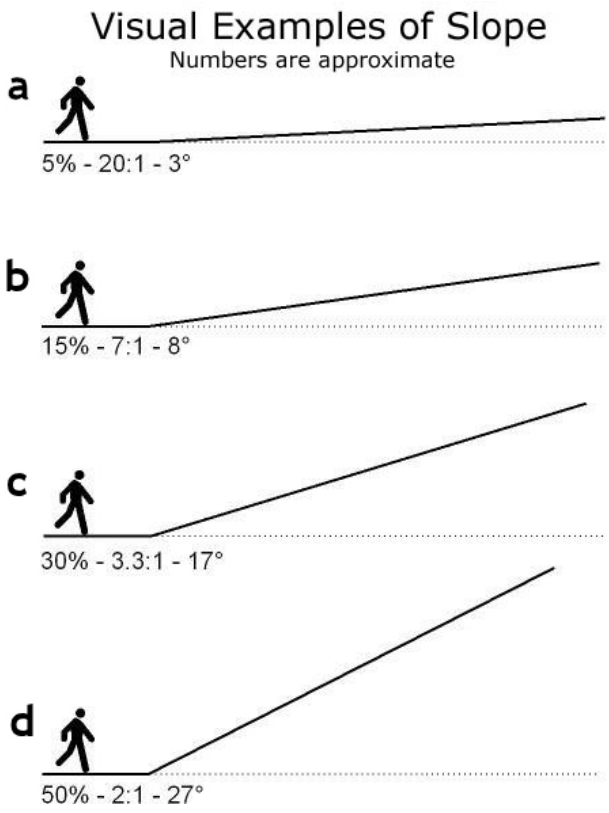


Diagram 2 shows a road in profile (from the side). A right triangle has been constructed in the diagram. The elevation, or height, of the highway increases in the sketch when moving from left to right. The bottom of the triangle is the horizontal distance this section of highway covers. This horizontal distance, sometimes called the "run" of the highway, indicates how far a vehicle would travel on the road if it were level. However, the road is not level but rises from left to right. This "rise" is a measure of how much higher a vehicle is after driving up the road. The road in Diagram 2 has a ten percent slope or grade (as does the road in Diagram 1).

Diagram 3 shows varying slopes. To calculate grade of a section of highway, divide the rise (height increase) by the run (horizontal distance). The equation, used to calculate the ratio of rise-to-run for highway grades, is the same ratio as the slope "y/x" encountered in a Cartesian coordinate system. In example 3d., if the rise of the highway section is 100 feet, and the run would is 330 feet, the resulting grade is thus 100 feet divided by 330 feet, or 0.30. Road and driveway grades are usually expressed as a percentage, so the

decimal is be converted to percent by multiplying the decimal by 100 to equate to 30 percent.

As shown in Diagram 3, a 15% grade is three times the angle of a 5% grade. A 30% grade is six times steeper than the angle of a 5% grade. In general, about half the road grade percent (although not exactly) is the road angle.

Why Grade is Important -- Driveway slopes influence speed differential. Turning vehicles must slow appreciably to enter a driveway. The steeper the driveway, the more vehicles must slow to prevent "bottoming out". Speed differential is the change in speed between vehicles continuing through on a road versus that of one turning off onto a driveway. If through traffic generally moves at 35 miles per hour and cars have to slow to 10 miles per hour to enter a driveway, the speed differential at that driveway is 25 miles per hour. Higher differentials are likely to experience higher accident rates. Steeper drives may be also harder to navigate, such as during harsher weather.

The location and specifications for driveways/street intersections (curb cuts) require Highway Superintendent approval. The Committee to Update Denning's Land Use Codes' consensus is that driveway entrances and egresses should not be too steep (either negative or positive slope), as a means to promote safe road exit speed differentials, including for large vehicles involved in emergency response. It is preferred to have driveways that have negative grade, meaning that the driveway's approach into the street intersection rises up to the street slightly so that drainage does not go into the road.

Denning has a high incidence of steep slopes (defined as land grades of 15% or more). Given the steep topography in the Town, it is proposed to provide for driveway grades of up to 15 percent outside of the immediate driveway approaches. Allowing for steeper grade driveways enables flexibility in the design and layouts of driveways. This would be less restrictive than in many communities. For instance, the Ulster County Fire Chiefs Association's preferred driveway grade is 12%. Some communities set maximum grades at 12% with steeper grades requiring the fire chief and/or other reviewing agency's approval. When steeper grades are permitted, there are many techniques which can help ensure safe driveways, including limits on the continuous lengths of steep grade, pavement requirements, wider travel lane widths and controls on curves.

At the April 12 meeting, there will be a series of questions to confirm people's comfort in allowing flexible layout of driveways within the Town. Likewise, minor roads, defined as streets intended to primarily provide access to abutting property, will be discussed in the same context. For these 'lower order' roads, we will explore providing grades of up to 15 percent.

TOPIC 2: Driveway Improvements

Policy should be clear about allowing private driveways, including common driveways shared between lots. There is also a need for clear standards for their construction, operation and maintenance. This will ensure adequate accommodation for emergency access, including that:

- Fire trucks can fit between gates that frame driveways;
- Vertical and side clearing is provided so that vehicles can safely travel along the whole driveway without impedance;
- Longer driveways have pullovers at intervals (in case other vehicles are encountered);
- There are 12 to 14 foot travel ways plus two to three foot shoulders on both sides;
- Directional signage is clear, such as to identify the house numbers served and the direction of each house at driveway branches; and
- Adequate turnaround areas are provided at the ends of driveways.

Just as with private roads, there should be thorough and binding maintenance agreements for common driveways. Executed legal forms would become a clear part of the permit and land record system. These would require future driveway owners to maintain infrastructure and carry out sustained driveway maintenance and upkeep.

In Denning, developed plats, including occupied dwellings and vacant lots on private roads exist. An example of a substandard route is Woodhall Road that was developed by deed, but is unpaved, constructed without a prepared road base, rutted, and has poor drainage without formal culverts. As a way to achieve safe access, if a property owner of such land seeks to add a bedroom to an existing structure, or build on a vacant lot, the Planning Board is proposed to be provided with a policy requiring access improvements in order to receive a building permit. Short of requiring the access to be brought up to a Town road standard, the policy would explore reasonable physical improvements to achieve incremental upgrades to the road, such as providing pavement, or establishing maintenance agreements.

On April 12 we will explore when there should be requirements to maintain driveways year-round, including the provision of snow removal. We will explore whether a maximum length for driveways should be established, such as 2,500 feet. Finally, there will be exploration of support for allowing common driveways and providing requirements to upgrade substandard roads when they are proposed to accommodate new development.

End