

PREFERRED DIRECTIONS REPORT

SEVIER COUNTY AND MUNICIPALITIES HILLSIDES AND RIDGES STUDY

Sevier County, Tennessee



Preferred Directions Report
Sevier County and Municipalities Hillside and Ridges Study

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EXECUTIVE SUMMARY

In early 2007, Sevier County and its municipalities commissioned the *Hillsides and Ridges Study*. The Study examined with the public the issues surrounding development on the regions hillsides and ridgelines. Recommendations have been developed for the practical and effective management of hillside ridgeline development as outlined within this Report – ‘*Preferred Directions.*’

The report contains the following sections:

- > An FAQ section to address possible questions that the public may have
- > A brief history of the project and a summary of the public process
- > A discussion of the areas potential for earthquake and landslides
- > A discussion of specific recommendations for each community to move to meaningful strategies to address the issues of hillside and ridgeline development.

Saratoga Associates worked closely with a Working Committee made up of planning officials from each involved community.) A Case Study analysis was conducted of several communities that have chosen to regulate hillsides and ridges. The Case Studies identified useful techniques other communities have used successfully along with potential pitfalls in rules and approaches that should be avoided. An analysis of the local land use regulations of each involved community was also conducted. In general, the analysis determined that the local regulations do not provide a framework designed to shape hillside development in a way that protects the region’s scenic resources or adequately promotes certain public safety concerns.

By July, all public comments from June meetings were compiled and used as a framework for an “Emerging Concepts Report.” The report outlined a preliminary set of recommendations for the enhancement of standards for hillside and ridgeline development. Public feedback was obtained at additional public and stakeholder meetings in July, which helped refine the Emerging Concepts into this Report – “Preferred Directions.”

Preferred Directions Recommendations

This Report represents a ‘*Tool Box*’ of relevant techniques each community could use towards properly addressing inappropriate hillside and ridgeline development.

Hillside Overlay District Approach

It is recommended that each community and the County consider implementing rules that would protect the region’s scenic and aesthetic resources. This Report outlines several measures and strategies to protect the hillsides and ridgelines from inappropriate

development. These measures and strategies range from limits on vegetative clearing, site and building design standards and detailed reviewing procedures to limit or avoid adverse visual impacts in each community which may result when development is allowed to proceed unchecked. To ensure that development which would not result in adverse aesthetic and scenic impacts are not unnecessarily regulated, a Hillside Overlay District could be established. The first step would be to identify the aesthetic and scenic resources to be protected and then identify areas where development is likely to occur and could be visible from those aesthetic and scenic resources. When development is proposed in an area above a certain elevation and visible from identified resources, additional review and design strategies and protective measures would be employed.

Critical Slope Floating Zone Approach

The second set of strategies involves the consideration of a Critical Slope Floating Zone that would involve the additional review of development proposed on slopes in excess of fifteen percent to avoid or limit potential adverse impacts associated with development on steep slopes. Similar to the Hillside Overlay District approach, development proposed in a Critical Slope Floating Zone would be subject to review requirements that might include site and design standards and confirmation that impacts on critical resources in the area are avoided or mitigated.

Implementation Strategies

The recommendations outlined in this report can be implemented any number of ways. Specifically, they do not have to be all implemented at once and in fact portions of the recommendations can be incorporated into local land use regulations. Communities would not be required to implement all of the recommendations for there to be effective and meaning full progress for protecting the areas hillsides and ridgelines.

The very first step should be to develop two sets of standards to provide consistent guidance and a running start for implementing this report's recommendations. Specifically, the report recommends that each community and the County consider Hillside Overlay District (HOD) and Critical Slope Floating Zone (CSFZ) provisions that could be adapted into existing land use regulations.

Phase I

1. Establish or maintain existing working committee to develop HOD and CSFZ provisions.
2. Working Sessions with City/County Planning Commissioners to discuss possible amendments/updates.

3. Begin implementation procedures at the speed acceptable to each involved.
 - a. First consider amending and revising PUD policies to limit the amount of clustering on very steep slopes and in areas visible from SLRS.
 - b. Amend subdivision and site plan review procedures to limit the amount of vegetation clearing allowed before and after construction more or less in line with the recommendations of this Report.
 - c. Encourage applicants to utilize the many design and mitigation measures recommended in the Report. A quick and simple guidebook could be developed for each community for distribution with application materials.

Phase II

4. Adopt Critical Slope Floating Zone Provisions
 - a. Establish Environmental and Public Resources of Concern
 - b. Establish Standards of Design and Construction
 - c. Establish Findings Statement procedures

Phase III

5. Adopt Hillside Overlay District Provisions
 - a. Establish SLRS
 - b. Establish Standards of Design and Construction
 - c. Establish Findings Statement procedures.
6. Assess feasibility of Transfer of Development Rights Program
7. Conduct a “Lessons Learned” analysis of how the rules are or are not performing

Phase IV

8. Update SLRS as necessary
9. Implement Transfer of Development Rights Program
10. Implement any revisions that were identified as necessary during the “Lessons Learned” analysis.
11. Keep analyzing progress and look for ways to improve.

FREQUENTLY ASKED QUESTIONS

The challenges facing Sevier County are very similar to the challenges facing communities across the nation. Public policies and attitudes useful in the past may need to be refreshed to tackle new realities about growth and development. It is at these times that communities strive to find new ways to move forward while remaining a special place. The question at the heart of such efforts is, “Who do *WE* want to be tomorrow?”

We sometimes forget that choices made as a community (‘we’ choices) are a special set of shared individual choices (‘me’ choices). To get there, the lines around ‘we’ and ‘me’ should be examined together and responsibly. How can individual rights be balanced with the public’s right to an attractive, clean, healthy, and safe community? What issues have become genuine public concerns worthy of a community response? How should the use of property be balanced with its potential negative impacts on neighboring properties and the public? Every community should be asking and resolving these questions when considering whether or not to adopt land use regulations.

During the public process of developing approaches and recommendations to address hillside and ridgeline development, all sides of the issue expressed articulate viewpoints. These many viewpoints became the framework for this Report. At the end of the day, one’s opinion and comfort level about changes in the community are worked out around the dinner table or over coffee with friends and neighbors. To promote such discussion, the following discussion brings forward some of the most important questions asked by Sevier County citizens, questions about ‘me’ and ‘we.’

As an interested citizen, please take a moment to read this and the recommendations of the Report.

Q: Who hired Saratoga Associates to develop these recommendations?

Saratoga Associates was hired by four local government legislatures: Sevier County and the Cities of Sevierville, Pigeon Forge, and Gatlinburg.

Q: Who is Saratoga Associates?

Saratoga Associates is a private consulting firm located in Saratoga Springs, New York (pop. 26,000). The firm employs community planners, engineers, architects, and landscape architects who work together on a range of projects. The firm is hired by

municipalities, state agencies, private individuals, developers, conservationists, and not-for-profit organizations. Examples of our projects can be found at www.saratogaassociates.com

Q: Who developed the stakeholder list and who are these ‘stakeholders?’

Every citizen of Sevier County who cares about hillside development is a potential stakeholder. In order to devise a workable focus group, the client communities compiled a list of approximately 50 potential participants. The intent of the stakeholder meeting was to gather concerns from professionals and individuals involved in a daily basis on land development or conservation. It was deliberately designed to include many viewpoints, even opposing viewpoints. It brought together professional architects, engineers, conservationists, local activists, property rights interests, local officials, natural resource managers, contractors, and the National Park Service. Each meeting was facilitated and open to public observation. The list of invitees has been provided to the press and is available for public review. Additional opportunities to participate were extended to members of the public at-large who felt their perspectives were not adequately represented.

Q: What is the yardstick for the recommendations?

The recommendations are guided by a four-goal vision for hillsides identified by the municipalities in the contract for this study:

- > Preserve significant vistas
- > Prevent severe environmental and aesthetic degradation
- > Maintain appealing community image for visitors and residents
- > Accommodate continued economic and residential growth

All four goals, including continued growth, are promoted by this set of recommendations.

Q: Will these recommendations apply to the whole county?

No. The Hillside Overlay District Approach, for example, would apply only when scenic resources of community-wide significance may be impacted by new development proposed above a certain elevation. The Critical Slope Floating Zoning Approach would

apply only on steep slopes, those in excess of 15%. There will be some areas where elements of both the HOD and CSFZ would apply. Shallow slopes, flat terrain (like the valley floors), and existing development would not be impacted by these recommendations.

Q: What happens after Saratoga Associates delivers these recommendations? Do they automatically become law?

No, the recommendations do not automatically become law. Saratoga Associates was hired only to facilitate a public participation process by which recommendations were developed. The recommendations in this Report should be considered a set of “Tools” from which each community can draw from to enhance their land use policies to better deal with hillside and ridgeline development. As one public participant declared, “...the report gives you the ABCs, and it is up to each community what book it wants to write.”

Q: Will a community have to adopt all of the recommendations at once?

No. Each community will need to decide if and how to move forward with the recommendations. The recommendations are designed to complement and build upon each other. Implementation guidance is provided in the Preferred Directions Report to assist communities.

Q: If these recommendations were adopted, how long would the adoption process take?

It depends on the adoption process in each community. At a minimum, as prescribed by law, the process could last as little as three months. This entails a careful review of the proposed ordinances necessary to implement the recommendations, public hearings, and official deliberations.

Q: I heard that the recommendations would prevent development over certain elevations. Is that true?

No. Above certain elevations, the goal is to use improved development standards, not to prevent development.

Q: I heard that the recommendations would prevent development on very steep slopes. Is that true?

Yes, but only on very, very steep slopes. Slopes over 60 percent are generally unsuitable for nearly all forms of development, and it is recommended that this be the upper limit on which very low-density development may occur. At this point, public health and safety concerns like fire, landslides, and erosion are paramount. Heightened development standards will be used for developments on slopes over 15 percent. Many communities nation-wide have chosen this as a starting point for regulation of hillside development.

Q: I'm troubled by what's happened to our hillsides here. What is really new and challenging with these recommendations to manage this?

Most recommended rules and standards in this report, if adopted, will be new. The exceptions are where the report recommends keeping certain existing standards for road grades and artificial slopes. What is new and challenging are the development of standards for the design of new construction and the lessening of visual impacts.

Q: What happens if these rules prevent any development from happening on my property?

Nothing different than what happens already. When a zoning rule deprives all economic use of the entire parcel, a locality would grant a variance. State law requires this. Instances where all economic value is lost rarely happen. If all economic value is lost and a variance is being considered, the variance must be the minimum necessary (not a waiving of all rules) to allow some economic use of the parcel. Planning officials from Park City, Utah, which adopted a very strict hillside protection ordinance, indicated that

such “relief from the rules” had been invoked only once in the last decade, in which case a variance was granted. The specifics vary by state.

This report recommends a third option that allows localities to enforce hillside standards and allows landowners to receive an economic return for their land. It is recommended that the communities of Sevier County study and possibly implement a “Transfer of Development Rights” (TDR) program. In the few, rare instances where a landowner was unable to use any portion of their land, they could sell the ‘right to develop’ their land to another individual whom would ‘transfer’ those rights to build more intensely elsewhere, like a downtown setting. If the land was too steep and the landowner was unable to use the underlying density, then that unused density could be sold, which will compensate the owner of very steep slopes. Such programs elsewhere in the nation have worked very well to compensate landowners.

Q: Will these recommendations apply to existing developments?

No. Most new land use rules are rarely applied retroactively. The policy of allowing previous existing uses to continue is called ‘Grandfathering’ and is often enshrined in state legislation or as court precedents. However, it is also common that if the landowner wishes to make major changes, like rehabilitating or constructing an addition to a home, then the new construction must follow the new rules. The specifics of grandfathering vary from location to location.

Q: I own a lot of land and I take good care of it. Good stewardship of the land is common sense. Why do we need more rules to tell people what to do?

In theory, government enacts land use rules because development on one piece of land can negatively impact the health, safety, and welfare of the public at-large. In order to manage these ‘we’ problems, public rules are enacted to publicize appropriate standards. Most people, most of the time, want to do what is right for the community as they go about their personal business. By the same token, if everyone always did the ‘right’ thing, rules would not be necessary. It takes only a few individuals who are unmindful of good stewardship to spoil the land and harm the public. Rules are necessary to guide those who are unaware of the public standards.

The more important question may be when an issue warrants new or updated regulations. The answers are rarely clear-cut. Each community must make its own decision, using its own criteria. This report was commissioned on the presumption that action should be considered, and that if the community wishes to exercise its legal power to regulate, then these recommendations propose a way forward that balances many of the concerns expressed during the public process.

Q: The recommendation for establishing scenic viewsheds seems very broad. If enacted, won't this cover most of the county and its cities?

No. The choice to nominate scenic sites is up to each community. The recommendations here do not nominate sites that will be used to create a viewshed. The recommendations list only the criteria for nominating such places. The criteria focus on the kinds of places that are likely to be enjoyed by many members of the public and areas that are officially designated as a protected or special place. It will be up to each community to nominate scenic sites or corridors that will then be used to map the viewsheds. Visual impacts from development on flat or gently rolling terrain typically fade after a distance of 5 miles. Distances increase for visual impacts from hillsides and ridges.

Q: Is it true that recommendations for streams are being recommended? Won't this impact existing development on the valley floor?

Stream buffers are being recommended, but they won't impact the valley floor. The buffers apply for new developments only on certain steep slopes. The intent of the recommendation is to reduce pollution of local waterways and drinking-water supplies from mud, toxins, and dangerous microbes (like e-coli from septic systems).

Q: Property rights and the 'greater good' seem at odds. How is it possible to balance these opposing viewpoints?

The right to develop property and the 'greater good' or 'public good' are not mutually exclusive. Many other communities have found lots of overlap between these two seemingly opposing viewpoints. Zoning regulations, ideally, should balance an individual's

right to enjoy their property while limiting the potential harm of that enjoyment to the public and neighboring properties. When zoning rules are well designed, they can enhance the quality and value of new development while improving the community. Time and again, appropriate regulations have been shown to raise property values. Everyone shares the benefits, including the landowner and their neighbors.

During the first public meeting, a citizen declared that without “honest and realistic dialogue,” opposing viewpoints would not find common ground. This prescription for good-faith participation is how balance is found among many viewpoints. Ideally, at the end of the day, everyone’s ‘fingerprints’ should be on the adopted regulation. This process made a genuine effort to include many diverse and opposing viewpoints, and the questions and recommendations found here is evidence for that. If the municipality chooses to begin official deliberations on whether or not to adopt the rules, local and state law provides the opportunity for additional public hearings and input.

Q: Where will the money come from for enforcement?

Enforcement is a vexing issue that faces every community. Each community here must decide how to fund the enforcement of these rules, if adopted. Recommendations on funding and the implementation of the rules are included in this report.

Q: Will the rules prevent all new hillside development from being visible?

No. While communities should strongly encourage applicants to screen as much of their development from significant public resources, the complete screening of new development is not the goal of these recommendations. The recommendations propose a standard for measuring how visible new development may be. This standard is called ‘Visually Subordinate.’ As noted in this report, visually subordinate means that new buildings and roads shall not be the defining feature of a hillside. Development should not be the most memorable feature of hillsides and mountains. Visually subordinate means that if someone tried, they could pick out individual buildings on a hillside. However, the buildings would not be the first things a person would see. There are many good examples of visually subordinate development in Sevier County and its municipalities. Likewise, there are many ‘visually prominent’ developments, that most public participants agreed were highly undesirable from a visual impact and public safety perspective.

Q: Won't new regulations have a chilling effect or stop all development?

No. As noted before, one yardstick for developing the recommendations is to ensure continued overall growth. Furthermore, it is important to examine if the recently adopted zoning rules have had a chilling effect on development in the communities of Sevier County. With respect to these recommendations, only on the most extreme steep slopes and on the most prominent ridgelines is it recommended to prohibit development. In these instances, there are recommendations to take the development that would otherwise be there and shift it to more appropriate areas of the parcel or to sell those development rights to another individual for use in more appropriate areas. In each case, the development community could easily see an improvement on their 'bottom line.' This is because they would be precluded from spending costly sums on infrastructure and utilities to access very steep slopes. Developers who chose to appropriately cluster units and conserve undeveloped land also stand to enjoy a tax windfall.

Section 1

Project Background

Section 1 Introduction and Project Background

1.1 PROJECT HISTORY

In early 2007, Sevier County and its municipalities commissioned a study to develop and examine a set of recommendations for the effective management of hillside development. As part of this effort, the client communities have retained Saratoga Associates to facilitate the recommendation process and to elicit public comments. The client communities consist of Sevier County and the Cities of Sevierville, Pigeon Forge, Gatlinburg, and Pittman Center. The development of recommendations is guided by a four-goal vision for hillsides identified in the contract for this study:

1. Preserve significant vistas;
2. Prevent severe environmental and aesthetic degradation;
3. Maintain appealing community image for visitors and residents; and
4. Accommodate continued economic and residential growth.

All four goals, including continued growth, are supported by the recommendations of this Report.

From March to May, Saratoga Associates conducted case studies of several communities that have chosen to regulate hillsides and ridges. The case studies strive to trace the development of their ordinance from its genesis to its adoption and enforcement. Their stories provide guidance for the challenges that Sevier County faces. (Refer to the Sevier County Public Library website for a copy of the Case Study Report)

During the same time, Saratoga Associates performed an analysis of local land use regulations. This was necessary to understand how local land use rules are shaping hillside development patterns, where weaknesses can be improved, and where strengths can be better known and leveraged. In summary, it was found that local regulations do not provide a framework designed to shape hillside development in a way that protects the region's scenic resources or adequately promotes certain public safety concerns. Some sections of local code provided limited guidance, but when considered collectively a comprehensive approach to hillside safety and aesthetics was missing. (Refer to the Sevier County Public Library website for a copy of the Local Land Use Regulation Analysis Report)

In June, Saratoga Associates conducted field visits and held two informational/workshop meetings. Meetings were held with a broad range of stakeholders and the public at-large, each well attended. All participant meetings were open to the public. The case studies and findings from the local zoning analysis were presented and the meeting was opened to comments from the public. In each meeting, participants expressed strongly a desire to see enhanced safety and aesthetic standards for hillside and ridgeline development.

In order to devise a workable focus group, the client communities compiled a list of approximately 50 potential participants. The intent of the stakeholder meeting was to gather concerns from professionals and individuals involved on a daily basis in land development or conservation. It was deliberately designed to include many viewpoints, even opposing viewpoints. It brought together professional architects, engineers, conservationists, local activist, property rights interests, local officials, natural resource managers, contractors, and the National Park Service. Each meeting was open to public observation, and the list of participants has been provided to the press and available for public review on the Sevier County Public Library Website.

The public meeting was designed as a parallel process to gather comments from the public at-large. Here, the offer was extended to include additional participants in the stakeholder meeting who felt their views were not adequately represented there.

In addition to these public forums, a ‘working committee’ was developed which consists of planning officials from each client community. This group has provided ongoing guidance regarding existing municipal rules and procedures. They have also reviewed the range of public comments made and feel that this public format provides a practical way to address specific concerns and to develop effective recommendations.

By July, all public comments from June meetings were compiled and used as a framework for an “Emerging Concepts Report.” The report outlines a preliminary set of recommendations for the enhancement of standards for hillside and ridgeline development. The report was designed to share with members of the public the concerns expressed at all meetings. At that stage, recommendations were preliminary and designed to advance the discussion on specific methods for enhancing hillside development standards.

By mid-July, the Emerging Concepts Report was presented in back-to-back stakeholder and public meetings by Saratoga Associates. Opportunities for open public comment were given. Again, many participants asked questions about the process and the document. At this point, comments shifted to what practical effect the recommendations might have on a range of

concerns. The questions have been collected and are presented as an “FAQ” section at the beginning of this report.

Comments from these meetings were used to refine both the direction and the substance of the recommendations. This Report represents a more refined approach to addressing the critical development problems facing the region.

Additional feedback on this Report is requested from the public in order to develop a complete set of recommendations for the County and each community. At that point, it will be the discretion of each client community if they wish to consider adopting the recommendations ‘as is’ or in an amended form. It is important to be aware that State and local law requires official consideration of new land use regulations be subject to additional public hearing and a public comment period.

1.2 CONDITIONS AND RISKS INHERENT TO STEEP SLOPES

Development on steep slopes presents benefits and poses risks. This summary discusses conditions and risks inherent to steep slope and concerning hillside development. The summary is based on both a professional assessment and on public comments gathered from the stakeholders meeting and the public meetings.

Fire

Risks from fire are worsened on steep slopes. As wildfires spread across a hillside they advance by up to twice the speed they otherwise would on flat terrain. Limited emergency access points, the potential for catastrophic building failure, and an extensive source of fuel, the forests worsen such risks. The risks for wildfires are increased as the urban interface moves deeper into forested terrain.

Landslides

Landslides and slope failure are an ever-present threat on hillside. Depending on the conditions of the slide, they may be termed debris flows, mudslides, landslides, rock falls, slumping, and mass wasting. These geologic phenomena are a natural part of erosion and are not limited to catastrophic slides. Soil creep and slumping occur in time spans of years, but pose similar risks to buildings and public safety. The Appalachian Mountains are dotted with evidence of historic and ongoing landslide activity. The evidence for this is often concealed by vegetation and soil, given the intervals of decades and centuries between natural slope failures.

Slides are often triggered by excessive rainfall events. Hurricanes Francis and Ivan in 2004, dropped significant amounts of rain, resulting in numerous landslides. The most devastating was

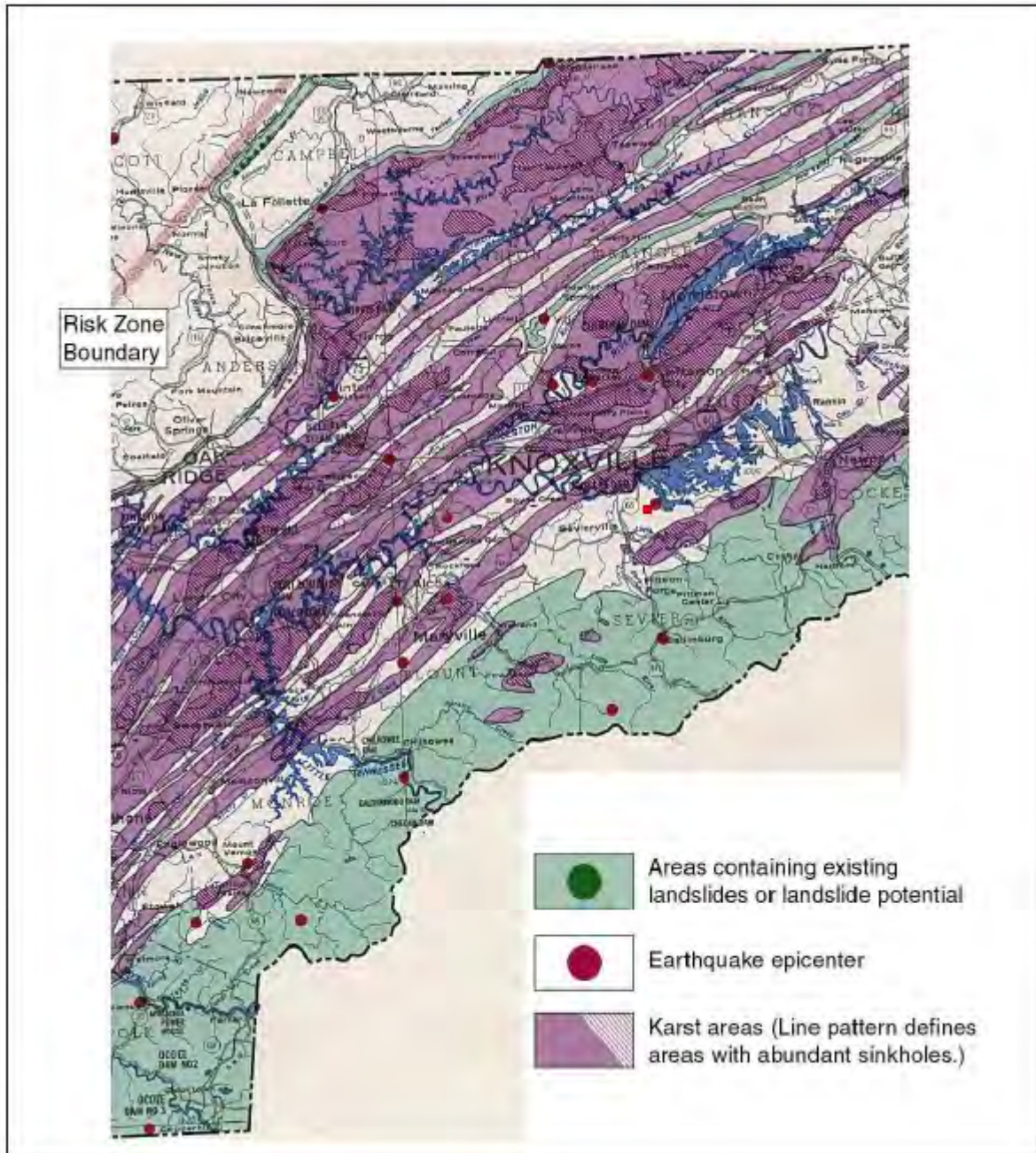
the Peeks Creek Debris Flow, killing 5 people, injuring 2, and destroying 15 homes. State geologists have examined many slope failures in eastern Tennessee. In almost all cases, they identified human induced disturbances such as roads and hillside cuts that destabilized otherwise stable conditions. In mountain location in western North Carolina and eastern Tennessee, hillsides are prone to natural failure where slopes exceed 30 degrees.



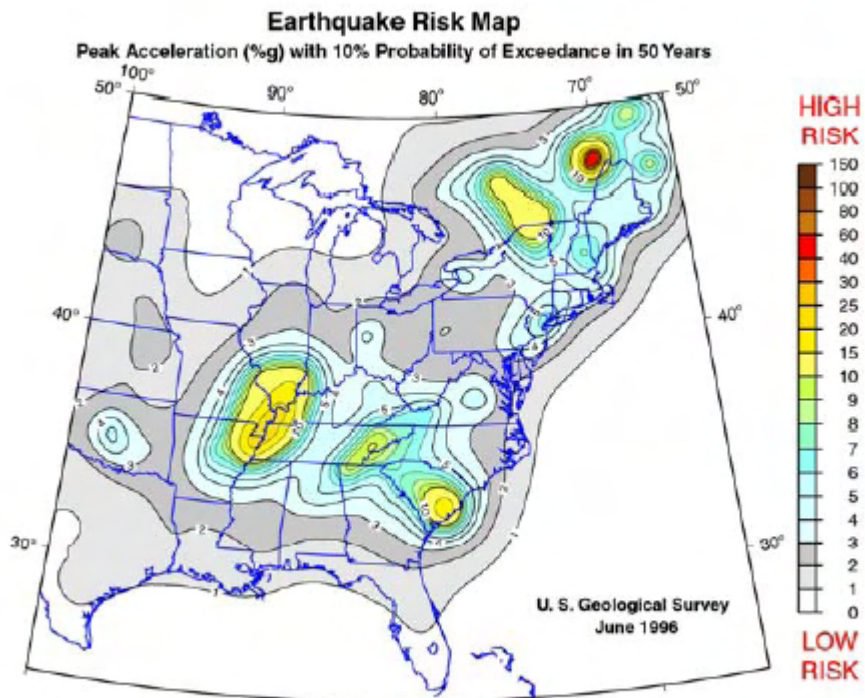
The image on the left indicates evidence for soil creep: As the slope ‘rolls’ downward over many years, the tree growing within the slope corrects its upward growth by curving in the opposite direction. The middle image is of the 1997 Pigeon Creek Landslide along Interstate 40 in North Carolina. This catastrophic slide cost in excess of 10 million dollars to clean up. For scale, notice the two construction trucks in the center of the middle image. The image on the right is of a Sevier County landslide that destroyed the rear of the house in 2001. The area was not designated a landslide prone area and occurred on a comparatively shallow slope of 25 degrees (most landslides occur on slopes in excess of 30 degrees). The slide was induced by increased stormwater runoff from an upslope road after a week long rain event.

Earthquakes

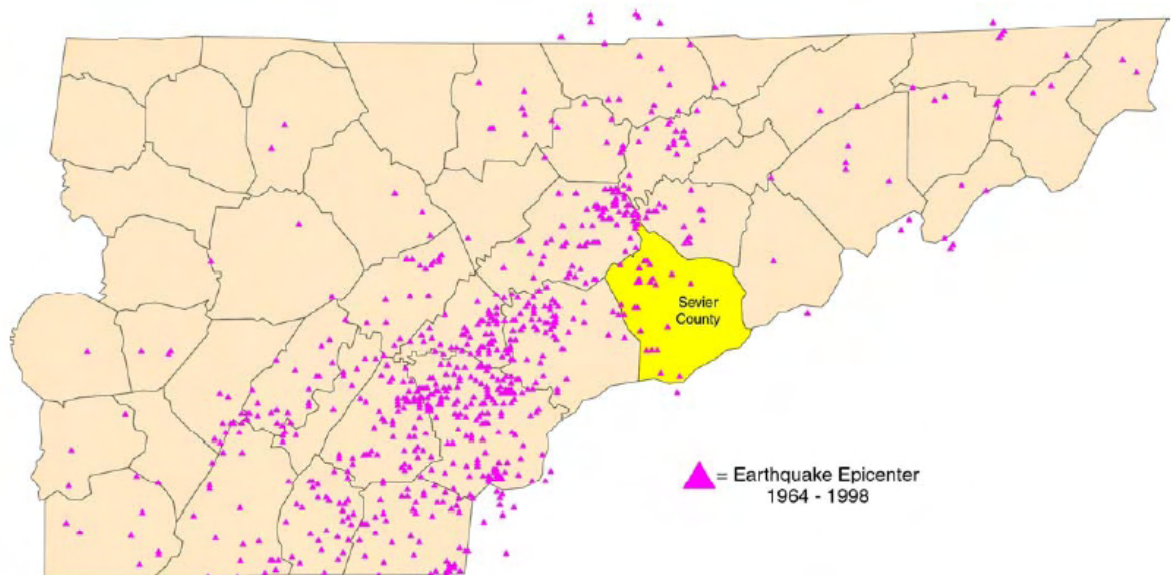
Earthquakes in eastern Tennessee are rare events. Nonetheless, the region lies within a zone of elevated risk within the Eastern United States. Recorded earthquakes ranged in strength from light to moderate. Approximately two-dozen earthquakes have been recorded in Sevier County between 1964 and 1998. Numerous others have been recorded in neighboring counties. Low intensity earthquakes in the area are a cause for concern based on the potential to destabilize marginally stable slopes and the possibility of slope and building failure.



This map figure is an excerpt from the Geologic Hazards Map of Tennessee (1977). The map indicates large portions of Sevier County are naturally prone to landslides. The red square northeast of Sevierville identifies the location of the 2001 landslide pictured on the previous page. The location is outside of areas designated as prone to landslides, highlighting the necessity for a site-by-site assessment of proposed projects. .



The largest event in east Tennessee is the 1973, 4.6 magnitude earthquake in the Alcou-Maryville area.



East Tennessee Seismic Zone

Soils and Bedrock

Steep slopes are typically covered by shallow or thin soils. Because of this, cuts in bedrock are typically necessary for safe building foundations and the placement of utilities. These disturbances to bedrock can alter the near surface hydrology and potentially destabilize naturally stable slopes. Furthermore, such soils tend to be sandy and otherwise well-draining. This means that stormwater runoff, septage, and other non-point source pollutants travel further with fewer opportunities for attenuation, like thicker soil horizons, longer residence times, and more vegetation. The near surface flow of water contributes water to area streams and waterways, in a natural process known as stream baseflow.

Certain geologic rock formations within Sevier County are naturally acidifying. While covered with soil or overlying rock, the acidifying layer poses no danger. However, when exposed to the atmosphere, the interaction of the rocks with water creates a low pH (acidic) water solution. This water solution interacts with the native soils and rocks to dissolve heavy metals contained in them. This process is known as ‘acid rock drainage.’ It is the dissolution of heavy metals and their transport off site that pollutes drinking water supplies and harms local ecology. Because these are sites of extreme chemical conditions, they are not favorable for the re-growth of native vegetation and are likely to remain exposed for decades.

Visibility and Natural Aesthetics

Hillsides are by their nature highly visible. Steep slopes exaggerate building features and ensure their visibility from farther distances. Ground disturbances, road cuts, and tree cutting that accompany building construction are also highly visible. The natural aesthetics of hillsides are formed by the natural patterns of continuous vegetation, rocky outcrops, and the contours of ravines and ridgelines. Development designed with sensitivity to the landscape can help ensure that the desired natural look of hillsides and ridges are preserved. Techniques and materials to lessen visual impacts are readily available to the design and building trades.

Erosion

Rates of erosion are higher on steep slopes. Reasons for this are the slope itself, which accelerates water flow, and thin unconsolidated soils, which are erosion prone. Natural vegetation, over time, tends to stabilize the underlying soils and helps to retain water by slowing its downhill flow. Such processes are important for reducing the introduction of sediment into waterways and slowing the flow of water. Construction grading removes naturally stabilizing vegetation and exposes loose soil to the elements. Runoff from construction sites and from impervious surfaces can erode and destabilize artificial slopes.

Watersheds and sub-watershed in the eastern United States where impervious surfaces constitute more than 10 percent of the area exhibit severe stream erosion and are prone to increased incidents of flooding.

Water

Groundwater resources on hillsides provide clean drinking water for the public and sustain healthy stream habitats. Groundwater resources of concern include aquifers and near surface water sources, such as seeps and stream baseflow. Hillside bedrock contains numerous cracks and fractures that allow water to move quickly into localized aquifers, much quicker than rates found in thick soil profiles or through flat terrain. This means that effluent from septic fields and the downward percolation of polluted stormwater runoff can contaminate drinking water supplies with toxins and pathogens. Techniques involving buffers and advanced septic management can easily mitigate such impacts.

Stormwater runoff, as with erosion, can adversely impact water supplies and stream habitats. Runoff from extensive areas of impervious surfaces is detrimental to stream habitats. Fish and stream invertebrates are particularly sensitive to changes caused by stormwater runoff. Increased volumes of stormwater runoff and the transport of pollutants is not the only concern. Stream ecologists found that the temperature fluctuations caused by the runoff, both colder and hotter, are as detrimental to ecological health as the pollutants.

Section 2 Recommendations

Section 2 Recommendations

2.1 FIVE GUIDING PRINCIPLES

- > *No Project shall result in an undue adverse impact on the region's significant and unique natural and scenic resources.*

The purpose of this principle is to promote more thought and care in the design and construction of hillside development. It is evident that many of the negative impacts from development are needless and can be avoided. This is based on field visits by Saratoga Associates and on the overwhelming number of such comments from the stakeholder group and the public. The goal is not to prevent all impacts from development- impacts are unavoidable. The key word is 'undue,' meaning unwarranted, unjustified, inappropriate, or excessive by reason of the conditions inherent to steep slopes. During the design and review of the project, the goal is to ensure that the applicant, the Planning Commission, and the public at large have taken a 'hard look' at likely negative impacts and their causes. Only after such an examination is it feasible to identify the best response and mitigation techniques.

- > *Any approved project shall mitigate adverse impacts to the maximum extent practicable.*

This principle builds on the preceding one, by helping to establish what impacts are 'undue,' meaning unwarranted, unjustified, inappropriate, or excessive. The standard, rather than prescribe specific practices, prescribes a way to assess the applicant's response to the project's impacts. It seeks to minimize the risk of being wrong with respect to mitigating adverse impacts. The key word is 'practicable' (*not practical*), meaning what is able to be practiced. If the applicant has failed to make a good-faith effort to explore and apply all appropriate and reasonable techniques to mitigate adverse impacts, then the applicant has not mitigated adverse impacts to the maximum extent practicable. Furthermore, this standard does not suppose that all adverse impacts will be avoided. However, it presumes that if adverse impacts cannot be avoided, they can be significantly minimized.

- > *"Visually subordinate" shall be the standard for assessing visual impacts of proposed development within scenic regions.*

By luck of geology and climate, the communities of Sevier County are blessed with astounding natural beauty and a profound sense of place. It speaks for itself that this natural beauty is the basis for a thriving local tourism economy that is second to none in the State of Tennessee. Human development within this natural landscape can either complement or harm this beauty, and by extension the local economy. The standard of 'visually subordinate' is designed to encourage development that complements the natural landscape. There are techniques and tools

easily available that make the standard practical and recommended. Conserving the natural landscape will ensure the continued authenticity of local tourism economy for this and future generations of Sevier County citizens.

> *Density shall decrease as slopes increase.*

Conditions inherent to steep slopes make intensive uses on them dangerous and unsightly. Hillsides possess scenic views, fresh air, and the feeling of ‘getting away.’ They also possess unstable slopes, rapid rates of runoff, natural hazards, and public health and safety concerns. Excessive density on steep hillsides not only exacerbates the hillside’s negative qualities, it even detracts from its desirable qualities. The intent of this principle is to require densities that balance the enjoyment of the community’s hillsides with the promotion of development in harmony with steep slopes.

> *Project approval shall take into consideration both positive and negative impacts.*

The promotion of sensible hillside development is the objective of this report. This recognizes that there are legitimate public and private benefits to hillside development. These include the promotion of the local economy and the diversification of housing. These positive impacts shall be considered to the degree that adverse impacts can be avoided.

2.2 ESTABLISH SCENIC AND LANDSCAPE RESOURCES OF SIGNIFICANCE

Sevier County and municipalities all possess significant aesthetic, scenic, geologic and ecologic resources all closely tied to the unique character of the Great Smoky Mountains region. Inappropriate development on certain hillsides and ridgelines can have the potential to result in adverse impacts on these aesthetic, scenic, geological and ecological resources.

To begin protecting these important resources, one must first identify specific publicly accessible places from which the views of these hillside and ridges are enjoyed. Such places normally include scenic highways, walking trails, scenic lookouts, parks, historic sites and buildings, and canoe and kayak routes.

It is recommended that Sevier County and its municipalities identify the following scenic and landscape resources of significance (SLRS) for protection and adopt them as part of an ordinance to protect the scenic and aesthetic resources of the region:

> Public recreation areas including parks, hiking trails, community greenways and scenic navigable waterbodies;

- > Designated segments of State and local ‘Scenic’ highways, byways, Parkways or other travel corridors identified that provide views of scenic landscapes;
- > Buildings and sites listed on the National Register of Historic Places
- > Specific views of the Great Smoky Mountains National Park from any of the above locations; and
- > Specific views from designated points within the Great Smoky Mountains National Park.

The next step in this process includes identification by each community and the County of areas that are available for development and likely visible from the SLRS discussed above. A common approach includes identifying a specific elevation above which development should be regulated. This establishes a know boundary for heightened review that is easily understood by landowners and reviewing agencies.

To tie these two factors together (SLRS and developable areas above a certain elevation) development review measures should be instituted for proposed development that is located above the identified elevation and potentially visible from a SLRS. Together, these recommendations could be organized into a *Hillside Overlay District* (HOD). These measures are discussed below.

2.3 ESTABLISH STANDARDS OF DESIGN AND CONSTRUCTION FOR MITIGATING ADVERSE IMPACTS TO SLRS – ACHIEVING VISUALLY SUBORDINATE DEVELOPMENT

Limitations on Vegetation Removal

The quickest and easiest method for limiting the visual impact of development is to restrict the amount of vegetation that is allowed to be removed from a development site. It is recommended that the vegetation removal and thinning to facilitate preliminary site planning and surveying be kept to a minimum, and be restricted to:

- > One unimproved access path no wider than eight (8) feet per lot;
- > Parcel boundaries for surveying needs, and
- > Selective patches for soil testing or other ground investigations.

These selective patches of clearing should have a minimum separation distance of one hundred (100) feet. In addition, no vegetation four or more inches diameter at breast height (DBH) and/or any vegetation forty or more feet in height should be removed from the site prior to approval by the Planning Commission. All clearing undertaken prior to application submission should be depicted on the required application materials.

While it is important to limit vegetative cutting, allowance must be made to allow the removal of diseased vegetation or of rotten or damaged trees or other vegetation that presents safety or health hazards.

Site Clearing for Construction

Roadways and Utilities. In the development of roads and/or clearing of utility easements, removal of trees should be the minimum extent necessary. The proposed and approved limits of clearing proposed for roadway and utility limits should be clearly marked in the field.

Perimeter Buffer Area. In subdivisions and in the development of building lots, a minimum buffer area of thirty feet wide between the building envelope and property lines should remain undisturbed except for driveways and utility lines. The specific intent of this requirement is that there should be no continuous strip clearing along contiguous lots.

Building Envelope. To allow for the construction of buildings, a specified building area should be identified in the application materials and clearly flagged in the field. The following clearing allowances for different buildings types are recommended:

- > Principal Building: Limited to a distance of forty feet beyond the proposed foundation/footprint.

- > Detached Accessory Building: Twenty feet of clearing beyond the foundation/footprint.

- > Structures having a footprint of one-hundred square feet or less: Five feet of clearing beyond the foundation/footprint.

It is recommended that all vegetation beyond the allowed clearing area be protected from encroachment by tree fences.

Typical Tree Fence



Additional Clearing for Construction and Views

At times, additional clearing may be necessary to allow for construction of structures. For these instances, a TN Licensed Civil Engineer, Landscape Architect, or Architect must make a determination that the above-recommended vegetative clearing allowances are insufficient to allow for safe construction of a proposed structure.

In addition, a landowner that would like to remove additional vegetation to increase their view of the surrounding landscape may also do so under specific guidance and only after the proposed structure from which the view is desired has been constructed.

Limited additional clearing for construction and views may be allowed providing that any additional clearing is in compliance with the four requirements set forth below under “Additional Clearing.”

> Recommended Additional Clearing Allowances and Procedures

- When construction is completed and additional clearing of vegetation is desired, or if additional vegetation clearing is necessary to allow for safe construction as demonstrated by a TN Licensed Civil Engineer, Landscape Architect, or Architect, a tree-by-tree inventory shall be prepared by a TN Licensed Forester or TN Licensed Landscape Architect showing the location, type, and DBH of every tree four or more inches DBH lying outside the permitted building envelope described above, and within the boundary in which clearing or trimming is proposed.

- All vegetation proposed and approved for removal should be clearly marked in the field for verification purposes. All vegetation to remain protected should also be clearly marked in the field. Said inventory should be made part of any submission for final project approval. Such a plan should assure that:
- A moderate forest density remains in place sufficient enough to ensure that any new proposed structure be Visually Subordinate with a minimum of 75% screening as viewed from a SLRS.
- No tree root areas should be filled above the natural grade.
- Trimming is conducted in a manner (a) sufficient only to allow a filtered view from the property towards any SLRS, (b) that will not result in a view of more than 25% of the proposed structure as viewed from a SLRS, and (c) that assures continued health of each tree left standing.
- Clearing should in no case create a cleared area of ¼ acre or more in size on any one lot/site as viewed from a SLRS.

Mitigation Measures – What if more than 25% of a proposed structure or more than ¼ acre of cleared area is visible from a SLRS?

When additional clearing of vegetation is desired for a view, or if additional clearing is necessary to allow for safe construction as demonstrated by a TN Licensed Civil Engineer, Landscape Architect, or Architect, the result of which will be a cleared area over ¼ of an acre or the visibility of a proposed structure more than 25% and is visually insubordinate as viewed from a SLRS, the Applicant should be required to utilize any combination of the following mitigation measures as deemed necessary by the Planning Commission to mitigate the adverse visual impact(s) on the SLRS to the maximum extent practicable.

Mitigation may reduce or eliminate the visibility of the project or alter the project's effect on the scenic or aesthetic resource in some way. The Planning Commission should encourage applicants to design aesthetically compatible projects that incorporate environmentally friendly design principles and components, as may be employed from the mitigation menu below.

- > Professional Design and Siting. A properly sited and designed project is the best way to mitigate potential impacts. Under optimum circumstances a project can be sited in a location, which precludes the possibility of having an aesthetic resource within its viewshed. Also,

through sensitive design treatment, elements of particular concern may be sited or dimensioned in a way that reduces or eliminates impacts on significant resources. Sometimes circumstances prevent the realization of optimal siting and sometimes engineering, economic or other constraints preclude optimum dimensioning or other appropriate design treatments. Under those circumstances, other mitigation strategies should be considered.

- > Screening. Screens are objects that conceal other objects from view. They may be constructed of soil, rocks, bricks, or almost anything opaque. Vegetation can, despite its visual porosity, function as a screen when a sufficient mass is employed. Screens may be natural, e.g. vegetation, or artificial, e.g. fences and walls. If used, screens shall appear natural e.g. wood, stone.

Screens constructed from soil are called berms. When used, berms shall appear natural e.g. blend with nearby topography, and *not* appear artificial e.g. geometrical or symmetrical shape. Properly sized and placed screens may completely conceal an object, while improperly sized and placed screens may fail to conceal. Screens may block desirable views when improperly placed. Screens are not necessarily buffers and buffers are not necessarily screens. A buffer may attenuate noise, soften a landscape or provide other functions that may or may not include screening.

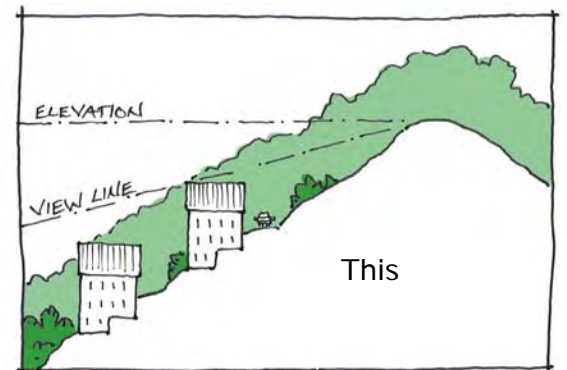
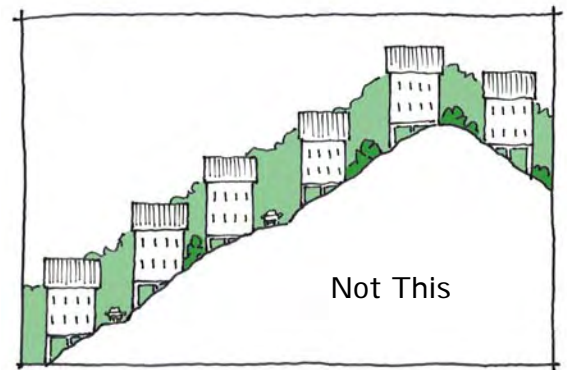
Screens possess line, form, texture, planes and color, and therefore, have their own aesthetic qualities. At times, they may be more impacting than the object to be concealed. Screens may draw attention to the object to be concealed. Screens may physically connect two similar or dissimilar areas.

- > Relocation. A facility component may be relocated to another place within the site to take advantage of the mitigating effects of topography and vegetation.
- > Camouflage/Disguise. Colors and patterns of color may conceal an object or its identity. Disguise may take many forms, and is limited only by the imagination of the project designers. As an example, communication towers can be disguised as trees, flagpoles, barn silos, church steeples, or any other “in-character” structure depending upon circumstances.
- > Low Profile. Reducing the height of an object reduces its viewshed area.
- > Downsizing. Reducing the number, area or density of objects may reduce impacts.

- > Non-Specular Materials. Using building materials that do not shine may reduce visual impacts.
- > Lighting. With respect to regional issues, such as a tall combustion exhaust stack or radio tower, the Federal Aviation Administration (FAA) requires certain lighting for public transportation safety. These impacts may be considered unavoidable unless lower profiles can be achieved. Applicants should also document that they have consulted with and met all applicable lighting standards under local jurisdiction. Consideration should be given to off-site light migration, glare and “sky glow” light pollution. Lighting requirements, through best engineering practices, should not exceed the functional requirements of the project.
- > Maintenance. How a landscape and structures in the landscape are maintained has aesthetic implications. “Eyesores” result from neglect. This should be part of any mitigation strategy.
- > Decommissioning. Removing an object from the landscape after its useful life is over, reduces the duration of a visual impact.

- > Decommissioning may take many forms. However, from the perspective of aesthetics, three are of most significance: 1) the total removal from the site of all Project components and restoration to an acceptable condition, usually with attendant revegetation; 2) partial removal of Project components, such as elimination of visually impacting structures; and 3) conditions designed to maintain an abandoned facility/development and site in an acceptable condition that precludes “eyesores” or site and structural deterioration. Applicants should provide such plans when deemed necessary.

Building Into Hillside

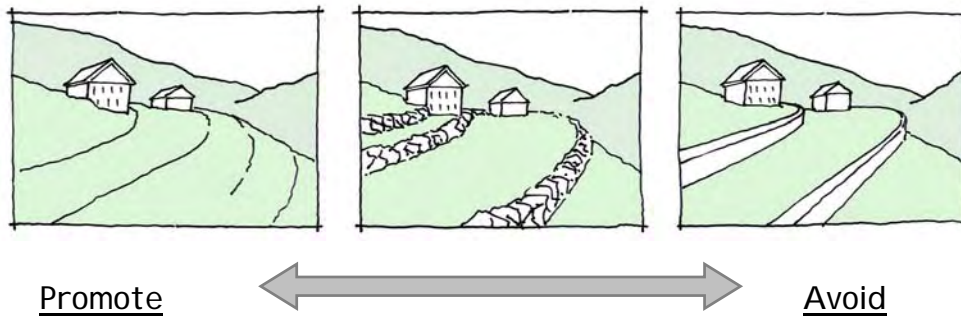


Additional Design and Mitigation Measures

It is recommended that in addition to drawing from the above mitigation menu, applicants proposing development that may be visible from a SLRS should be required to incorporate the following:

- > **Setdowns from Ridgelines.** Units should not project above significant ridgelines. No units should be built on ridges. Forest canopy of ridgeline should be thick, natural, and unbroken.
- > **Set into hillside.** Buildings should be stepped into the side of the hill and not pushed up, out, away from the hillsides as is prevalent in the region. Buildings should also not be perched on highpoints, outcroppings or prominent knolls. Split development pads, ‘stair-stepping’ should be encouraged, and structures should be oriented along and not across the topography.
- > **Retaining walls.** Retaining walls should be designed and constructed parallel to pre-disturbance slopes.

Retaining Walls



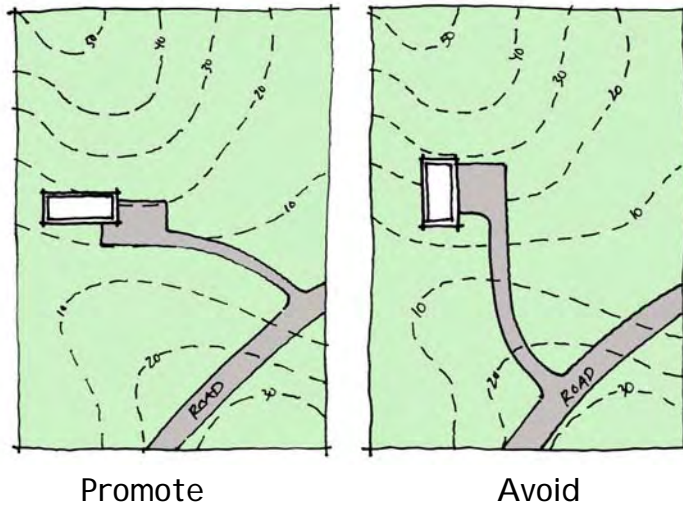
The image on the left illustrates an ideal landforming design for hillside grading. The image on the right illustrates how inappropriate grading practices can exaggerate visual impacts.

- > **Cut & Fill.** Contour landscaping should be required to the greatest extent practical. Contour grading results in rounded edges and slopes, both vertically and laterally, and allows for the gradual blending of artificial and natural surfaces which may help to reduce the visual impacts of hillside grading.
- > **Setbacks.** The yard setbacks from the property line should be no less than 1.5 times the height of the proposed structure or the setback requirement of the existing zoning regulations whichever are greater.
- > **Signage.** No signage should be permitted which will be visible above the existing tree canopy.
- > **Roads and Driveways.** Roadways and driveways should be constructed following the natural topography and not across. The footprint of roads should be limited to the maximum extent practical.

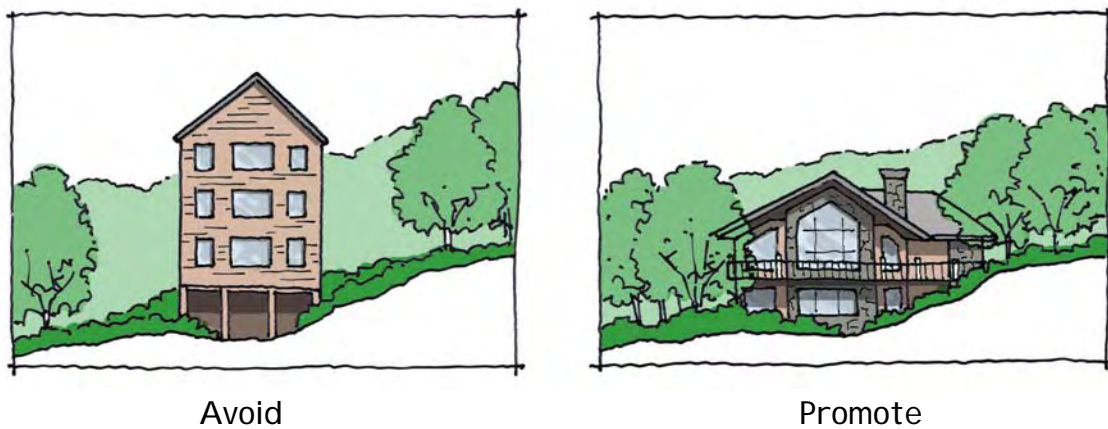
Materials/Orientation.

- > *Lighting.* Requiring shielded, downcast (45 degrees) lighting only in functional areas should be considered. Floodlights should be motion activated. No lighting should be permitted above the eaves or parapets, no landscape lighting or continuous lighting over 75 watts should be permitted, while subdivision street lighting should be concentrated at intersections.

Driveways

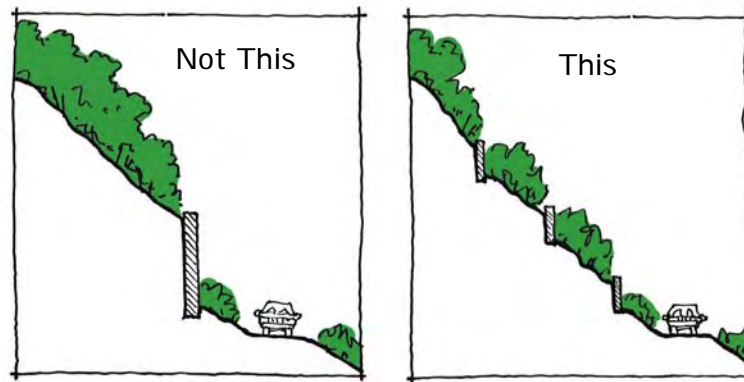


Building Materials, Design and Orientation



- > *Color.* On building faces visible from SLRS – exterior (roofing, siding, fascia, window treatments) building materials with muted, dark earth tones are strongly encouraged and white should be avoided.
- > *Building and Retaining Walls.* To reduce the visual scale of buildings and retaining walls, uniform and blank massing or surfaces should be avoided.
- > *Terrace retaining walls/constructed slopes.* Retaining walls should be finished using materials of a color and texture that are similar to local natural conditions. Shorter walls

should be staggered/terraced to the maximum extent practical in place of one larger wall to allow for the planting of vegetation that will provide screening of the slope cuts.



- > *Reflectivity – Windows.* Non-mirrored, tinted, and low-reflectivity glass should be used where practical for all windows visible from a SLRS. Avoid uninterrupted expanses of windows, use overhangs, eaves, porches and patios to shade windows. Reflective material for roofing, fascia, and soffits should also be avoided.
- > *Walls/Rooflines.* Continuous rooflines over 40 feet in length should be avoided, and the use of smaller roof components that imitate the natural slope of the terrain should be encouraged. In addition, major rooflines should parallel the topography of the hillside.
- > *Building Height.*
 - If a lot does not contain a sufficient number of trees greater than four inches DBH within fifty feet of the proposed building and any accessory building or element, that are not capable of screening 75% of the proposed structure from a SLRS after clearing the maximum vegetation allowed during construction as outlined above, the height of the proposed structure and any accessory element should not extend more than twenty-five (25) feet above ground level.
 - If the property does contain a sufficient number of trees greater than four (4) inches DBH within fifty (50) feet of the proposed building and any accessory building or element which is capable of screening 75% of the proposed structure from a SLRS after clearing the maximum vegetation allowed during construction as outlined above, the height of the proposed building(s) and any accessory element shall not exceed thirty (30) feet above ground level, whichever is more restrictive.

- At no time shall any proposed structure or any appurtenances affixed thereto exceed the ridgeline, and as a result have no vegetation as a backdrop as seen from a SLRS.
- The height of any structure or accessory elements attached thereto shall be measured from the lowest natural or manmade grade (whichever is lowest) to the top of the structure or the top of the uppermost fixture or appurtenance affixed thereto, whichever is highest.

Vegetative Screening Procedures

- > Mitigation. When the existing vegetation does not allow the screening of the proposed structures from any SLRS. A mix of vegetation matching both in species and density, indigenous to the area and within good soil shall be planted such that, within two years, they can reasonably be expected to screen all new proposed buildings from SLRS. All planted vegetation shall be no smaller than four (4) inches DBH and no less than ten (10) feet in height at the time of planting. All vegetation shall be planted in a manner representative of surrounding conditions and shall not have the appearance of a suburban style hedgerow.
- > Mitigation when the proposed structure cannot be fully screened from any SLRS by the planting of additional vegetation. When the use of additional vegetation will not create a 75% screen of proposed structures, the applicant shall be required to utilize each of the following mitigation strategies shall be incorporated to the maximum extent practicable: design and siting, screening, relocation, camouflage, low profile, downsizing, alternate technologies, non-specular materials, lighting, and maintenance/decommissioning.
- > The use of earth berms not in character with the immediate natural surroundings to screen a structure shall be prohibited.

2.4 ESTABLISH ENVIRONMENTAL AND PUBLIC RESOURCES OF CONCERN

It is recommended that the Communities of Sevier County identify and establish Environmental and Public Resources of Concern. The purpose of establishing resources of concern is to identify priority resources that are a matter of promoting the public health, safety, and welfare of current and future generations. These resources include environmental features inherent to steep slopes, public services, and policy priorities that may be significantly and negatively impacted by improper hillsides design.

It is envisioned that the implementation of this recommendation will be through the official adoption of a local ordinance or resolution. Such action will be consistent with the adoption of a Critical Slope Floating Zone, as proposed in this report. This recommendation is designed to provide the Planning Commission and the public with a checklist of issues common to hillside development. It is also necessary from the perspective of ‘due process’ to alert all potential applicants to public interest concerns they will be asked to consider during the review of hillside development. By establishing this in a local ordinance, this will provide an objective basis for identifying potential adverse impacts from hillside development.

In implementing this recommendation, the applicant and the Planning Commission will have the tools and parameters to establish a productive dialogue to ensure that risks are minimized and the quality project minimizes harm to the public interest. In keeping with the first guiding principle of no undue adverse impact, the Planning Commission or its technical staff will be expected to examine the resources of concern in light of the project application in hand.

The objective of this recommendation is not to enumerate a ‘laundry list’ of highly specific, potentially localized issues. In fact, such issues can only be known once a site assessment has been conducted and the project design is prepared. Furthermore, in the interest of fairness and predictability, the resources of concern cannot be so general as to be useless. Rather, the resources of concern should be concise enough to provide the applicant with reasonable guidance during the design phase of the project, such that they may reasonably anticipate appropriate mitigation or avoidance techniques.

The following is a preliminary list of Environmental and Public Resources of Concern:

1. Surface Soils and Geology
 - a. Thin or shallow soils prone to erosion
 - b. Bedrock prone to slope failure
 - c. Acid rock drainage
 - d. Ridgelines
 - e. Ravines
 - f. Rock Outcrops
 - g. Long term management plan of undeveloped areas of site
2. Water Resources
 - a. Contributions to creeks and streams, both surface and near surface hydrology (seeps and baseflow)
 - b. Management of stormwater quality and quantity
 - c. Management of stormwater impacts on slope stability and erosion

- d. Surface and ground water pollutants, including sediment, litter, heavy metals, salts, phosphates, nitrates, and pathogens
- 3. Air Resources
- 4. Terrestrial and Aquatic Ecology
 - a. Sensitive and endangered species endemic to the region
 - b. Maintain quality of permanent and intermittent streams
 - c. Preservation of native vegetation for its aesthetic and slope stabilizing qualities
 - d. Long term management and deeded protection of undeveloped portions of site
- 5. Transportation and Access
 - a. Access by emergency service providers
 - b. Alternative emergency means of access
 - c. Safe access
 - d. Lines of sight
 - e. Switchbacks
 - f. Congestion
- 6. Land Use, Zoning, and the Master Plan
 - a. In harmony with existing, surrounding uses
 - b. Consistent with provisions of zoning intent and purpose
 - c. Consistent with the policies of the Master Plan
 - d. Creation of lots of sufficient size and location to promote the recommendations established here
- 7. Water Supply
 - a. Well water, sources and potential impacts to offsite watersupplies
 - b. Surface water, creeks
 - c. Stormwater drainage
 - d. Free from pollutants and pathogens
- 8. Sewage Treatment
 - a. Pick up and Disposal
 - b. Effluent discharge downslope
 - c. Long term plan for operations and maintenance
 - d. Sufficient area for treatment and attenuation of pollutants
- 9. Utilities
 - a. Water pressure
 - b. Installed on stable slopes
 - c. Available during emergencies such as wildfire
- 10. Solid Waste Disposal
 - a. Cleanliness
 - b. Attraction of wildlife

- c. Odors
- d. Long term operations and maintenance

11. Community Services

- a. Access by emergency service providers
- b. Police, fire, and first responders

2.5 STANDARDS OF DESIGN AND CONSTRUCTION FOR SITES IMPACTING RESOURCES OF CONCERN

The following standards of design and construction are recommended for proposed areas of disturbance on slopes with grades 15 percent or greater. It is recommended that the following standards be implemented through adoption of a local ordinance or resolution. Such action is consistent with the recommendation of adopting a Critical Slope Floating Zone.

Artificial Slopes

Artificial slopes refer to both retaining walls and ‘cut and fill’ slopes. Generally, retaining walls are characterized by vertical or sub-vertical walls. Cut and fill slopes are created by cutting into the hillside (cut slopes), and gathering the cut rock and soil to form nearby embankments (fill slopes). When designed well, these can provide flat and stable terrain on steep slopes. Cut and fill slopes, consistent with existing local practices, are not to exceed slopes of 2:1.

Cut and fill slopes require significant disturbances to steep slopes, removing all vegetation and creating large disturbances on the hillside. In order to avoid unnecessary disturbances and visual impacts, any unterraced cut or fill slope is not to exceed a rise of 15 feet. Any cut and fill slope that exceeds 15 feet will be designed to include terraces suitable for the survival of vegetation and trees. Terraced slopes may not exceed 45 feet. Engineered retaining walls will be subject to the same requirements regarding heights and terracing.

Due care will be taken by engineers, designers, and contractors to ensure that artificial slopes use appropriate materials, are sufficiently compacted using professionally approved practices, and ensure that water draining through or across artificial slopes do not jeopardize the stability of the artificial slope.

Significant amounts of extra soil and rock are generated through grading and construction. The disposal of this material on steep slopes is a public health and safety concern. The disposal of cut material on site will be away from streams, wetlands, intermittent streams, and ravines. A buffer of 100 feet around permanent and intermittent streams will be used to demarcate where fill

material may be responsibly disposed of. This is to avoid the sedimentation of streams by the erosion of soil and rock disposal.

Where necessary, engineered surfaces and vegetation will be used to prevent runoff and to stabilize the slopes of soil and rock disposal on site. These are necessary to limit the formation of rills and gullies on artificial slopes.

Mass grading shall be prohibited. The grading of entire hillsides is unnecessary and harmful. The exposure of soils and rock by the wholesale removal of vegetation worsens runoff and pollutes nearby streams. Under these conditions, runoff has effectively no residence time and can increase the frequency of flooding downstream. The grading of hillsides and the creation of artificial slopes will be the minimum necessary for providing safe access, extending utilities, and constructing onsite improvements.

Roadways & Driveways

Consistent with existing practices, public and private road grades are recommended to not exceed grades of 12 percent. Runs not to exceed 200 feet in length may exceed the 12 percent grade, but may not exceed grades of 15 percent. This is to allow reasonable access to upslope areas to site suitable for development under the recommendations of this report.

Driveways provide access between the residence and any public or private roads. Driveways are recommended to not exceed 25 percent. Where the driveway intersects a public or private roadway, there will be sufficient length and shallowness of grade to allow emergency services equipment to safely turn onto the driveway. Likewise, this is necessary to allow vehicles to safely slowdown and turn onto hillside driveways.

Switchbacks are to be avoided. Concerns about switchbacks are the short lines of the sight, the steep and short curves (for emergency access), and the amount of grading required. However, this report recognizes that in limited instances, switchbacks provide the only possible method of access. As such, switchbacks will be allowed in either of the following two cases. First, switchbacks may be used if it allows more appropriate development upslope than could be found downslope, by reason of shallower slopes and fewer negative impacts. Second, switchbacks may be used if no downslope sites are feasible for development under the recommendations of this report. In either case, road grades for switchbacks are not to exceed the standards provided above.

Stream Buffers

Buffers around streams and waterways provide the beneficial service of attenuating surface water flows and reducing pollutant loads of contributing waters. The cost of this service is free, so long as sound land management principles are being utilized. The alternative, whereby professionally designed water filtration and remediation systems are constructed and maintained, are excessively costly to the public. It is recommended that buffers of 100 feet be used as a setback for development and other site improvements. Intermittent and permanent streams as identified on the most recent 7.5 minute USGS quadrangle are to be used to identify applicable streams. Intermittent and permanent streams identified through a site assessment are to be included, as well. Buffers may be disturbed for the placement of roads, bridges, and utilities, but only the minimum necessary. All reasonable alternatives will have to be exhausted.

The elements of a stream buffer that provide these critical services are the vegetation and soil layers within the buffer. Together they slow the flow of water allowing sediment and mud to settle within the organic layer of the forest floor. Plant uptake of nitrogen and phosphates lessen the amounts that will otherwise enter local waterways. Furthermore, the soil provides a substrate for pollutants to attach to, while microbes within the soil and organic layer help to sequester pollutants. Naturally regulated water temperatures promote the health and integrity of aquatic ecosystems for human enjoyment. Thus, the natural shade provided by existing stream buffers help to cool stormwater runoff in the summer and warm them in the winter months. Soils are generally inhospitable environments for human pathogens and viruses. Hence, ensuring adequate distances between effluent points and receiving waters reduces the input rate of harmful microbes into waterways.

The ability to naturally filter and treat surface water depends on the flow rate of water through the buffer. Extensive scientific literature has been compiled to assess the filtering capacity of various soils and their efficacy at removing specific pollutants. Thin, sandy soils with little organic matter require greater buffer distances to provide the same amount of filtering capacity as thick silts. Likewise, steep slopes require greater buffers to provide the same filtering capacity as level terrain. Buffer widths for thin, well-drained soils on steep slopes range from approximately 100 feet to figures in excess of 300 feet. The recommendation of 100 feet is based on a comprehensive review of this literature and will provide a high degree of filtering capacity for the pollutants of primary concern, such sediment and pathogens.

Utilities

Utilities are to be incorporated into common trenches, utilizing duct banks. Care regarding the retention or drainage of stormwater runoff will be taken in the design and construction of such

trenches. Utility cuts will be restored to a natural grade and re-vegetated, as necessary, to conform to the character of the surrounding natural terrain.

Stormwater & Erosion

The use of pervious pavements and surfaces are to be promoted and considered for use. Such surfaces allow water to percolate downward and reduce the amount that will flow to erosive drainage points. Where feasible, surfaces will be designed and engineered to promote sheet flow and to avoid the channeling water. Upslope runoff across artificial slopes will be limited or avoided to the maximum extent practicable. The creation of erosive rills and gullies erode and destabilize steep slopes and as such are to be avoided. Artificial slopes are to be vegetated and otherwise stabilized to prevent erosion from stormwater runoff.

Naturally acidifying soils and rock formations identified on the site are to be avoided. Where a cut into such soils and formations cannot be avoided by exhausting all alternatives, the exposed surfaces will be capped and sufficiently sealed to reduce the percolation of water across them.

Grading and Clearing

Exposed surfaces created by grading and construction are to be kept at a minimum throughout the construction process. To limit these exposures and the greatly increased potential for polluted runoff, it is recommended that grading not commence earlier than 15 days prior to the initiation of construction and building of specific sites, not subdivision development phases. Within 15 days of substantial completion of the construction and building, exposed surface are to be stabilized using native species, cover crops, geotextiles, and other engineered surfaces.

2.6 MITIGATING ADVERSE IMPACTS

In order to promote the principle of ‘no undue adverse impact,’ a two-stage process is recommended. The first is the preparation of a “Findings Statement” by the Planning Commission and its technical staff based upon an initial review of the preliminary plat or site plan. Second, the project applicant must demonstrate sufficiently that the adverse impacts identified in the findings statement have been mitigated to the maximum extent practicable (MEP). Again, the intent of the demonstration of no undue adverse impact is to ensure that resources of concern on steep slopes are properly considered and, if necessary, protected from needless degradation.

A demonstration of no undue adverse impact is to be made in addition to the standards of design and construction recommended in this report. The standards are intended to address the core issues most common to hillside development. However, since each project and site are unique,

the list of standards to address the development would have to be exhaustive and overly restrictive. Instead, the purpose of the findings statement is to address impacts unique to the project and to provide the applicant with flexibility in addressing them.

Preparing the Findings Statement

The findings statement will enumerate any reasonably anticipated negative impacts created by the project on SLRS or Environmental and Public Resources of Concern. A findings statement will be prepared for any applications proposing a subdivision of land or new development. The statement will enumerate the resources (as established in local law) to be impacted, the cause of such impacts, and the nature of such impacts. The adverse impacts will be characterized by the likelihood, duration, extent, intensity, under what conditions the impact is likely to occur, and any other such information that will assist the applicant in addressing the impact. Cumulative impacts may be considered to the degree that specific components of the project can be identified as contributing to the impacts.

In order to facilitate the process, it is recommended that a preliminary scoping meeting be held between the applicant and the Planning Commission or its technical staff. The purpose of the meeting is to review together the application, its plans, to identify the significant impacts likely to occur, and to identify those impacts that are irrelevant or not significant. This meeting may take place concurrently with the optional pre-application conference already established in local laws.

It is of legal importance for the applicant that the findings statement not be arbitrary or hopelessly vague. Since the applicant will be asked to mitigate or avoid the adverse impacts identified in the findings statement, the applicant will need to know and understand the impact created, the cause for the impact, and the scope of the impact. These three pieces of information (type, cause, and scope) will allow the applicant to formulate and design a response that is appropriate to the scope of the impact. If no adverse impacts to resources of concern are identified, the findings statement will indicate such.

Likely adverse impacts are to be based on a rational and reasonable connection between the elements of the project and the conditions known to exist on and around the site. The type, cause, and scope of the impacts are to be based upon a professional assessment of the project, the conditions at the site, and in consideration of similar experiences and circumstances elsewhere. Adverse impacts are to be identified only whereby the health, safety, and welfare of the public is promoted and the purposes and intent of any ordinances adopted pursuant to this report are realized. It is envisioned that the findings statement will be concise and of sufficient detail to assist the applicant in mitigating adverse impact. Detailed quantitative analysis will not be

required, but may be provided where necessary. The applicant will not be expected to respond to findings within the findings statement that are arbitrary or vague.

Demonstration of No Undue Adverse Impact

The applicant, upon receipt of the findings statement, will begin to examine and formulate a response to adverse impacts identified in the findings statement. It is anticipated that the scoping meeting and clear rules outlining the parameters of issues to be considered will allow the applicant before hand to avoid or sufficiently mitigate adverse impacts before they are identified in the findings statement. If the findings statement identified adverse impacts, then the applicant must mitigate such impacts to the maximum extent practicable (MEP). Any impact not mitigated to the maximum extent practicable is to be considered an ‘undue adverse impacts.’

The goal of the MEP standard is not to eliminate all adverse impacts, which is ideal. Rather, it requires the applicant to examine the full range of proven and advanced techniques available to them, and then identify from those choices, which works best within their project. As such, the standard provides flexibility to the applicant and strives to realize honest mitigation.

The maximum extent practicable means, specifically, that the applicant has proposed mitigation practices and avoidance techniques that minimize adverse impact by reason of 1) the project’s scale, 2) the severity of the adverse impacts, 3) the commitment of resources commensurate with the project’s scale, 4) the level of mitigation to be achieved, 5) and the use of innovative or state-of-the-art development practices and community planning techniques. The standard is to be assessed objectively in light of the findings statement and the applicant’s due care in mitigating to the maximum extent practicable. Impacts that have not been mitigated to the maximum extent practicable are to considered an ‘undue adverse impact.’ In the event of an undue adverse impact, the applicant may elect to amend the project appropriately or the Planning Commission shall reject the application until the applicant has demonstrated no undue adverse impact.

The Planning Commission and its technical staff, during the final review, are to assess each application on a case-by-case basis examining the resources of concern, the project as proposed, and in consideration of the applicant’s reply to the findings statement. In part, the MEP standard is based on a determination of ‘feasibility.’ Feasibility, in the strictest sense, means ‘capable of being done’ or done at any cost, and as such, is too strict. However, the assertion that something is unfeasible must be examined in light of the project’s scale (including size, extent, and expense) and the applicant’s commensurate commitment of resources. Thus, the response must be proportional to the cause, thus providing an objective basis for assessing a demonstration of no undue adverse impact.

Incorporating the Findings Statement into existing procedures

The findings statement, its preparation and the applicant's response, can be incorporated smoothly into existing procedures. Current local rules require the preparation of preliminary plans for submission to and consideration by the Planning Commission and its technical staff. After a set time, the preliminary plans are returned to the applicant with comments for improvement. The applicant makes suitable adjustments and resubmits the application as a final plan for final consideration by the Planning Commission. The findings statement can 'piggy back' on this effort, given that review-respond-review process provided by current rules is in harmony with the intent of the findings statement. In the event that a project is subject to the rules of both the Hillside Overlay District and the Steep Slope Floating Zone, a single findings statement may be prepared for both processes.

2.7 CHANGES TO SUBDIVISION/PUD RULES

Density

It is recommended that the density of development be tied to the severity of slope with the principal that the steeper the slope, the less dense development should be. Each community and the County will need to determine for themselves the appropriate level of density for particular slopes.

Clustering Techniques

The use of clustering can be a beneficial technique to protect areas significant natural and aesthetic resources, if implemented correctly. While Clustering should continue to be encouraged, communities should consider the possibility of limiting the amount of clustering on very steep slopes which will assist in concentrating environmental and aesthetic impacts to localized areas.

"No guarantee of maximum development"

It is important to note that while the recommendations provided in this Report are not intended to "shut off development" it is intended to have applicants focus more of their attention on proper development techniques and mitigation measures to avoid adverse impacts. By following these recommendations, there will likely be instances where the maximum allowed density per zoning regulations may not be achievable due to the use of certain techniques to avoid or mitigate adverse impacts.

2.8 ENHANCED SITE PLAN REVIEW

Slope Calculation

Slope maps shall be provided for all development projects subject to these recommendations, and slope shall be represented at two-foot contours. Areas outside of proposed development areas can be represented at five-foot contours. Through the use of industry-accepted computer aided design software, slope shall be calculated between each individual contour line. The averaging of slope for a development area shall not be permitted. If a community desires to establish a density schedule tied to slope, it is recommended that this process of calculating slope be used.

Non-binding referral to NPS

For Projects subject to the Hillside Overlay District recommendations, it is a recommendation of this report that the reviewing agency make a non-binding referral to the National Park Service (NPS) for feedback on any potential adverse impacts to the aesthetic resources of the Great Smoky Mountains National Park. This process will keep project reviews open and transparent and provide an opportunity to mitigate potential adverse impacts that may occur when development is visible from certain scenic sections of the Park. This referral would be non-binding in that if the NPS found that a proposed project would adversely affect the Park, it would not in and of itself result in a denial of the project. Rather, it would encourage additional design and mitigation measures towards reducing or removing the adverse impacts.

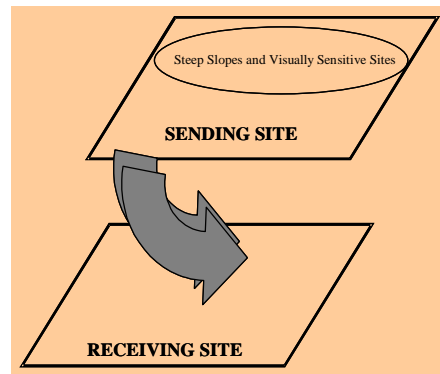
2.9 MOVING FORWARD

- > *Consider a Transfer of Development Rights (TDRs) program to encourage development away from steep slopes and visually sensitive locations.*

Transfer of development rights (TDR) programs allow landowners to transfer the right to develop one parcel of land to a different parcel of land. TDR programs have historically been established to protect farmland and open space areas by shifting development from agricultural, areas targeted for open space preservation and undevelopable areas to areas planned for growth. In the case of Sevier County and municipalities, the program could direct building away from the steep slopes and visually sensitive site to land more suitable for development which may have less or no adverse impacts compared to what could result with inappropriate development on the regions hillsides and ridgelines. TDR programs could also be used in concert with Planned Unit Developments (PUDs).

Important issues to keep in mind when considering a TDR program:

- > Under Tennessee Code Annotated § 13-7-402, counties and municipalities may establish a voluntary transfer of development rights program to preserve historic districts, or significant environmental or agricultural areas. Any TDRs must be voluntary and by contract.
- > Receiving and sending districts must be designated and mapped in accordance with a comprehensive/master plan;
- > Pursuant to State law, the sending districts may include agricultural land and that the receiving districts must have the infrastructure needed to support increased development;
- > Development rights are documented as conservation easements that are enforceable by the town or other designated entity;
- > For TDR to work, communities must build consensus on its use as a way to protect resources and direct future growth.



A market must exist for both the development rights (either in the private sector or via a municipal development rights bank) and the higher density development that will result. It is clear that in Sevier County, a significant market exists as evidence by the high demand for development on the regions hillsides and ridges.

Without flexible development techniques to encourage the appropriate development of the community’s valuable parcels as well as infill sites, uses and development styles in contrast to the environmental and scenic character may result.

Section 3

Implementation

Section 3

3.1 IMPLEMENTATION

The following program is suggested for implementation of the policies and standards made in this report. The preferred mechanism for implementing the bulk of them is by adoption through local law or resolution, in particular the Hillside Overlay District and the Critical Slope Floating Zone. It is further suggested that the inspection and enforcement procedures of these policies be implemented in phases, to allow time for municipal and county resources to be sufficiently ready. Other recommendations are to be adopted by amending existing local laws and by the study and commencement of future programs, such as a Transfer of Development Rights Program.

The very first step should be to develop two sets of standards to provide consistent guidance and a running start for implementing this report's recommendations. Specifically, the report recommends that each community and the County consider Hillside Overlay District (HOD) and Critical Slope Floating Zone (CSFZ) provisions that could be adapted into existing land use regulations.

Phase I

1. Establish or maintain existing working committee to develop HOD and CSFZ provisions.
2. Working Sessions with City/County Planning Commissioners to discuss possible amendments/updates.
3. Begin implementation procedures at the speed acceptable to each involved.
 - > First consider amending and revising PUD policies to limit the amount of clustering on very steep slopes and in areas visible from SLRS.
 - > Amend subdivision and site plan review procedures to limit the amount of vegetation clearing allowed before and after construction more or less in line with the recommendations of this Report.
 - > Encourage applicants to utilize the many design and mitigation measures recommended in the Report. A quick and simple guidebook could be developed for each community for distribution with application materials.

Phase II

4. Adopt Critical Slope Floating Zone Provisions
 - > Establish Environmental and Public Resources of Concern
 - > Establish Standards of Design and Construction

- a. Establish Findings Statement procedures

Phase III

5. Adopt Hillside Overlay District Provisions
 - > Establish SLRS
 - > Establish Standards of Design and Construction
 - > Establish Findings Statement procedures.
6. Assess feasibility of Transfer of Development Rights Program
7. Conduct a “Lessons Learned” analysis of how the rules are or are not performing

Phase IV

8. Update SLRS as necessary
9. Implement Transfer of Development Rights Program
10. Implement any revisions that were identified as necessary during the “Lessons Learned” analysis.
11. Keep analyzing progress and look for ways to improve.