

A Context - Sensitive Design Approach for Scenic Byways in New Mexico

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by
School of Architecture + Planning
University of New Mexico

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A Context - Sensitive Design Approach for Scenic Byways in New Mexico

UNM Study Team

Alf Simon, Principal Investigator, Director, Landscape Architecture Program

John Barney Faculty, Landscape Architecture Program

Judith Wong, Faculty, Landscape Architecture Program

Teresa Harner Graduate Student, Landscape Architecture Program

Jeff Ross Graduate Student, Landscape Architecture Program

Phil Rottman Graduate Student, Landscape Architecture Program

Allison Wait Graduate Student, Landscape Architecture Program

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Introduction

This document explores context sensitive design issues for historic scenic byways in New Mexico, and suggests a number of strategies that can be adapted to a variety of different scenic corridors. Although the study uses the Turquoise Trail, NM 14, as a model for developing the ideas, it should be stressed that this is not a scenic byway plan for NM 14.

National Scenic Byways designations recognize those roads across the country that exhibit one of more six core intrinsic qualities-- scenic, natural, historic, recreational, archaeological, or cultural-- contributing towards a unique travel experience. As of 2006, there are 126 roads from 44 states that are designated as either National Scenic Byways or All - American Roads. To be considered for designation as a National Scenic Byway, a road must possess characteristics of regional significance within at least one of the intrinsic quality categories. In addition, the byway must demonstrate strong community support and develop a corridor management plan that describes in detail the preservation, marketing, and improvement strategies for the byway. (<http://www.scenic.org/byways>).

The National Scenic Byways Program is administered through the Federal Highway Administration (FHWA) to recognize, protect, and promote America’s most outstanding roads. Congress established and strengthened the program under the Intermodal Surface Transportation Efficiency Act (ISTEA) in 1991, the Transportation Equity Act for the 21st Century (TEA-21) in 1998, and the Safe, Accountable, Flexible, and Efficient Transportation Equity Act - A Legacy for Users (SAFETEA-LU), in 2005. The National Scenic Byways Program helps communities balance economic development and resource conservation.

The Federal Highway Administration awards the funds competitively each year in the form of merit–based grants covering 80 percent of the project cost and with the requirement that the remaining 20 percent be matched by local, state, other federal or in-kind means.

Eight of the one hundred and twenty-six designated National Scenic Byways are in New Mexico:

- Billy The Kid National Scenic Byway
- El Camino Real National Scenic Byway
- Jemez Mountain Trail National Scenic Byway
- Route 66 National Scenic Byway
- Turquoise Trail National Scenic Byway
- Geronimo Trail National Scenic Byway
- Santa Fe Trail National Scenic Byway
- Trail of the Mountain Spirits National Scenic Byway

There are an additional eighteen roads designated by the State of New Mexico as scenic byways:

- Abo Pass Trail
- Corrales Road Scenic Byway
- Enchanted Circle Scenic Byway
- Dry Cimarron Scenic Byway
- Guadalupe Back Country Byway
- High Road to Taos
- La Frontera del Llano
- Lake Valley Back Country Byway
- Mesalands Scenic Byway
- Narrow Gauge Scenic Roadway
- Native Heritage Trail
- Puye Cliffs Scenic Byway
- Quebradas Back Country Byway
- Salt Missions Trail
- Santa Fe National Forest Scenic Byway
- Socorro Historical District Scenic Byway
- Sunspot Scenic Byway
- Wild Rivers Back Country Byway

In highway construction, reconstruction, maintenance and management, it is important to recognize the intrinsic qualities that the road corridor may have, and to identify a method for acknowledging these in the design and management process. The

process for doing this has been termed Context Sensitive Design (CSD) or Context Sensitive Solutions (CSS). Until very recently the design of roadways has focussed primarily on issues of safety and efficiency. These are very important elements, but an acknowledgement of the social, cultural and environmental factors of the landscape through which a roadway passes, the context, is also important. This kind of acknowledgement adds complexity to the roadway design process by including additional constituencies into the decision-making process, and adding a number of variables into the design considerations. This additional complexity has been an obstacle to a wide adoption and application of the CSD/CSS process.

Beginning in the 1990s the implementation of CSD/CSS methods have included studies of existing neighborhood character, architecture, aesthetics, ecology, economics, and community needs, and have sought to incorporate those contextual dimensions into project planning. Increasingly, CSD/CSS is also required by federal and state regulation. Taking the local context into account can help transportation agencies design and manage better projects, generate local buy-in, and avoid opposition and litigation from local constituencies. CSD/CSS can save time and money while better meeting the needs of those communities that projects are expected to serve. In New Mexico and elsewhere, effectively implementing CSD/CSS is a major challenge for state Departments of Transportation and local transportation planning agencies.

The Federal Highway Administration has issued the following definition of context sensitive solutions:

Context sensitive solutions (CSS) is a collaborative, interdisciplinary approach that involves all stakeholders to develop a transportation facility that fits its physical setting and preserves scenic, aesthetic, historic and environmental resources, while maintaining safety and mobility. CSS is an approach that considers the total context within which a transportation improvement project will exist.

(http://www.contextsensitivesolutions.org/content/topics/what_is_css/)

The document titled Architectural and Visual Quality Design Guidelines for Context Sensitive Design and Context Sensitive Solutions was prepared in 2006 for the New

Mexico Department of Transportation. This document elaborates the process of context sensitive design and serves as the background for this study.

Context sensitive design practices can be applied to new road construction, reconstruction projects or to the on-going management processes related to changing conditions on existing roadways. In the case of scenic byways, context sensitive solutions will help to maintain and enhance the road character, while still acknowledging the inevitable processes of growth and change.

As with the general Guidelines for Context Sensitive Solutions, developed by the University of New Mexico School of Architecture + Planning research team in 2006, the scenic byway toolbox is not intended as a formula, or one-size-fits-all approach. Rather, the idea is to develop a set of principles and strategic interventions that can be applied to each project such that its unique qualities can be identified and celebrated.

Process

As a National Scenic Byway, the Turquoise Trail, NM 14, possesses the six intrinsic qualities necessary for the scenic byway designation: it is a scenic corridor, it moves through relatively undisturbed landscape, it is associated with legacies of the past, there is archaeological content, the corridor is rich in cultural features and it is a recreational destination for skiers and hikers.

Although the Turquoise Trail is an exemplary scenic byway, some zones of this road are at risk of having their character altered due to expanding development pressures.

Because of its prominence as a scenic byway, the Turquoise trail, NM 14, was used in this document to serve as a model for developing a CSD/CSS toolbox for scenic highway development, management and enhancement throughout New Mexico. However, as stated in the opening paragraph, this is not a Turquoise Trail scenic byway plan, and should not be read as such.

This study is carried out in two stages. The first stage, called the ‘audit’, demonstrates a process for identifying the ‘context’ of the Turquoise Trail, and the second stage,

‘design opportunities’, is an articulation of design strategies and conditions. In the first phase a corridor audit is carried out in order to identify contextual conditions, using the Turquoise Trail corridor as a model for this process. This is a data collection and analysis approach that helps the study team to understand a corridor as a number of segments, each of which has a specific identity, but that collectively form the identity of the corridor as a whole.

In the second phase a number of ‘place types’ and applied design elements along a scenic byway corridor are identified, and the general application of design strategies is discussed.

Public Involvement and the CSD/CSS Process

Because this study uses the Turquoise Trail as a geographic location to develop a more generalized model or process, and it is not intended to be a formal ‘plan’ for the Turquoise Trail, the scope does not include a public participation process. However, it is necessary here to underscore the importance of including a range of stakeholders in any CSD/CSS process. Identifying stakeholders is a preliminary step toward involving the community in the design and planning process for a transportation project.

- Each project is unique and will draw out a different mix of stakeholders. These may include:
- Regional organizations such as a council of governments
 - County, municipal, village, and tribal government planning departments
 - Public works departments
 - Commissions within local government
 - Neighborhood Associations
 - Chambers of Commerce
 - Educational institutions and school districts
 - Local bicycle and pedestrian organizations
 - Beautification organizations
 - National scenic preservation organizations
 - Historic preservation organizations

- Main street and downtown revitalization programs
 - Community development corporations (CDCs)
 - Civic organizations
 - Social, cultural, and religious organizations
- More detailed information on the public participation process can be found in the document Architectural and Visual Quality Design Guidelines for Context Sensitive Design and Context Sensitive Solutions (2006).

The Place Audit: Guidelines for Evaluating the Context

The place audit is a procedure designed to study and evaluate the components of a roadway corridor in order to reveal the essence and character of that environment. This is what constitutes the 'context', or a set of environmental and cultural conditions that define the physical manifestation of the roadway corridor, and that make each place unique.

There are other agents that act upon and within a corridor to produce contextual conditions, including economic development, political processes, historic precedents, demographics, use and travel data, area or sector plans, pressure for growth, and community dynamics. These components are elements of an audit in the larger sense, and are described as a part of the general CSD/CSS process in *Architectural and Visual Quality Design Guidelines for Context Sensitive Design and Context Sensitive Solutions*, (2006).

The place audit, carried out in this section and using the Turquoise Trail as a model, focuses on the elements of context that are manifested in the existing physical characteristics of the roadway corridor. The data for the audit is generated in two primary ways: through ground truthing and visual analysis, and through a variety of existing documentation.

The media with which the data can be represented include photography, sketching, measured drawing, mapping, synthetic software such as GIS, and narrative description. Existing data may be available from a number of sources. Map information can be found in the United States Geological Survey (USGS) databases, county GIS databases and aerial photography. Other data can be found in reports such as environmental impact assessments, planning documents, inventories, and historical or archaeological studies.

Environmental Conditions of the Turquoise Trail

Air Quality

Separated from the City of Albuquerque by the Sandia Mountains, the airshed associated with the Turquoise Trail does not contain the higher carbon monoxide levels of its urban counterpart. Vehicular pollution is minimal with no additional sources of air pollution, rendering air quality along the trail to meet federal ambient air quality standards for all criteria pollutants.

Noise

Ambient noise levels along the corridor are relatively low due to the rural character of the area. Current sources of noise pollution are limited to heavy truck and car traffic.

Wetlands

Wetlands, that provide wildlife habitat and naturally purify water, have been identified along the Turquoise Trail. As transitional lands between aquatic and terrestrial systems, wetlands along the turquoise trail are generally located where the trail meets perennial streams. Future road construction should minimize impacts to this valued and ecologically important landscape type.

Drainage and Water Quality

Roads, including the Turquoise Trail, have an impact on water quality by conveying pollutants, such as sediment and motor oil, into waterways. Right-of-way treatment along the Turquoise Trail can be designed to minimize erosion and pollutants entering water systems. Additionally roads crossing drainages can have an impact on wildlife travel if culverts are improperly placed. Context Sensitive design can avoid habitat fragmentation by accounting for species within the area that use the drainages as corridors for travel.

Vegetation

As links between different geographic regions, roads can have an impact on communities of vegetation by providing a dispersal agent for the seeds of exotic, competitive plant species. Additionally, construction could eliminate or disturb existing vegetation within the right-of-way. Plants occurring along the trail, such as ponderosa pine,

pinyon pine, native grasses and wildflowers, frame distant views and contribute to the perceived quality of the landscape and therefore should be minimally impacted during road improvements.

Wildlife

Mammals, birds, reptiles, and amphibians associated with pinyon-juniper woodlands and desert grasslands and riparian areas are found along the Turquoise Trail. Roads have ultimately been designed without the movement of wildlife as a strong consideration, fragmenting habitat and affecting population diversity. Future road improvements should consider the habitat needs of species present along the trail. There are 16 sensitive, threatened, or endangered species of plants and animals occurring along the Turquoise Trail.

Mining

The landscape surrounding the Turquoise Trail has been mined by Native Americans, Spaniards and Anglos for centuries, removing resources such as turquoise, coal, gold, silver, lead, copper and gravel. Mine tailings, easily seen from the trail at the gateway into Madrid, pollute waterways by exposing elements previously tied up in rock substrate and by allowing for excess sedimentation.

The majority of the information presented was taken from the Environmental Assessment: Improvements to NM 14 from mile-marker 29.0 to mile-marker 38.5

Project Number: TP-BR-0014(9)31, CN 1285; TP-0014(10)28, CN 2516

*US Department of Transportation, Federal Highway Administration, New Mexico Division, and New Mexico State Highway and Transportation Department
28 June 1999.*

It is important to note that the Turquoise Trail Scenic byway begins in the town of Tijeras, and also include the road leading from NM 14 up to the Sandia Crest recreation area.

Turquoise Trail History

The Turquoise Trail, otherwise known as New Mexico State Route 14, is a 51 mile scenic highway linking Albuquerque with Santa Fe. It is called the ‘High Road’ by those that use it frequently. Named for the famous turquoise mines at the north end, it is believed that the trail was used for centuries by Native Americans.

Archaeology in the Galisteo Basin

There are many ancient pueblos and petroglyphs in the Galisteo Basin dating between 1200 and 1600 AD. Paa-ko Pueblo, near Golden, NM, is one of the largest pueblos in the basin. It was inhabited by the Tano people between the 14th and 17th centuries. There is evidence of a Spanish Colonial visita mission and was also the site of major metal work, probably for the benefit of the mission and not used so much by the Native Americans that populated the area. Although Paa-ko is not open to the public today, it is visible from NM14. Currently none of the archaeological sites in the basin are open to the public. (Galisteo Basin Archeological).

Mining Communities along the Turquoise Trail

There are several mining communities that were established in the mid-1800s—Golden, Madrid and Cerrillos. Gold was discovered in the Ortiz Mountains around 1825. Soon after, a new town called Golden was formed and eventually selected as the center of the Gold mining community. Golden’s post office was established in 1880. The population of Golden boomed until the gold began to dwindle about 1882. As a result, people began to leave the area. By 1928, the post office closed and Golden was considered an official ghost town. Today, Golden has seen a small bit of revitalization as people have built new houses and restored other homes.

Further north on NM 14 sits the small mining town of Madrid, New Mexico. 1500 years ago Native American inhabitants of the area mined the nearby hills for turquoise. When the Spaniards arrived in 1540, they ignored the turquoise in favor of silver and gold mining. The Spanish forced the natives to mine the silver and gold until the Pueblo Revolt in 1680 when the Spaniards were forced out. Thirteen years later, the Spanish re-conquered the area.

As the gold and silver mines dried up, the Spaniards turned to farming and ranching in the area but the region remained very low in population until 1869 when large amounts of coal were discovered.

Eventually, there was enough activity on the coal mine that a six mile railroad spur was built by the Santa Fe Railroad. Coal production peaked in 1928 when 180,000 tons of coal was shipped out of Madrid on coal cars. However, when natural gas began to take over as the primary fuel source, demand for coal fell and eventually the town of Madrid became a ghost town. At one time, the Wall Street Journal had the entire town listed for sale for \$250,000. Today, most of Madrid has been restored and has become an artist’ haven. The town is home to about 400 people.

The next town on the Turquoise Trail Scenic Byway is Cerrillos. Cerrillos was founded in 1879 but its history goes back 1500 years. The history of Cerrillos is very similar to that of Madrid—the Native Americans mined the hills for turquoise; the Spaniards moved in and forced them to mine silver and gold until the revolt of 1680. For nearly 200 years, the Native Americans continued to make use of the mines of Cerrillos.

In 1879, two miners from Colorado found gold in the hills and before long, the place was crawling with Americans mining for gold, silver, lead, copper and turquoise. In 1879, the Cerrillos Mining District was formed and immediately, over 1000 claims were filed. However, the mining boom would not last and Cerrillos was declared a ghost town. Today, Cerrillos is still a popular day trip for residents of Santa Fe. The mining district is listed on the New Mexico State Register of Cultural Properties and is listed in the US Department of Interior’s National Survey of Historic Sites and Buildings. (National Park Services, 2008).

Naming the Road

Until the completion of Interstate 25 in 1967, NM 14 was the primary route between Central New Mexico and Santa Fe. In 1975, in an effort to rejuvenate the area and create a destination for tourists, the process of naming the road was revisited by two members of the community. A petition was sent to the State Highway and Transportation Department suggesting that the route be named “Ghost Town Trail.” Both the Highway and Transportation Department and the Department of Economic Development suggested

that since the road has been locally known as the “Turquoise Trail” attempts to designate an official name should be in support of the “Turquoise Trail.” On December 5, 1975, a resolution was adopted by the New Mexico State Highway Commission that officially designated the road as a scenic route and recommended that signs, reading “Turquoise Trail” be placed at intervals along the road. However, due to a change in the commission and economic decline of the area, the official name change would not take place until April, 1996 when the “Turquoise Trail” became an official State Scenic Byway.

The Turquoise Trail Association worked diligently to protect the scenic and historic qualities of the Turquoise Trail by petitioning the National Scenic Byways Association for national scenic status. In June 2000, the Turquoise Trail was given National Scenic Byway Status in the merits of its archeological, natural, recreational and scenic intrinsic values. (Turquoise Trail Corridor Management Plan) .

Mapping

The following pages illustrate a process of how mapping can reveal the character of the corridor by breaking it down into a number of constituent elements. These elements include both natural and cultural factors, all of which contribute to the overall character, and indeed, the context, of the Turquoise Trail as a fifty-one mile continuous scenic byway corridor.

The mapping sequence includes:

- Landform
- Topography
- Geology
- Hydrology
- Vegetation
- Land Use
- Land Ownership
- Conservation Zones
- Historic and Cultural Resources

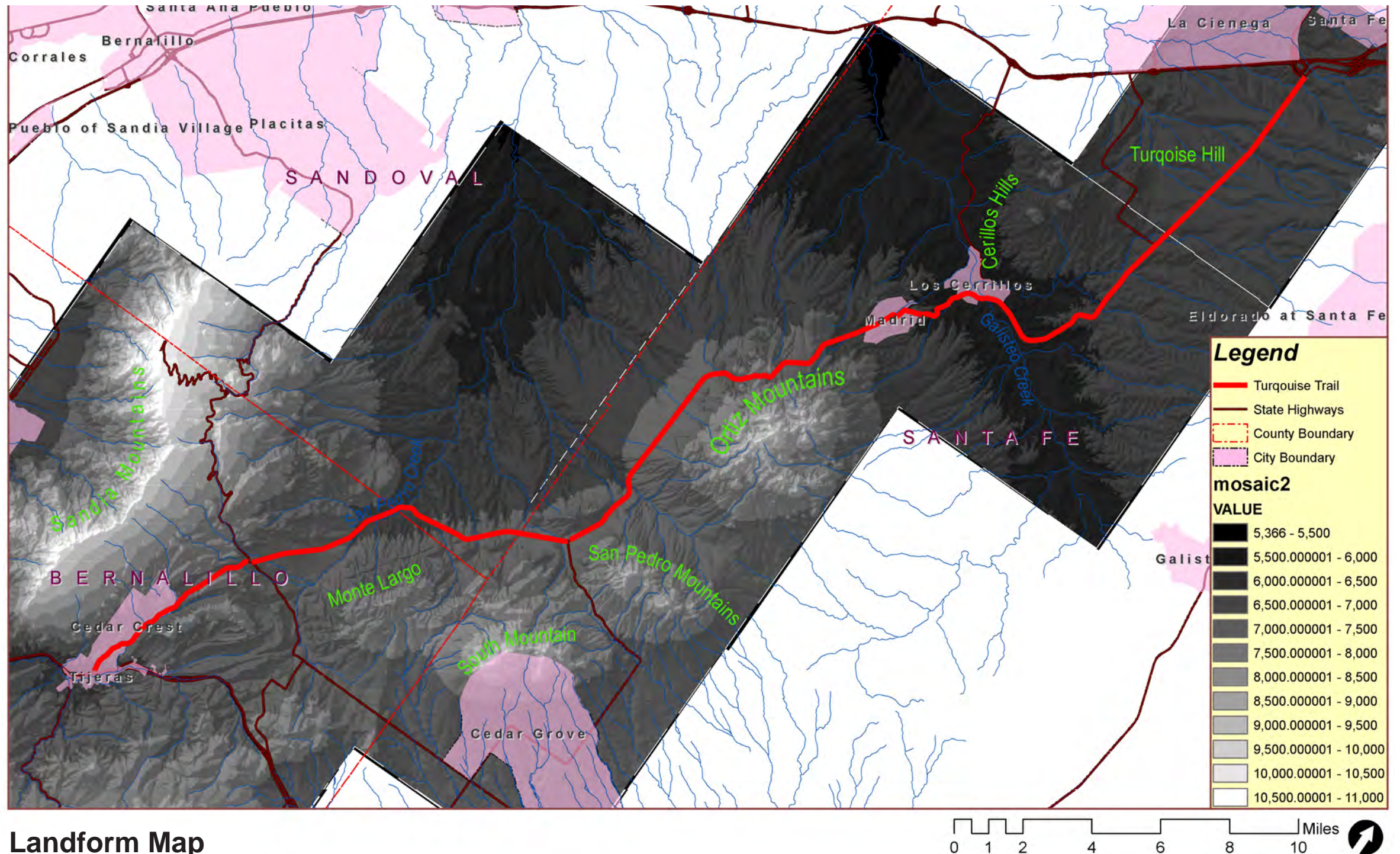
Character Zones

The final map of Corridor Zones represents a synthesis of mapped and observed data. The resulting map identifies four main zones within the corridor, and eighteen sub-zones, or segments.

Landform

Landform for much of the roadway corridor consists of primarily gently slopping ridges and hills, and nearly level plateaus. Drier southerly facing slopes and cooler, wetter northerly facing slopes can be found in the vicinity of Cedar Crest Village, the San Pedro Creek watershed, the Ortiz Mountains and Madrid. These typological land forms are reflected by the changes in vegetation along the corridor: desert scrub tends to dominate the southerly slopes and pinyon-juniper predominates along northerly facing slopes.

The corridor contains vistas of a series of topographical features including the back side of the Sandia Crest, Monte Largo, South Mountain, the San Pedro Mountains, the Ortiz Mountains, the Cerrillos Hills, the rock formations of the Garden of the Gods and Turquoise Hill near the northern end of the Although more remote, the Jemez Mountains and the Sangre de Christos are also visible from the roadway. On a clear day, Cabezon Peak may be seen.



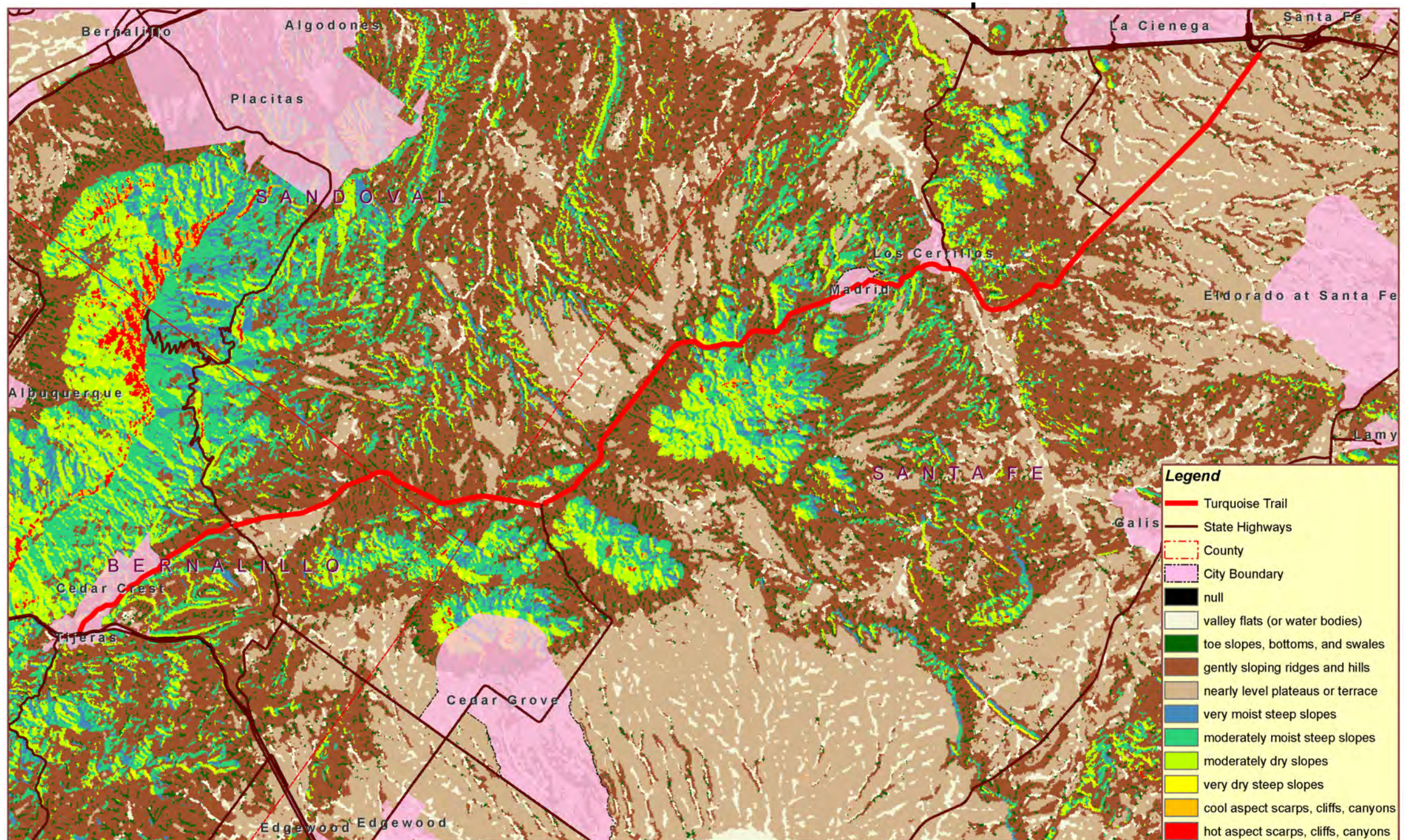
Landform Map

Topography

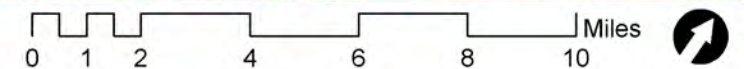
Topography in the vicinity of the Turquoise Trail is varied, and includes striking examples of most forms found in New Mexico. Moving from south to north, the corridor passes along the back side of the Sandias, over a saddle formed by the Ortiz Mountains, down into the Galisteo Creek valley and finally up through the Garden of the Gods and onto the high plains found north and east of Santa Fe.

Topography and geology in the corridor define boundaries for the Middle Rio Grande, Santa Fe, Galisteo Creek and Estancia ground water basins. The corridor passes through parts of the Arroyo San Antonito Watershed, the San Pedro Creek Watershed, the Galisteo Creek Watershed and the Santa Fe River Watershed at the north end of the corridor. The San Antonito is a tributary to the Tijeras and originates at a series of springs and canyons along the east side of the Sandias. The San Pedro Creek feeds into the Tongue Arroyo, both the Tongue and the Tijeras are a part of the Middle Rio Grande system. Watershed divides occur near the turn-off for Sandia Crest, the Ortiz Mountains, and just north of Garden of the Gods. The most apparent of those is the saddle in the vicinity of the Ortiz Mountains, which separates the San Pedro/Tongue system from the Galisteo Creek system. The roadway itself crosses over and runs along canyons created by the Arroyo San Antonito, the San Pedro Creek, the Madrid Creek and the Galisteo Creek.

Elevation in the vicinity of the corridor ranges from close to 7500 in the vicinity of the Ortiz Mountains to just above 5500 feet near Cerrillos along the Galisteo River. Although the roadway itself has a significant grade only going into and out of the Madrid Creek Canyon and Galisteo Creek Valley, steeper slopes are evident near Cedar Crest, San Pedro Estates and portions of the Ortiz Mountains. Close to Santa Fe, the corridor is markedly flatter and more open.

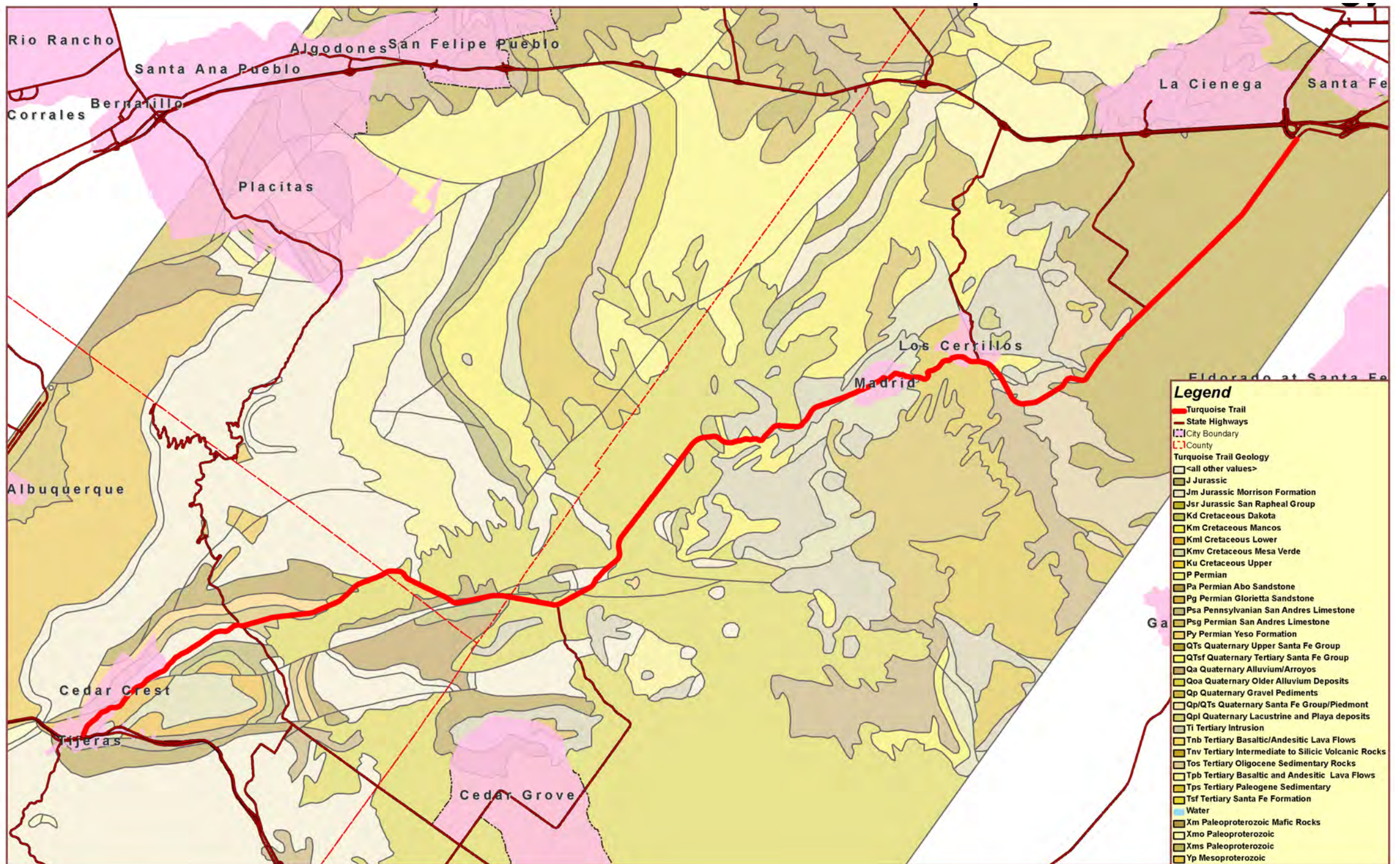


Topography Map

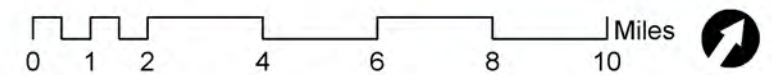


Geology

The Geologic map shows the varying layers and formations unique to the geologic history of the Turquoise Trail. The map shows the story of ecological and anthropologic activity along NM 14. Examination of the different geologic activity dictates the type of development and recreation that can occur along the corridor and points to potential view sheds. The map legend formation symbols are to be interpreted as follows, the upper case letter being the system in time and the lower case letters are the formation name abbreviations.



Geology Map



Hydrology

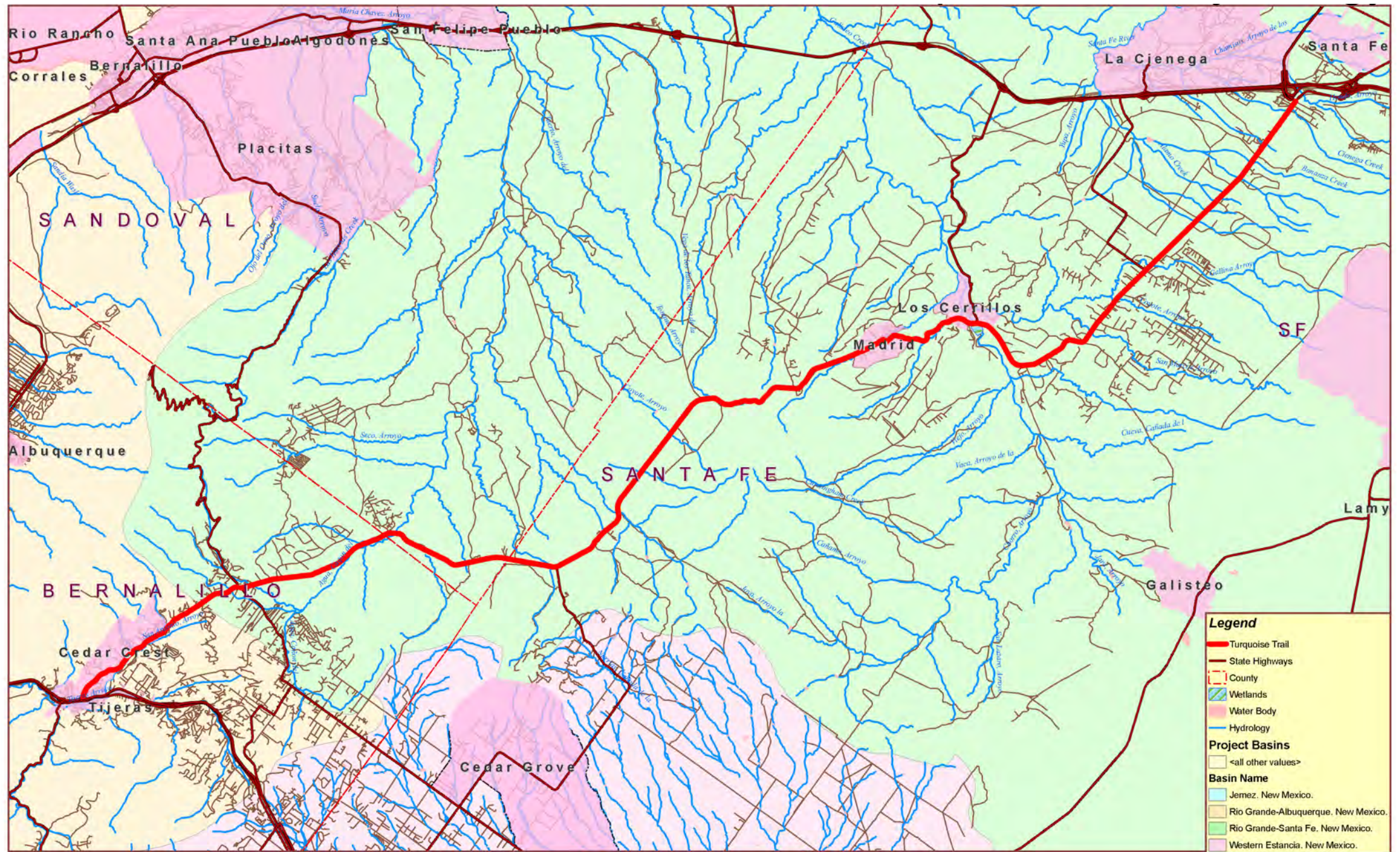
Surface water in the form of rivers, streams, arroyos, ponds, lakes and wetlands are depicted on this map. Data for aquifers did not result in any graphic change to the area of interest and are therefore not depicted on this map.

The Santa Fe Rio Grande Basin is included in the map because it is the dominant water basin on the trail. The trail also crosses the Western Estancia River Basin. These basins show the general jurisdiction of the surface water.

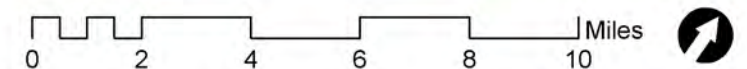
There are wetlands on Galisteo River and the San Marcus Arroyo. These are included in order that they be protected and should be considered a “No Build” zone.

The trail crosses 26 bodies of water in the form of rivers and streams.

Care needs to be taken when performing any road construction project to the Turquoise Trail as our actions on the land affect water quality and quantity far downstream and below. Best Pollution Prevention Practices should be adopted in order to reduce the amount of contaminates that are exposed to our surface water.



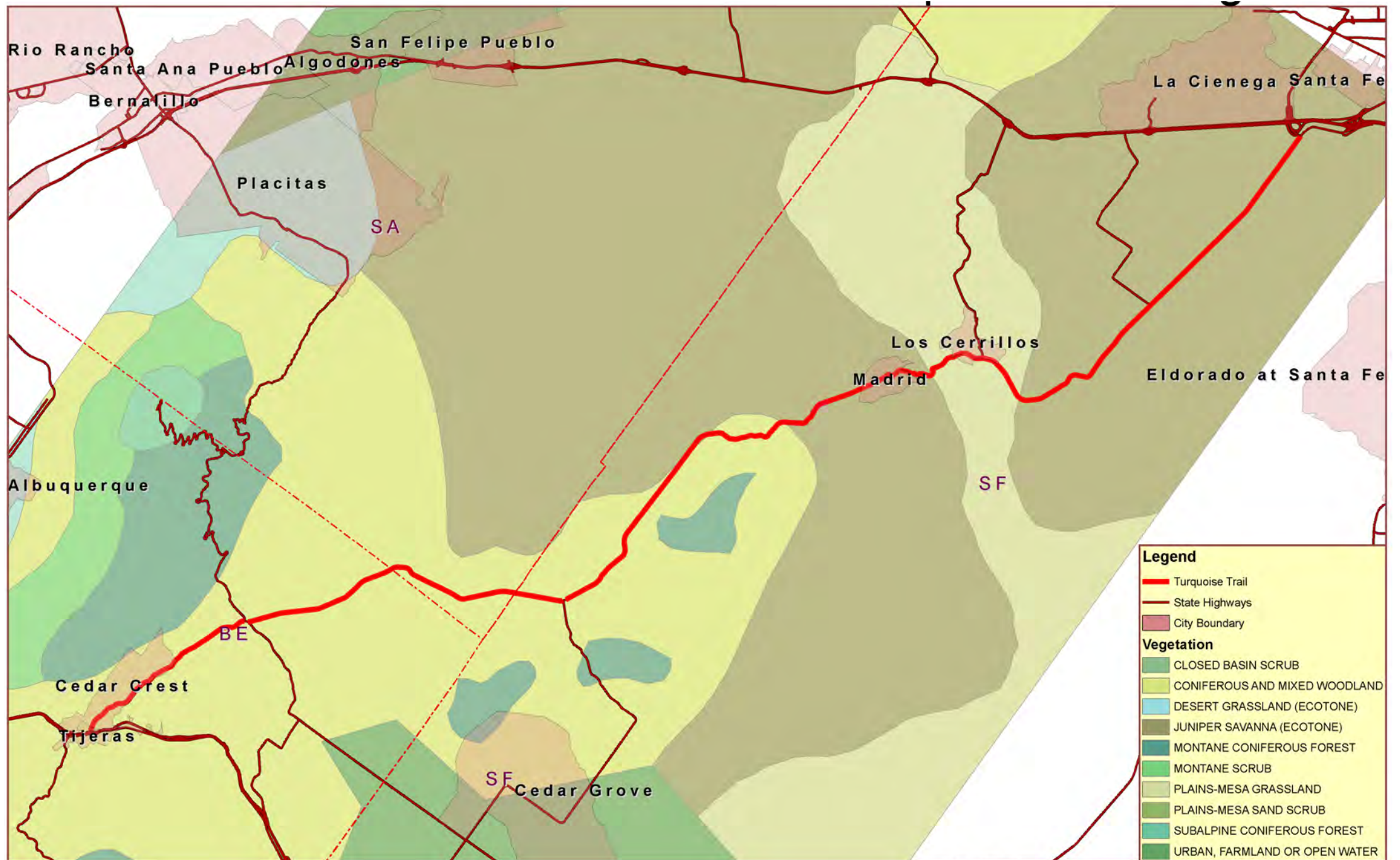
Hydrology Map



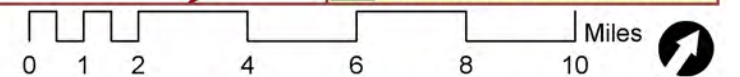
Vegetation

The Turquoise Trail (NM 14) passes through Coniferous and Mixed Woodland (yellow), Juniper Savanna (brown), Plains-Mesa Grassland (tan), and Juniper Savanna (brown) from south to north. Pinyon pine (*Pinus edulis*) and single-seed juniper (*Juniperus monosperma*) are the dominant tree species in the Coniferous and Mixed Woodland vegetation zone. Red berried mahonia (*Mahonia haematocarpa*), cholla cactus (*Opuntia sp.*), yucca (*Yucca sp.*), gramma grass (*Bouteloua sp.*), dropseed (*Sporobolus airoides*), snakeweed (*Gutierrezia sarothrae*) and locoweed (*Astragalus sp.*) are also found within this vegetation zone. Tree density is relatively high (30-50% canopy cover) compared to the Juniper Savanna ecotone to the north (5-30% canopy cover). The Juniper Savanna vegetation zone is an ecotone (transition zone) between the Coniferous Mixed Woodland and the Plains-Mesa Grassland surrounding Cerrillos. Plains-Mesa Grassland is the most extensive grassland type in the state of New Mexico, occurring on mesas between mountain ranges. Blue Grama grass (*Bouteloua gracilis*) is the dominant species.

New Mexico is one of the most diverse states in the United States in terms of plant species, with many endemic species (specific to a geographic area). Plant communities occur in the landscape based on geologic, geographic, and climactic factors. A vegetation analysis for the Turquoise Trail or any other scenic byway in the state can provide an abundance of information regarding specific site conditions for a corridor audit.



Vegetation Map

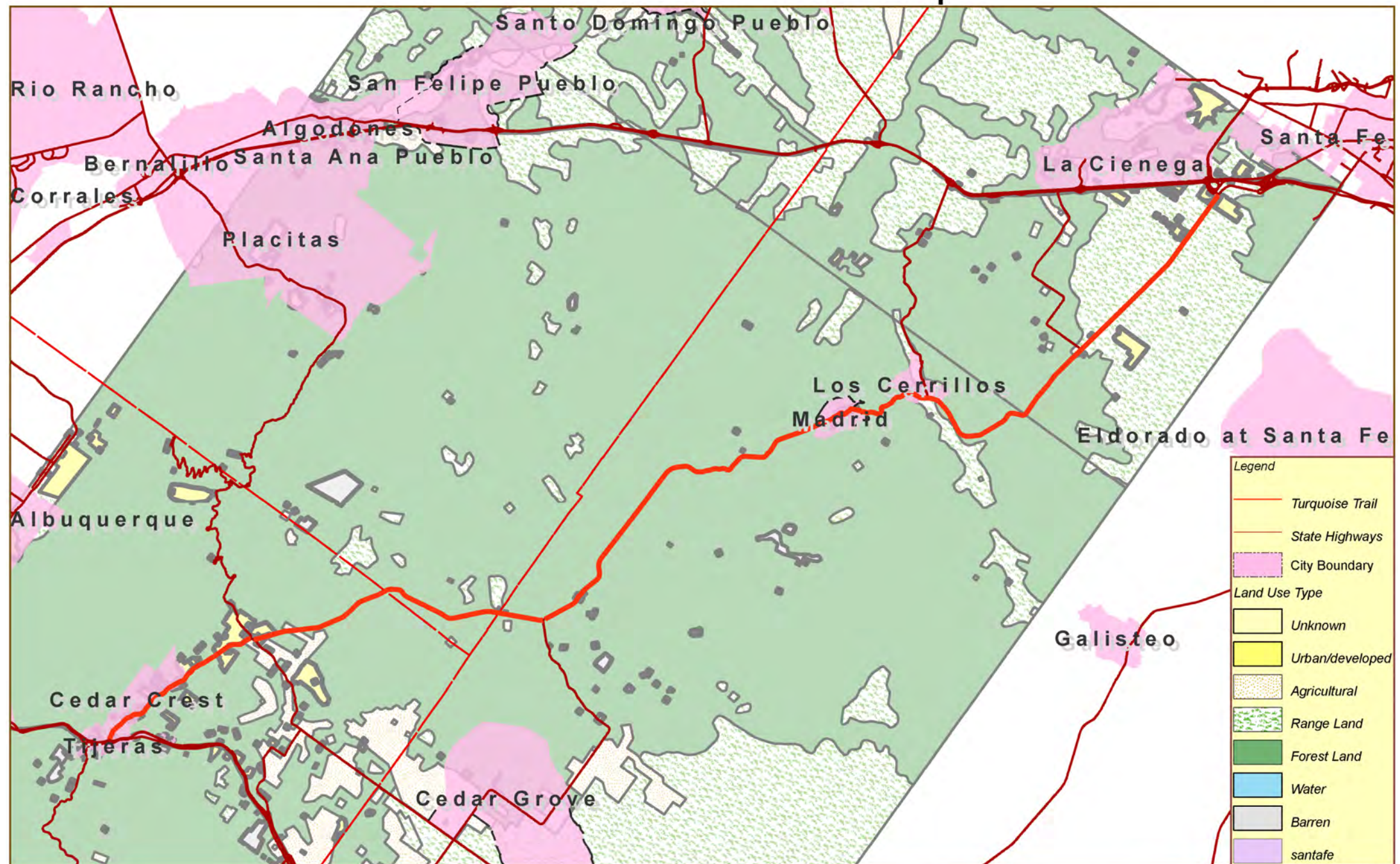


Land Use

The Turquoise Trail winds through a variety of terrains that accommodate various land uses unique to and indicative of the character of New Mexico. As part of the National Scenic Byway program Highway 14 has been identified as a road exhibiting one of more six core intrinsic qualities: scenic, natural, historic, recreational, archaeological, or cultural--contributing towards a unique a road. The purpose of this map is to contribute to the body of knowledge in order to make an acute analysis of the characteristics that contribute to the Turquoise Trail's status as a National Scenic Highway while striving to preserve them.

Contained between New Mexico's two largest metro areas—Albuquerque and Santa Fe, the road disappears from both cities ensconced in mountains and foothills with views opening and closing in all directions. While determining land use is ultimately a subjective process in which a number of concurrent factors must be analyzed, certain trends, more prevalent in some locations than others, do begin to emerge. Generally, it is the topography of the area that dictates its land use.

Following the route north to south reveals a mixture of uses in which areas of light residential and commercial development adjacent to the road emerge within a landscape dominated by a mixed Pinion- Juniper forest. The largest concentrations of development occur at the north and south terminuses of the road- Tijeras and Santa Fe as well as in the small valley communities of Madrid, Golden and Cerrillos. The western side of road features the steepest terrain with stands of Ponderosa and the occasional residence clinging to the highest slopes. To the east, excluding the Ortiz Mountains, ranching occurs within the more gentle Pinion Juniper Foothills and open sections. The largest stretches of grasslands occur towards the northern most part of the road prior to becoming light residential properties on the margins of Santa Fe.



Land Use Map

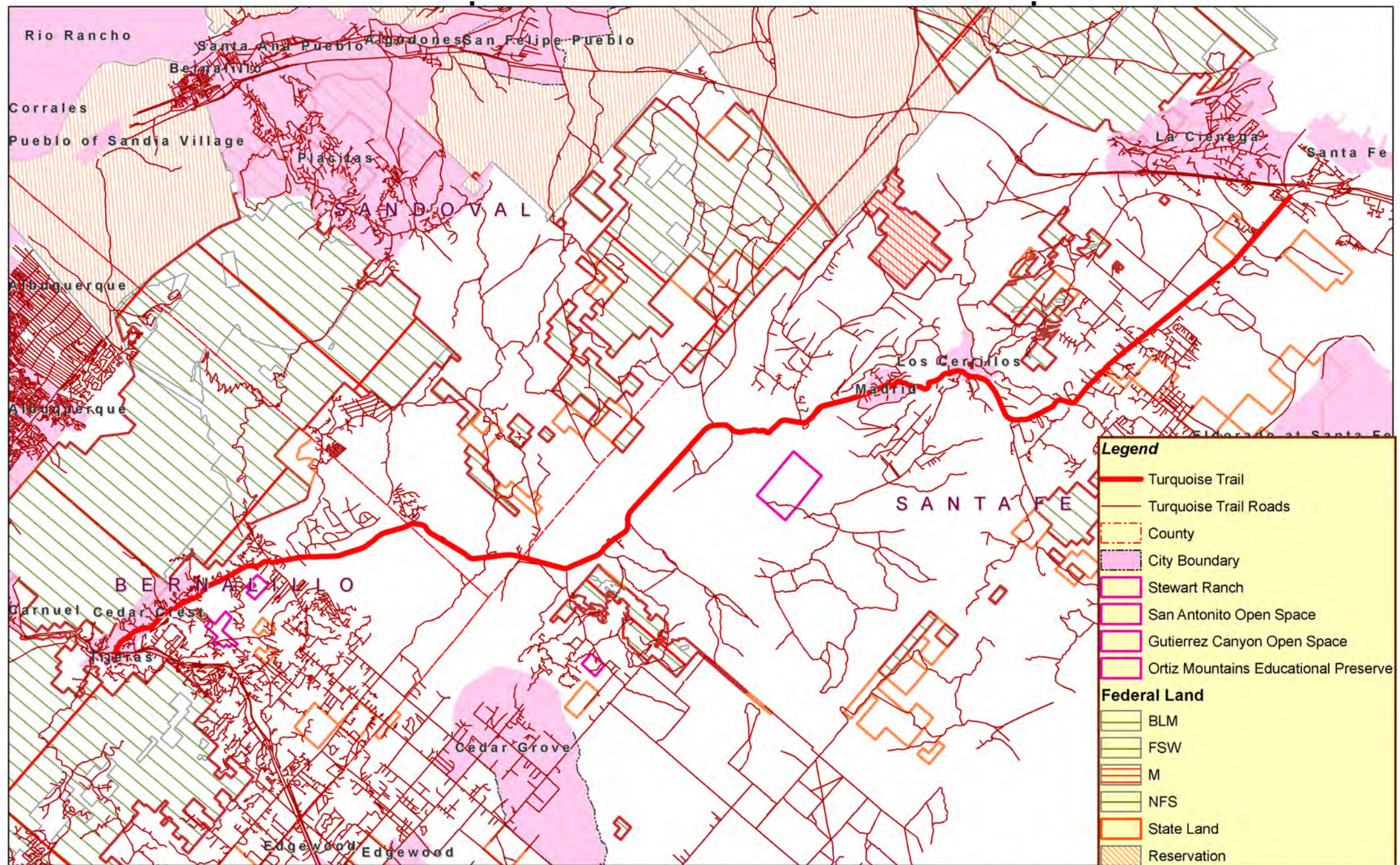


Land Ownership

Land owners along the Turquoise Trail may be affected by, or may affect the character of the Scenic Byway. This includes businesses and institutions along the Byway, tourist-oriented business with access from the byway, landowners with large parcels directly in major viewsheds, government owned properties such as wildlands, academic and other institutions interested in further exploring archaeological, cultural, and physical characteristics of the area, residential developers with large holdings adjacent to and accessed from the byway, and owners of undeveloped properties that are available for exploitation of minerals or other resources.

The viewshed is one of the primary defining elements of a scenic byway, but, because the state normally owns the land within the narrow roadway corridor, there is very little control of the conservation of the views.

The audit, in identifying the landowners along the corridor, can provide the data for developing a view conservation plan that could inform scenic easement agreements with landowners.



Land Ownership Map

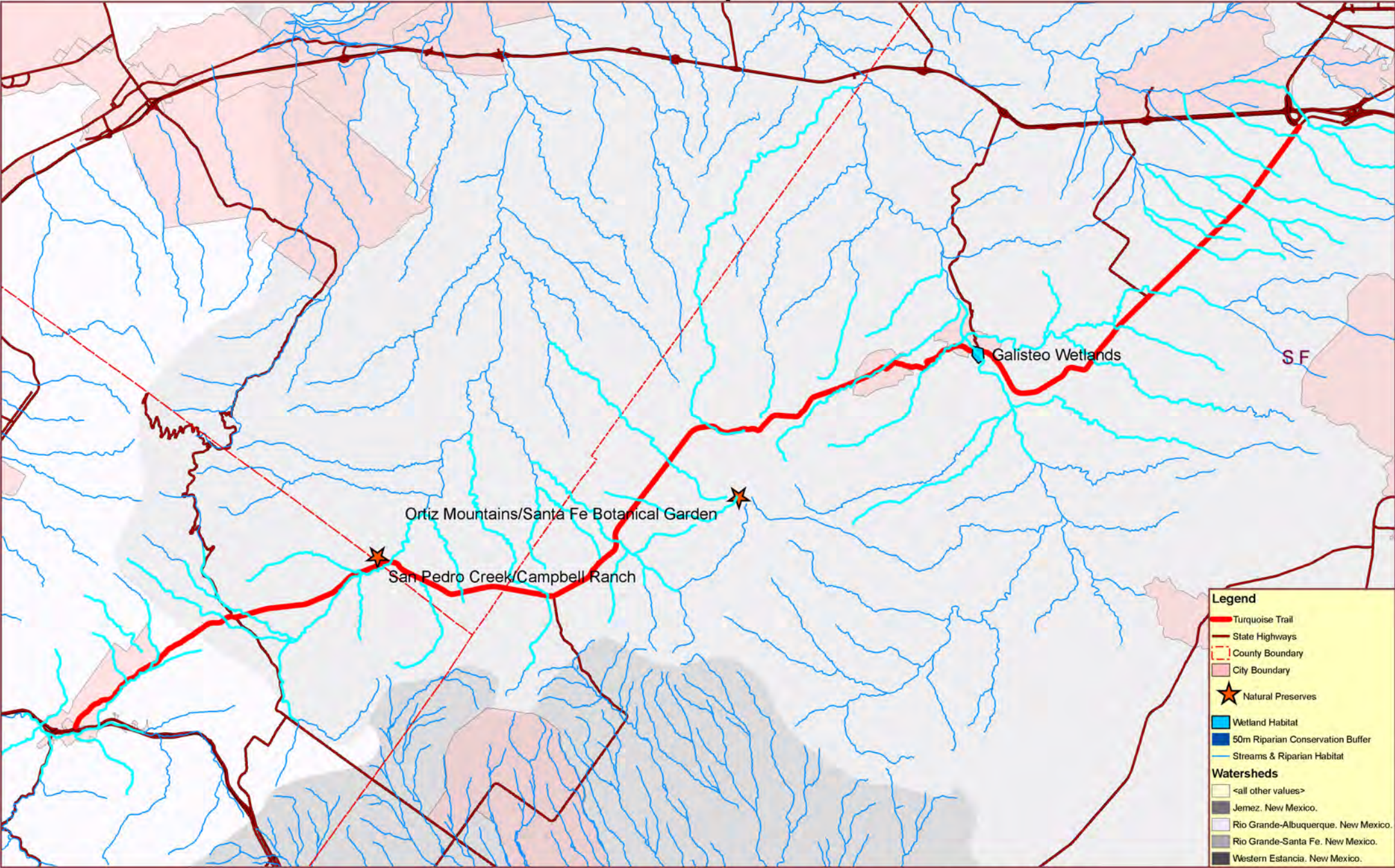
0 1.25 2.5 5 7.5 10 Miles



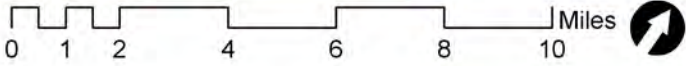
Conservation Zones

This map shows designated lands for conservation along NM 14. Natural preserves, wetlands and riparian habitat adjacent to the Turquoise Trail are shown. San Pedro Creek Nature Area, the southernmost preservation area on the map, is a 625-acre conservation easement from the Campbell Corporation for the purpose of protecting wildlife habitat and water quality within the San Pedro Creek basin. The Santa Fe Botanical Garden has created a 1,350-acre nature preserve for educational purposes, located within the Ortiz Mountains. This preserve is the northernmost natural preserve on the map. Three wetland areas have been identified along NM 14, located within vicinity of the Galisteo Creek crossing. As transitions between aquatic and terrestrial systems, wetlands are valuable wildlife habitat and are represented in red on the map. Streams crossing NM 14 have also been identified as zones for conservation for their importance as wildlife habitat and for highway related water quality impacts. Streams adjacent to the highway and a 50 meter riparian buffer are identified on the map and can be seen in light blue.

Areas of conservation along the Turquoise Trail characterize the experience of the scenic byway. Views, recreational opportunities, and the environmental quality of the area are enhanced by existing conservation zones.



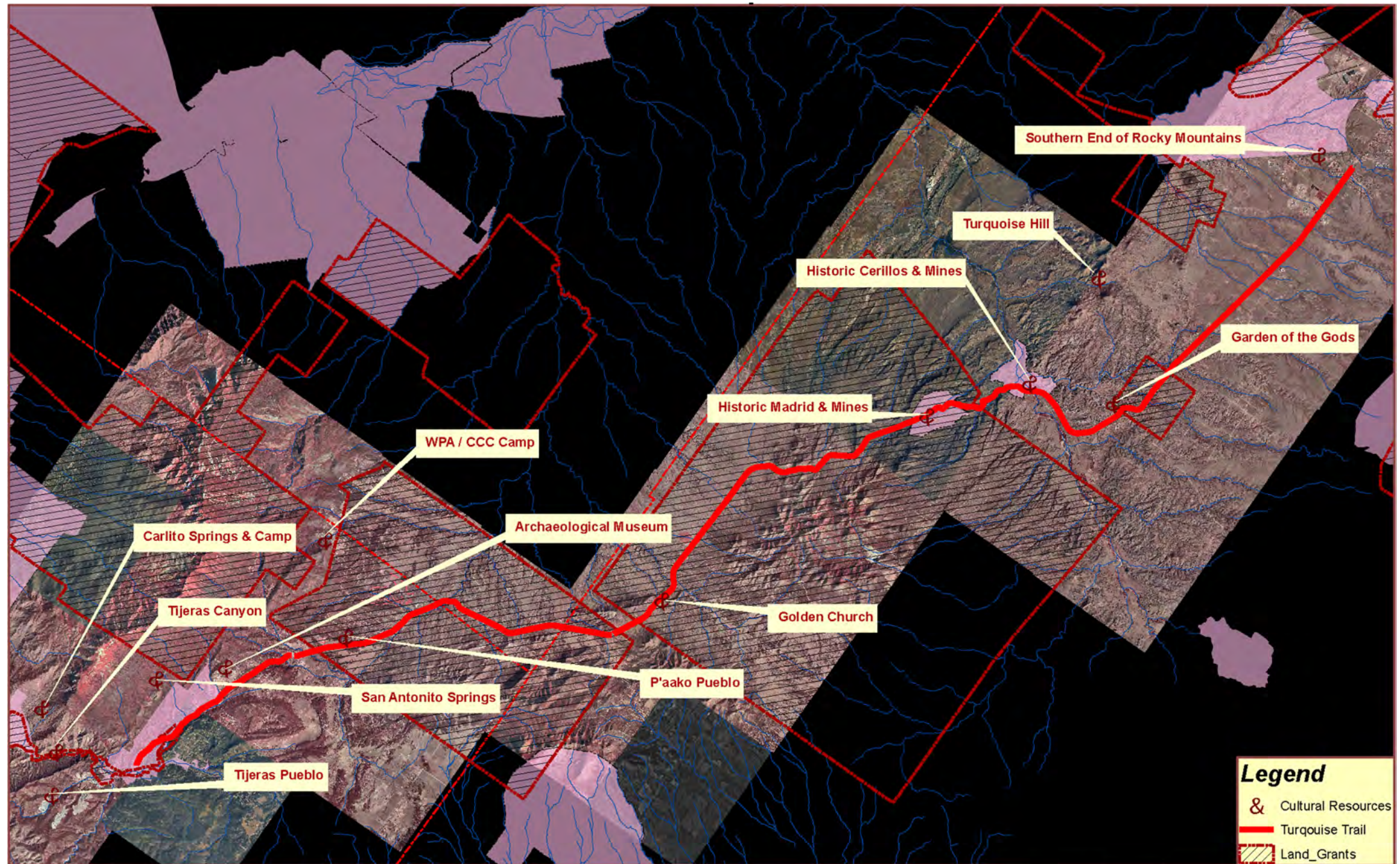
Conservation Zones Map



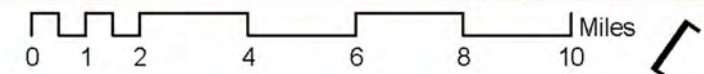
Historic and Cultural Resources

Several sites and areas of historic and cultural significance are shown on the map opposite.

Identifying these resources can inform the location of various types of visitor facilities, the development of an interpretive information in the corridor, and can provide the structure for the general narrative that expresses the character and identity of the byway.



Historic and Cultural Resources Map



Corridor Zones

Based on the preceding mapping process and on site visits, the Turquoise Trail can be seen as having four distinct character zones, and within these there are eighteen identifiable segments. In this analysis the zones and segments were given working names related to their particular conditions and character.

This process illustrates how the spaces within a corridor can be identified and understood both as having unique identity and as a part of the larger byway landscape. In identifying these zones and segments we can begin to articulate the conditions along the roadway that inform how design interventions and strategies could be applied in specific places.

The four primary zones, as seen on the map on the preceding page, are:

Cedar Crest

Jemez Views / Ortiz Mountains

Madrid Mines

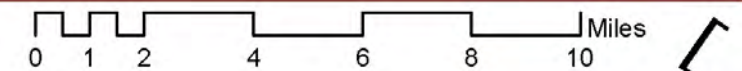
Institutional Grasslands

The map to the right shows the four major zones, and the segments.

The pages following identify and describe each segment.



Corridor Zones and Segments Map



Turquoise Trail Character Segments

Zone 1 Cedar Crest Character Area

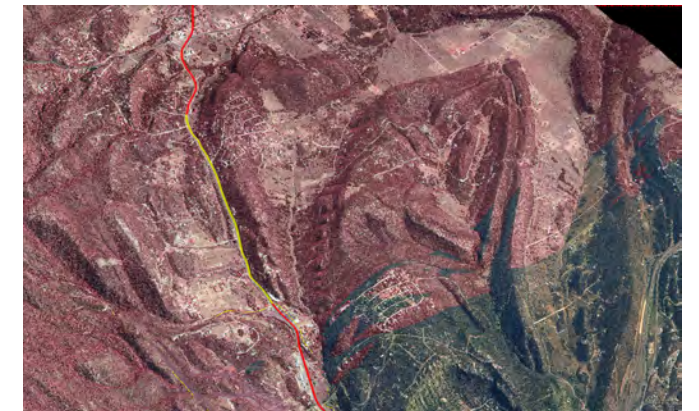
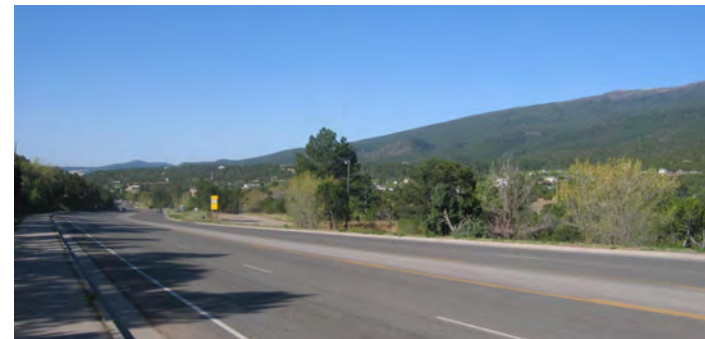
1. I-40 Gateway – This area encompasses the Interstate underpass that begins the driving experience along the Turquoise Trail. It is non-descript consisting of little vegetation/landscaping, concrete and steel. The intersection is busy with east, west, north and south traffic.



2. Cedar Crest Village – Along this segment light residential and commercial activity becomes apparent. Although the village does not have a distinct center the highway is lined with local shopping centers and the sense of rural living is clearly felt in the land zoning and architectural styles.



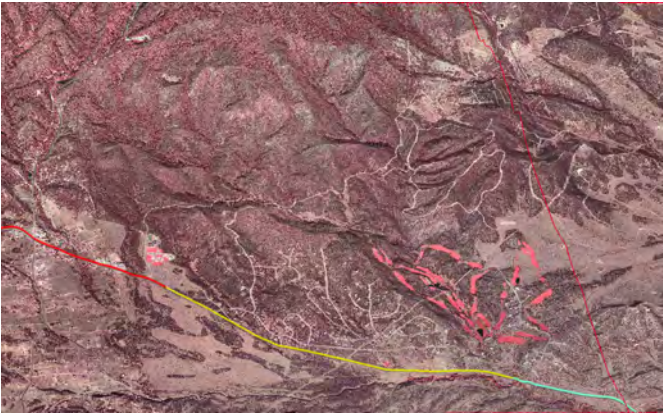
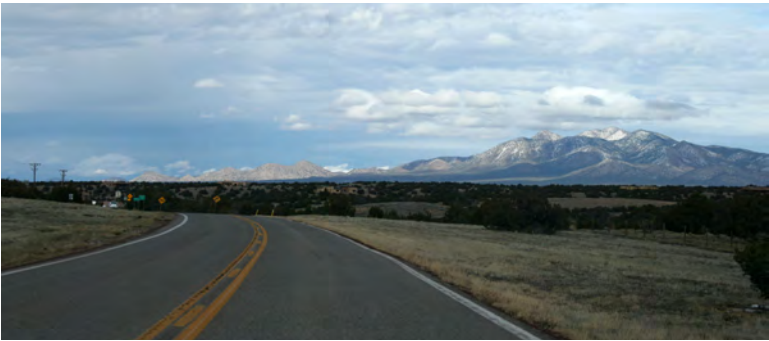
3. San Antonito – A small area with important archeological and historical significance to the evolution of the region.



4. Sandia Crest Gateway – This segment includes the road to the top of the Sandia Mountain Crest. The intersection where the turquoise trail divides is a large area with little character. This gateway is significant for recreational activities that lie along the divided route.



5. Paako – Relating to the pueblo that once occupied this stretch of the road it is now a newly constructed residential development and golf community. The housing lies within a private gated community and takes on the character of large lot subdivisions and is clearly visible from the trail.



Zone 2 Jemez Views and Ortiz Mountains Character Area

6. San Pedro Creek – A significant segment relating to the surrounding watersheds and wildlife. The creek passes beneath the highway and is significant for future conservation management.



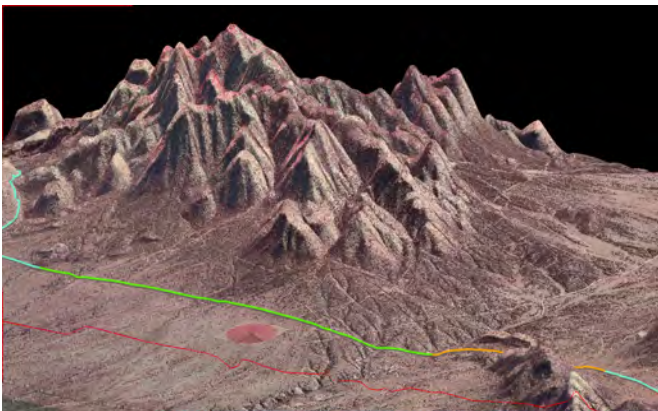
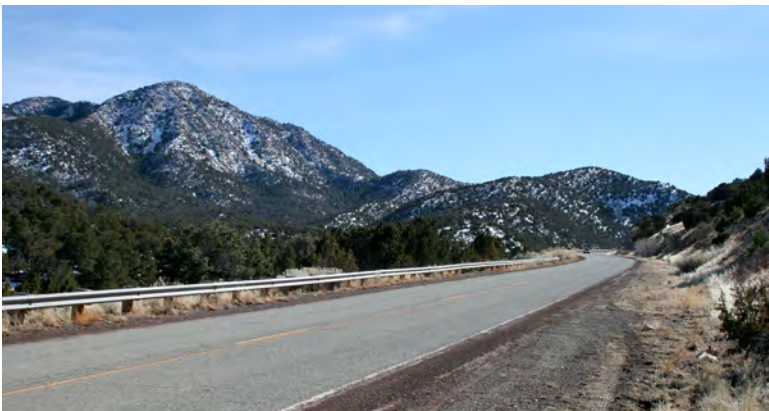
7. Jemez Views – An undeveloped stretch of roadway lined with private ranches visibly distinguished by signage and fencing. This area holds vast stretches of view sheds that bring the distant landscapes of the mountain ranges to the east and Cabazon Peak into the Turquoise Trail.



8. Golden – A quaint little village that appears almost like a ghost town. There are few houses and even less commercial activity. It is clearly marked by the historic church that lies within its boundaries.

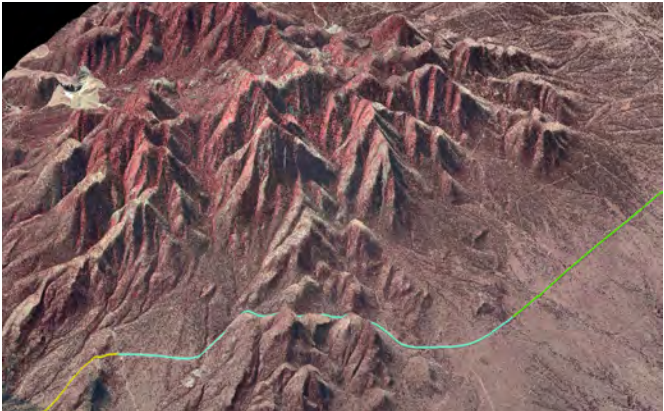


9. Ortiz Mountains – An area with the large and impressive mountains to the east of the roadway with plenty of natural undisturbed views. The rolling foothills give the road a distinct rolling terrain and experience.



Zone 3 Madrid Mines Character Area

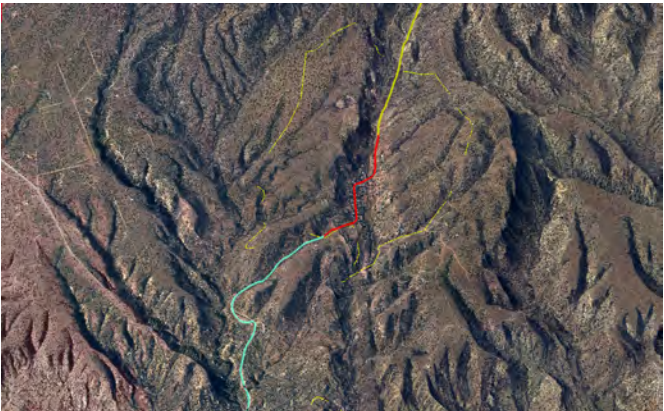
10. Madrid Gateway – This Segment begins at the apex of a hill and gently winds down into the town of Madrid. Santa Fe is visible in the distant along with the distinct remnants of the mining history of the area.



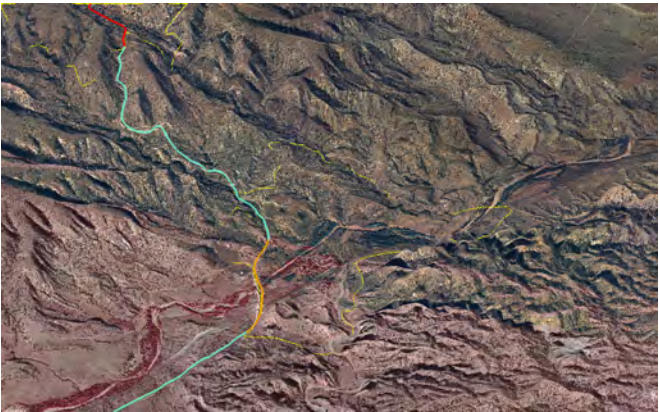
11. Madrid – A quirky town of art galleries, restaurants, and environmentally friendly residents. The Architecture encompasses adaptive re-use of former mining structures. The housing consists of simple wood structures and the roadway edges contain former WPA structures.



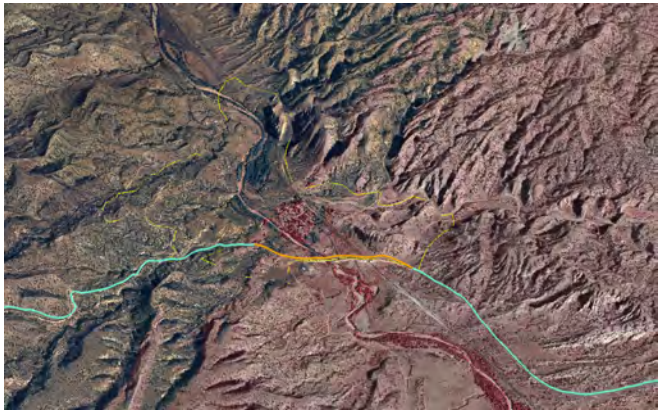
12. Madrid Canyon – A small stretch of the trail that offers rolling hills and natural views that mark the end of the Ortiz Mountain range.



13. Cerrillos Gateway – This is a 1-2 mile stretch that introduces the small and historic village of Cerrillos and the roadway to the village of Galisteo to the east. It is marked by signage and the church in Cerrillos is distinctly in view.



14. Garden of the Gods – This segment is geologically unique due to the striking rock formations that are a result of weathering sandstone in the area. There is some residential activity in the area.



**Zone 4 Institutional Grasslands
Character Area**

15. San Marcos – A geographically significant place. The great plains disolve to the east as the Sangre De Cristo foothills



become visible.

16. Grasslands – A stretch of valley between the Cerrillos Hills, Ortiz Mountains and the Sangre de Christo Mountains. Housing becomes more visible and denser and lies within a small grassland area. Santa Fe is clearly visible in the near distance.



17. Penitentiary – Clearly marked by the New Mexico State Penitentiary. Signage along the roadway advises against picking up hitchhikers. It offers vast views in all directions. Residential and commercial activity of Santa Fe becomes apparent along the drive.



18. Santa Fe Gateway – This gateway is clearly marked by the presence of Interstate 25 and is the first place that the urbanity of Santa Fe is experienced.



Relational Matrix of Corridor Segments

The matrix on the opposite page represents a device for collecting and representing information on the corridor segments including location, length of segment, physical character and experiential character.

The matrix of relational information becomes a ‘snapshot’ of the contextual conditions that comprise the byway landscape, and lays out the sequential journey along the corridor.

Name	Location	Length	ROW	Land Use	Physical	Experiential
I-40 Gateway	0-2.4	2	120	intersection, transportation infrastructure	juniper, ponderosa	I-40 Gateway – This area encompasses the Interstate underpass that begins the driving experience along the Turquoise Trail. It is non-descript consisting of little vegetation/landscaping, concrete and steel. The intersection is busy with east, west, north and south traffic.
Cedar Crest Village	2.4-3.5	1	120	urban/ light resedential/ low density commercial	pinon, juniper, ponderossa	Along this segment light residential and commercial activity becomes apparent. Although the village does not have a distinct center the highway is lined with local shopping centers and the sense of rural living is clearly felt in the land zoning and architectural styles
San Antonito	3.5-6.4	1.5	150	open space, ranching	pinion, juniper, riparian at creek intersection	A small area with important archeological and historical significance to the evolution of the region
Sandia Crest Gateway	6.4-7.5	1.5	150	resedential, open space	higher in elevation than surrounding terrain. ponderosa forest emerges	This segment includes the road to the top of the Sandia Mountain Crest. The intersection where the turquoise trail divides is a large area with little character. This gateway is significant for recreational activities that lie along the divided route.
Paako	7.5-9.3	3	210	new development, low density resedntial on west side of road	pinion juniper on slopes, sage and grasslands in flatter location	Ortiz Mts now visible, Sangre De Cristo visible in distance
San Pedro Creek	9.3-14	3	210	rural	pinion juniper on slopes, sage and grasslands in flatter location. Riparian at creek intersection	Relating to the pueblo that once occupied this stretch of the road it is now a newly constructed residential development and golf community. The housing lies within a private gated community and takes on the character of large lot subdivisions and is clearly visible form the trail.
Jemez Views	14-17	4.5	150	rural	pinion juniper, valley	An undeveloped stretch of roadway lined with private ranches visibly distinguished by signage and fencing. This area holds vast stretches of view sheds that bring the distant landscapes of the mountain ranges to the east and Cabazon Peak into the Turquoise Trail.
Golden	17-17.6	2	120	low density res. /light commercial	Adobe arch. remnants of mining	A quaint little village that appears almost like a ghost town. There are few houses and even less commercial activity. It is clearly marked by the historic church that lies within its boundaries
Ortiz Mountains	17.4-23.7	3.5	150	rural	Rising terrain to east. Pinion Juniper Extensive view to west	An area with the large and impressive mountains to the east of the roadway with plenty of natural undisturbed views. The rolling foothills give the road a distinct rolling terrain and experience
Madrid Gateway	23.7-29.3	5	150	rural, mining	Declining terrain Madrid becomes visible	This Segment begins at the apex of a hill and gently winds down into the town of Madrid. Santa Fe is visible in the distant along with the distinct remnants of the mining history of the area.
Madrid	29-31	1.2	40	resedential, commerical	Valley floor, Pinion Juniper in surrounding hills	A quirky town of art galleries, restaurants, and environmentally friendly residents. The Architecture encompasses adaptive re-use of former mining structures. The housing consists of simple wood structures and the roadway edges contain former WPA structures.
Madrid Canyon	31-36	4	60	Rural	Winding canyon terrain.	A small stretch of the trail that offers rolling hills and natural views that mark the end of the Ortiz Mountain range
Cerillos Gateway	35-43	.5	90	resedential, commerical to the west. ranchland to the east	Intersection of Highway 14 and Galiesteo creek. Riparian environment at intersection	This is a 1-2 mile stretch that introduces the small and historic village of Cerrillos and the roadway to the village of Galisteo to the east. It is marked by signage and the church in Cerrillos is distinctly in view.
Garden of the Gods	35	3	120	rural, some lresidential	Badlands, sand stone formations	This segment is geologically unique due to the striking rock formations that are a result of weathering sandstone in the area. There is some residential activity in the area
San Marcos	35-43	3.3	150	ranchland	Great Plains meet the Rocky Mountains here High Plains grassland	A geographically significant place. The great plains disolve to the east as the Sangre De Cristo foothills become visible.
Grasslands / Penitentury	43-51	6.5	150	ranchland, state penetitiary	High Plains grassland	Clearly marked by the New Mexico State Penitentiary. Signage along the roadway advises against picking up hitchhikers. It offers vast views in all directions. Residential and commercial activity of Santa Fe becomes apparent along the drive.
Sante Fe Gateway	51-52	1	varied	residential on peripehery of Highway 14 and 1-25	grasslands	Undefined entry

Corridor Design Opportunities

The following sections discuss two categories of roadway design intervention:

Places of Opportunity and
Materials and Design Elements

Places of Opportunity

Gateways
Intersections
Visitor Facilities

Materials and Design Elements

Materials
Signage
Lighting
Vegetation
Multi Modal Movement
Alignment
Infrastructure
Highway Art

The components that make up these two categories can be seen as common to all scenic byway corridors. The application of specific design strategies with respect to these components must be carried out in light of the contextual character of the byway, as revealed in the audit of the previous section .

Therefore, the first part of this study, the audit, established the context, and the second part, design opportunities, shows examples of how design interventions could be applied in a context sensitive manner.

The examples in the following sections will sometimes use the Turquoise Trail to illustrate a design application, but a variety of contextual conditions and responses are also shown as examples of how strategies can be adapted to a variety of different landscapes.

Gateways

Gateways are place-making devices that mark strategic points of entry, exit or transition.

As key points of arrival, gateways can signal a change in a corridor, establish identity and convey pride of place. While a gateway is often thought of as a specific structure that one passes through and/or under, a gateway may also be a longer zone in which a number of design elements communicate a transition from one area to another.

Gateway markers and gateway zones can be developed using planting lighting, signs, art, structures or a combination of these. The nature of a given transition constitutes the context of the gateway and will inform decisions regarding scale, materials and form. It is important to state that gateways need not always be grand gestures. They may be subtle cues in a roadway landscape that signify some level of change in the journey.

Gateways along a scenic byway may be applied in a number of possible conditions. These include the entry points to the designated scenic corridor, entries into towns or villages, and entries to larger sites of special significance.

Each gateway is unique and must be considered with respect to the particular conditions in which it is being considered. A rubber stamp of the same gateway design in every case would not embrace the idea of context. At the same time, the scenic byway corridor should present an overall identity, and the gateways can serve to reinforce this. While these two statements may sound contradictory, it is possible to design each gateway differently while still incorporating iconic and strategic elements that begin to suggest a familial relationship in the designs. This may be achieved in a number of ways, including the use of materials characteristic of the region, variations on a particular form, rhythms and spacing of elements within a zone or plant types.

The use of vegetation is an effective way to create gateways. Different types of vegetation, suitable to the landscape zone and the corridor context, can be planted in different patterns to generate a variety of gateway conditions.

Fig. 1 shows regularly spaced rows of trees on both sides of the roadway creating a gateway zone that produces a transition from one type of environment to another. This is an effective way to create a gateway into a town or village.

In Fig. 2 we see a row of trees on one side of the roadway, balanced with another element, in this case fence posts, on the other side, to create a gateway zone.

Fig. 3 illustrates how irregular plantings, in this case a grove of trees, can also serve as a marker that indicates some form of change

A gateway may also be designed as an 'event', or a specific point of passage. In some cases existing elements, such as a highway overpass or a bridge may be used as a gateway structure. When this is done the design strategy should be to enhance the structure such that it is perceived primarily as a gateway, or point of entry, rather than primarily as highway infrastructure.

For example, Fig. 4 illustrates an opportunity for a gateway that has not been taken advantage of. The structural form of the underpass seems to suggest an ideal gateway form, and needs to be accentuated with a design overlay to reinforce the gateway idea.



Fig. 1 Alleé of trees as a gateway zone (Flickr)



Fig. 2 Trees and fence posts as a gateway zone (Flickr)

Fig. 5, on the other hand, illustrates how the application of paint on an underpass attempts to transform it into a gateway. The results are somewhat grim. In this case the sloping landscape on the approaches to the underpass need to be incorporated into the design.

In some cases, usually at the entrance to towns, specific gateway structures are built. Great care should be taken when designing such structures, because they run the risk of dominating the environment as artifacts and losing their meaning as gateways. When placing such structures it is important that the landscape truly undergoes a change from one side to the other, otherwise the whole idea of a gateway becomes unimportant.

Public art is another element that can serve as an gateway marker. These pieces will normally be sculptural in nature, and their scale and placement within the landscape will have a bearing on their effectiveness as a gateway. Natural or built features within the landscape can be important contextual conditions for siting a piece of art. Placed too far from the roadway the piece won't be perceived as a gateway. In some cases, particularly at the entry to a town, a change of road condition that incorporates a traffic circle, with an art piece in the center, can serve as a notable gateway. Art installations offer the opportunity to give strong expression to the announcement of a place, can have elements of seriousness and fun, and can symbolize important aspects of place along the corridor.



Fig. 3 Grove of trees as a gateway marker (Flickr)



Fig. 4 A potential gateway condition (Flickr)

Figs. 6,7 and 8 illustrate examples of common gateway designs where the transition is marked by passing under an artifact/structure. Some form of arch and sign is quite common. In fig. 8 the mid century design places the gateway at a specific time and like many artifacts of this era the form has become iconic and somewhat of a nostalgic curiosity.

Gateways such as those seen on these three examples can be very easily absorbed by the landscape, particularly when a chaotic assembly of other elements enter the picture such as in fig. 9, and can lose their impact as gateways.

Fig.9 and 10 illustrate how works of public art can serve as gateway markers. In fig. 10 the piece is placed in an open landscape, and is of a scale that is difficult to ignore. In fig. 11 the piece is also of notable scale and in this case is placed in a median/ road divider. Such placement could also be in the center island of a traffic circle. This makes the element a very effective gateway marker.



Fig. 5 An attempt at creating a gateway (Flickr)



Fig. 6 Common arch-style gateway (Flickr)



Fig. 7 This mid-century design dates the gateway, but it is iconic (Flickr)



Fig. 8 A poorly placed gateway within visual clutter



Fig. 9 Roadside art at a large scale as a gateway marker (Flickr)



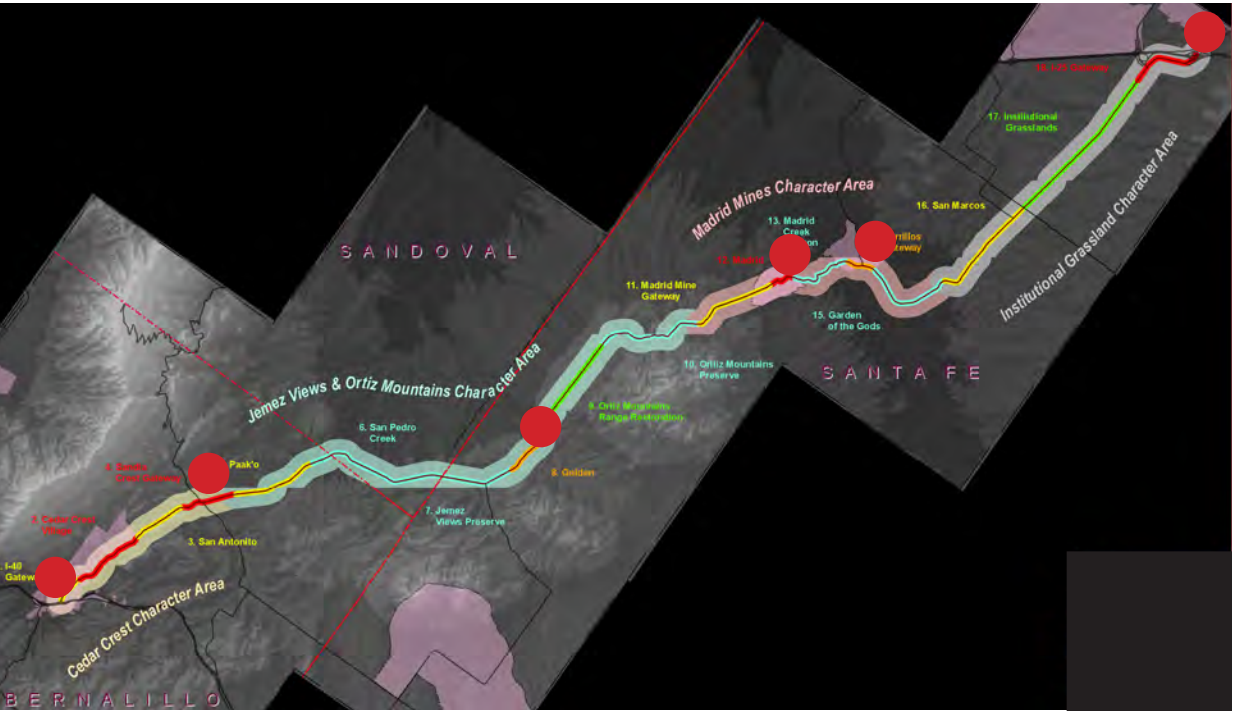
Fig. 10 Art work placed within a median or traffic circle (Flickr)

Gateway Opportunities on the Turquoise Trail

Based on the Turquoise Trail corridor audit, suggested gateway locations along the scenic byway as shown on the map below, are:

- the two ends of the corridor, I-40 and I-25
- at the entry road to the Sandia Crest
- the north and south entries to Golden
- the north and south entries to Madrid
- at the entry road to Cerrillos

The following pages illustrate how these gateway opportunities on the Turquoise Trail might be expressed as gateway configurations.



Map of Gateway Opportunities

The I-40 Gateway at Tijeras

Although the Turquoise trail road officially starts before the I-40 underpass, the optimum place to locate the formal gateway would be at the underpass. This is a point of common access to the corridor.

Passing under I-40 is, in itself, a gateway experience. The suggestion here is to use and enhance the inherent elements of the overpass structure, including the embankments on either side of the overpass and the surfaces of the structure, to develop the entry.



I-40 gateway at Tijeras

The Sandia Crest Gateway

The intersection at the entry to the Sandia recreation area is probably the busiest intersection along the Turquoise Trail. It is also a natural location for a gateway to Sandia Crest. The suggestion below incorporates a roundabout at the intersection. The center area of the roundabout provides an opportunity for a gateway marker, and the roundabout itself resolves some confusing traffic and turning issues.



Sandia Crest gateway

Golden Gateways

At present, the only entry signifiers on the approach to Golden are reduce speed signs. These are easily missed and don't adequately announce the arrival to this small but historically important village. In this case it might be appropriate to create a gateway zone.



Golden gateways

Madrid Gateways

The historic nature of Madrid, and its transformation into a art center has made it a very popular destination. Elements of the existing cultural landscape at the south of the town already comprise an effective transitional gateway, and one would want to be careful not to overwhelm or disturb this rich character zone. The entry on the north side is more abrupt, and more intervention to create a transitional gateway would be beneficial.



Madrid gateways

Cerrillos Gateway

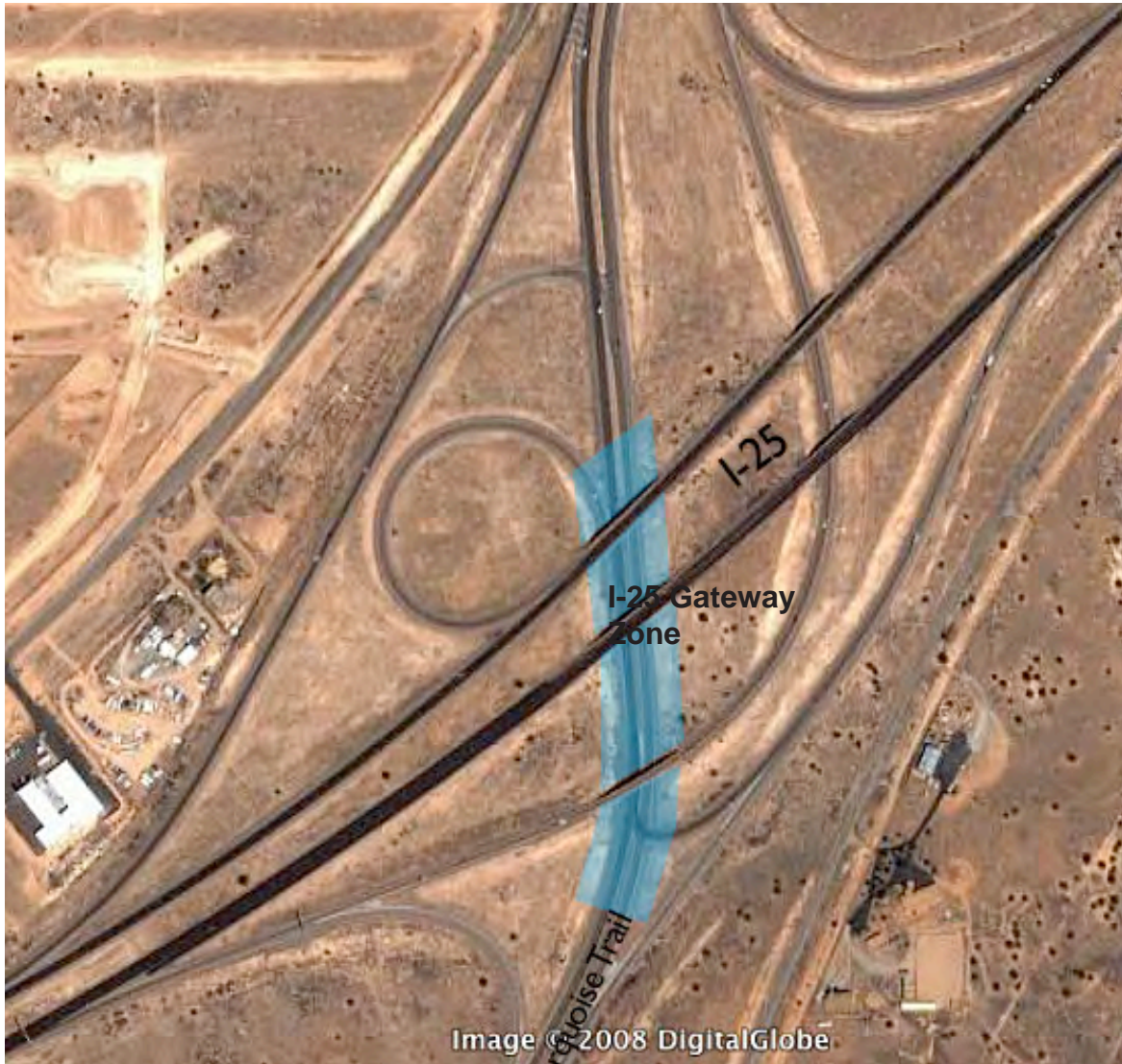
The intersection at the turn-off to Cerrillos, and the entry to the town currently lacks definition. The character of the road and of Cerrillos suggests that any gateway intervention should be modest. The blue shaded area below indicates the possible location and extent of a gateway.



Cerillos gateway

The I-25 Gateway at Santa Fe

The Turquoise Trail is an extension of Cerillos Road in Santa Fe, but the passage under I-25 seems to mark the experiential entry on to the Trail. The zones just to the north and south of the interstate is a possible gateway zone, and the overpass structure itself could be incorporated as a part of the gateway event.



I-25 gateway at Santa Fe

Intersections

Intersections can be defined as any point along the scenic byway where one or more paths or flows meet or pass across the byway. These may be paths, roadways, rivers and streams, major drainage arroyos, or even designated wildlife corridors. Intersections mark places along the byway that enhance and add to the overall experience of driving the trail. At intersections decisions may be made to continue driving along the trail, to turn off to go to another part of New Mexico or stop and participate in the local landscape, recreations, or activities along the byway. An intersection may also be a point of punctuation, such as where a stream might cross, where travellers can begin to understand the wider context of the corridor.

The scales of intersections will vary, and are normally indicators of the type and level of traffic or other cross-flow, and the density of activity that may occur at the intersection. These factors need to be considered in the design and degree of intervention at an Intersection.

Intersections at smaller rural roads will not have the same degree of infrastructure and signage as larger intersections that mark major arterial roadways. Natural intersections such as rivers or wildlife corridors may require very little infrastructure so as not to disturb the natural landscapes that rivers and wildlife require to continue their paths.

In addition changes in pavement materials or planting along the byway edge can mark can signal upcoming changes in traffic speeds and events along the road.

Intersections can be classified as follows:

- A natural intersection where an arroyo, river, wildlife corridor or geologic feature may intersect.
- A constructed intersection where a bridge or underpass intersects the byway (Fig 1).
- A recreational intersection where a bicycle, horse, pedestrian or recreational vehicle



Fig. 1 Bridging over a natural intersection. (Sites Southwest Ltd.)

may cross the byway.

- A level crossing intersection where a road such as an entrance to a community or village along the trail intersects the corridor.

There are examples of where accommodations are made for wildlife to safely cross the roadway corridor (Fig 2). Typically, these intersections are marked by a bridge, culvert and/or control fencing. One example of such a project is the Edgewood to Mountain Valley wildlife crossing, developed by NMDOT.

In general, intersections should be designed:

- to accommodate safely the flow and density of activities occurring at the crossing point
- to be in keeping with the character of a particular segment of the corridor.

Intersections in more built up areas will be more complicated and developed differently than intersections in natural and rural areas.

Examples of major intersection locations on the Turquoise Trail are:

- I-40 Intersection at the southern gateway
- I-25 intersection at the northern gateway
- The Sandia Crest roadway
- The San Pedro creek river and wildlife corridor
- The Galisteo intersection
- The Cerrillos Village intersection



Fig. 2 Drawing of a wildlife underpass (Sites Southwest Ltd.)

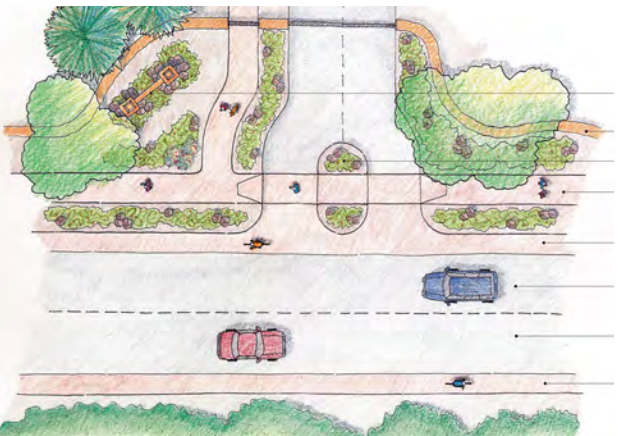


Fig. 3 This drawing is a concept design for both a recreational and a residential intersection for the Santa Fe Scenic Byway.

Two intersections along the Turquoise Trail are discussed below, with suggestions made for potential context sensitive design applications.

The Sandia Crest road entry is a major intersection that is utilized year round for both residential access and recreational activity. The intersection is very large, creating traffic confusion at higher speeds. The character of the intersection is bland with little warning or signification of an important turn-off onto a segment of the Turquoise Trail leading to the Sandia Crest. Lighting is sufficient but lacks the character of a rural residential and commercial zone. Corridor edges in the intersection zone are basic and potentially substandard with regards to safety and character. The potential for different types of mobility are not addressed.



Fig. 4 .Sandis Crest intersection

One suggestion to enhance and articulate this important intersection is to construct a roundabout to slow traffic to safer speeds. The center of the roundabout would act as a possible gateway to the recreational activities provided along the Sandia Crest road. Additionally, signage lacks the character of the history and culture along the trail and could benefit from a re-design appropriate to the intrinsic qualities outlined in the signage section of this document. Lighting should be addressed with concerns for safety, considerations for nearby residential communities that lie in close proximity to the intersection and should be consistent with the character of the trail. Roadway edges are institutional in appearance and feeling and could be improved with the use of local materials. Finally, rights of way for different modes of transportation such as bicycle, equestrian, and pedestrian lanes should be added or enhanced to allow for cars and others to mingle safely.

San Pedro Creek is a natural intersection; it is a subtle intersection along the trail but significant for wildlife and watershed conservation. The overpass is sufficient but could benefit form guardrails utilizing local materials to fit with the character of the trail. A recommendation in this situation subtle, yet informative, signage be added to notify the traveler that an important conservation zone is being passed through. In addition a small pullout may be required if future recreational activities are enhanced. The landscape along this section should not be changed as it would disrupt the natural riparian vegetation currently growing and could potentially disrupt the natural flow of the creek and wildlife that are dependent upon its habitats.



Fig. 5 .San Pedro Creek intersection

Visitor Facilities

Any place that a visitor would stop along a scenic byway could be considered a visitor facility.

In general, types of visitor facilities include:

- 1. Visitor centers
- 2. Overlooks and views
- 3. Interpretive features
- 4. Trailheads
- 5. Rest areas

Some visitor opportunities will be connected with private commercial enterprises but many will be public facilities and might be combined with other built features such as gateways and intersections.



Fig. 1 A scenic road worthy of public notice (Photograph by authors)

Rest areas will not be necessary on shorter scenic byways or areas with several towns and villages along the route. The type and number of visitor facilities will depend on the length of the corridor, the points of interest that merit a pull off from the road, and the space available for amenities and parking.

A corridor audit of scenic byway (or the road to be considered as a scenic byway) will suggest the types of visitor facilities that should be included. These may be stops at magnificent views, stops for geological, vegetative and cultural interpretation, recreational stops such as trailheads, fishing and rock climbing opportunities, and stops for natural and historic interpretation. Communities within the corridor become part of the byway, and if the road is long enough and relatively unpopulated, there may be rest stops. A visitor center may be located at either end of the corridor if the area is large enough to warrant the cost.

Any visitor facility will probably involve issues of road alignment (for safety in pulling on and off the corridor), parking (for cars, bikes and possibly for hitching horses), vegetation (as

a decorative, didactic or buffering element), information and signage, and parking. Other amenities may include shelter for picnics or interpretive displays, seating, walls, guardrails or other safety structures, paving, lighting, dog walking areas, and trash recycling and disposal.

Functional requirements and layouts for various visitor facilities have been studied and documented in various publications prepared by a number of different agencies whose mandate includes visitor sites (eg. the National Parks Service). These may serve as guidelines in designing facilities, but it is important to stress the point that every scenic byway has its own identity and character, and visitor facilities should be designed to reflect and reinforce these.

Visitor Centers

A visitor center can be a major piece of infrastructure with staff, amenities, a visitor's shop and a museum and information center, or a simple kiosk with a map and brochures. The length and area of the scenic byway will determine the type of building, as will the available budget, and the available land.

Any visitor center will need parking, and the structure itself will set the design approach to the byway. Signage and lighting will signal the presence of the byway day and night, and will be especially effective if the visitor center is located near an entrance to the road, and can be seen from a major highway.

The visitor center is an opportunity to concentrate the essence of the region for the visitor and encourage a broader and deeper understanding of the area. Visitors can be encouraged to travel more slowly and to linger. This can bring economic benefits and, a greater awareness of



Fig. 2 Zion National Park (www.nrel.gov)

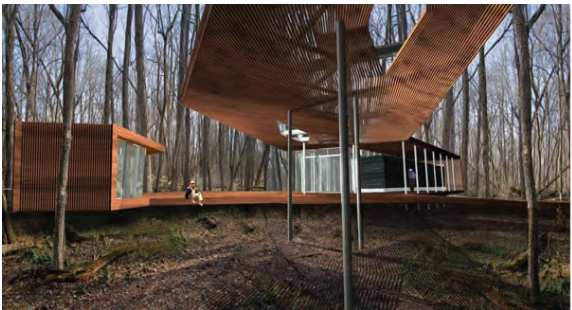


Fig. 3 A modern visitor facility design (ae.ibj.com)

regional identity, and a deeper connection to the land and its communities.

Other suggestions:

- a staffed building with maps or
- unstaffed sun shelter and picnic tables
- use of solar and other sustainable strategies wherever possible



Fig. 4 Seating at a scenic outlook. (www.so-utah.com)

Overlooks and Views

A beautiful view deserves contemplation. Providing a marker sign, a way to pull off the road, and a place to park are the minimum requirements. Additional amenities would be interpretive signage, protection from any abrupt drop-off, (a seating wall for example) and planting of regional vegetation. If the area is large enough, picnic facilities and trash containers would be appropriate.

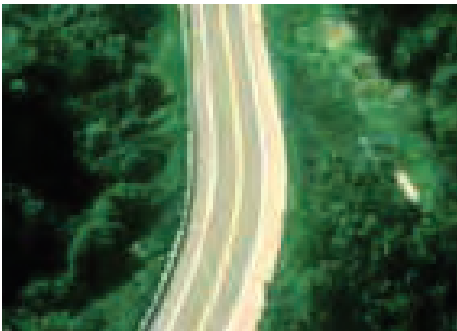


Fig. 5 An example of a pullout on a steep slope. Note the planting buffer (static.howstuffworks)

Interpretive Features

Interesting roadside areas are as worthy of examination as long scenic views. As with other attractions, safe exit and entrance to the road are required, as well as a place to park. In order to understand the feature, interpretive signage is necessary, and if possible a short loop hike can bring the viewer up close.

Trailheads

Like any other amenity, the visitor must be aware of the presence of a trail in order to use it.



Fig. 6 This exhibition area allows visitors to enjoy the scenery while learning about it.(www.nrel.gov)

A trailhead along a scenic byway will need the appropriate signage and parking for visitors. In addition, it may provide a shelter with information, interpretive information for animals, vegetation, geology, and planting to buffer it from the road.

Information at trailheads may include maps, distances, levels of difficulty descriptions of features to be found along the trail, general information on geology, ecology, vegetation etc., and hazard warnings.



Fig. 7 Garden of the Gods trailhead area, on the Turquoise Trail (Photo by authors)



Fig. 8 A seating wall acts as a safety edge rail (www.tlausser.com)



Fig. 9 Local materials and strong design (Flickr)

Resources:

There has been a good deal of study on the design requirements for visitor facilities. Detailed information on visitor facilities can be found in the resources below.

<http://www.bywaysresourcecenter.org/>

<http://www.bywaysresourcecenter.org/resources/publications/vistas/>

<http://www.nps.gov/hfc/products/waysides/contents.htm>

<http://www.fs.fed.us/r2/cdi/>

<http://corpslakes.usace.army.mil/employees/related.cfm?Id=interpretive>

http://www.clui.org/clui_4_1/index.html

Whole Building Design Guide:

http://www.wbdg.org/tools/tools_cat.php?c=1

<http://www.wbdg.org/design/aesthetics.php>

Forest Service visitor center examples:

http://www.fs.fed.us/r2/cdi/portfolio/facilities_plan_design/vistr_rec_facilities/index.shtml

Zion visitor center:

<http://www.google.com/search?hl=en&q=visitor+center+building+design&start=30&sa=N>

Denali visitor center:

<http://www.treehugger.com/files/2008/11/eielson-denali-national-park-green-visitors-center.php>

http://www1.eere.energy.gov/femp/newsevents/fempfocus_article.cfm/news_id=7462

Sample floor plans:

<http://www.google.com/search?hl=en&q=visitor+center+floor+plan&btnG=Search>

www.fs.fed.us/r2/cdi/portfolio/interpretive_products/exhibit_plan/pdfs/white_mtn_progression.pdf

www.dupageforest.com/updates/lymanwoods.pdf

Publications:

Interpretative Centers: The History, Design and Development of Nature and Visitor Centers

Michael Gross and Ron Zimmerman, University of Wisconsin-Stevens Point Foundation Press, 2002

An examination of the forms, techniques, and architectures of these increasingly common, single purpose, and sometimes sophisticated structures. Visitor Centers are so often considered with postmodern irony in that much of their richness and artistry is missed. This book of mostly captioned photographs is written for the interpretive trade, and is meant to stimulate and encourage better design by highlighting a few dozen of the best recent work in the field, such as the Head-Smashed-In Buffalo Jump interpretive center in Alberta, Canada.

Materials

The materials used in the development of a scenic byway will be very important in helping to maintain the character and quality of the road. In general, it is important to find a balance between, on the one side, achieving a level of consistency in the use of materials, and, on the other side, having everything look the same. The materials employed in the interventions along the roadway should reflect the same diversity as the landscape through which it passes. Materials are not only important in obvious structures such as buildings or walls, but are an equally important consideration in the construction of infrastructure elements, such as drainage ways, barriers and lighting.

In Fig. 1 the use of corten steel in this location on the Turquoise Trail gracefully and subtly frames the extensive views on the route. The rusted finish of the corten blends successfully with the landscape. Where care has been paid to infrastructure the aesthetic experience of the route is enhanced.



Fig. 1 corten steel barrier Phil Rottman

Fig. 2 is indicative of the majority of drainage patterns along the road - Base course loosely scattered in a trench serves for drainage purposes and feels like an extension of the high desert landscape. Drainage within the right of way should be multifunctional with greater use of crushed stone and filtering swales.



Fig. 2 Drainage swale of loose base course Phil Rottman

The variety of topographical conditions along the roadway may necessitate the use of a different of materials to control water flows. The low impact method in Fig. 3, an erosion control mat, will allow vegetation to reestablish itself along the trail and the material surface will change over time.



Fig. 3 Erosion control mat Phil Rottman

Most buildings along the highway 14 corridor have a stucco finish, very characteristic of New Mexico architectural surfaces. Older buildings will be constructed of real adobe block, while newer buildings will be either concrete block or wood frame with stucco finish. A survey of existing building types and styles provides a clue for the use of materials in new buildings proposed along a scenic byway.



Fig. 4 Typical architectural style with stucco finish Phil Rottman

Along highway 14, the town of Madrid is an exception in terms of materials, where most of the buildings are wood frame with clapboard siding. This vibrant arts community has many shops and galleries, and the buildings are painted bright colors. While this is a break from the look along the rest of the corridor, it is successful and richly ties the town to its colorful mining roots. This demonstrates that not everything needs to be the same, particularly when there is a local contextual condition that suggests a unique use of materials.



Fig. 5 The Town of Madrid Phil Rottman

Stone is used extensively along the Turquoise Trail corridor, and has found its way into the local architectural vernacular, particularly as walls. Some of the walls and other stone work are the legacy of the WPA program of the 1930's. Stone is available in most regions of New Mexico and where it is evident in the landscape, it is a good material to integrate into landscape structures.



Fig. 6 Stone walls near Madrid Phil Rottman

Stone can be used very effectively in wall and other structures with the use of gabions. Figs. 7 + 8). These are wire baskets filled with stone or rock of various sizes. The gabions are easily stacked and can be used for a large variety of structural and aesthetic needs along the roadway.



Fig. 7 A large gabion wall creating a buffer and an edge Phil Rottman



Fig. 8 A water structure constructed with gabions

Bridges on the roadway and on pedestrian paths over arroyos and drainways made with regionally available materials enhance the scenic quality of a byway and reinforce the sense of place that makes the scenic corridor special.



Fig. 9 A a simple stone bridge

Materials used at visitor facilities can help to reinforce the character of the roadway.



Fig. 10 Stone steps / pathway art at a visitor facility

Signage

Signage is a key component for communicating with visitors at a Scenic Byway. It provides for wayfinding, orientation, education, information and alerts. It should be clear, legible, well placed and attractive. If not properly designed and managed, signage can clutter a roadway, obstructing views and degrading a sense of place. Alternatively, well designed signage can add to the visual quality of a roadway and can inform motorists of regional identity.

The signage will fall into a number of categories, including identification (place); informational (orientation/wayfinding, recreational, educational, hazard); location (amenities); community/ commercial; and traffic control (vehicular, bicycle, equestrian, pedestrian). Signage may also be part of gateways, intersections and visitor amenities and will occur both regularly along the byway and at point locations.

The design of state and federal signage is predetermined, but recommendations for the design of other types of signage may be made, and their placement and organization can be made to enhance (or at least remain neutral) rather than detract from the qualities of the scenic byway.



Fig. 1 Local materials and construction (www.JacksonHoleWyoming.com)



Fig. 2 (www.rockymountainroads.com)



Fig. 3 (Flickr)

Signage can be used to make the experience of the scenic byway much richer and interactive. It can create reasons to pause, allowing the place to be encountered with all the senses.

General Guidelines

There are a number of different uses for signs, and design approaches that can be used, as seen in the examples on the following pages. There are also some basic principles for effective design that should be acknowledged:

Legibility A sign needs to convey information clearly. The type of font and the size are important. It is also important to understand whether a sign needs to be read from a moving vehicle, or on foot, and how close the reader will typically be from the sign.

Position The angle of the sign to the viewers and the height at which the sign is set will not only affect legibility, but affects the degree to which the sign competes with other elements of the road.

Graphic quality Appropriate imagery, color and composition will be factors that influence the way in which the sign fits into the roadway landscape.

Consistency Different signs will be for different

things, and there will be a variety in the expression of information. Without making everything look the same, there should be a level of consistency developed along the corridor. This can be achieved, in different sign types, through the use of images, materials positioning and fonts.

Materials Materials can have some variation along the byway, but should generally reflect the materials found in the landscape of the corridor.

Structures Signs of different types and sizes will be mounted in different ways. The mounting structure itself may be a part of the expression of the byway character and should be carefully considered.

Overdoing Signs can take over and become more visually apparent than the place that they are trying to announce. Restraint in design, while achieving the above goals, is important.



Fig. 4 (www.metal-art-online.com)

Amenity Signage

One form of informational signage allows visitors to locate amenities.

It benefits from standardization, as these information symbols become easy to spot and read.

Simple graphics allow information to be processed at vehicular speeds, and are not language dependent to convey meaning (Fig. 5).



Fig. 5 Standardized amenity signs (Flickr)

Hazard Signage

Warning signs indicate hazardous conditions along trails or abrupt drop-offs (Fig. 6).

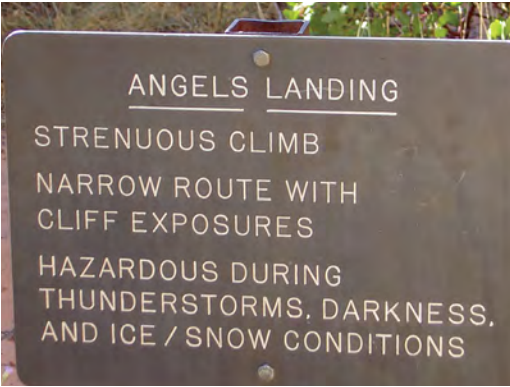


Fig. 6 Hazard (americanhikingadventures.com)

Interpretation Signage

Many people enjoy learning about the landscape and people along a scenic byway. Interpretive signage has become very popular in areas that attract travelers. Interpretive narratives can be everything from simple roadside elements to major exhibits at visitor centers. There are many ways of designing and presenting interpretive narratives. In all cases, it is important to consider that the design and method of presentation is a part of the story, and needs to be consistent with the type of information, the place and the setting in which the interpretive narrative is located (Figs. 7-9).



Fig. 7 Sequential signs at visitor center (Flickr)

Commercial Signage

The contribution of private commercial business to the character of an area can be substantial (Figs 10-12). While it is difficult to control the quality of privately installed signs, it may be possible to develop design guidelines for a scenic byway that are agreed on by landowners along the byway, and that become codified as a part of roadway aesthetic standards.



Fig. 10 (www.dontdrinkbees.com)



Fig. 8 Interpretive signage using photography (Flickr)



Fig. 11 (www.the-white-dog-inn.co.uk)



Fig. 9 Metal plaque set directly into native rock (www.rockymountainroads.com)



Fig. 12 (Flickr)

Identification Signage

A very important type of signage is the type that alerts visitors to the presence of the scenic byway, and that guides them to it and through it. Identification of the byway at entrance gateways offers the opportunity to use local materials and methods in larger, welcoming signs.

Signs having a clearly readable image mark the length of the byway, and the graphic image may be used as a logo (Fig. 13). The design of the sign structure, and the materials used, are opportunities to reinforce the character of a byway (Figs. 16-18). Signs mounted on posts are the most common, however direct marking on the road can also be effective (Figs. 14-15).



Fig. 14 Post type signage (Flickr)

Location signs are also used to identify towns and communities, specific views and features within the scenic byway area. This is also an opportunity to create a unique place identity through graphics, materials, and color (Figs. 9-15).



Fig. 13 Wayfinding along the highway (Flickr)



Fig. 15 Logo type sign painted on pavement (Flickr)



Fig. 16 Local materials (www.povn.com)



Fig. 17 Sign carved in local stone (www.schoodicbyway.org)

Banner Signage

In communities, overhead banners can be used to announce place names, special events, and to display artwork (Figs. 19-20).



Fig. 18 Local building techniques and materials give a regional flavor (bp1.blogger.com)



Fig. 19 (Flickr)



Fig. 20 (beautivacation.osceola.org)

Traffic Control

Road signage needs to be unambiguous and systematic. For example, traffic control:
“To be effective, a traffic control device should meet five basic requirements:

- A. Fulfill a need;
- B. Command attention;
- C. Convey a clear, simple meaning;
- D. Command respect from road users; and
- E. Give adequate time for proper response.

Design, placement, operation, maintenance, and uniformity are aspects that should be carefully considered in order to maximize the ability of a traffic control device to meet the five requirements listed....
Vehicle speed should be carefully considered as an element that governs the design, operation, placement, and location of various traffic control devices.”¹

On a Scenic Byway, there will be a different modes of transportation. Users will move at different speeds, and may be sharing the same space. Signage becomes crucial for safety.

Where there are too many signs in too small a space, the result is that there is too much information to be readily taken in, and the overall effect is chaotic (Figs. 22-23)

Simple and clear, these signs indicate both the state road number and the beginning of a particular Scenic Byway (Fig. 24).



Fig. 21 (www.hankstruckpictures.com)



Fig. 22 (Freephoto.comr)

Where users must share the road, signage can make the rules clear (Fig. 25).



Fig. 23 (Flickr)



Fig. 24 (Flickr)



Fig. 25 (Flickr)

References:

<http://www.trafficsign.us/index.html>
<http://ci.pinetop-lakeside.az.us/Town%20Sign%20Design%20Theme.pdf>
http://www.fs.fed.us/r4/wcnf/unit/kamas/mirror_lake_sce-nic_byway.shtml

Lighting

Roadway lighting is used for both pedestrian and vehicular safety and to enhance the experiential quality of a road at night. The particular landscape through which a road passes determines the amount, form and style of lighting and associated fixtures. For example, the dark skies of rural roadways can be maintained, limiting lighting applications to intersections, gateways, towns and rest areas. Lighting in urban settings however, is often more continuous, occurring as patterned street lamps and ambient light from buildings. In the well designed light scheme, safety and artistry are equally upheld and the effects of light pollution are minimized.

The International Dark-Sky Association defines light pollution as any adverse effect of artificial lighting including sky glow, glare, light trespass, light clutter, decreased visibility at night and energy waste. Light pollution is harmful to human health, altering circadian rhythms causing the carcinogenic disruption of hormone levels. Light pollution also inhibits wildlife, affecting mating, migration and predation behavior in nocturnal animals. The International Dark-Sky Association approves light fixtures that reduce the adverse effects of light pollution. A list of approved manufacturers can be found on their website ([darksky.org](https://www.darksky.org)).

Light fixtures come in a wide variety of styles and types for different applications. Scale, color, intensity, glare, fixture style and materiality are important factors when determining a lighting scheme and can reinforce a sense of place along scenic byways and other roadways. Lighting can be

used to generate a rhythm along a road. It can be used to express the history and culture of a place and it can change according to the various local conditions that a roadway passes through.

Cobras, and other tall light fixtures, are designed to provide an even wash over a roadway. This type of lighting can be found extensively along the urban collector roads, but would normally be inappropriate along many scenic byways. Pedestrian scale lighting is achieved by low pole lighting, bollards (Fig. 4) and wall-mounted fixtures, and can add a sculptural quality to the roadway. Lower scale lighting can serve functions of illumination, way finding, safety, and art.

Lighting can either be direct, that is, we can see the source of the light, or indirect, that is, we can see the effect of the light but we can't see the source. Indirect lighting tends to be softer and more dramatic, allowing the light to play on shapes and forms as sculptural elements (Fig. 3).

Along the Turquoise Trail and many other scenic byways, the rural context of the roadway could be disturbed if the road were to become substantially illuminated. Virtually no lighting is needed along the Turquoise Trail between towns, gateways, and rest areas. Lighting schemes to incorporate into gateways, to illuminate pathways, or at rest areas, may take the form of low pole or bollard lighting.

As the byway passes through towns, pedestrian scale lighting may be appropriate again, enhancing the ambience of the place for locals and visitors alike. Indirect lighting can be used effectively on highway art pieces,



Fig. 1 (Flickr)



Fig. 2 (Flickr)



Fig. 3 (Flickr)



Fig. 4 (Flickr)

vegetation and on signage.

On a scenic byway, it is important that the light fixtures themselves do not begin to dominate the landscape. They should be low key in design and inobtrusive, doing their job in effective and artful ways.

Artificial lighting is only one aspect of lighting on scenic byways. It is important to remember that natural light can interact with the landscape in dramatic and much more striking ways than artificial means can produce (Figs. 6-7).



Fig. 5 (Flickr)



Fig. 6 (Flickr)



Fig. 7 (Flickr)

Vegetation & Reclamation Strategies

Vegetation and reclamation strategies are techniques for using plants to enhance the scenic quality and ecological function of areas within the right-of-way. Well crafted planting design strategies are therefore a key component of context sensitive design.

The vegetation along a roadway corridor is a key component of its scenic quality (Fig. 1). Vegetation varies depending on the character of the landscape adjacent and within view of the roadway and on the ecological community and life zone through which the roadway passes. Changes in vegetation in the New Mexico landscape signify changes in elevation, proximity to water, other topographical micro-climatic effects and the nature of human disturbance over time (Fig. 2). As a result, vegetation will also vary depending on the degree of human engagement with a particular landscape. Natural areas will have primarily native plants, while rural landscapes are likely to have a mix of native and introduced agricultural (or post-agricultural) species. Urban landscapes are likely to have more non-native plants.

Vegetation performs key functions for a roadway, including erosion control, storm water mitigation, noise mitigation/buffering and traffic calming. Plants can also be used to announce, celebrate or signify a particular place and its regional character, for example, gateways.

Interesting roadsides also help keep highway users alert and attentive providing for greater safety. Emotional health of the driver can be addressed with vegetation along the byway. A condition known as “white line fever” has been shown to be lessened by plants along the roadway to break up the monotony of a long stretch of two-lane roadway. Along the Turquoise Trail, there is a 16 mile stretch of highway between Cedar Crest and Golden that is very flat and straight. Attractive native plantings could be used to break up the monotony of that section of highway.

General Vegetation Strategies

The native flora in many parts of New Mexico is distinctive and critical to a local

sense of place. A first step in any scenic byway corridor audit would be to identify ecological communities and their constituent native plants for every segment of a scenic byway.

In general, native vegetation along a scenic byway should be preserved and restored wherever possible. Seeding and plant specifications for planting along the corridor should be consistent with plants typically found in the larger landscape at that elevation. Use of native plants will connect the roadway right-of-way into the larger landscape, both aesthetically and ecologically, mitigating the fragmentation processes caused by the roadway. Because these plants are adapted to local environmental conditions, they are likely to have a greater chance of survival and require less maintenance over time. In some areas where the vegetation outside the right-of-way has been disturbed intensively by grazing, fire, etc., the roadside vegetation inside the right-of-way can provide a visual and ecological reference/guide for understanding and ultimately ameliorating the those disturbances.

Maintenance regimes should also be developed for scenic byways and undertaken at regular intervals in order to eliminate noxious weeds (typically non-native plants) and facilitate the growth of native vegetation.

In the case of gateways, intersections, signs, art installations and more urban areas, a more diverse plant-palette may be used. In these areas, attention is drawn away from the regional scenic landscape to a specific element that is being called out in the adjacent roadside landscape. Strategically placed plant materials can also signify a transition, for instance, as one travels from an undeveloped, rural area to a more densely populated urban area such as Golden or Madrid.



Fig. 1 Wildflowers, grasses and trees along the turquoise trail corridor are essential to the sense of place of the scenic byway.

The use of native plants in the landscape along a scenic byway can also be used for educational purposes. Native plants along with appropriate educational signage could be placed at all visitor amenities such as rest stops, picnic areas and trail heads. These native plantings can tell the story of the area’s biological history as well as provide a wildlife habitat. Based on the Turquoise Trail audit, a mini botanical garden could be placed at proposed rest areas outside of Madrid, Golden or Cerrillos, New Mexico. (Fig. 3)

Vegetation can also be used to frame a scenic vista, borrowing from the distant landscape. Natural beauty is not limited to mountains, coastal vistas, pine forests, geological sites, or lakes and rivers. Many highway users discern more aesthetic satisfaction and simple pleasure in viewing a roadside of prairie flowers and grasses such as those found along the Turquoise Trail in the spring.

In the urban setting along the byway, selective planting can be used to as a traffic calming device at intersections. The physical space for plantings can be provided through curb extensions, planting strips, and median extensions. Also, low plantings and trees could help to improve the visual quality of intersections that are often cluttered with utility poles, signal boxes, and parked vehicles.

Cultural History

Planting design should be an expression of cultural context and town history. Though large street trees are typically thought of as the way to institute planting design, many regions of New Mexico should consider using desert species. And again, the use of plants that are native to the area should be paramount. For example, the Turquoise Trail audit revealed several different plant associations along the corridor ranging from grasslands to Piñon/Juniper/Oak segments. Depending on where the design is going to occur, the plant palette should be dictated by the region where the design is going to occur.

However, the use of plant species that are associated with the history of an area should also be considered. Even though cottonwoods pose certain maintenance

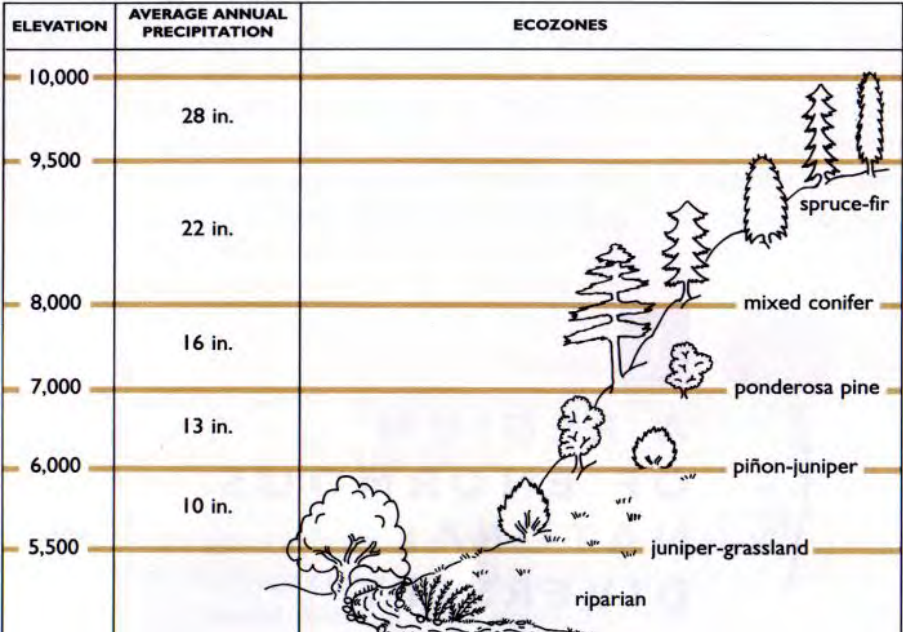


Fig. 2 Vegetation changes in New Mexico with elevation and proximity to water.



Fig.3 Using native plants for education purposes as part of a rest steep (Sites Southwest Ltd.)

issues, the use of them as street trees may express the cultural history of a town. In such instances towns could consider a similar, more hearty tree that would provide the same visual experience, while not posing maintenance problems.

Community Involvement

Community involvement is key to any successful CSD project, especially in relation to plant choices. The establishment of all of the planting decisions– the use of hearty, low water use, culturally expressive plant species should be determined by the community in order to insure respect for and maintenance of the new planting design.

Maintenance is also a consideration in planting design. Maintenance includes annual pruning, mulching, and replacing ill or damaged species. Choosing plants that are adapted to the climate lowers these costs, but does not eliminate them. Some populations have involved community members in the maintenance of plantings. These communities may designate a day or a weekend devoted to maintaining the landscape in town as well as segments outside of town. In many cases, “Adopt a Highway” programs have proven successful ways of maintain the scenic byway. Even when using hearty and native plants, maintenance is crucial to maintaining a sense of place and more importantly a sense of community pride.

Reclamation Strategies

Reclamation strategies are meant to mitigate the effects of human induced disturbance to the natural systems in the roadway corridor, and to facilitate restoration of the vegetation and topography. Often in the construction of all roadways, including Scenic Byways, cuts into the existing topography are made and significant areas of existing vegetation are cleared in order to complete the proposed alignment. Reclamation strategies are specified to prevent further environmental degradation and to restore areas in the corridor outside of the roadway to their pre-construction condition or in some cases a more natural condition. Reclamation strategies can be divided into two categories: 1) erosion control and steep slope mitigation, and 2) re-vegetation and restoration.

Erosion Control and Steep Slope Mitigation typically include strategies to ameliorate significant cuts into the topography in order accommodate the alignment of the roadway

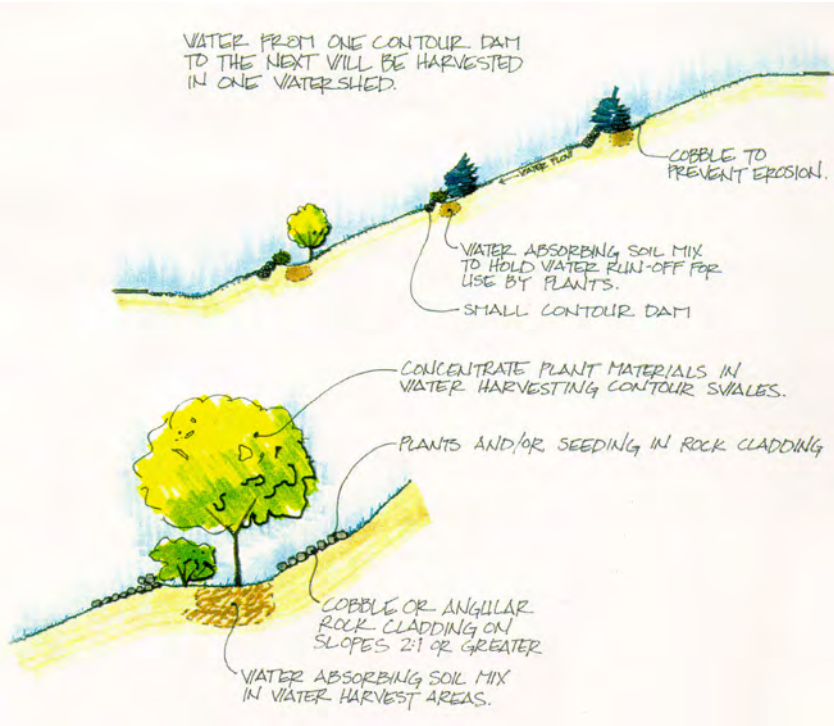


Fig. 4 reclamation strategies assist in both erosion control and steep slopemitigation



Fig .5 reclamation strategies at work along the Turquoise Trail corridor.

(Figs. 4,5 & 6). There are naturalistic steep slope treatments, which include benching, construction of water harvesting contour swales and weirs, boulder contours, rock/gravel cladding/mulching, and seeding. Benching is the cutting of benches into a severe cut or slope preferably at more stable places in the geographic stratigraphy. Contour swales and boulder formations are interventions along a contour in order to slow down drainage flows and distribute them across the landscape. Gravel mulch, especially if it is local stone and is combined with a native seed mix is an effective for medium to steep slopes (Fig. 4).

Artificial slope retention treatments include gabions, concrete barriers, jute netting and other types of erosion control blankets. Although not natural, these strategies can be quite beautiful if well designed. In general, however, along Scenic Byways, naturalistic strategies are preferred especially in more natural and rural stretches, such as the Ortiz Mountains segment on the Turquoise Trail.

Revegetation strategies are intended to facilitate the regeneration of the eco-system that has been disturbed by the creation of the roadway. As such, regardless of the strategy implemented, plants and seeding appropriate to the location in the landscape should be used. For example, the lower montane/ponderosa forest plants should be used in Cedar Crest and Sandia Crest segments, while bosque plants should be used in along the Galisteo River valley in the Cerrillos Gateway segment. Revegetation strategies also work in tandem with erosion control strategies listed above to limit erosion and heal major cuts. Revegetation strategies consist primarily of planting and seeding techniques.

Seeding techniques include hand seeding, mechanical broadcast seeding, blanket seeding and crimp and drill seeding. Seeding can be combined with straw, gravel and/or wood chip mulch in order to facilitate germination and retain moisture for use by the seedlings. Seeding would be important for all segments, except the Madrid segment, which is too urban for reclamation seeding.

Planting techniques consist of putting in whole plants into the ground. As noted above the plants selected should change depending on the ecological community of a

particular segment. The principal differences among these planting techniques are what type of irrigation strategies are employed. There are generally four types of irrigation systems – water harvesting (no irrigation), dry water, temporary irrigation through a PVC pipe, and temporary irrigation system connected to the municipal water supply. Again these techniques may not make sense for a more urban/dense area such as the Madrid segment. In segments such as those, a more typical street-tree planting would be appropriate with its own irrigation system connect into the municipal water supply.



Fig. 6. Before and after revegetation simulation using native grasses.

Multi-modal Facilities

Multi-modal facilities are physical accommodations constructed within the right of way of a roadway, or as part of a roadway, to enable non-motorized users to travel safely along a roadway corridor. Multi-modal facilities are key components of context sensitive design (CSD) for all roadways, including scenic byways.

In general, multi-modal facilities should be incorporated into the alignment and design of a Scenic Byway. There are many potential users of most Scenic Byway corridors in addition to drivers and passengers in automobiles. Pedestrians, cyclists and equestrians are typical users that employ modes of non-motorized transportation, which should be accommodated safely within a Scenic Byway corridor.

In general, the specific facilities will vary along the corridor depending on context, including the character of a segment, and requirements of the user type. The context of a roadway is both environmental, i.e. the character of vegetation, geology of a particular segment, and social, i.e. the density, demographics, and existence of potential users residing in the area determine the context. For example, where the character of the corridor is largely or natural, care should be taken to select materials for facilities that are local to the region, and which do not impact the scenic qualities of the landscape adjacent to the roadway.

Figure 1 is an illustration of how multiple modes can be accommodated along a roadway corridor. Figure 2 illustrates how accommodation of multiple modes can change the character of the roadway.

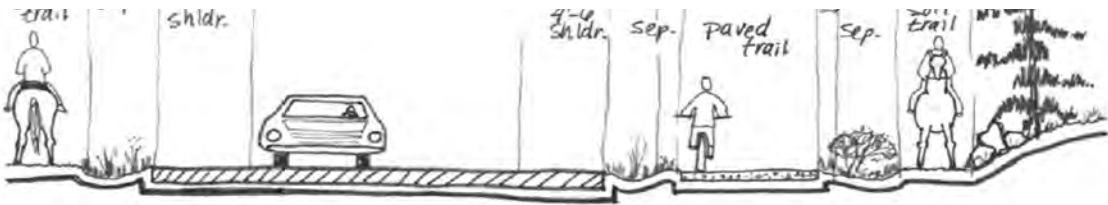


Fig. 1 Typical cross section of roadway corridor that accomodates multiple modes (Sites Southwest Ltd.)



Fig. 2 Visual Simulation of changes of a scenic byway roadway corridor to accomodate multiple modes. (Sites Southwest Ltd.)

Pedestrian Facilities

Pedestrians may be divided into four sub-types: 1) pedestrians of necessity (e.g. persons without a vehicle because it is parked, broken-down, etc.); 2) recreational pedestrians (e.g. hikers, dog walkers, joggers); 3) children going to school (Safe Routes to School); and 4) disabled users with physical handicaps.

Pedestrians of necessity require at least a shoulder area for walking, which is a minimum of four feet in width (Fig. 3) in order to provide refuge from traffic. Where traffic moves faster, a defined and maintained unpaved trail four to six feet in width is also desirable (Fig. 4). In more “urban” or higher use areas, a sidewalk or off-road paved multi-purpose trail that is a minimum of six feet wide is preferable (Fig. 5). The requirements for recreational pedestrians are similar, although they prefer off-road unpaved and paved multi-purpose trails that are a minimum of six feet in width (see Figures 4 and 6). For Safe Routes to School and disabled users, a

combination of paved off-road multi-purpose trails and sidewalks is the preferred strategy (Figs. 7 and 8).

Cycling Facilities

Cyclists include road bikers, mountain bikers and leisure bikers. Road bikers require a broad paved shoulder (minimum of four feet, preferably six feet) that is a continuation of the asphalt surface of the traffic lanes (Fig.1). In higher traffic areas, a bike lane such as shown in Fig. 7 is desirable. Where possible, off road paved trails are preferred. They are safer and more enjoyable for recreational cyclists, and these trails can be multi-purpose (Fig. 6). Unpaved, off road trails are preferred by mountain bikers (Fig. 4). Scenic byways are attractive to recreational cyclists and the Turquoise Trail is a good example of this. Safe cycling paths along the roadway increase the enjoyment of the byway for cyclists and motorists. Cycle lanes should maintain a reasonably consistent width along the corridor.

Equestrian Facilities

Equestrian users include horse-riders and horse-and-buggies. Both require off-road, unpaved multi-purpose trails (Fig. 4). The only difference is that the horse-and-buggies need a wider clearance along the trail corridor. Figure 8 is an example of wider area set aside for horse-and-buggy usage along a roadway.



Fig. 3 Roadside shoulder (Sites Southwest Ltd.)



Fig. 4 Unpaved multi-purpose trail (Sites Southwest Ltd.)



Fig. 5 Paved sidewalk (Sites Southwest Ltd.)

Facility Type Selection and Segment Character

The appropriateness of a particular facility will also vary by the location. The character of a particular segment of the corridor will suggest the specific strategy to be selected. In more natural and rural areas, the emphasis is on preserving as much of the view off the roadway as possible and keeping the developed or paved corridor as narrow as possible. There are also fewer users of the facilities in these areas, because there are few residents. Therefore less formal strategies are desirable, than in higher traffic areas, where safety and accommodation of larger numbers of users dictate more extensive and formal facilities.

Along the Turquoise Trail for example, natural preserve and rural segments, such as the Ortiz Mountains and Jemez Views segments, accommodations should be limited to a paved shoulder and an off-road un-paved trail. In rural residential and commercial areas such as the Institutional Grasslands and the Crest Gateway, the same accommodations should be made as in preserve areas. However, for segments within a half mile of a school, community center, park, senior center, major residential area or a commercial area, a paved multi-purpose trail should be provided. Figures 10 through 12 show different potential cross-sections along a scenic byway corridor.

In more “urban’ areas such as Madrid and Cedar Crest, a sidewalk and separate bike lane would be



Fig. 6 Paved multi-purpose trail (Sites Southwest Ltd.)



Fig. 7 Bike lane (Sites Southwest Ltd.)



Fig. 8 Equestrian path (Sites Southwest Ltd.)

most appropriate. In areas where the buildings are set-back a distance from the road, a paved multi-purpose trail may be preferable to a sidewalk. In more urban areas, furnishings such as bike-racks for cyclists, benches for pedestrians are desirable amenities for users.

Material Selection

Materials for multi-modal facilities are also an important consideration, and should change by type of segment. In general local gravel should be used for construction of multi-purpose trails in rural and preserve areas such as the Ortiz Mountains and Jemez Views segments. Paved multi-purpose trails in rural and rural residential areas such as Pa’ako and San Antonito should be constructed from a local aggregate combined with mastic (see paved trail in Figure 2 above). A local aggregate could also be used in the concrete for sidewalks in more urban areas such as Madrid and Cedar Crest, and the concrete finished to expose the aggregate. An alternative material would consist of putting in a pigment or staining the concrete using a earth tone similar to those found in the geology of the locale.

Safety Features

Safety features for non-motorized users also need to be addressed. In Preserve and Rural segments such as the Garden of the Gods, only signage warning of pedestrian crossings is desirable (see Signage Strategies below). In residential and commercial areas such as Sandia Crest striped crossings are appropriate (see Figure 9). In heavily trafficked urban areas the roadway should be narrowed as it is in the Madrid segment, or a median with a pedestrian refuge should be created in segments like Cedar Crest and San Antonito segments (See Figure 9). In some areas, such as Cedar Crest segment, or the north end of the Sandia Crest segment where the school and community center are, a flashing light may also be necessary to ensure safe crossing of traffic by other modes of transportation.



Fig. 9 Urban crossing with median refuge.

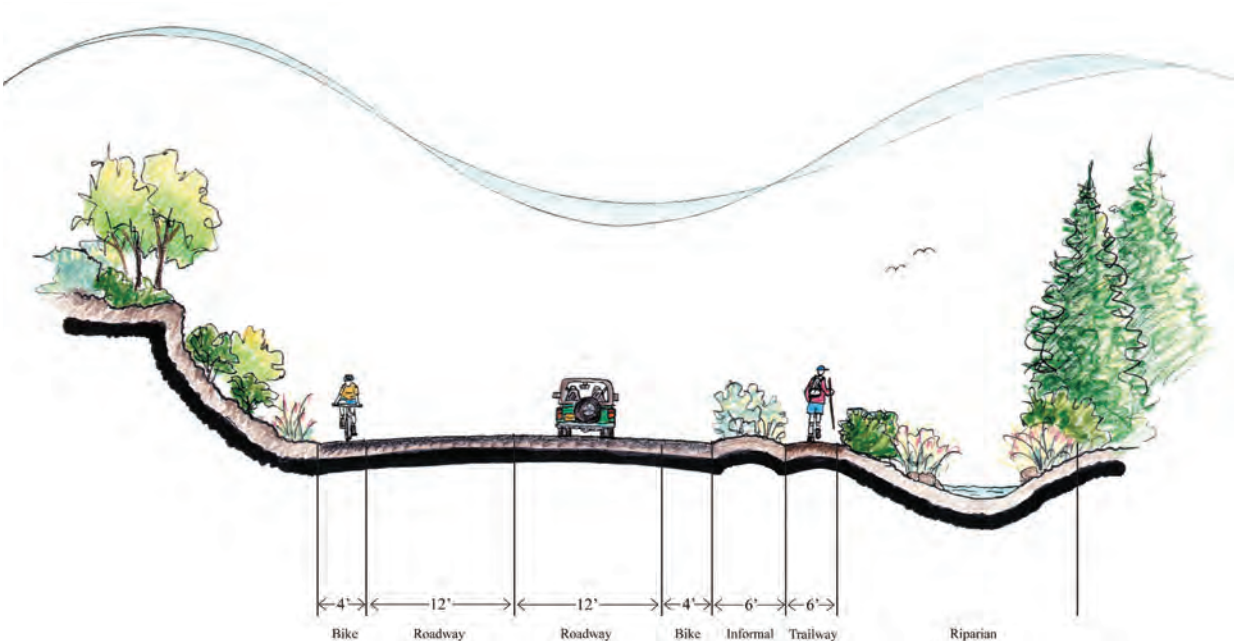


Fig. 10. Rural / Natural Area Scenic Byway Cross-section (Sites Southwest Ltd.)

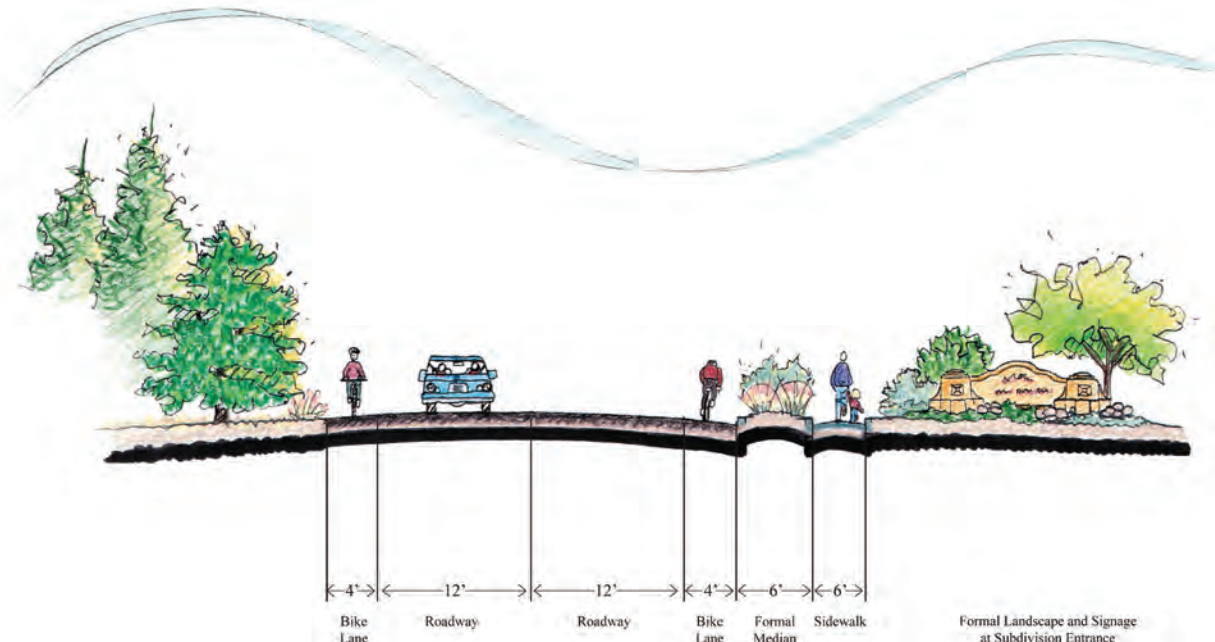


Fig. 11. Rural Residential/suburban Scenic Byway Cross-section (Sites Southwest Ltd.)

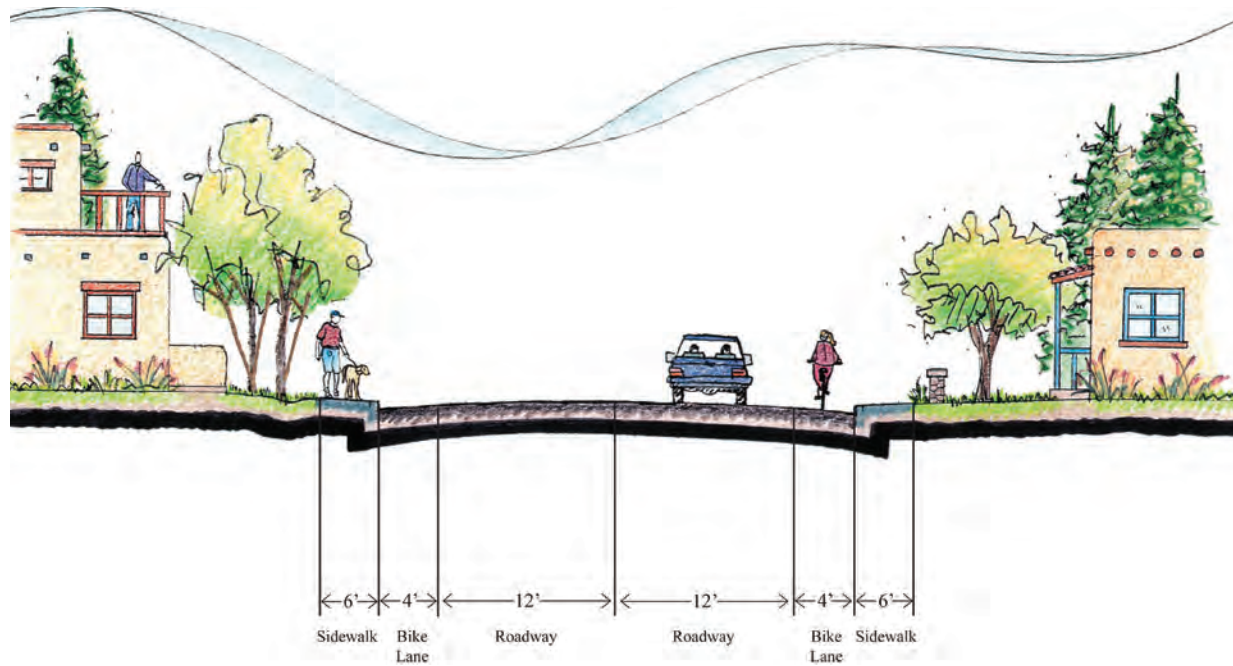


Fig. 12. Urban Scenic Byway Cross-section (Sites Southwest Ltd.)

Roadway Alignment and Edge Treatment Strategies

Roadway alignment and edge treatment strategies are a key component of any roadway corridor design, including scenic byways. These features form the roadway portion of the corridor. They are also critical safety measures that help reduce traffic fatalities.

In the case of a scenic byway, these features should be designed to minimize impacts to the views from the byway and visual character along the byway. Impacts can be reduced by using materials that are more in keeping with visual character of a particular segment of the corridor.

Design and placement of safety features and edge treatment strategies is often a function of roadway alignment within the corridor. Most Scenic Byways move through difficult terrain, which is generally what gives them their scenic quality. The concern for safer, i.e. straighter alignments, however, must be balanced with impacts to the roadway corridor (e.g. major cuts), which would have a significant negative impact on scenic quality. For this reason, major realignments should be especially avoided in natural area segments, such as the Garden of the Gods, Jemez Views and the Ortiz Mountains along the Turquoise Trail. Where cuts are made as a result, appropriate re-vegetation strategies should be employed to mitigate erosion effects and visual impacts of the cuts.



Fig. 1 Re-vegetation of a cut along NM 14 (Sites Southwest Ltd.)

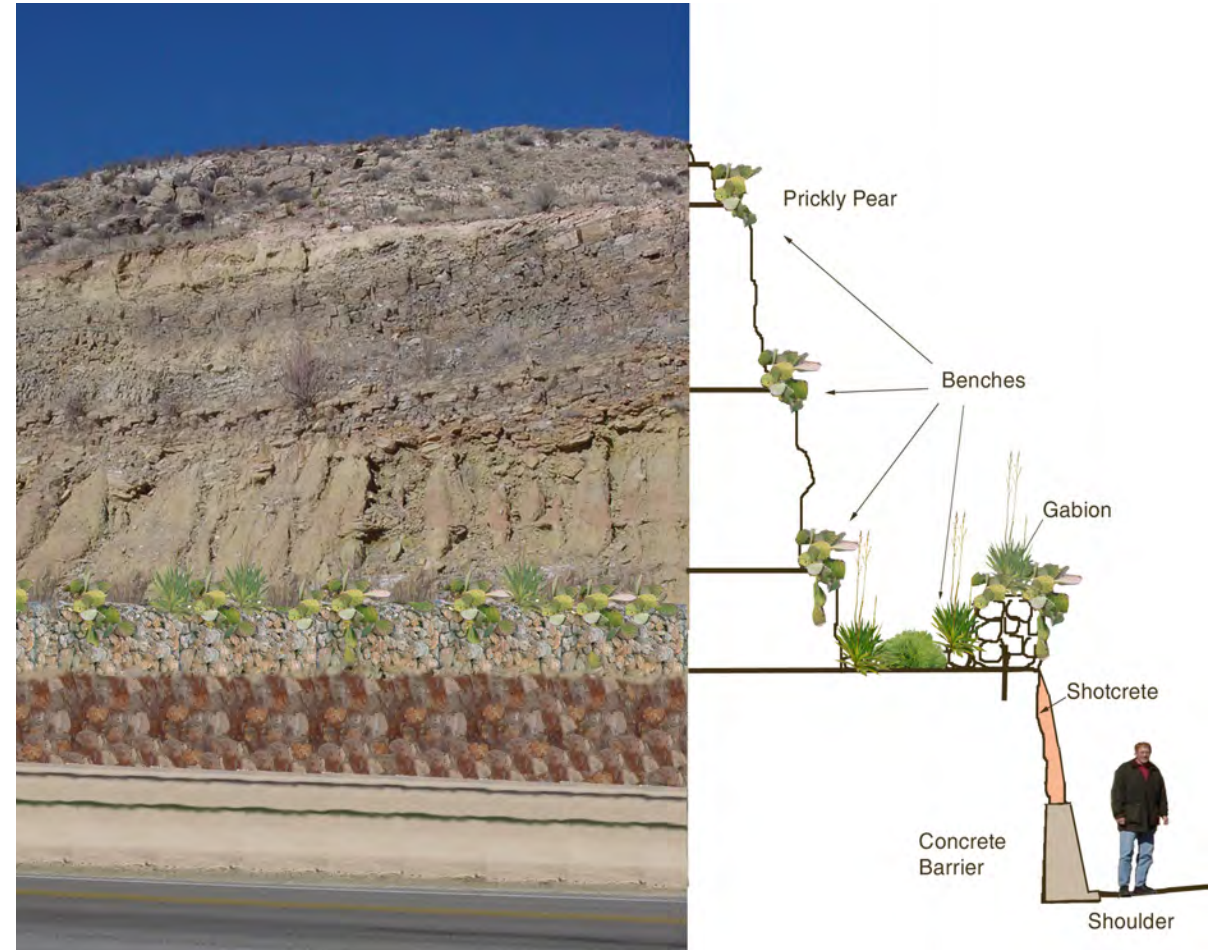


Fig. 2 Benching uses the existing geologic strata to break up a cut and provide opportunities for re-vegetation. (Sites Southwest Ltd.)

Figure 1 illustrates mitigation of a cut that results from a realignment of the roadway. Cuts can also be made in a way that can emphasize and use the existing geologic strata to assist in the mitigation process through providing niches for plants. One such technique is called benching as shown in Figure 2.

Roadway Edge Treatments

There are principally three types of road edge treatments: concrete barriers, guard rails, and shoulders. In village or more urban areas there may be a fourth, curbs.

Concrete wall barriers are made from reinforced concrete and generally have a triangular form. The concrete can be pigmented, stained or be treated so that that the aggregate is exposed in order for the barriers to blend into the landscape of a scenic byway corridor (Fig 3). Another strategy is to cap them with a local stone product or treat them as a potential art project (Fig 3).

Guard rails and wall barriers are intended to keep automobiles on the roadway from going off the roadway and over an embankment or steep slope resulting in a more catastrophic accident. Guard rails generally consist of steel rails or cables mounted on posts. Both the material of the rails and the posts are important considerations. Corten steel has been used successfully on the Turquoise Trail north of Madrid (Fig. 4) In other landscapes, wooden posts are often used with the railing, but the climate in New Mexico makes the use of wood less desirable. Also, the posts are often treated with chemicals which are toxic to the environment.

Guardrails and wall barriers should be considered as alternative strategies with the guard rails being the preferred strategies in more natural segments such as the Ortiz Mountains and the Jemez Views segments, because they are more permeable visually than concrete wall barriers. Barriers

Treatments of the shoulder (Fig. 5) are important to the function of the roadway for drainage, refuge for disabled vehicles, cyclists and pedestrians and to provide a clear edge to the roadway. Types of

treatments of the road edge could include unpaved shoulder, paved shoulder and curb and gutter with or without a sidewalk. The latter strategy makes sense only in more urban and commercial/ mixed-use segments, such as Madrid and the I-25 Gateway. Unpaved shoulders would make sense in the more natural segments such as the Ortiz Mountains and Garden of the Gods, because they would make the road seem very, very narrow, emphasizing the visual character. The paved/ extended shoulder is important where there will be significant use by cyclists, such as the segments south of Sandia Crest gateway.



Fig. 4 Guardrails can be stained, acid washed or selected for its patina qualities in order to be more consistent with byway character (Sites Southwest Ltd.)



Fig. 5 Shoulders can be tinted concrete, or use local aggregate. (Sites Southwest Ltd.)



Fig. 3 Concrete wall barriers can have tinted concrete and caps to be more consistent with scenic byway character. (Sites Southwest Ltd.)

Roadway Infrastructure Strategies

Infrastructure runs along every major roadway including Scenic Byways. Because the character of the surrounding landscape is key to the Scenic Byway, infrastructure should to be treated in a way that it does not dominate or even intrude upon the view. Material selection and placement are fundamental to achieving this goal. There are principally two types of infrastructure – utilities that serve adjacent communities and facilities, principally drainage, that serve the roadway.

Utilities

As a general rule, utility poles, tanks and pipelines should be placed below ground wherever possible along Scenic Byways, especially in more natural and rural segments. For example, above ground utilities would negatively impact the scenic quality and views along the Turquoise Trail’s Jemez Views and Garden of the Gods segments and therefore should be avoided. Where utilities such as power lines and cable boxes need to be above ground, they should be placed and be constructed of materials or be that help them blend into the natural landscape.

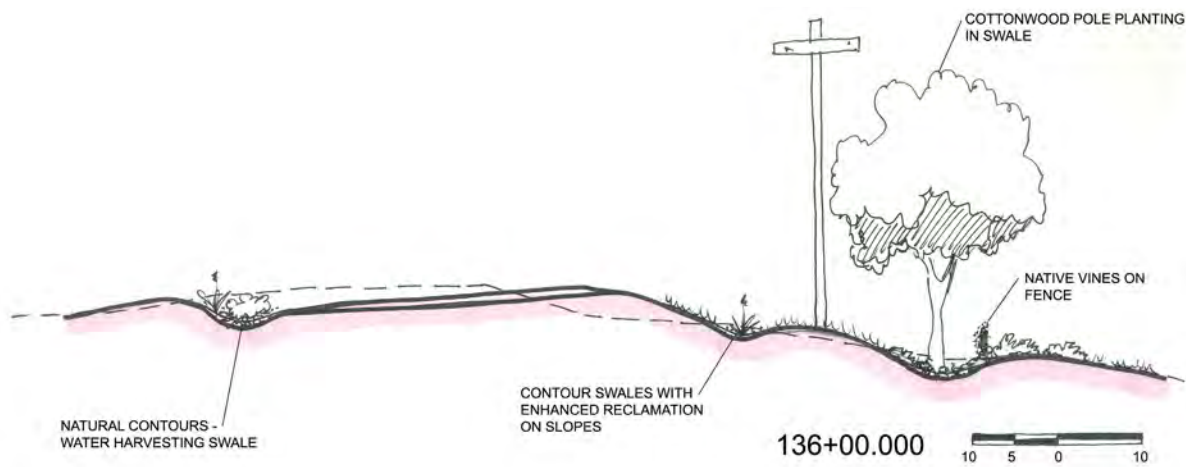


Fig. 1 Sectional view of infrastructure and utilities (Sites Southwest Ltd.)

Drainage Infrastructure

Although there are other infrastructure systems that serve a roadway, his section focuses on the primary system: drainage. Drainage systems along Scenic Byways should work with flows from and moving across the roadway in order to minimize impact to existing hydrologic features, prevent erosion and promote the harvesting and application run-off. C

In general, the drainage infrastructure along a scenic byway should both connect the roadway into the larger landscape and blend into the existing landscape. Typical drainage features include water harvesting swales, cobble rundowns and check damns. (see figures 2-6).

Wherever possible, drainage features should employ local materials, e.g. river cobbles and moss rocks to connect them into the surrounding landscape visually and functionally (see figure 4). In lieu of concrete, gabions should be used for retention walls, culverts and erosion control. Where the use of concrete is unavoidable for budgetary or functional reasons, it should be stained or treated to expose the local aggregate used in its construction. Special attention to the use of local materials is especially important in natural and rural areas such as the Garden of the Gods, Jemez Views and Ortiz Mountains segments of the Turquoise Trail.



Fig. 2 Water harvesting swales take run-off from the roadway and bring it to plantings in the median or shoulder areas of a roadside (Sites Southwest Ltd.)



Fig. 3 Materials for swales and cobble rundowns such as those at right should be constructed of local materials to connect into the larger landscape both aesthetically and functionally.



Fig. 4 Check dams using locally sourced boulders can be used to slow water moving down slopes adjacent to a roadway (Sites Southwest Ltd.)

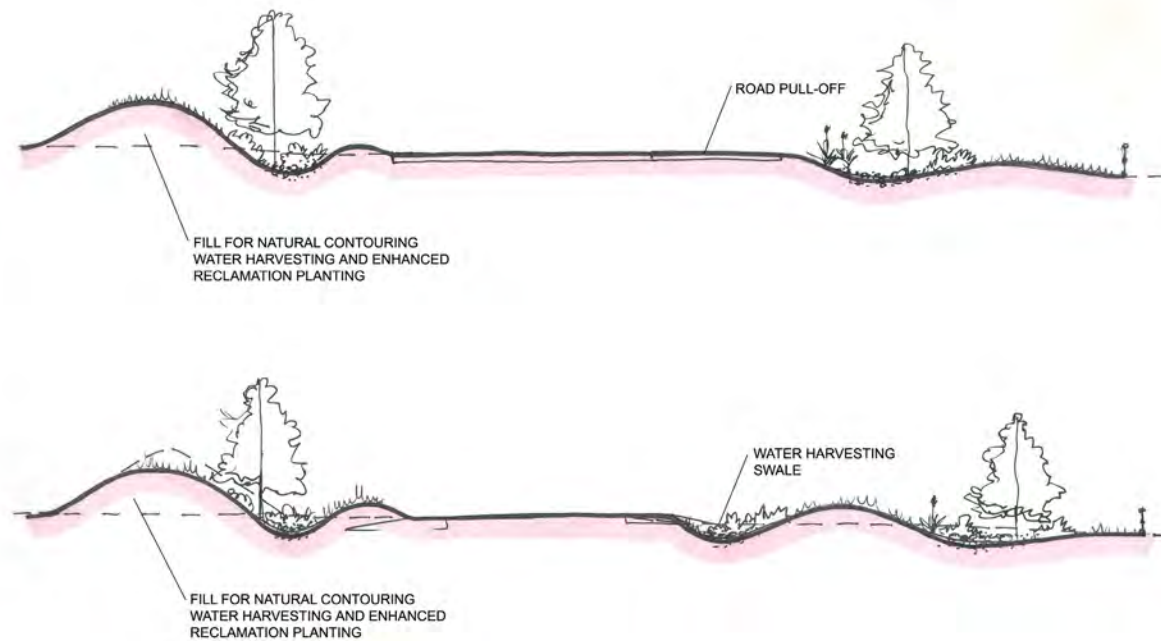


Fig. 5. water harvesting strategies and drainage infrastructure proposed for NM 14 (Sites Southwest Ltd.)

Public Art

Public art along roadsides and as part of civil infrastructure has a rich history dating from Roman times. It occurs in forms as diverse as sculpture, signage, applied decoration and land art. Public art can include statues, friezes, fountains, pavement patterns and decorative lighting.

The road has always played a vital part in the exchange of goods, ideas and the transportation of people. This heavy public usage consequently allows it to be a signifier of the region to travelers and residents alike. The use of art within the context of the byway has the potential to impart a distinct sense of place and endow residents with a sense of community and pride.

A public art plan should be a component of the planning document for a scenic byway. The plan should identify acceptable and unacceptable art features, and should have a process in place for reviewing proposals for art ion the scenic corridor.

The appropriateness of public art is frequently dependent upon its location and composition. An art piece or feature chosen for the back side of a noise wall, at a safety rest area, or along a bike path may not be suitable at the



Fig. 1 Roadside art of recycled road signs (lh4.ggpht.com)



Fig. 2 This covered bridge in Allegheny, NY is a contemporary structure using traditional materials and construction techniques (www.empire.state.ny.us)



Fig. 3 A painted overpass in Dona Ana, NM (Flickr)

end of a freeway ramp or along the main line of a highway.

Considerations for public/roadway art should take into account:

- The subject of the recommended art.
- Visibility – Art visible from the main line must contribute to corridor continuity and the view from the road. Art visible to the community or adjacent to the neighborhood side of a structure may have more flexibility in design than that visible from the main line.
- Safety and security – Public art must not negatively impact safety nor create an attractive nuisance.
- Potential for traffic distraction – Proposed art must not distract motorists. It must be appropriate for the speed and angle at which it will be viewed.
- Scale and context compatible with the surrounding landscape and land use.
- Contribution of the art to community character.
- The impact of the proposed art on social, cultural, and environmental features.
- Compliance with applicable laws

(from Washington State DOT Design Manual M22-01.02)



Fig. 4 Painted water tank in T or C NM (Flickr)



Fig. 5 Art expressed in a paved surface



Fig. 6 A bench as art

Infrastructure as art

Bridges, retaining walls and other pieces of infrastructure, if well-designed, detailed and constructed, may be themselves considered works of art (Fig. 2).

The use of local materials and construction techniques can separate the scenic byway engineering from standardized, mass produced design that adds no character to a place.

Existing infrastructure that has been built with little thought for aesthetics may benefit from applied decoration. This is the case with much overpass art, where painted or tiled decoration is applied to existing surfaces (Fig. 3).

Where infrastructure creates large empty surfaces, these areas may be treated as canvases for artwork (Figs. 4 and 5).

Artwork can also be created in more intimate settings. The opportunity exists for benches, seat walls, railings and other small structures to incorporate an artistic treatment (Fig. 6).



Fig. 7 Vernacular art by the roadside near Madrid (Photo by Allison Wait)



Fig. 8 Vernacular art by the roadside near Madrid (Photo by Allison Wait)

The Art of Place

Where scenic byways go through inhabited areas, particularly rural areas, there will likely be some sites that are highly individual. These sites are not added to the roadway by artists or designers, but are embedded in the place and its culture. They are usually delightful in a quirky way, and contribute significantly to the art of the roadway.

The site on the north side of Madrid shown in figs. 7 and 8 are examples of the art of place.

Freestanding Art

Free standing sculpture is used both publicly and privately to draw attention and to serve as an identifying or orientation marker.

Oversized figurative sculpture, such as the cow in figure 9, are frequently used to ‘brand’ a place and as a tourist attraction. These pieces also add humor, a critically important element in any environment.

Nevertheless, one such sculpture may be evocative and funny, but too many along a byway will severely reduce the effect of one good one.

New Mexico is fortunate to have so many artists living throughout the state. Scenic byway development should take advantage of this wealth to interpret and add to the landscape.



Fig. 9 Gigantic figures are always popular ... (www.rwc.uc.edu)

Conclusion

A scenic byway is normally designated as such because of the inherent aesthetic and cultural qualities of the corridor. Nothing however, remains static, and as changes are introduced into a scenic byway corridor, it is important that the interventions acknowledge and respect the character of the byway.

The Context Sensitive Design process, as discussed in this document and in *Architectural and Visual Quality Design Guidelines for Context Sensitive Design and Context Sensitive Solutions* (NMDOT, 2006), outlines strategies for appropriate roadway interventions.

The two major components of the process are to identify and describe the social, cultural, environmental and aesthetic context, and to respond in a sensitive manner to those contextual conditions in all design decisions.

The basic process for context sensitive design for a scenic byway is fundamentally the same as the CSD process for any roadway, but the expectations and experiences of the users of a scenic byway will be different from those of the users of an un-designated roadway.

It is of particular importance to re-state that the design opportunities discussed in this document do not represent a formula for design. Rather, they identify the physical elements of a scenic byway that will need to be considered in the design, re-design and/or maintenance of a corridor, with examples of specific strategies and applications.

Finally, the goal of this document is to introduce principles that, when applied to the decision-making process, will enable our scenic byways in New Mexico to sustain the beauty and character that makes these corridors unique.

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