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Traffic Management Unit



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Lake Lure and Chimney Rock Traffic Study Rutherford County

Prepared by:

Municipal and School



Transportation Assistance

Joel Cranford
Municipal and School Transportation Engineer
Zaker Alazzeh, PE
Municipal and School Project Engineer
Kimberly Hinton
Municipal and School Project Engineer
Joe Futrell
Municipal and School Project Engineer

NOTICE

The following report was prepared using information collected by Municipal & School Transportation Assistance. The methodology used to complete the evaluation is believed to be consistent with the current traffic engineering practice and principals. The recommendations presented herein are based on a comprehensive review and analysis of the available data, direct observations, and the application of engineering judgment. Any figures included in this report are Concept Plans and Not For Construction.

MAILING ADDRESS:
MUNICIPAL AND SCHOOL TRANSPORTATION ASSISTANCE
1561 MAIL SERVICE CENTER
RALEIGH, NORTH CAROLINA 27699-1561

TELEPHONE: 919-773-2800
FAX: 919-771-2745

WEBSITE: [HTTPS://CONNECT.NCDOT.GOV/MUNICIPALITIES/SCHOOL](https://connect.ncdot.gov/municipalities/school)

LOCATION:
750 NORTH GREENFIELD PARKWAY
GARNER, NORTH CAROLINA 27529



Traffic Study along US 64 / US 74-A in Lake Lure and Chimney Rock

Prepared for:

**Town of Lake Lure,
Chimney Rock Village,
and
Chimney Rock State Park**

Prepared By:



**Traffic Management Unit
Transportation Mobility and Safety Division
North Carolina Department of Transportation**

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We wish to express our appreciation to those private citizens, representatives from the Town of Lake Lure, Chimney Rock Village and Chimney Rock State Park, members of the Isothermal RPO and NCDOT who assisted the Municipal and School Transportation Assistance in developing this study.

Members of the Comprehensive Transportation Plan Core Committee

Lake Lure - Bob Keith, Bob Cameron, Paula Jordan, Shannon Baldwin

Chimney Rock Village - Barbara Meliski, Bob Wald, Peter O'Leary, Amy Wald, Bill Whittman

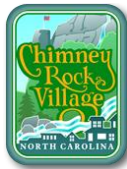
Chimney Rock State Park - Adrienne Wallace, James Ledgerwood

Rutherford County - Jerry Stensland, Michelle Whitaker

NCDOT, Division 13 - Doug McNeal

Key Staff Team - Josh King, Karyl Fuller, Pam Cook, Nazia Sarder

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IMPLEMENTATION DISCLAIMER

The recommendations and findings of this report should not be thought of as mandates for action, nor a commitment, by the Division of Highways to fund and/or construct any of the improvements mentioned herein. It is and will be the responsibility of the Town of Lake Lure, Chimney Rock Village and Chimney Rock State Park to determine which recommendations will be used, implemented and/or constructed within their property boundaries and zoning limits. Any recommendations or improvements located within the Department of Transportation roadway right-of-way will require the consultation of the Division Engineer. If participation needs to be considered, the following factors will be taken into account before any action is taken: jurisdictional responsibility, availability of funds, and the priority placed on the improvements by the Department of Transportation relative to all other planned and programmed improvements in the area.

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I. INTRODUCTION

In early 2012 the Town of Lake Lure and Chimney Rock Village began the process of performing a Comprehensive Transportation Plan (CTP) for Hickory Nut George through the Transportation Planning Branch with the North Carolina Department of Transportation (NCDOT), and the Isothermal Rural Planning Organization (IRPO). The CTP identifies major long-range multi-modal transportation needs and provides long term solutions. During the early stages of the CTP process a number of transportation related issues were identified that are not normally covered. These issues were:

- Critical Shortage of Parking
- Wayfinding for parking
- Complementary shuttle (transit) service between parking and destinations
- Multi-modal options to encourage more parking outside of the core areas of town
- Blueways (Water taxi, paddle trails, etc.)

Several of these issues were identified in the *Lake Lure and Chimney Rock Transportation Study* dated July 1994 (1994 Study) performed by Municipal and School Transportation Assistance (MSTA). The committee recognized the 1994 Study and MSTA was contacted by the Transportation Planning Branch to provide input to the CTP process. After reviewing the 1994 Study and comparing it to existing conditions it was determined that many of the findings and recommendations identified are still considered appropriate. This is mainly due to the limited roadway right-of-way width of US 64/74A, land terrain restrictions, minimal property development and low traffic volume growth in the area. This report will investigate findings identified in the 1994 Study and provide updates where necessary. Additional information will be provided regarding the expected traffic volume growth and a proposed vehicle access onto US 64/74A for the newly acquired and developing Chimney Rock State Park.

During the CTP process there were a number of CTP Committee meetings and two public input meetings where local officials and a large number of citizens participated. The public meetings had an outstanding response and input from the community for the CTP plan and this report.

Minimizing traffic congestion and providing good traffic flow along US 64/74A is vital to both the Town of Lake Lure and Chimney Rock Village since it is the only highway through the area. Solving congestion problems in these areas is difficult because typical improvements to the roadway, such as widening or a possible bypass, are virtually impossible. The mountainous terrain, Rocky Broad River and the lake (Lake Lure) physically constrain the area from all directions.

Observations were made on several occasions during 2012 in the Town of Lake Lure, Chimney Rock Village and Chimney Rock State Park using the 1994 Traffic Operations Study as a reference. Traffic volumes along US 64/74A were considered low due to the Chimney Rock State Park being closed for construction. Items of specific interest were:

- For the area to include multi-modal transportation capabilities (pedestrian and bicycle).
- Town of Lake Lure – to incorporate the proposed Chimney Rock State Park entrance with future growth plans of a “Downtown” Lake Lure.

- Chimney Rock Village – to convert the Chimney Rock State Park access to an exit only and reducing congestion along US 64/74A.
- Chimney Rock State Park - consisted of incorporating their Master Plan with a proposed one-way traffic pattern for the Park facilities.



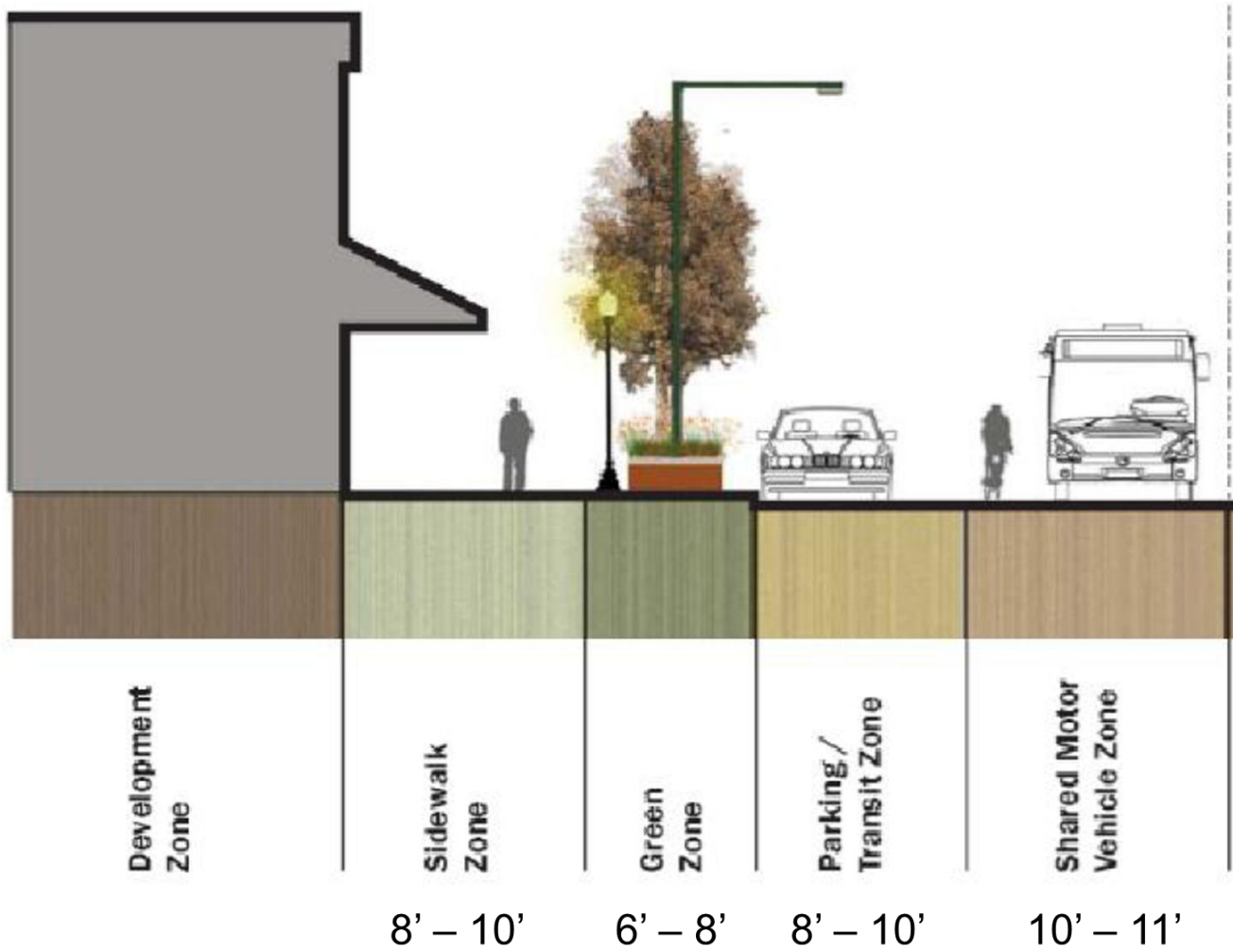
Complete Streets Policy

NCDOT along with many municipalities in North Carolina have adopted a Complete Streets policy. Complete Streets are streets that are designed and operate to enable safe access for all users, including pedestrians, bicyclists and motorists of all ages and abilities. Complete Streets concepts make it easy to cross the street, walk to shops, and utilize bicycles as another mode of daily transportation. Complete Streets complement NCDOT's goals of making our transportation network safer, move people and goods more efficiently and allows our infrastructure to last longer.

Citizens of the Town of Lake Lure and Chimney Rock Village have expressed their desires to incorporate the Complete Streets policy in the future development of their local transportation network. Included in local designs they are also interested in a public transportation system to further encourage alternative modes of transportation during their peak visitation periods. The ultimate transportation design will make the street network better and safer for drivers, pedestrians, bicyclists and future transit users – making these two communities a better place to live. Figure 1 is an example of a complete street cross section suitable for this area.

Chimney Rock State Park has developed a Master Plan that includes a large amount of walking and bicycling trails. The plan indicates several attractions extending outside of the existing Chimney Rock Park with proposals to incorporate many walking and bicycle trails. Some of these trails may be constructed for not only recreational purposes but also as daily routes for alternative modes of transportation. Between the Park's plan and initiatives addressed in the CTP, all modes of transportation using roadways, pathways and waterways will be addressed. These wide varieties of transportation modes will certainly increase the number of visitors to the area for vacation and recreational events as well as enhance the lifestyle for year round citizens.

Figure 1: A Complete Street Cross Section suitable for this area.



II. TOWN OF LAKE LURE

A. Analysis

The Town of Lake Lure is a resort community with a population of 1,068 that grows to around 10,000 during the summer months. The area provides many recreational opportunities from walking and bike trails, like the Flowering Bridge, to many water sports activities on the lake and river. The downtown area is comprised of a few shops, restaurants, and Inn. During the summer months, the main attraction in this area is Morse Park, a marina and a beach swimming area.



Citizens of Lake Lure have expressed the following transportation desires:

- Present visitors with a more appealing presence
- Maintain good traffic flow along US 64/74A
- Maintain on-street parking
- Improve emergency vehicle access
- Provide for all users— pedestrians, bicyclists, and motorists of all ages and abilities
- Create a more conventional “Town” atmosphere that will encourage commercial and economic growth

Towns Concerns:

- On-street parking along the beach area creates pedestrian conflicts, parking maneuver delays, and traffic delays. These issues are a concern today and future visitor traffic to Chimney Rock State Park will greatly influence these issues.
- Improve emergency access by reducing traffic congestion along the beach front parking area by either redesigning the on-street parking to create fewer delays or rerouting US 64/74A traffic around this congestion.

1. Traffic Flow and On-street Parking

During the summer months, both directions of US 64/74A have significant traffic congestion along the Lake Lure Beach Front area. This congestion is caused by motorists wishing to park in the 84 perpendicular on-street parking spaces, numerous pedestrians crossing from the on-street parking spaces, and multiple wide and undefined driveways designed for the local business establishments. Motorists drive slowly through the area looking for an open parking space while other motorists, proceeding through the area, are forced to slow down or stop for vehicles maneuvering in and out of parking spaces. The Town Plaza, located across from the beach area, provides additional parking. These parking areas have three pedestrian crosswalks crossing US 64/74A and do help define single crossing points to the beach front area.

Aisle width is the roadway width required to safely maneuver a vehicle into and out of a parking space. Proper aisle width is very important to traffic safety and affects the delays and congestion for the through traffic. The minimum aisle

width required is a function of the parking angle and stall width. If the goal for Lake Lure is to maintain good traffic flow along US 64/74A, improve emergency access and maintain on-street parking then parking maneuvers should stay within only one direction of travel. Recommended aisle widths based on parking angle are shown on Table 1: Typical Aisle Dimensions:

Angle of Parking (deg.)	Aisle Width (ft.)
90	24
60	19.58
45	10.25
30	11.0

The pavement width along the on-street parking of US 64/74A in this area is 17 feet (13 feet with a 4-foot bike lane). This data indicates that motorists must block both lanes of traffic to safely enter and exit these spaces. Using the aisle width of 17 feet as a guide, this chart indicates the on-street parking in Lake Lure should be 45 degrees to improve safety and increase traffic flow along this section of US 64/74A or traffic should be rerouted to avoid this area.

2. *Proposed Traffic Flow with Chimney Rock State Park*

It is our understanding that Chimney Rock State Park (CRSP) has intentions to construct a new driveway access to their Ticket Booth and Main Parking Lot. This new driveway is needed for several reasons, some of which are:

- to help reduce traffic congestion on US 64 at Chimney Rock
- to help reduce traffic congestion on US 64 at Lake Lure
- emergency vehicle access to CRSP (ambulance and fire rescue)
- a second CRSP access in case of an emergency evacuation
- to provide an alternate route for CRSP during roadway maintenance
- to allow vehicle access to and from CRSP in case of an accident or vehicle mechanical failure along their existing driveway

Park officials have modeled the features and amenities of CRSP to similar parks in North Carolina. That comparison estimates CRSP is expected to have 350,000 visitors a year. At the time of this report the park had only 10 months of data from the 2012 traffic. That data was calculated to produce an estimated peak hour traffic volume expected during the mid-morning arrival time. Table 2 indicates the projected traffic volumes.

2012 Data	Projected Traffic	Description
191,000	350,000	visitors to CRSP in 10 months / 12 months
35,348	64,770	visitors during July
7,069	12,954	visitors in one day during July
1,060	1,943	estimated vehicles in the highest hour

The CRSP Master Plan indicates the new entrance driveway will be constructed east of the park and connect to US 64/74A somewhere near the Town of Lake Lure. Exiting traffic is planned to primarily exit the existing driveway at Chimney Rock Village. Concerns were raised with how the increase in traffic volumes would affect Lake Lure and the traffic congestion already being experienced. It must be understood that the heaviest traffic is expected during holidays and weekends during the summer months. Entering traffic will likely be heaviest during the mid-morning times as visitors will likely plan to spend several hours hiking and enjoying the wide variety of natural plants, spectacular foliage and vista views. Exiting traffic will likely be mid to late afternoon.

Using Synchro7 and SimTraffic, traffic engineering software, this report studied two connection proposals:

1. Connect to existing Lake Lure streets
2. Connect to a proposed Lake Lure Parkway

Several items were identified in the traffic analysis:

- If the proposed park entrance is accessed from a connection to C Avenue (a Lake Lure street), the traffic volumes generated by CRSP will produce unacceptable delays at the intersection of Keeter Road and 1st Street.
- Traffic delays at the downtown Lake Lure streets are expected to back-up to, and compound, traffic delays already being experienced in both directions of US 64/74A at the beach front area.
- Realizing the expected traffic congestion would not meet the transportation desires of Lake Lure citizens, the option of an alternate US 64/74A route was explored and appropriately named the Lake Lure Parkway.

The MSTA traffic analysis did take in account that CRSP will not increase traffic volumes immediately. These volumes are expected to increase over the next few years as new pedestrian and bike trails as well as climbing areas and camping facilities are provided. This type of growth complements the idea of a “Roadway Project Phasing Process” for a Lake Lure Parkway. The following Parkway Phasing was discussed at Town meetings as shown on Figure 2, page 10:

- **Phase 1** would install a roundabout near the Town of Lake Lure Municipal Center, construct a northern parkway section and provide a driveway access to CRSP.
- **Phase 2** would install a roundabout at A Avenue, realign 1st Street, realign C Avenue and provide an eastern access to CRSP. This section of the parkway could incorporate the desires of the Lake Lure citizens by providing a more defined “Town” setting by intergrating 1st Street with a “Main Street” presence.
- **Phase 3** would extend the parkway with a “limited access” route around the south side of Lake Lure and connect at the roundabout built in Phase 2. This Parkway section would bring additional benefits to US 64/74A travelers by further improving pedestrian and traffic safety with fewer conflict areas, reduce traffic delays, and allow Lake Lure to become more of a pedestrian and bicycle oriented town.

If the Lake Lure Parkway is constructed, than the newly designed streets of Lake Lure should complement the street cross section designs presented in the Complete Streets policy.

Each of the three phases were analyzed with the following results:

- **Phase 1 and Phase 2** combined would produce the best results. Producing the lowest traffic delays and congestion for US 64/74A traffic is achieved by routing traffic along Lake Lure “Main Street” without being influenced by the the beach front parking delays and pedestrian crossings. Most importantly, all of the citizens desires could be achieved.
- **Phase 1** would produce acceptable traffic delays along US 64/74A by utilizing a roundabout to process the left turning traffic delays entering into CRSP. Traffic delays and other concerns along the beach front area would still be present.
- **Phase 2** would produce unacceptable traffic delays along US 64/74A mainly due to the congestion and parking maneuvers occuring at the beach front area, but also due to left turn conflicts expected at the intersection of Keeter Road and 1st Street.

During the traffic analysis, the following traffic aspects were noted:

- CRSP’s Main Parking Lot is expected to accommodate only 1,100 vehicles. This indicates the park alone will not be able to provide all the parking needs they are expected to generate over the next few years. Additional parking will be difficult to obtain due largely to the topography (acceptable flat land). Additional parking facilities will be necessary and could be a benefit to the commercial needs and growth potential for both Lake Lure and Chimney Rock Village if these municipalities assist with this parking need.

If adopted, the proposed Lake Lure Parkway design should incorporate NCDOT’s limited access policies and could serve as an alternate route for US 64/74A. Once completed, this Parkway could help reduce traffic delays and improve pedestrian and vehicle safety for US 64/74A through traffic and the proposed Parkway would allow drivers, traveling along US 64/74A, to select a less congested route and allow Lake Lure citizens to maintain their existing roadway characteristics with less vehicle traffic demands. Another important feature the parkway would provide is an alternate route for emergency vehicles.

Figure 2: Lake Lure Parkway Concept



B. Recommendations

1. Traffic Flow and On-street Parking

The findings in this study indicate that on-street parking along the beach front area creates pedestrian conflicts, parking maneuver delays and traffic delays along this section of US 64/74A. Visitor traffic to Chimney Rock State Park is expected to increase these traffic volumes and will greatly influence these traffic concerns. To address these concerns the beach front parking should be either removed, redesigned to have less impact, or avoided by providing an alternate route around the area.

2. Proposed Traffic Flow with Chimney Rock State Park

This study has presented a Lake Lure Parkway Concept shown on Figure 2 and recommends the downtown area to conform to the street cross section shown on Figure 1: Complete Street Cross Section, page 5.

In reviewing the Complete Streets Cross Section, note the shared motor vehicle zone (mixing bicycles with motor vehicles). This design should be appropriate in this area especially for experienced bicycle riders due to the low speed limit but also due to the proposed shared use paths also in the area. These shared use paths will be more bicycle friendly for young and less experienced cyclists that may be staying in the many vacation homes in the area. Providing both types of bicycle facilities will certainly promote cycling as a safe mode of transportation for all ages and provide the opportunity to access the Town Center as well and the many proposed shared use paths.

The Lake Lure Parkway design identifies two other features, a Festival Lawn and a proposed Town Parking Lot. Town Officials, business owners and local citizens had expressed the wishes to provide a community lawn that could house special events to benefit existing and future downtown businesses as well as generate revenue. These two features could provide the open space and additional parking spaces needed to support the community wishes.

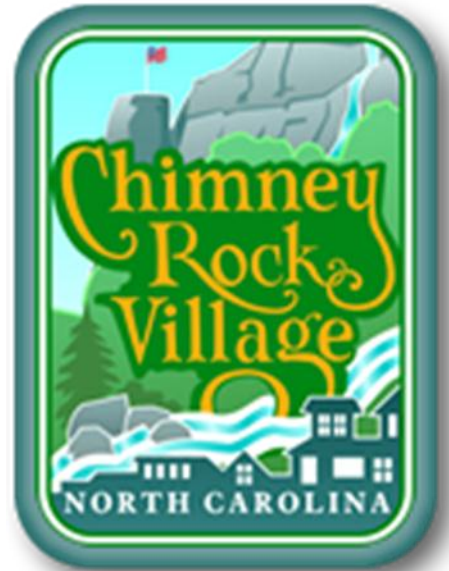


III. CHIMNEY ROCK VILLAGE

A. Analysis

Chimney Rock Village consists of a group of shops loosely clustered along both sides of US 64/74A and residential property located along side streets and driveways. The Village is located in the Hickory Nut Gorge area with property having a mountainous contour preventing the ability to establish a formal street structure.

The commercial area has largely been dependent on Chimney Rock Park but is continuing to evolve to more of a destination by offering a number of other attractions such as the Rocky Broad River Riverwalk, restaurants, overnight accommodations and recreation activities that include camping, hiking and fishing. Even so, most businesses are still primarily supported by a tourist economy.



Nearly all of the stores in the area were constructed well before the incorporation of the Village in 1991 with many dating back to the 1920's. Many find the building structures to present a very unique and quaint old-timey atmosphere. Adding to this uniqueness is the fact that most of the storefronts are uneven with each other, some built right up to the street and others set back at various distances. These inconsistencies make the pedestrian sidewalk and on-street parking spaces inconsistent in design and dimension. With just a few visitors in the area, the existing sidewalks can easily become filled and force pedestrians to stand and/or walk along the edge of pavement. Vehicles parked along the edge of pavement also cause pedestrians, especially children, to be hidden from oncoming drivers until they step into the traffic lane. Another important factor is that many of these inconsistencies in design do not conform to the Americans with Disabilities Act (ADA) standards of 2010. (The full text of the 2010 Standards is available for review at www.ada.gov.)

Nearly all businesses that provide goods or services to the public are required to meet ADA requirements, regardless of the size of the business or the age of their buildings. The ADA requires businesses to remove architectural barriers in existing buildings and make sure that newly built or altered facilities are constructed to be accessible to individuals with disabilities. "Grandfather provisions" often found in local building codes do not exempt businesses from their obligations under the ADA.

It is not the intent of this report to neither identify infractions of the ADA regulations nor imply enforcement of the mandates. It is the intent to identify items that could be considered barriers (obstructions of the travel path to businesses), provide an insight to how the public views and will use the public facilities within

the Village limits, and offer some suggestions for making the Village more welcoming to, and usable by, individuals of all ages and abilities including individuals who use wheelchairs.

Citizens of Chimney Rock Village have expressed the following desires:

- Present visitors with a more appealing presence
- Maintain good traffic flow along US 64/US 74
- Improve emergency vehicle access
- Provide for all users— pedestrians, bicyclists, and motorists of all ages and abilities
- Provide pleasant looking and safe buildings
- Encourage commercial and economic growth
- Expand the Rocky Broad River Riverwalk

Items this study identifies and the Village wishes to address are:

- Pedestrian accesses that are not ADA compliant.
- The need to provide pedestrian crossing access from sidewalk to sidewalk.
- Parking space designs should be standard and consistent. In many cases, parked vehicles are in the roadway or dangerously close.
- The Village acquiring additional properties for future installation of off-street parking lots.
- Traffic control signs that should be supported by an ordinance and/or comply with national standards indicated in the “*Manual on Uniform Traffic Control Devices.*”
- The Village should continue efforts to expand the Riverwalk and provide for alternative transportation modes.

A community with a Complete Streets policy ensures streets are designed and operate to make it easy for people to get physical activity as part of their daily routine. Street designs will have less emphasis on motor vehicles and more for pedestrian mobility and access. These design attributes could provide additional appeal and atmosphere the Chimney Rock Village by reducing traffic congestion, offer sidewalks that are less crowded and more pedestrian friendly, expand customer access to the village shops and offer sidewalk displays to store fronts. Implementing these designs would address the desires expressed by citizens.

It is important to note that US 64/74A roadway right-of-way is essentially white line to white line and that nearly all of the on-street parking spaces and sidewalks are privately owned. Parking is a problem for both property owners and visitors (potential customers), property owners needing more spaces for their customers and visitors being able to find an available space. It has taken a huge camaraderie between property owners to share these spaces, realizing the parking in front of their business is often taken by a customer of a neighboring business. These issues place more of a challenge on the property owners, local citizens and community leaders to determine immediate needs and long range goals that can be achieved with a united vision that will bring an improved lifestyle and economic growth to the area. Another huge hurdle is funding for corrective measures. There are two

areas this report will address: Pedestrian Sidewalks and Crosswalks, and Vehicle Parking.

1. Pedestrian Sidewalks and Crosswalks

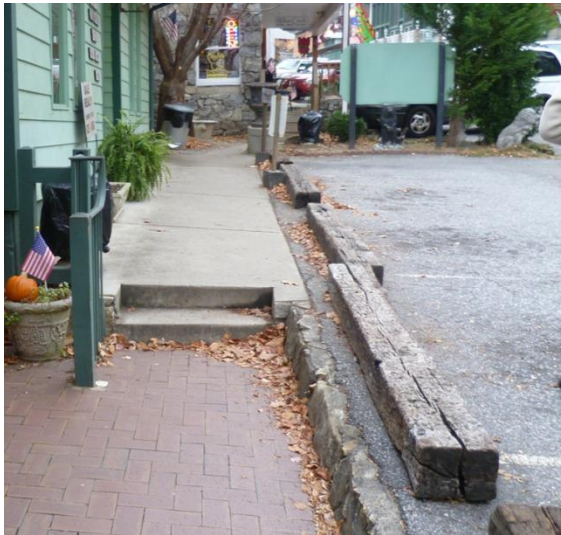
a) Sidewalks

Walkability and accessibility, in regards to ADA, is questionable for most of the shops with many obstacles for people with limited abilities such as vision impaired and/or wheelchair bound. The majority of the adjoining stores have individual narrow private sidewalks, the general lack of continuity, occasional steps, disjointed crosswalks and other physical conditions that create pedestrian barriers and obstacles. Some locations could be considered wheelchair accessible but most are not ADA approved in regards to slope angle, detectable warning surface and minimum landing area. The following photos indicate obstacles around the village:

Pedestrian Obstacles Around Chimney Rock Village



Pedestrian Obstacles Around Chimney Rock Village



This sidewalk is not flat and more than a 2 % slope. The design could pull a wheelchair into the street

These ramps exceed the 12:1 maximum slope



b) Crosswalks

Chimney Rock Village has three pedestrian crosswalks marked with high visibility pavement markings. The two end crossings have overhead “Yield To Pedestrians” signs with flashing lights. These crosswalks do not provide a continuous path from sidewalk to sidewalk and may not serve the heaviest pedestrian crossing locations. At two locations, pedestrians are forced to walk between closely parked vehicles making it nearly impossible for a vision impaired or wheelchair person to cross. There are no sidewalk features to encourage pedestrians to cross at these crosswalks resulting in pedestrians randomly crossing throughout the village.

Chimney Rock Village Crosswalks



Chimney Rock Village Crosswalks



Pedestrian Crosswalks with no access to sidewalks



2. *Vehicle Parking*

a) **Off-street Parking**

Chimney Rock Village has an off-street Municipal Parking Lot that is fee based (\$1 a day) consisting of a large paved surface with 109 marked parking spaces and 6 handicapped spaces. In addition, there are some smaller adjoining unmarked earth and gravel open areas used during heavy traffic demand times. An off-street parking program is utilized by the Village where business owners and employees purchase a multi-day parking permit. This program works very well to help keep the limited number of on-street parking spaces open for customers.

A large number of motorists in Chimney Rock Village are visitors looking for a parking space. On-street parking is at a premium and finding a vacant parking space can be difficult at times. There are different signs identifying the same Municipal Parking Lot none of which are a standard design sign based on the *Municipal on Uniform Traffic Control Devices (MUTCD)*. Standard design signs and standard placement help drivers quickly and easily recognize the sign and its meaning ultimately reducing traffic congestion and delays. In this case, the signs can help drivers quickly recognize there is an off-street parking area and easily be directed to the location. Drivers were observed passing the off-street parking area turning around and returning. This activity adds to the already congested roadway.

Signs currently being used for the Municipal Parking Lot:



Parking Area sign D4-1 in accordance with the MUTCD standard:



The standard sign D4-1 is recognized nationally and can be easily acknowledged and read at a further distance.

b) **On-Street Parking**

Traffic operations and parking maneuvers were observed along US 64/74A during the summer months of the year when visitation was at its highest. These observations revealed that traffic congestion in this area was created

by motorists stopping to enter and/or exit on-street parking spaces, queuing of westbound left turn vehicles wishing to enter Chimney Rock Park, and motorists stopping or slowing for pedestrians that are randomly crossing, walking, and stand along the edge of the through travel lane. The existing crosswalks were not being used for primary crossing locations by pedestrians. At several locations the existing sidewalks seemed over crowded which may have caused some pedestrians to walk along the edge of the road mixing with moving vehicles.



During the peak traffic days, many motorists are tourists and/or visitors looking for a space to park. During those times, on-street parking is at a premium and finding a vacant parking space can be very difficult. When parked, many vehicles will extend up to, and even beyond, the white edge of pavement line and encroaching into the travel lane. Some spaces may seem narrow and difficult to enter and exit a vehicle. These features are not considered very acceptable or welcoming to many drivers.

On-street parking consists of approximately 132 on-street parking spaces along both sides of US 64/74A. The majority of these spaces are privately owned by the shops they are located in front of and are, in most cases, the only parking provided by the business. This limited amount of road frontage property results in many of the parking spaces to be non-standard in length and width and varying from 30 degrees to 90 degrees in a relatively inconsistent pattern. This type parking typically has negative impacts on traffic safety and operations, these include:

- A narrow stall width can be difficult and cramped for passengers to enter and exit their vehicle. For some motorists, this is considered undesirable characteristics.
- The shorter parking stall lengths may have larger vehicles extend over the edge of pavement line and into the through travel lane.
- Increased traffic congestion can be caused by motorists driving very slowly through the area to find an empty parking space. This delay is dramatically increased when a driver locates a parking space on the left side of the road and waits for an adequate gap in opposing traffic to turn into the space.
- Higher vehicular delays and accident rates may be experienced. This is due to drivers have difficulty seeing oncoming traffic when exiting a parking space. As a result, drivers must back into one or two traffic lanes causing oncoming traffic to slow or stop suddenly.
- Reduced traffic flow occurs due to drivers feeling unsafe when vehicles, pedestrians and buildings are so close to the roadway.

Standard Parking Stall and Aisle Dimensions

There are two key elements to designing parking spaces, the first being the length of the stall and the second being the aisle width.

Stall Dimensions

For higher-turnover self-parking, a minimum stall width of 9 feet is acceptable and where shops are located a desirable width of 9.5 or 10 feet. The depth of the stall is a minimum 18 feet with a desirable length of 18.5 feet. In most cases angle parking is used for one-way traffic and 90 degree parking is for two-way and mainly used in parking lots where traffic volumes and speeds are low. For a major through route such as US 64/74A, 90 degree parking is not considered a desirable parking design because it requires stopping both directions of traffic for the parking maneuver and greatly increases traffic delays and congestion.

Aisle Dimensions

Aisle width is a function of the parking angle and stall width. If the goal for Chimney Rock Village is to minimize traffic delay and congestion along US 64/74A than parking maneuvers should stay within only one direction of travel. Essentially, the parking aisle width should be one travel lane width of US 64/74A (11 feet). Proper aisle width is very important to traffic safety and affects the delays and congestion for the through traffic. Recommended aisle widths based on parking angle are shown on Table 1 – Typical Aisle Dimensions on Page 7:

Using the aisle width of 11 feet as a guide, this chart indicates the on-street parking in Chimney Rock Village should be between 45 and 30 degrees.

c) The Hickory Nut Gorge Transit Service

Efforts are being made by Chimney Rock Village, Town of Lake Lure and Chimney Rock State Park to provide a local transit service in the area. The Hickory Nut Gorge Transit Circulator is a bus system that would encourage visitors to park their cars at designated locations, board a bus and be shuttled to and from business areas and tourists destinations in the Hickory Nut Gorge area. This service would help lower traffic congestion and reduce the importance for on-street parking in the village as well as promote physical activity and improve air quality for the region. This transit service will not just be beneficial to tourists but would also benefit local citizens by providing alternative transportation to young people, disabled, and senior citizens.

B. Recommendations

1. *Pedestrian Sidewalks and Crosswalks*

a) **Sidewalks**

It is the responsibility for all business owners to bring their property up to the current ADA requirements. People who own, lease, lease out, or operate places of public accommodation in existing buildings are responsible for complying with the barrier removal requirement. The process of determining what changes are readily achievable is not a one-time effort; access should be re-evaluated annually. Barrier removal that might be difficult to carry out now may be readily achievable later. There are tax incentives and various funding sources available to help absorb costs over several years.

It is important that visitors feel comfortable and welcome as a pedestrian. The village shops along both sides of US 64/74A should have a minimum 4-foot wide clear sidewalk to meet ADA requirements and should be uniform and connected. Most municipalities, and the North Carolina Department of Transportation, have adopted a standard minimum sidewalk width to be 5 feet. The sidewalk should be located away from the edge of pavement. In some areas it will be necessary to change the parking angle or remove parking to provide an adequate pedestrian walkway. The walkways should be designated by installing concrete sidewalks or painting two solid white lines 6 inches wide spaced 5 feet apart on new or existing pavement. If necessary, an ordinance should be established and “No Parking Any Time” signs (R7-1) installed. Strict enforcement of these areas will be required to maintain pedestrian safety.

Using the Complete Streets designs the width of the sidewalks should be designed for a large number of pedestrians to comfortably walk in both directions. This location would work best with minimum 8 to 10 foot wide sidewalks. Wider widths would be necessary where shop owners would like to

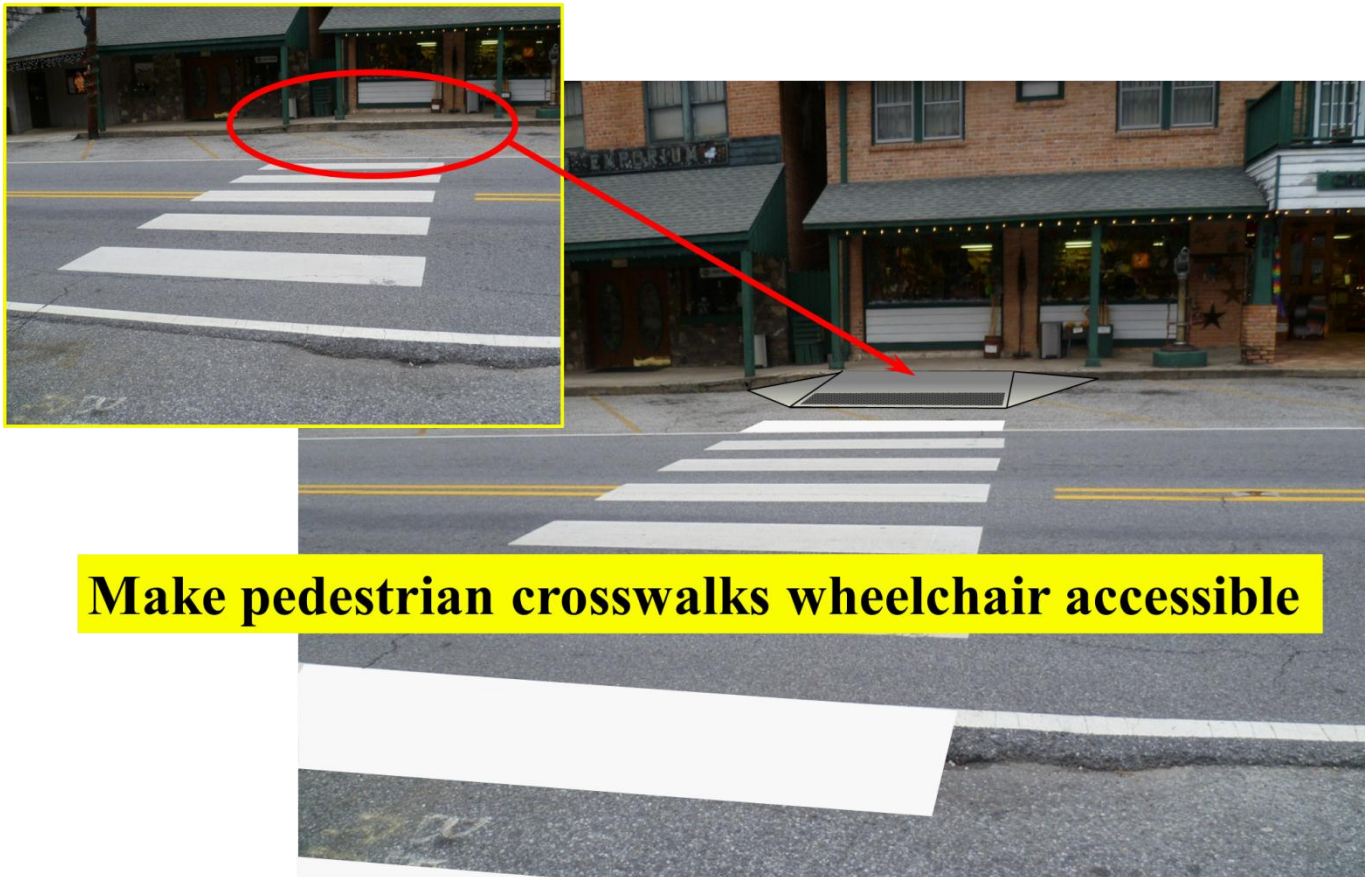


extend their business onto the sidewalk to provide for merchandise, and pedestrian features such as planters, benches and/or tables and chairs. This design would remove on-street parking for many shops requiring more emphasis on a Municipal Parking Lot. A Complete Street cross section is provided on Figure 1, page 5.

During the course of this study, the Chimney Rock Village Council has expressed that the local community is aware of the physical constraints identified in this report and is committed to look forward to finding future solutions, which may include changes by the individual private property owners, and by assisting in obtaining funding sources and other methods to assist the private owner to accomplish the changes suggested in this report. Most funding sources for sidewalk improvements are not available for private property. An option to consider is for property owners to release their road frontage through a municipal land acquisition or easement contract allowing more options for funding and more unified project designs.

b) Crosswalks

Crosswalks must lead from an established pedestrian walkway across US 64/74A to a corresponding pedestrian walkway. All access points to the crosswalks must meet ADA requirements. Chimney Rock Village should evaluate the existing pedestrian activity, determine if the existing crosswalk locations are appropriate, identify the safest location(s) possible and install ADA approved crosswalks. The example below indicates how a ramp could be constructed to provide ADA access at this location.



2. *Vehicle Parking*

a) **Off-street Parking**

Motorists should be informed of the existing Municipal Parking Lot before entering the congested area and then provided guidance to the parking lot. Parking Area signs (D-1) should be placed in accordance with the MUTCD (Section 2D.47). These signs will allow visitors to more easily locate available off-street parking quickly and help eliminate motorist from driving through the Village several times and/or driving slowly through the area looking for an available on-street parking space. The placement is described as follows:

Parking Area signs, with appropriate arrow, should be placed back-to-back at the entrance of the Municipal Parking Lot and also in advance of the entrance. The approximate locations for the advance signs is: 475 feet west of the entrance, for this eastbound traffic and 850 feet east of the entrance for the westbound traffic.

The parking lot should be evaluated in regards to it adequately serving the area with enough parking spaces. If additional parking is needed, than efforts should be made by Chimney Rock Village to acquire additional properties for the future installation of off-street parking lots. This can be accomplished by leasing or purchasing property that is within close proximity of the local shops. Sidewalks and crosswalks should be installed to provide pedestrian access to these new parking lots. If property is not available within walking distance to the Village, a shuttle bus service should be considered.

As Chimney Rock State Park and their amenities increase so will the number of visitors and the need for additional parking in Chimney Rock Village. The Municipal Parking Lot and the multi-day parking permit program is working very well. This program may need to be expanded for longer periods of time to accommodate a Complete Streets design.

b) **On-street Parking**

Parking spaces should be restriped in a way that vehicles will not block both directions of traffic when entering and exiting the parking space. This will require spaces to be angled between 45 and 30 degrees. Angle parking spaces will increase traffic safety and traffic flow along this area by discouraging motorists from turning left against opposing traffic and limiting the effect of the parking maneuver to only one direction. The space angle should be based on the distance from the sidewalk to the edge-of-pavement and provide a minimum 2-foot clearance from the edge-of-pavement line.

The citizens of Chimney Rock Village are encouraged to adopt a Complete Streets concept for the business area. This design would essentially remove the parking issue from the on-street locations and relocates the parking in easy to find off-street parking lots. The property in front of the businesses can then be converted to pedestrian areas and bicycle lanes with open walkways, shaded planting locations, seating areas and businesses that extend onto the sidewalks.

c) Shuttle Bus Service

This report supports the Hickory Nut Gorge Transit Circulator efforts and encourages this program to expand its opportunities by building a parking lot(s) in and around Chimney Rock Village for park and ride services. At first, the transit service may only need to operate on weekends and holidays when peak tourism is present. To increase awareness of the transit service and its operations, a schedule of operation days, times, and destinations should be determined and posted at appropriate sites. Strategic locations should be determined for Bus Stops that will be convenient and accessible to all businesses and those areas established with pedestrian shelter, seating and possible kiosk or information board providing operational hours and local information. As this transit service grows so will the importance of the village shops to address their ADA issues especially around future Bus Stop areas.

IV. CHIMNEY ROCK STATE PARK

Since 2007, the Division of Parks and Recreation has obtained 4,531 acres along both sides of US 64/74A in the Hickory Nut George area and includes Chimney Rock Park. These properties have become integrated into the state parks system and are now known as Chimney Rock State Park. The state park system is in the process of implementing a master plan designed to offer readily available public access, development of facilities, and recreation options as well as resource protection. The master plan identifies the necessity to provide an additional driveway for emergency access and future transportation needs to serve the Chimney Rock parking lot facility. The location of this driveway is proposed to access US 64/74A in the vicinity of the Town of Lake Lure. This new driveway will serve as the park's main entrance and the existing park access at Chimney Rock Village will become the exit.



MSTA agrees with the park's master plan of creating a one-way traffic pattern with the exit at Chimney Rock. The 1994 Study identified traffic congestion is high at the Chimney Rock Park entrance especially during the summer months and recommended constructing a left turn lane for westbound traffic and relocating their ticket collection booth. The ticket booth was relocated; however, the left turn lane was not constructed due to the limited roadway right-of-way and the inability to obtain additional property necessary for widening the roadway. The proposed one-way traffic pattern will essentially eliminate all of the heavy traffic congestion at Chimney Rock Village along US 64/74A caused by vehicles entering Chimney Rock State Park but will move that congestion to a new location. Careful consideration should be made in regards to the new entrance and placing it in a location that will not create congestion concerns at Lake Lure. This study addresses this issue under the Lake Lure analysis.

