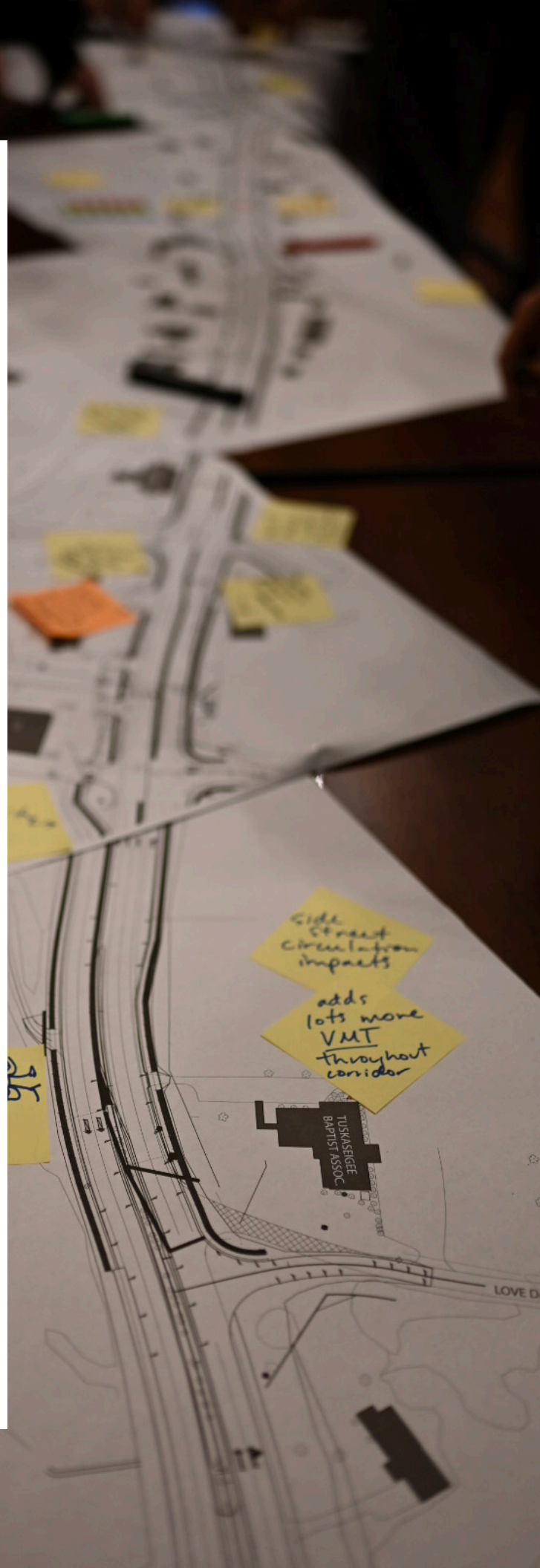


NC-107 Report

NOVEMBER 2019

ASHEVILLE DESIGN CENTER

A Program of MountainTrue



ACKNOWLEDGMENTS

The Asheville Design Center is very grateful to those that participated in this design process. The NC-107 Report was supported by the following individuals, organizations, and entities.

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Mary Gelbaugh, Commissioner
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Greg McPherson, Commissioner
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Town of Sylva

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EXECUTIVE SUMMARY

Overview

The North Carolina Department of Transportation (NCDOT) proposes to improve NC-107 from south of Webster Road to US 23 Business and US 23 Business from Skyland Drive to Municipal Drive. NCDOT's stated purpose of the project is "to improve safety, relieve congestion, and improve traffic operations along this heavily traveled route. N.C. 107 serves traffic to Sylva, Webster, Cullowhee, Tuckasegee, Glenville, and Cashiers."

The Asheville Design Center (ADC), a program of MountainTrue, was recruited by representatives of Smart Roads Alliance in June 2018 to examine NCDOT's proposal. We presented a scope of work to the Sylva Board of Commissioners, which was accepted in August 2018. ADC agreed to provide a neutral third-party evaluation of the existing roadway conceptual plan and corridor constraints to identify alternatives that better mitigate community impacts, while meeting the corridor safety and congestion needs.

Site Analysis & Community Engagement

ADC assembled a volunteer team of transportation specialists to examine NCDOT's plan for NC-107. We were encouraged by the agency to explore any and all alternatives that we thought were feasible and that addressed the project needs. The focus of the review work was driven by community concerns related to business impacts due to roadway widening and whether there may be alternative solutions to minimize impacts to businesses and property owners.

To better understand the design constraints surrounding the NC-107 project, the ADC design team first conducted a thorough site analysis of the project area, including consideration of: existing traffic patterns, projected traffic volumes, safety, topography, access, business viability, modes of travel, utility easements, project funding, permits, construction schedule, long-term maintenance, and cost sharing considerations.

In the first half of 2019, ADC conducted numerous community engagement activities including a focus group of business and property owners, two community meetings, a public design workshop, a meeting with utility providers, and numerous individual and small group meetings with stakeholders.

Recommendations

Given the corridor safety and mobility goals of the project, as well as the numerous corridor constraints discussed herein, ADC's design team did not uncover any substantially new corridor alignment alternatives that would achieve similar results without adding impacts to businesses and substantially increasing local funding requirements. Taking into consideration the land use and traffic context for this corridor, the ADC team focused on improvements to the design that would better accommodate all modes of travel. A summary of our recommendations include:

1. Corridor intersections should be refined to enhance bicycle and pedestrian safety through tightening radii, provision of pedestrian median refuges, and signal enhancements. A separate *NC-107 Pedestrian Crossing Recommendations* memo is included in the Appendices to address a number of potential enhancements.
2. Plans should include a separated bicycle facility such as a multiuse sidepath, raised cycletrack, or buffered bike lanes. The multiuse sidepath option has promise, especially in corridor sections with significant greenspace adjacent to the roadway; however, this option may require additional local funding and would increase local property impacts and right of way width requirements, which could be prohibitive.
3. The Town, NCDOT and Southwestern Commission should convene a meeting to discuss recent complete streets policy revisions that may affect this project. The requirement for a local match is a significant constraint to providing a separated bicycle facility along the corridor, and it is important to clarify the NCDOT's position on funding projects in light of the new policy guidance as this may impact project outcomes.
4. If funding can be identified for a multiuse sidepaths, we recommend commissioning a detailed engineering feasibility study to determine the extents of additional impacts that would occur under this alternative. In addition, a feasibility study would be needed to evaluate the best way to address the significant number of driveway crossings along the corridor.
5. Given that reducing crash severity and frequency is a goal for this corridor, we recommend narrowing motorized vehicle travel lanes to 11', providing an additional 2' to accommodate a bike lane separation.
6. Street landscaping along the NC-107 corridor are recommended and should be further investigated.

INTRODUCTION

PROJECT OVERVIEW

The North Carolina Department of Transportation (NCDOT) proposes to improve NC-107 from south of NC-116 (Webster Road) to US 23 Business (Asheville Highway) and US 23 Business from Skyland Drive to Municipal Drive. These improvements are included in the State Transportation Improvement Program as Project No. R-5600 (herein referred to as “NC-107” or “project area”).

NC-107 is the main arterial through the Town of Sylva and serves as a primary commercial corridor in Jackson County. The Town of Sylva is situated directly between US Highway 74 and Western Carolina University, Southwestern Community College, and Cashiers. There is dense commercial development throughout the project area with many driveways and intersections within the project limits. As many as 32,400 vehicles per day currently travel through the project corridor. Based on NCDOT forecasting methodology, the volume of traffic is expected to increase to 39,200 vehicles per day by the year 2035. Construction of this project is expected to start in February 2023 and last for three years.

NCDOT PROJECT PURPOSE STATEMENT

As stated in NCDOT's September 2018 newsletter, the purpose of the project is “to improve safety, relieve congestion, and improve traffic operations along this heavily traveled route. N.C. 107 serves traffic to Sylva, Webster, Cullowhee, Tuckasegee, Glenville, and Cashiers.”

OVERVIEW OF NCDOT PROPOSED IMPROVEMENTS

Based on the current NCDOT project concept, the proposed improvements will include the following:

- Corridor Safety and Capacity Enhancements (Access Management):
 - ✓ Reduction in the Width and Number of Driveway Curb Cuts
 - ✓ Raised Center Median
 - ✓ Protected Left Turn Lanes
 - ✓ Controlled U-Turns
- Intersection Safety and Capacity Improvements
- Multimodal Enhancements

-
- ✓ Complete Missing Sidewalk Sections (Both Sides)
 - ✓ Accessibility (ADA) Upgrades
 - ✓ Pedestrian Enhancements at Signals
 - ✓ Bike Lanes
 - General Modernization of Roadway
 - ✓ Signal Upgrades
 - ✓ Drainage Improvements
 - ✓ Structural Repair/Replacement
 - ✓ Utility Relocation

SCOPE OF WORK

The Asheville Design Center (ADC) is an independent, nonprofit agency founded in 2006 on the belief that everyone deserves good design. In 2017, ADC merged with the regional environmental nonprofit, MountainTrue. ADC recruits volunteer professionals to work with stakeholders to create design solutions that promote healthy, thriving, and equitable communities.

ADC was contacted by representatives of Smart Roads Alliance in June 2018 and asked if we would examine NCDOT's current proposal. After reaching out to the Town of Sylva and Southwestern Commission, ADC presented a scope of work to the Sylva Board of Commissioners, which was accepted on August 6, 2018. ADC is pleased to offer the Town of Sylva our services on a pro bono basis.

For the NC-107 Project, the purpose of the ADC work was to provide a neutral third-party evaluation of the existing roadway conceptual plan and corridor constraints to identify alternatives that better mitigate community impacts, while meeting the corridor safety and congestion needs within the known corridor constraints. The ADC scope of work was limited to a high-level planning evaluation and did not include independent traffic analysis, safety audits, roadway engineering/design or detailed review of engineering reports and design plans.

The focus of the review work was driven by community concerns related to business impacts due to roadway widening and whether there may be alternative solutions to minimize the impact on businesses impacts.

Here is a brief introduction to the team of volunteers that assisted with the evaluation of the Sylva NC-107 project:

Rachael Bronson is a transportation planning specialist with Traffic Planning & Design, Inc. Rachael has 11 years of experience in public and non-profit sector work in multimodal transportation policy, planning, programs, design and construction. She earned her Master's degree in Civil Engineering from the University of Colorado Denver. Rachael has both a technical background in engineering and professional experience as a planner.



Kristy Carter is a Senior Project Manager with Traffic Planning and Design, Inc. Kristy has 20 years of public and private sector community work, including time as the owner and principal of Friction Shift Projects. Kristy specializes in projects that build active transportation networks, promote healthy built environments, and empower community voices in planning discussions.

Chris Joyell has served as director of the Asheville Design Center since 2008. The ADC, which merged with MountainTrue in 2017, connects volunteer designers—architects, engineers, landscape architects, and planners—with projects that promote healthy, vibrant, and equitable communities.

Colin Kinton has over 25 years of experience in traffic and transportation engineering in both Tennessee and South Carolina. He most recently served as the Director of Transportation Engineering for Beaufort County, South Carolina. In this role, he oversaw management and operations of the countywide signal system, traffic engineering studies, long range transportation planning and project development. Colin received his Master's degree in Engineering Management and a Bachelor's of Science degree in Civil Engineering from the University of Tennessee. He holds a Traffic Signal Field Electrician Level II certification with the International Municipal Signal Association.

Kelsey Morrow is a recent graduate of UNC Charlotte's Master of Urban Design program. She has a Bachelor's degree in Urban and Regional Planning from East Carolina University. She specializes in research and design with a focus on affordable housing, active transportation planning, environmental planning and placemaking.

Christy Staudt is a professional transportation engineer and the regional lead of Traffic Planning & Design, Inc.'s North Carolina office. With 20 years of experience in public and private transportation planning and design, she has worked for a variety of clients including municipal, county, state, non-profit, private developers and community advocacy organizations on a wide range of transportation engineering and planning tasks.

PROJECT HISTORY

The width of NC-107 through Sylva is essentially as it has been since the 1960s, when it was reconstructed to its current footprint to move traffic from Sylva to Cullowhee and further south. The adjacent land use then was rural residential. It was not designed to be the commercial corridor as it functions today. In 1968, NCDOT projected that by 1988 there would be 6,000 cars per day on NC-107, but the actual count turned out to be closer to 20,000. Growth occurred more quickly than expected, and over time, Sylva expanded its jurisdictional boundaries along the corridor to capture the commercial development occurring there. Minimal standards were in place to mitigate the impacts of this development.

With the addition of new businesses along the corridor came the addition of many new access points and driveways. The NC 107 Corridor Study documented a steady increase in the corridor crash rate. Some modifications were made to the corridor, including a reduction in lane widths to accommodate a center turn lane. Some additional signals and turn lanes have been added and a sidewalk was added to one side of the road, but otherwise, no substantial improvements have been made.

The Thoroughfare Plan for the Towns of Sylva and Dillsboro (1994) was the first planning document to propose a solution to address the NC-107 corridor. The Thoroughfare Plan's "Southern Loop" concept was a four-lane highway that by-passed Sylva by running from US 74 to US 441, south of Sylva. Opposition to this route arose when NCDOT began to take a serious look at funding the Southern Loop by-pass, and Sylva and Jackson County asked for more planning before moving forward. Jackson County began the process of developing a Comprehensive Transportation Plan (CTP) in 2003, while subsequently developing the county's first land use plan.

NCDOT completed the Southern Loop feasibility study in 2003. Concurrently, an opposition group formed under the name of the Jackson County Smart Roads Alliance.

Jackson County Smart Roads Alliance was formed in 2002 in response to a proposal by the North Carolina Department of Transportation (NCDOT) to build a new \$132 million highway through the middle of our most precious and beautiful rural county. Our goal since 2002 has been to work together as a community and create smart solutions to our traffic and transportation issues. (* \$132 million construction cost source: NCDOT 2008)". Smartroads.org*

The project was altered and paired down as a result of public pressure, as the conceptual "Southern Loop" was downsized by removing the western portion from US 441 to NC 107 from

the plan. The remaining leg was changed from a four lane divided highway to a two lane, controlled access parkway-style facility, called the “NC 107 Connector”, connecting US 74 to NC 107 in Cullowhee. In 2008, NCDOT dropped the western half of the Southern Loop and renamed the project as the NC-107 Connector.

Controversy over the proposed Southern Loop stalled its planning and development, leading local officials to express a desire to improve the existing route. In response, a feasibility study was conducted which considered ways to handle traffic through the year 2035, based on projected growth.

Acknowledging that with no improvements, congestion in the corridor would only get worse, the feasibility study examined possible improvements to the existing NC 107. The study results showed solutions both with and without the NC-107 Connector. It was estimated that the connector would divert 15% of the traffic from the existing road, and that reconfiguring NC-107 without increasing its width would not address congestion and safety concerns. The study concluded that the only way to address these concerns was to expand the NC-107 footprint to the extent that nearly every business along the corridor would be impacted. The public made it very clear, as did the Town of Sylva Board of Commissioners through an official letter, that they wished for improvements to be made within the existing footprint, as much as possible.

In 2012, a cooperative effort between the Town of Sylva, Jackson County, and the Southwestern Rural Planning Organization produced the NC 107 Corridor Study Report. The report summarized a local task force’s evaluation of NC 107 in the Town of Sylva’s city limits. The report attempted to define the community’s vision for the corridor, calling for minimizing impacts while working within NC-107’s existing footprint as much as possible. The report also recommended adding a sidewalk to the east side of the corridor and increasing the capacity and multi-modal safety of road.



PROCESS & TIMELINE

ADC uses a community-driven design process for every project. In its simplest form, design is problem solving. To solve a problem, we must first understand it. While our volunteers may be experts in their respective disciplines, they do not have an inherent understanding of the needs of the communities we serve. ADC's volunteers start by listening. We ask residents to define the problems their communities face, and, in turn, help us identify and design the solutions needed to improve their lives.

For this project, ADC assembled a volunteer team of transportation specialists to examine NCDOT's plan for NC-107. We were encouraged by the agency to explore any and all alternatives that we thought were feasible and that addressed the project needs. The Town of Sylva, the Southwestern Commission, and Smart Roads Alliance all helped in the design of our process, as well as efforts to engage the larger community.

Below is a brief outline of the steps that ADC took throughout the process from our initial involvement to the final community meeting. A more in-depth discussion of ADC's community engagement can be found later in this report.

2018

- **June** - ADC invited by Smart Roads Alliance to explore alternatives to current NCDOT design for NC-107.
- **August** - ADC presented a Scope of Work to Sylva Board of Commissioners and was invited to engage the public in design examination.
- **November** - ADC team met with representatives from Town of Sylva, NCDOT, Southwestern Regional Planning Organization (SWRPO) to review ADC's proposed Scope of Work and conduct a site tour.
- **December** - ADC convened a focus group of property and business owners along NC-107 and representatives of Smart Roads Alliance to help identify potential issues.

2019

- **January** - First community meeting, with over 120 people in attendance. The ADC team provided an overview of the design process, regulations and constraints, as well as information on the many factors that impact engineering decisions. Participants were then asked to affix comments, observations, and objections directly to NC-107 section sheets.
- **March** - ADC convened a meeting with Sylva, NCDOT, SWRPO, and the utility companies whose easements would impact designs and potential ROW.
 - ADC, Town of Sylva, NCDOT and SWRPO participated in a public design workshop, where the participants worked through a number of issues raised by the public in an attempt to identify problems ADC could further examine. The public was given the opportunity to submit questions on note cards and those questions were presented to the workshop participants.
- **April** - Second community meeting, with about 50 people in attendance, where ADC presented our initial findings and draft recommendations for improvements to the NC-107 design.
- **May** - Follow up meeting with Smart Roads Alliance, where ADC was asked to re-examine some specific design issues.
- **November** - Final report drafted and submitted for review.
-

SITE ANALYSIS

To prepare for the community engagement events and to better understand the unique challenges surrounding the NC-107 project, the ADC design team first conducted a thorough site analysis of the project area. We gathered maps, reviewed past feasibility and corridor studies, and conducted a site walk with Sylva staff on November 9, 2018. As with any design process, our team first set out to understand the physical, social, and economic constraints that ultimately shaped our final recommendations.



PROJECT CONSTRAINTS

Local & Through Traffic: NC-107 is the main artery through the Town of Sylva, and serves as a primary commercial corridor in Jackson County. The Town of Sylva is situated directly between US Highway 74 and Western Carolina University, Southwestern Community College, and Cashiers. The section of the road that is within the Sylva city limits is already experiencing volumes that exceed roadway capacity during peak travel hours and conditions are predicted to worsen as population continues to grow. According to an NCDOT Public Meeting Handout (dated

2/23/17) NC-107 currently carries around 32,000 vehicles per day. It is anticipated that within 15 years, that number will approach 40,000 vehicles per day.

Safety: The 2012 NC-107 Corridor Study revealed that this stretch of road has experienced over 100 crashes in a three-year period. The frequency of crashes is expected to grow as the corridor becomes more congested. The installation of a TWLTL in the early 1990s along portions of the roadway provided a turning bay to remove left turning vehicles from the flow of traffic. As indicated by the AASHTO Highway Safety Manual, TWLTL can reduce crash rates under certain conditions (i.e. corridor driveway density of up to five driveways per mile). Typically, left turn bays help to reduce the number of vehicular conflicts associated with left turn movements by removing them from through traffic and providing space for left turns to wait for gaps in opposing traffic. However, as driveway density and commercial turning movements increase, the crash reduction benefits of a TWLTL are diminished (see Page 10-30 of the 2010 Highway Safety Manual). In addition, vehicles often use TWLTLs as either passing lanes or merging lanes, although they are not designed as such.

Topography: Scotts Creek and the mountainous terrain surrounding the valley constrain the project. The current footprint of NC-107 already represents the path of least resistance. Alternatives that divert NC-107, or split its north- and south-bound traffic into separate traffic corridors are precluded by the topography of the area. Scotts Creek also winds its way through the valley, with NC-107 crossing over it twice. Again, alternate paths present new creek crossings, bringing with it additional environmental impacts and costs that accompany new bridge and culvert construction.

Access to Land: The topography of Sylva, and in particular the NC-107 corridor, presents several constraints for designers. The valley forces traffic into a narrow corridor, leaving little room for re-routing and relocation of existing businesses. To create access to private property, numerous curb cuts and driveways have been installed along NC-107. Sylva is developing a land use plan that can reorganize access to land along NC-107, allowing for better managed access and possibly fewer driveway entrances.

Business Viability: It is important to note that until utility easements have been finalized, these impacts remain undetermined. However, preliminary assessments have indicated that right-of-way acquisition could impact at least 55 businesses along the NC-107 corridor. Impacts will range in severity. Some businesses may see the loss of a few parking spaces yet would remain viable. Others may require driveway reconfiguration or shared access with neighboring businesses. Some businesses may be forced to relocate. In some instances, required business relocations may have parcel remnants that can be redeveloped to host a new business. The most significant potential impact to existing land uses would a total acquisition, leaving no viable land use.

Multiple Modes of Travel: The NC Board of Transportation adopted a Complete Streets Policy in July 2009 and issued a Complete Streets Policy Update Memo in August 2019. This policy directs the NCDOT to consider and incorporate all modes of transportation when building new projects or making improvements to existing infrastructure. Currently, NC-107 has significant gaps in dedicated bicycle and pedestrian infrastructure. Sidewalks extend along the southern edge of NC-107 but are interrupted repeatedly by curb cuts and driveways. There are gaps in sidewalk infrastructure along the eastern edge of NC-107, which impacts pedestrian connectivity and corridor access. Bicyclists do not have dedicated infrastructure and must use the roadway or ride on sidewalks illegally. According to Sylva's Code of Ordinances (Sec. 30-3. - Riding on Sidewalks), riding a bicycle on sidewalks in the town limits is prohibited.

Utility easements: At the time of our last meeting with utility providers, easements were still being determined to accommodate Duke Energy, Tuckasegee Water and Sewer Authority (TWSA), Dominion Energy (formerly PSNC), Frontier Communications, and Morris Broadband. It is expected that above-ground easements may expand the proposed footprint for NC-107. At our



utilities meeting, participants estimated that the cost of putting utilities underground was cost prohibitive, rendering that option infeasible.

Project Funding, Permits, and Schedule: Since the NC-107 project includes federal funding, it is subject to various state and federal transportation project regulations, including US Code Title 23, Section 109, Americans with Disabilities Act (ADA) of 1990, and the National Environmental Policy Act (NEPA) of 1970.

Construction Considerations: NC-107 must remain open and operable during construction. That consideration poses a significant challenge to designers, as it limits options requiring significant re-routing of traffic or shutting down entire segments of roadway for any period of time.

Long Term Maintenance and Cost Sharing Considerations: If the corridor concept is revised to incorporate multiuse sidepaths, streetscape elements or trees/ landscaping enhancements, funding and resources will be required at the local level. NCDOT will require a maintenance agreement with the local municipality for the upkeep and maintenance of these elements, the cost of maintenance will be a factor for the local jurisdiction to evaluate. Also, depending on the percentage of the construction cost that would be required to be funded by the local jurisdiction, this could present an obstacle.



PUBLIC ENGAGEMENT

Meaningful public engagement is key to ADC's community-driven design process. Our process promotes change to the built environment from the neighborhood to regional scale and aims to meet community needs through participatory decision-making at all levels. Community-driven design focuses on designing our built environment with the strong participation of those who are using it.

Sylva Board of Commissioners

On August 6, 2018, ADC presented a Scope of Work to the Sylva Board of Commissioners to examine the NC-107 project and offer alternative designs to mitigate impacts throughout the corridor.

Kick Off Meeting & Site Walk

On November 9, 2018, ADC held a kickoff meeting with representatives from the Town of Sylva, Southwestern Commission and NCDOT, as well as ADC design team members. We reviewed the Scope of Work and set a schedule for community meetings. Following the kick-off meeting, Sylva staff led the ADC design team on a site walk and windshield survey of the project area.



Focus Group

On December 6, 2018, ADC convened a small focus group consisting of several property and business owners within the corridor to help identify issues to address at our first community meeting.

Community Session #1

On January 14, 2019, ADC held its first community meeting, with over 120 people in attendance. We began the meeting by inviting the audience to participate in helping us identify the trouble spots along the NC-107 corridor. Using several maps of the project area, attendees attached sticky notes to locations that presented issues needing a solution. Once we collected the community's input, our design team traffic engineer, Christy Staudt, gave a presentation outlining the design process engineers use and the constraints this particular project presented.



Utilities Meeting

On March 14, 2019, ADC convened a meeting of the various utility providers located along the NC-107 corridor, including representatives from Duke Energy, Tuckaseegee Water and Sewer Authority (TWSA), Dominion Energy (formerly PSNC), Frontier Communications, Morris Broadband, as well as representatives from the Town of Sylva, Southwestern Commission, and NCDOT. The group discussed various timelines for installation of utilities and they explored potential impacts of above- and below-ground utilities and easements they will require. (see Appendices: *Utilities Meeting Minutes*)

Design Workshop

On March 21, 2019, ADC convened a Design Workshop open to the public. Participants at the work session included representatives from the Town of Sylva, Southwestern Commission, and NCDOT, as well as the ADC design team. Drawing from the input we received at the first community meeting and feedback from the utilities meeting in March, ADC presented NCDOT staff with a series of questions and concerns in advance regarding the proposed plans for NC-107. NCDOT responded in detail to each of those questions (see Appendices: *NCDOT Responses*), which set the stage for the work session. Numerous issues were raised and

discussed, including the construction of a new road parallel to NC-107, separated/combined bike paths and sidewalks, and the configurations of various intersections.

Community Session #2

On April 17, 2019, ADC held its second and last community meeting where we presented our findings and recommendations. Noting the constraints listed above, our team acknowledged that our options for modifying NCDOT's current proposal were severely limited. With few options available to alter the proposed alignment, our team focused on potential improvements to the bike/pedestrian infrastructure, street trees, and configurations of two main intersections--US-23 Business/NC-107 & NC-116/NC-107.

Over the past year, ADC's director has also met with Sylva residents and representatives of Smart Roads Alliance to gain a better understanding of the community's concerns. Additionally, in March 2019 ADC facilitated a meeting between NCDOT and Carl Queen, a local resident who proposed the concept of the parallel road structure, to better understand the concept and test it for feasibility.

RECOMMENDATIONS

Road Alignment

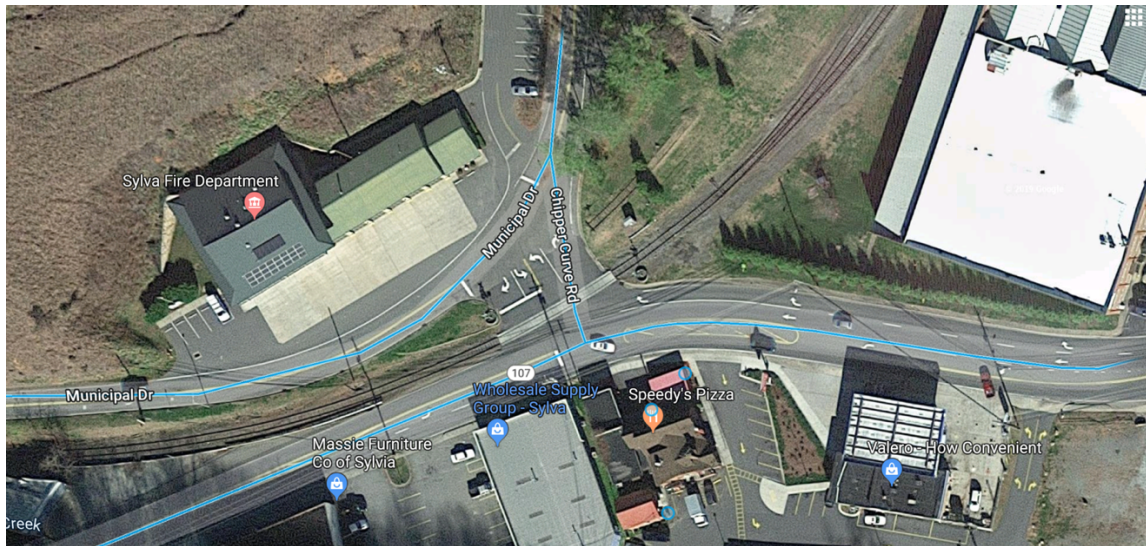
From the outset, project partners, including NCDOT, encouraged ADC to explore any and all alternatives to the proposed NCDOT NC-107 project that would satisfy the purpose and need of the project, while mitigating the impacts to properties within the NC-107 corridor.

Given the corridor safety and mobility needs and goals as well as the numerous corridor constraints discussed above, our team did not uncover any substantially new corridor alignment alternatives that will achieve similar results without adding business impacts and substantially increasing local funding requirements, which are anticipated to be prohibitive. As such, the ADC team focused on improvements to the design that would improve accessibility, and bicycle and pedestrian accommodations.

Parallel Road Proposal: Our team provided a high-level feasibility review of Carl Queen's concept of a parallel road structure that would carry north and south-bound traffic on separate roads. Because of the topography of the valley, any parallel side road option would require significant cut and fill sections as well as significant re-grading well beyond the roadway alignment, which will impact local business and homes to a far greater extent than the NC-107 improvements. There would also be substantial right-of-way impacts necessary to construct a parallel road. Additional impacts would be necessary to construct appropriate connections to the existing NC-107. This road would also trigger a new environmental review process,

and likely require a new application for state funding.

Intersections



Municipal Drive/West Main: This is a challenging intersection due to the geometry of the existing roads, the railroad and the close proximity of buildings on both sides of the intersection. All intersections are evaluated as part of the project development. A roundabout has been conceptually considered. The design would increase property impacts. Additionally, the intersection would be closed during train movements.

Cope Creek Road/NC-107: The current geometry of the Cope Creek Road intersection creates significant safety issues for vehicles, particularly vehicles turning right off NC-107, or turning left onto NC-107. A roundabout here was explored, but our team determined that it would result in more property impacts than the current design. It would also require more stream impacts (more culvert length) to Cope Creek.



US-23 Business/NC-107 & NC-116/NC-107: The ADC design team has developed pedestrian crossing enhancements at the intersections of NC-107 with US-23 Business and NC-116 (Webster Road). Both of these intersections pose significant challenges to bicyclists and pedestrians. (See Appendices: *NC-107 Pedestrian Crossing Recommendations*).



In addition, NCDOT modeled a roundabout for the US-23/NC-107 intersection in their feasibility study. Even a dual-lane roundabout would not be able to handle the traffic volume unless a flyover bridge was included to accommodate the volume of traffic turning left from US-23 Business to NC-107. A roundabout with a flyover bridge would have substantially more property impacts than the current design. The southbound right turn at US-23 Business is essential to maintain an acceptable level of service.

Lane Widths

The width of NC-107 is essentially as it has been since the 1960s, when it was reconstructed to its current footprint to move traffic efficiently from Sylva to Cullowhee and south. The addition of a turning lane, or a two-way left-turn lane (TWLTL) in the early 1990s along portions of the roadway helped improve the crash rates. To accommodate the TWLTL, the 48-foot four lane undivided roadway was restriped as a five-lane roadway. This accommodation was implemented to meet mobility and safety needs at the time, but as traffic volumes increased over time, the TWLTL no longer meets local mobility and safety needs for the corridor. Current industry guidance, including the AASHTO Highway Safety Manual, have shown that TWLTLs are not as safe as raised medians with exclusive turn lanes, particularly on high volume roadways of 20,000 or more vehicles per day and roadways with a high density of driveway access points.

ADC's design team asked NCDOT to consider narrowing travel lanes to 11 feet, to which the agency responded:

Following the February 23, 2017 Public Meeting, NCDOT considered narrowing the travel lanes to 11' and had discussions with the Town and SWRPO to weigh the pros and cons of doing so. Narrowing the travel lanes would reduce the width of the roadway by 2' on each side. This could reduce the impacts to some adjacent properties, however; those reductions could be offset by easements necessary to relocate the utilities. The wider travel lanes will enhance safety and mobility for the 32,000 vehicles that currently travel the road daily, assist with emergency response, snow removal and routine maintenance. After considering all these factors, we concluded that the lane width should remain at 12'.

As noted by the ADC design team, narrowing lanes to 11' would provide an additional 2' to accommodate a bike lane separation, aka "painted buffer" from traffic, which could include delineator posts at key conflict locations. Given that reducing crash severity and frequency is a goal for this corridor, there are several reasons this should be evaluated further:

- Oncoming traffic will have a median separation and the roadway does not have sharp horizontal curves; these conditions reduce the need for wide travel lanes.
- Narrower lanes allow a greater separation from traffic and items in the clear zone as well as pedestrians on the sidewalk.
- Cyclists are more vulnerable than motorized vehicles and have no other path through the corridor.

Reducing the width of 12-foot lanes could benefit all modes of travel as narrower lanes have been shown to correlate with reduced travel speeds (Transportation Research Record # 1751). The Federal Highway Administration (FHWA) documented the direct correlation between increased speed and increased crash severity (FHWA-HRT-17-098, January 2018).

Complete Streets



As indicated previously, NCDOT recently adopted an update to their 2009 Complete Streets policy. This update provides new guidance for incorporating a complete streets approach to the Department's planning, programming, design and maintenance. Given the new guidance provided in this resource, which specifies new funding parameters that may impact projects such as NC-107, the ADC Team recommends that the Town, NCDOT and Southwestern Commission convene a meeting to discuss how this guidance impacts the complete streets recommendations of this project. As outlined below, funding is a significant constraint to this project's bicycle and pedestrian recommendations, and it is important to clarify the Department's position on funding projects in light of the new policy guidance as this may impact project outcomes.

Bike Lanes

NCDOT's current plan calls for striping a five-foot bike lane adjacent to vehicle travel lanes to separate the bikes from the cars. Our team was asked to evaluate the need and appropriateness of this recommendation along this corridor. Given the lack of a parallel bicycle connection and the fact that this corridor provides primary regional connectivity, all modes should be considered. In addition, parts of NC-107 in this project study area are a designated statewide bicycle route known as the Mountains to Sea route. Given these factors, the need and appropriateness for bike facilities along this corridor is evident.

The next step in our team's evaluation is to determine the most appropriate bicycle facility type. Based on national bicycle facility selection guidance (2019 Bikeway Selection Guide, FHWA), more enhanced and lower-stress bicycle facilities should be incorporated into this design. Ideally, this facility would have horizontal and vertical separation from traffic. The FHWA Bikeway Selection guidelines that relate road volume to speed limit in order to determine the most appropriate bicycle facility show that the NC-107 project falls well within the range of requiring a separated bicycle facility such as a multiuse sidepath, raised cycletrack, or buffered bike lanes.

Multiuse Path: The team investigated these options that further separate bicycle traffic from motorized vehicle traffic. The multiuse sidepath option has promise, especially in corridor



sections with significant greenspace adjacent to the roadway; however, this option may require additional local funding and would increase local property impacts and right of way width requirements. Sidepaths are also subject to design challenges along sections that have significant driveway crossings. As such, detailed engineering feasibility studies would be needed to determine the extent of additional impacts that would occur under this alternative. The updated NCDOT

Complete Streets policy needs to also be considered in light of the sidepath consideration, particularly as it relates to funding.

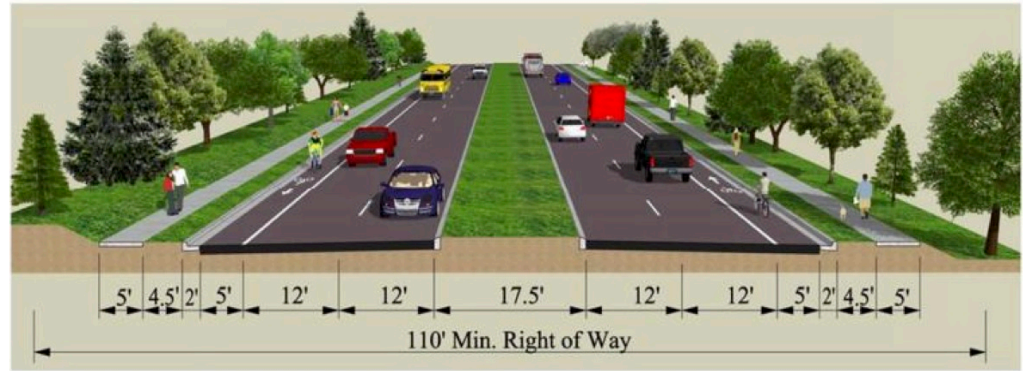
In the event that funding requirements and right of way impacts for a multiuse path are studied and deemed infeasible, another option can be considered that has less impact on local businesses and land owners. This option would include a buffered bike lane — a bike lane that has a striped buffer from traffic that may include delineator posts, as needed and as feasible. This option can be achieved without requiring additional right-of-way if the vehicle lanes were built slightly narrower (see Lane Widths, above).

Pedestrian Amenities

ADC endorses the current plan for installation of sidewalks on both sides of NC-107. There are pedestrian destinations on both sides of the corridor. Sidewalks only on one side would not adequately serve all pedestrians and would not meet corridor safety and mobility needs for all modes.

In addition, removing sidewalk from one side would not reduce the effective roadway footprint because the sidewalk lies within the roadway clear zone and vehicle recovery area. Within the clear zone, just outside the vehicle lanes, the roadway must not have structures that do not have “crashworthy” or breakaway design. In addition, the roadway must be graded for recovery of

errant vehicles. As such, this location is unusable for local businesses and would be underutilized. This space along the corridor provides a logical space for a sidewalk in the constrained corridor.



The ADC design team explored the feasibility of combining the sidewalk and bike lane into a 10' multi-use path but found that it would not reduce the right-of-way. The minimum required clear and graded width behind the curb is 10' for a standard 5' sidewalk. The clearing and grading width would increase to 15' to accommodate a 10' path. The multiuse sidepath option has promise, especially in corridor sections with significant greenspace adjacent to the roadway; however this option may require additional local funding and would increase local property impacts and right of way width requirements. Sidepaths are also subject to design challenges along sections that have significant driveway crossings. As such, detailed engineering feasibility studies would be needed to determine the extent of additional impacts that would occur under this alternative.

An option was discussed that would provide separated bicycle and pedestrian facilities further from the roadway and along the creek. A separated multi-use path along the creek would be beyond the scope of NCDOT's project area, meaning the Town of Sylva would be responsible for the costs associated with its design, property acquisition, construction, and maintenance. In addition, it does not provide adequate bicycle and pedestrian access to land uses that directly front the corridor. Such a project could be submitted to Strategic Transportation Prioritization (SPOT) as a standalone bike/ped project. If it scored well and was funded, the Town may have to pay a percentage of the entire cost; a decision that is contingent on the interpretation of the updated NCDOT Complete Street policy. In addition, based on a high-level review of the alignment, this option has significant physical constraints and would require further study to assess feasibility and associated costs.

Landscaping

The benefits of appropriate street landscaping along the NC-107 corridor are numerous and should be further vetted.

- Urban street trees create vertical walls framing streets, providing a defined edge, helping motorists guide their movement and assess their speed (leading to overall speed reductions). Street safety comparisons show reductions of run-off-the-road crashes and overall crash severity when street tree sections are compared with equivalent treeless streets.
- Create safer walking environments, by forming and framing visual walls and providing distinct edges to sidewalks so that motorists better distinguish between their environment and one shared with people.
- Soften and screen necessary street features such as utility poles, light poles and other needed street furniture. Trees are highly effective at screening those other vertical features to roadways that are needed for many safety and functional reasons.
- When properly positioned and maintained, the backdrop of street trees allow those features that should be dominant to be better seen, such as vital traffic regulatory signs.

Street landscaping does require creative and thoughtful design to minimize utility impacts and the impact of root systems on the roadway infrastructure while maintaining an environment where vegetation can survive. There are more new approaches available; however, additional input will be required from a qualified landscape architect.



Additional tree considerations have been noted:

- Height and Spread. Will the tree bump into anything such as power lines, tall trucks etc. when mature?
- Is the tree deciduous or coniferous? Will it lose its leaves in the winter?
- Form or shape. A columnar tree will grow in less space. Round and V-Shaped species provide the most shade.
- Growth rate. How long will it take for your tree to reach its full height? Slow growing species typically live longer than fast growing species.
- Soil, sun, and moisture requirements.
- Hardiness zone indicates the temperature extremes in which a tree can grow.

SUMMARY

From the outset, project partners, including NCDOT, encouraged ADC to explore any and all alternatives to the proposed NCDOT Project R-5600 that would satisfy the purpose and need of the project, while mitigating the impacts to properties within the NC-107 corridor. Our findings are summarized as follows.

Given the corridor safety and mobility needs and goals as well as the numerous corridor constraints discussed above, our team did not uncover any substantially new corridor alignment alternatives that will achieve similar results without adding business impacts and substantially increasing local funding requirements. Given the land use and traffic context for this corridor, the ADC team focused on improvements to the design that would better accommodate all modes of travel:

1. Corridor intersections should be refined to enhance bicycle and pedestrian safety through tightening radii, provision of pedestrian median refuges and signal enhancements. A separate NC-107 Pedestrian Crossing Recommendations memo is included in the Appendices to address a number of potential enhancements.
2. FHWA Bikeway Selection guidelines indicate that based on NC-107 traffic conditions, the most appropriate bicycle facility would include separated bicycle facility such as a multiuse sidepath, raised cycletrack or buffered bike lanes. The team investigated these options at a high level. The multiuse sidepath option has promise, especially in corridor sections with

significant greenspace adjacent to the roadway; however, this option may require additional local funding and would increase local property impacts and right of way width requirements, which could be prohibitive.

3. The ADC Team recommends that the Town, NCDOT and Southwestern Commission convene a meeting to discuss recent complete streets policy revisions could affect this project. The requirement for a local match is a significant constraint to providing a separated bicycle facility along the corridor, and it is important to clarify the Department's position on funding projects in light of the new policy guidance as this may impact project outcomes.
4. If funding can be identified for a multiuse sidepaths to separate bicycle travel from motorized vehicle travel, detailed engineering feasibility studies would be needed to determine the extent of additional impacts that would occur under this alternative. In addition, a feasibility study would be needed to evaluate the best way to address the significant number of driveway crossings along the corridor.
5. If on road bicycle facilities become the only viable bicycle facility option, narrowing motorized vehicle travel lanes to 11' would provide an additional 2' to accommodate a bike lane separation, aka "painted buffer" from traffic, which could include delineator posts at key conflict locations. Given that reducing crash severity and frequency is a goal for this corridor, there are several reasons this should be considered:
 - Cyclists are more vulnerable than motorized vehicles and have no other path through the corridor.
 - Oncoming traffic will have a median separation and the roadway does not have sharp horizontal curves, these conditions reduce the need for wide travel lanes.
 - Narrower lanes allow a greater separation from motorized vehicle traffic and items in the clear zone as well as pedestrians utilizing the sidewalk.
 - Reducing the width of 12-foot lanes could benefit all modes of travel as narrower lanes have been shown to correlate with reduced travel speeds (Transportation Research Record # 1751). FHWA documented the direct correlation between increased speed and increased crash severity (FHWA-HRT-17-098, January 2018).
6. Street landscaping along the NC-107 corridor are recommended and should be further investigated.

APPENDICES



Appendix A: NC-107 Pedestrian Crossing Recommendations

May 30, 2019

Memo Background: Following the full project public meeting on April 17, 2019, several members of the Asheville Design Center consultant team convened an internal design meeting to review pedestrian crossing enhancements at the intersections of NC-107 with US-23 Business and NC-116 (Webster Road). This memo describes the design process that the team followed and recommendations for consideration by the Town of Sylva, NCDOT, Southwestern Commission and Jackson County.

Pedestrian Crossing Recommendations Design Process:

Several of the Asheville Design Center consultant team members, from Traffic Planning & Design and Friction Shift Projects, reviewed the NCDOT preliminary plans for NC-107 (Titled: 'R5600_RDY_PRELIMINARY_DESIGN_MAP', Dated: January 2019). Our review of the NCDOT preliminary designs for the intersections of NC-107/US-23 and NC- 107/Webster Road yielded several pedestrian and bicycle safety related treatments for consideration at these intersections. The team formulated these recommendations with key goals in mind, which were informed by the community engagement portions of this project:

- Improve the pedestrian crossing experience
- Enhance safety through traffic calming and reducing pedestrian exposure to high speed motorized traffic

NC-107 and US-23 Business

Signing/Pavement Marking Elements:

- Consider crosswalks throughout: the design team is recommending that high visibility crosswalks be marked at all legs of this intersection to enhance driver awareness at pedestrian crossing locations.
- Consider green skip stripes through intersection: while this is not explicitly a pedestrian

recommendation, the design team encourages the use of green pavement markings through the intersection that are installed in a skip stripe pattern to indicate potential conflict areas for people on bicycles. This higher level of bicycle facility design is encouraged because of the posted speed limit and motorized vehicular traffic volumes on NC-107. Several design options are detailed by NACTO and are available via this website: <https://nacto.org/publication/urban-bikeway-design-guide/intersection-treatments/intersection-crossing-markings/>.

Vertical Traffic Calming Elements: For visual location of the following references, see Figure A.

- Consider reconfiguring the island at Location #1 in Figure A: The NCDOT preliminary design accommodates relatively high travel speeds for the free flowing right turn movement from NC-107 onto US-23 Business northbound. It may be feasible to reconfigure this right turn design to slow traffic for pedestrian safety purposes. As shown in the attached resource from University of Texas, there are several compound radius alternatives that encourage slower speeds and increase pedestrian visibility. Additional benefits and considerations to this design are as follows:
 - Reconfiguring the island would also provide a pedestrian refuge, reducing pedestrian exposure and potentially calming traffic. Under this scenario, this island would require pedestrian signals with properly placed accessible push buttons.
 - Alternate channelized right turn designs could potentially reduce the right-of-way impact, pending further vetting in design (See Figure A, Location #2).
- Consider raised and textured crosswalks and supplemental pedestrian (W11-2) signage: These can be considered at all dedicated right-turn lanes for traffic calming and pedestrian crossing visibility. The raised crosswalk treatment would be an enhanced design feature that would meet the community desires for pedestrian amenities.
- Consider adding an island (Figure A, Location #3) at the northwest corner of the intersection: There may be an opportunity to add a pedestrian refuge island at this location. This could present an opportunity to reduce pedestrian crossing distances and provide space for pedestrian signal equipment.

- Consider extending median for pedestrian refuge area (Figure A, Location #4): The design team identified this median for further investigation. This extension could provide a small pedestrian refuge area and could calm traffic as it would require slower turning speeds.

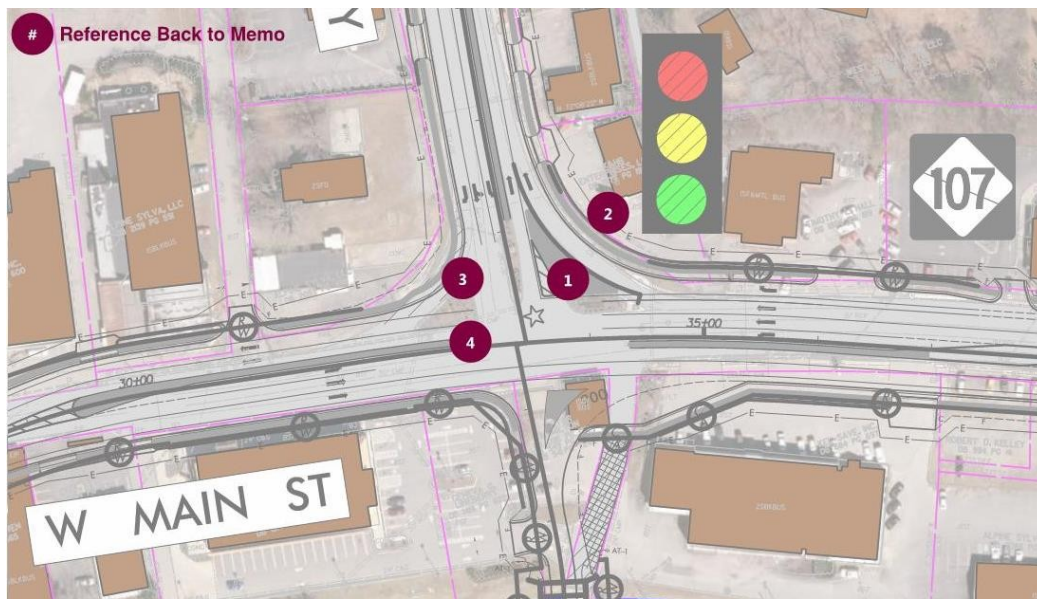


Figure A: NC-107 at US-23 Intersection Shown with References to this Memo.

NC-107 and Webster Road

Signing/Pavement Marking Elements:

- Consider high visibility crosswalks: The design team recommends high visibility crosswalks to enhance driver awareness at pedestrian crossing locations. It is unclear whether a crosswalk is planned for the northern leg of NC-107 at this intersection. As designed, this crossing would need substantial modification if a pedestrian crossing is to be allowed on the northern leg. In addition, the NC-107 crossing here would be lengthy with no pedestrian refuge potential and competing high volume right turning movements. Considering these factors, substantial modifications would be needed for a pedestrian crossing at this location.
- Consider green skip stripe through intersection: while this is not explicitly a pedestrian recommendation, the design team encourages the use of green pavement markings through the intersection that are installed in a skip stripe pattern to indicate potential conflict areas for people on bicycles. This higher level of bicycle facility design is encouraged because of the posted speed limit and motorized vehicular traffic volumes on NC-107. Several design options are detailed by NACTO and are available via this website: <https://nacto.org/publication/urban-bikeway-design->

guide/intersection-treatments/intersection-crossing- markings/.

Vertical Traffic Calming Elements: For visual location of the following references, see Figure B.

- Consider adding an island: At the southwest and southeast corners of the intersection (See Figure B, Locations #1), there may be an opportunity to add pedestrian refuge islands. The recommendation could help shorten pedestrian crossing distance and reduce pedestrian exposure to traffic.
- Consider raised and textured crosswalks and supplemental pedestrian (W11-2) signage: These can be considered at all dedicated right-turn lanes for traffic calming and pedestrian crossing visibility. The raised crosswalk treatment would be an enhanced design feature that would meet the community desires for pedestrian amenities.
- Consider a two-stage crosswalk (See Figure B, Location #2): The pedestrian crossing distance on the southern leg of NC-107 is wide and has a skewed crosswalk alignment from Webster Road to Alexander Street. Further investigation into a two-stage crossing is recommended for several reasons:
 - This design option would allow for better crosswalk orientation (closer to 90 degrees) for visually impaired users
 - Enhanced pedestrian safety with a two-stage crossing and pedestrian refuge island

For this option, the pedestrian refuge island would need to be a minimum of 8 feet wide and would require pedestrian channelization fencing to prevent jaywalking. Photo 1 shows an example of a two-stage crosswalk from FHWA's webpage.

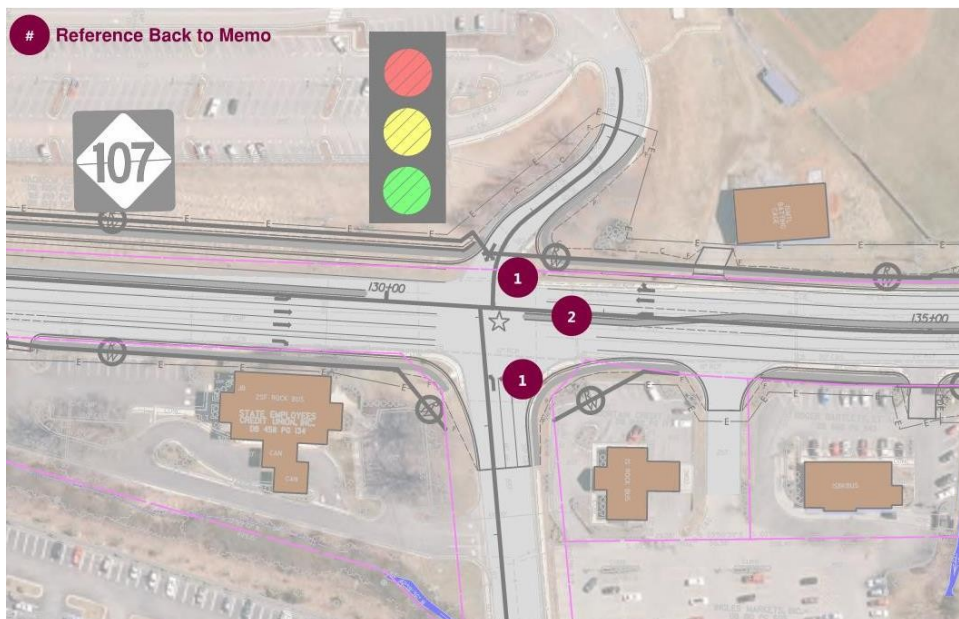


Figure B: NC-107 at Webster Road Intersection Shown with References to this Memo.



Photo 1: FHWA Example of Two-Stage Crosswalk.

Engineering Considerations:

The Asheville Design Center team of consultants have not been hired to vet these recommendations through engineering and design. As such, all comments are recommendations for further investigation by NCDOT. We understand that there are obstacles for NCDOT to employ newer treatments on state maintained roadways and, if desired, our team is available to provide similar treatment examples from previous projects on state maintained roadways.

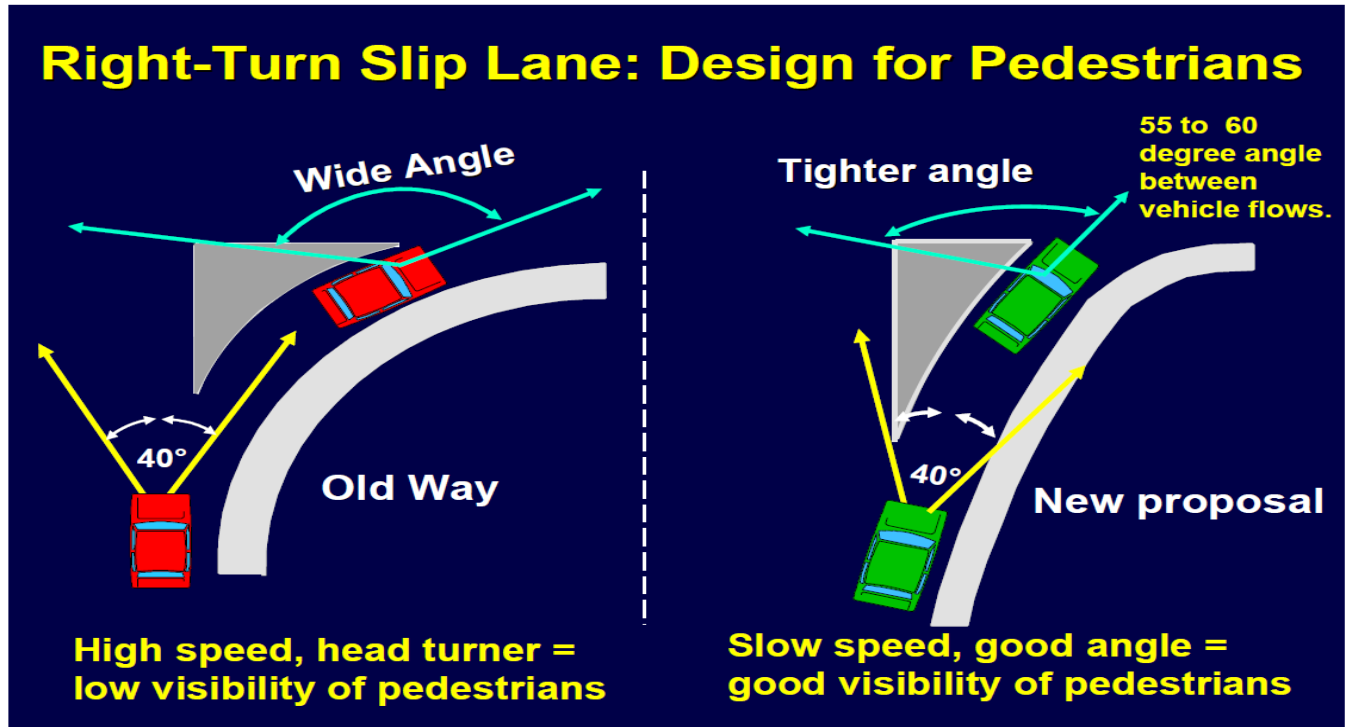
Should NCDOT, the Town of Sylva, the Southwest Commission or Jackson County have any questions about this preliminary review, please do not hesitate to contact our volunteer team.

APPENDIX B

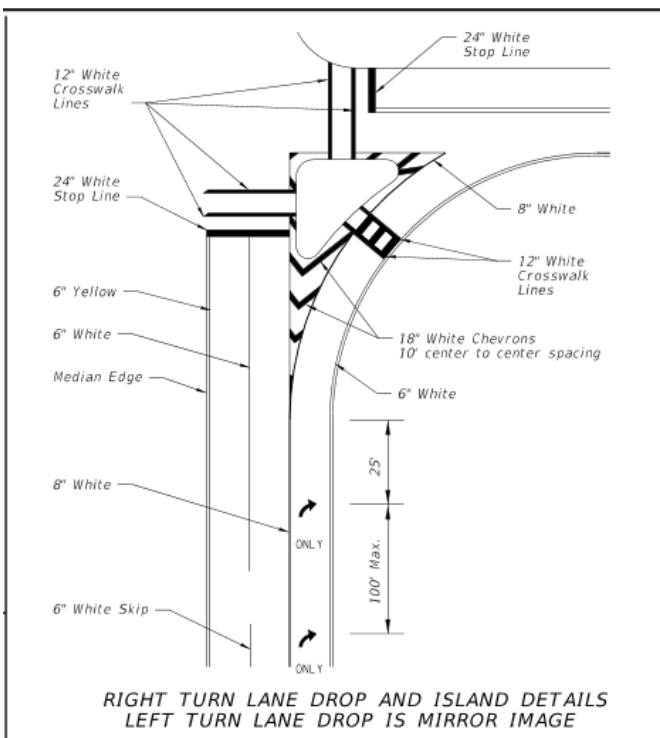


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Sample Layouts

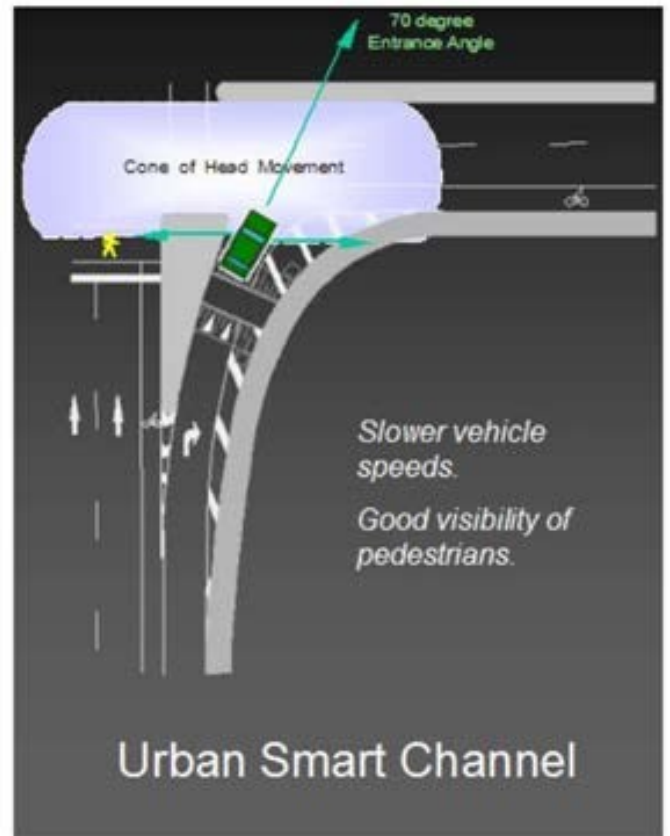
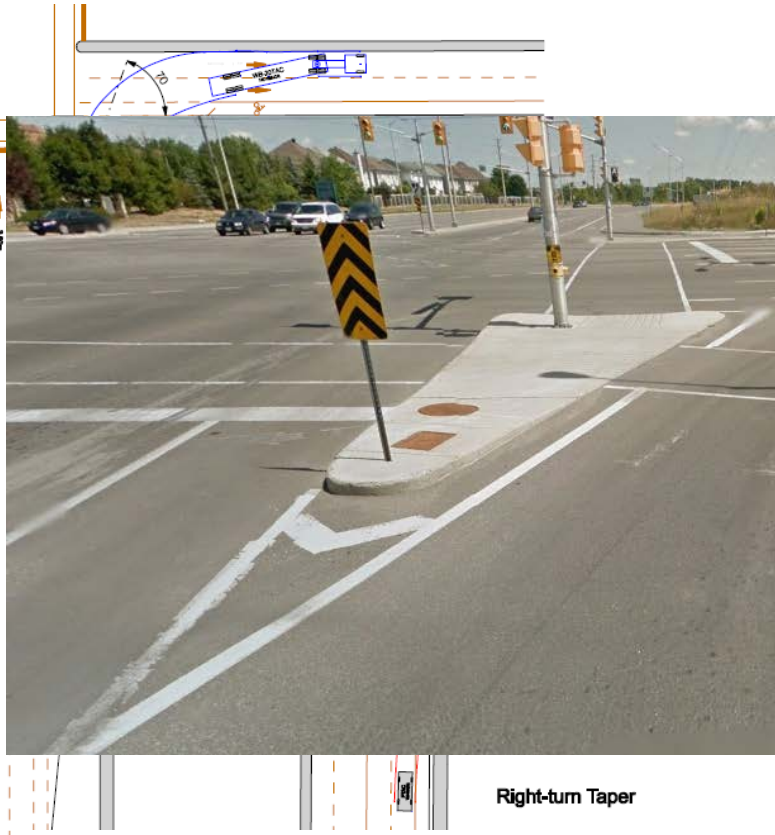


Source: Umbs, Randy. "Raised Right Turn Islands", 2010

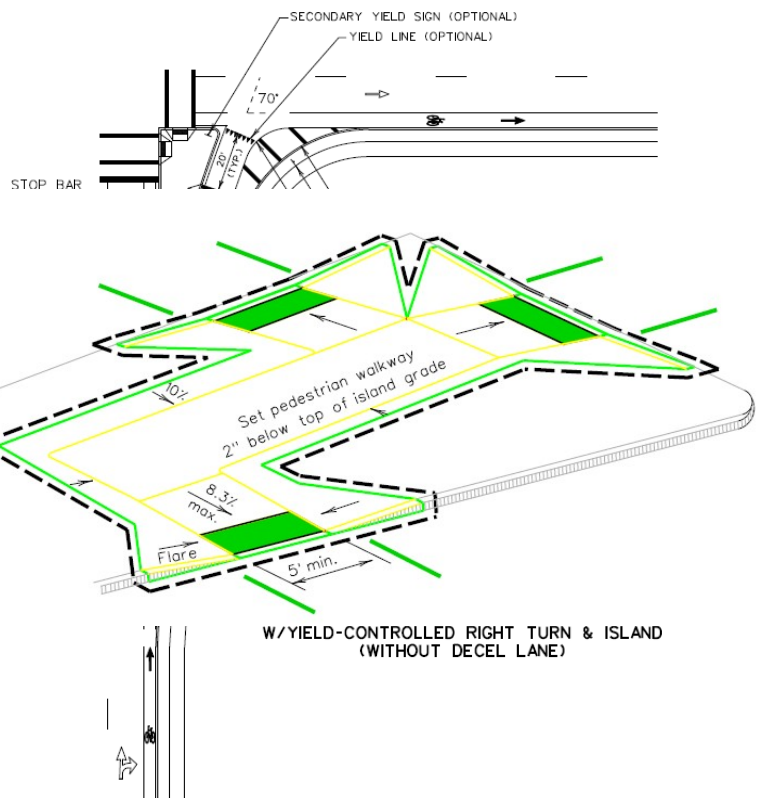
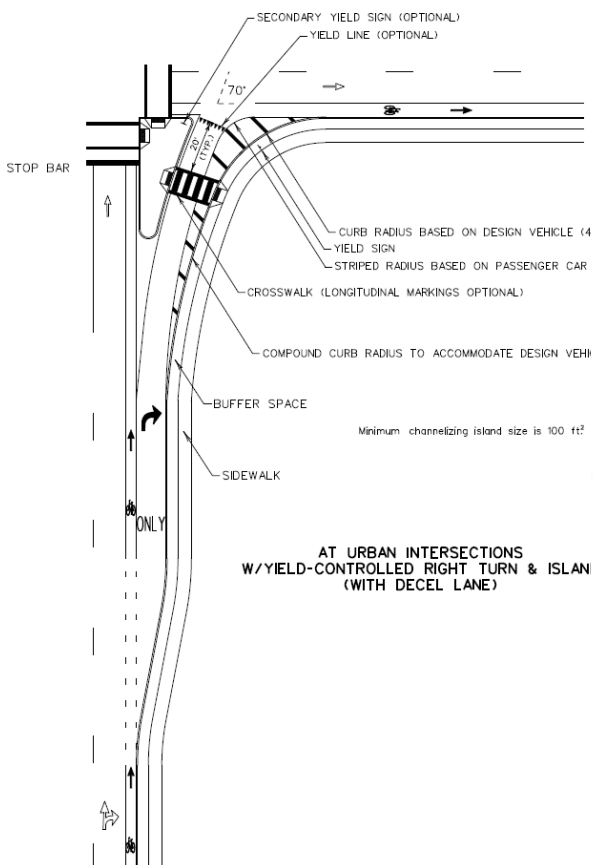


RIGHT TURN LANE AND ISLAND DETAILS

Florida DOT Standard "17346 - Special Marking Areas". Source: FDOT Design Standards, 2014



Source: City of Ottawa Pedestrian Plan, 2009



APPENDIX C

Minutes: NC107 Utilities/NCDOT/ADC

Meeting February 18, 2019

Sylva Town Hall

Present: Paige Dowling/Jake Scott, Town of Sylva; Brian Burch/Jonathan Woodard/Jack Debnam, NCDOT; Sarah Thompson, Rose Bauguess, SW Commission; Bob Mabry/Lisa Leatherman, Duke Energy; Dan Harbaugh, TWSA; Ken Owenby, PSNC; Jerry Fisher, Frontier Communications; Chris McCall, Morris Broadband; Chris Joyell/Kelsey Morrow, ADC.

- Joyell provided an overview of the Asheville Design Center's involvement in the NC 107 project
 - Scheduled a public work session with ADC design team, Town of Sylva, NCDOT and Southwest Commission for March 21st, 5:30-7pm, Jackson Public Library
 - Plan to hold a final community meeting following the work session to share final recommendations with the public (early April)
- Woodard provided a brief overview of NCDOT's current plans
 - Plans are 25% complete; Final drainage design is expected by the end of February. This includes locations of drainage structures as well as permanent easements needed to maintain the drainage system.
 - NCDOT will provide final drainage design to utility companies (by end of February) and they can incorporate this information into the utility plans.
 - Duke anticipates sending their utility plans to NCDOT by the end of April. NCDOT will incorporate this information into the next iteration of the design plans, resulting in 65% plan sets in early June.
 - Duke shares poles with Morris Broadband and Frontier.
 - Baslam West and PSNC utilities are located within existing DOT ROW.
 - TWSA is waiting on drainage plans from NCDOT to complete their design, anticipated by March 6. They typically take 45 days to review these plans -

April 18. The water and sewer design will be done by HDR by agreement with TWSA. Temporary easements will be needed to maintain service during construction, though there will likely be short disruptions in service.

- The addition of the median will affect maintenance activities for utilities. Currently, traffic can be diverted into the center lane to maintain traffic if an outside lane is closed for utility maintenance. After the median is constructed, maintenance activities can take place within the bike lane and berm, which is a secondary benefit to having the extra width. Otherwise, the lane would have to be closed, causing significant backups.
- The berm is typically 10 feet wide, with a 3-foot grass utility strip, a 5-foot sidewalk, and another 2-foot buffer.
- Bike lanes provide space for utility maintenance, ensuring that service vehicles don't block a lane of traffic. Maintenance trucks can park on berm/in bike lane if needed.
- Pumping station near Jackson Paper does not affect NCDOT plan.
- Locating utilities along corridor
 - Water & Duke Energy run on both sides of road
 - Sewer alternates service between both sides of road
 - Gas lines currently are primarily on south side of road
 - It is too expensive for Duke to go underground for this project
 - Est. cost of construction ~\$26 million (not including easements)
 - Underground also requires more ROW (up to 20')
 - Above ground costs ~\$2 million
 - Duke poles need ~15' on either side for anchors (parking lots okay)
 - Utilities placement should not affect building footprints, but may impact signage, parking, etc.

-
- Other Utilities Comments
 - Construction costs for this project are currently ~\$21 million
 - DOT ROW acquisition planned to begin January 2020
 - Street lights will be under Duke's control. Duke is designing a lighting plan.
 - Lane closures for maintenance only allowed after 8:30 pm.
 - Duke and other utilities companies coordinate power outages with individual businesses directly
 - Pike Engineering is doing the Duke Energy design for this project
 - Future Meetings
 - Public Workshop with NCDOT, March 21st
 - Public Engagement Meeting, April 17th

APPENDIX D

NC 107 Work Session with ADC 1/31/19

General Project Questions

1. Can NCDOT provide a brief overview of your Complete Streets policy?

The NC Board of Transportation adopted a Complete Streets Policy in July 2009. This policy directs the NCDOT to consider and incorporate all modes of transportation when building new projects or making improvements to existing infrastructure. Under this policy, NCDOT collaborates with cities, towns, and communities during the planning and design phases of projects. Together, we decide how to provide the transportation options needed to serve the community and complement the context of the area. Jackson County's Comprehensive Transportation Plan (CTP) recommends bicycle and pedestrian facilities along NC 107.

2. Can NCDOT provide a brief overview of Right-of-Way (ROW) negotiation timeline?

The project is currently in the preliminary design phase. The current schedule calls for right-of-way acquisition to begin in January 2020. The right-of-way acquisition is expected to take two to three years to complete. Most of the above ground utilities will be relocated during this phase of the project.

3. Has NCDOT considered narrowing travel lanes down from 12' to 11'? Would this net a reduction of 4' ROW? At what functional cost?

Following the February 23, 2017 Public Meeting, NCDOT considered narrowing the travel lanes to 11' and had discussions with the Town and the Rural Planning Organization (RPO) to weigh the pros and cons of doing so. Narrowing the travel lanes would reduce the width of the roadway by 2' on each side. This could reduce the impacts to some adjacent properties, however; those reductions could be offset by easements necessary to relocate the utilities. The wider travel lanes will enhance safety and mobility for the 34,000 vehicles that currently travel the road daily, assist with emergency response, snow removal and routine maintenance. After considering all these factors, we concluded that the lane width should remain at 12'.

4. Can NCDOT combine the southern sidewalk & bike lane into single 10' multi-use path? Has this been explored? If we employed this approach on both sides of NC 107, would we reduce ROW?

Combining the sidewalk and bike lane into a 10' multi-use path would not reduce the right-of-way. The minimum flat shoulder width behind the curb is 10' for a standard 5' sidewalk. The shoulder width would increase to 15' to accommodate a 10' path. To comply with Complete Streets; a 14' outside lane is required; therefore, this would increase ROW width by 2'. A multi-use path

was explored early in the design process but was considered to be less safe because of all the driveways along NC 107. Vehicles waiting to exit the driveways often block the sidewalk area and drivers are less likely to see bicycles riding on the sidewalk. Bicyclist would have the right-of-way crossing the driveways on the MUP. The local government cost share is greater to construct a multi-use path.

5. Would the Town of Sylva be willing to create an access management plan to reduce curb cuts?

Our current design will reduce the number of curb cuts currently out there. Facilities within the limits of State Transportation Improvement Program (STIP) projects are automatically evaluated to comply with the NCDOT current driveway and street policy. ADC NOTE: Sylva developed an access management plan in 2011, and our team will review it in the context of this project.

6. Would NCDOT be willing to adjust timeline/budget to fully evaluate a center bike lane in median?

We are willing to consider it, but it is our belief that it would result in a wider footprint and more impacts than the current design. The proposed 17.5' median includes many 12' turn lanes. This only leaves 5.5' for the island and striping. A center bike lane would require 5' for each travel direction plus 5' of buffer on each side (20' total). This would require the curbs to extend 5' wider on each side of the road. There are also safety concerns to consider with center bike lanes, such as issues with bicyclist access to goods and services between intersections. Each time a bicycle enters or exits the roadway it must cross two lanes of vehicular traffic. This would also include a dedicated bike phase in each of the signals.

7. Has NCDOT analyzed u-turns for Vehicle Miles Traveled (VMT) generation? Can NCDOT communicate how improvements impact travel time, emissions, VMT, & delay?

The Department has conducted in-depth traffic studies for this project. The current U-turn locations were analyzed based on travel demand and the proposed locations were selected in an effort to balance mobility for motorists and impacts to commercial properties. We are willing to explore shifting locations for some of the bulb-outs.

NC 107 is currently congested and during the busiest hours the major intersections operate at unacceptable levels of service. Congestion and traffic delays will continue to worsen if no improvements are made. Current travel times range from 5 to 10 minutes. If no improvements are made, travel times are expected to increase to 13 to 28 minutes by 2035. With the proposed design, travel times are expected to be between 8 and 15 minutes by 2035. The proposed design results in significantly less delay than doing nothing, which will reduce vehicle emissions.

Signal warrants (conditions that an intersection must meet to justify a signal installation) have been evaluated at the bulb outs and some have the potential to meet warrants in the design year (2035). NCDOT will evaluate at which year the warrants are met.

8. Have you analyzed the community proposal to develop a one-way road parallel to NC 107? A parallel road concept was analyzed during the development of Jackson County's

Comprehensive Transportation Plan (CTP) that was completed in 2017. Due to the terrain, it is not feasible to construct a road on either side of NC 107 that closely parallels the existing road. To achieve an acceptable grade without moving vast amounts of earth, a new road would need to curve around the ridges. This would result in longer travel times and less acceptable service than existing NC 107. There would also be substantial right-of-way impacts necessary to construct a parallel road. Additional impacts would be necessary to construct appropriate connections to NC 107.

9. Does NCDOT plans call for improvements to wayfinding?

The proposed project will upgrade the highway signage along the corridor. The Town has existing wayfinding signage within the right of way that will continue to be accommodated.

Project Sheet Questions

Sheet 1

Q: Has NCDOT analyzed where Municipal Drive enters West Main? Can it get a spot safety improvement? Can NCDOT remove or reshape the traffic islands? Can NCDOT provide a pedestrian refuge?

This is a challenging intersection due to the geometry of the existing roads, the railroad and the close proximity of buildings on both sides of the intersection. All intersections are evaluated as part of the project development. A roundabout has been conceptually considered. The design would increase property impacts. Additionally, the intersection would be closed during train movements.

Q: Would Sylva/NCDOT like ADC to sketch out a pedestrian crossing plan for this intersection?

Pedestrian crossings are not shown on the plans at this stage of the design but will be incorporated as the design work progresses. We would welcome input from ADC on pedestrian crossing design for the project.

Q: The westbound left turn lane across from Speedy's Pizza is awkward—has it been eliminated or converted into a 2nd lane eastbound? Could NCDOT clarify the intersection of West Main and Municipal Dr.?

Currently there is a left turn lane from US 23 Business onto Municipal Dr./Chipper Curve Road and a left turn lane from US 23 Business into the Valero gas station. The proposed design includes the left turn lane for Municipal Drive/Chipper Curve but eliminates the left turn lane into Valero. We have asked our design consultant to evaluate the need for the left turn lane at Valero to remain. It potentially could be extended to serve the Speedy's/Family Dollar driveway.

Q: Is West Main still part of the plan? Is there a plan to taper West Main between the bridges?

The project includes pedestrian improvements to West Main Street out to The Coffee Shop and Innovation Brewing. To maintain lane continuity, the two westbound lanes need to continue to Municipal Drive/Chipper Curve Road.

Q: Is NCDOT planning to include sidewalks on both sides?

Yes. There are pedestrian destinations on both sides of the corridor. Sidewalks only on one side would not adequately serve all pedestrians. Removing sidewalk from one side would not reduce the right of way width because it is part of the vehicle clear recovery area.

Sheet 2

Q: Has NCDOT considered stacking in right turn lane beyond Dunkin Donuts? Does eliminating the left turn out of DD solve the problem?

The access management introduced as a function of the project will improve the traffic operation of the business but will not completely eliminate the delays related to right turns into the business.

Q: Bus 23/Main St. intersection: Has NCDOT modeled a roundabout that we can share? How critical is the Bus 23 Southbound right turn?

A roundabout was modeled for this intersection in the feasibility study. Even a dual-lane roundabout would not be able to handle the traffic volume unless a flyover bridge was included to accommodate the volume of traffic turning left from US 23 Business to NC 107. A roundabout with a flyover bridge would have substantially more property impacts than the current design. The southbound right turn at US 23 Business is essential to maintain an acceptable level of service.

Q: Business access questions: Kel-Save, Rite-Aid... When does NCDOT come out and address individual concerns surrounding these properties? When do you address issues that become apparent during ROW negotiations?

We held a public meeting in February 2017 to receive input on the conceptual designs and answer questions from the public and business/property owners. The next time we initiate contact with individual business/property owners is when right-of-way plans are complete and we can show exactly what the impacts to their property will be. We are available to meet with business/property owners anytime at their request.

Sheet 4

Q: Has NCDOT considered narrowing the 17' median in between signalized intersections?

We have considered this also. In many locations the median includes a left turn lane. Most of the stretches between turn lanes are relatively short and don't afford an opportunity to narrow the median.

Q: Has NCDOT analyzed the parallel connector road concept?

This has already been addressed above. The grading impacts would exceed a 60' ROW so additional easements would be needed.

Sheet 5

Q: Has NCDOT analyzed installation of a roundabout at the Cope Creek intersection?

A roundabout would have more property impacts than the current design. It would also require more stream impacts (more culvert length) to Cope Creek.

Q: If a separated multi-use path were developed along creek—outside the NCDOT project area—does the Town have to pay for it?

A separated multi-use path along the creek would be beyond the scope of project R-5600. It could be submitted to Strategic Transportation Prioritization (SPOT) as a standalone bike/ped project. If it scored well and got funded the Town would have to pay a percentage of the entire cost, including right-of-way. It would be expensive, impactful and may not even be feasible. The rest of this question is already addressed above.

Q: Has NCDOT considered converting the center turn lane as a reversible lane to accommodate high school traffic?

That space is better utilized as a left turn lane for moving traffic. This would increase impacts at intersections because an additional lane is needed to accommodate left turning movements.

Q: Can NCDOT address the site-specific issues surrounding Dollar Tree?

Driveway at Dollar Tree will become right in/right out. This will improve the safety of vehicles accessing the business.

Sheet 6

Q: Can NCDOT address the site-specific issues surrounding Hensley Circle, Citrus Drive and Liberty Drive?

This entrance to Hensley Circle is proposed to be closed and a turn-around is proposed. Citrus Drive and Liberty Drive are at different elevations and it would be difficult to combine them.

Q: Community feedback expressed concerns that the proposed U-turn near the Print Shak poses a danger considering the grade lack of a traffic signal. Can NCDOT take a second look at this bulb-out?

The sight distance appears to be adequate, but we will look at this location again. This location could potentially meet signal warrants in the design year.

Sheet 7

Q: Can NCDOT address the site-specific issues surrounding private driveway north of Andy Shaw Ford?

This residential driveway is designed to accommodate a right in and a right out. Southbound vehicles would need to U-turn and come back to access the driveway.

Sheet 8

Q: Can NCDOT address the possibility of a center bike lane in the median? Center bike lane addressed above (General Project Questions #6).

Sheet 9

Q: Can NCDOT address the site-specific issues surrounding access to existing business after a median has been installed?

We understand that the median can be an inconvenience, particularly during off-peak times.

During peak hours it is often about as quick to go passed a driveway and make a U-turn. The median will reduce crashes and improve traffic flow.

Q: Can NCDOT address the site-specific issues surrounding impacts to existing parking for businesses?

There are certainly parking impacts to some businesses. That will be considered and compensated for during ROW negotiations.

Sheet 10

Q: Can NCDOT address the pedestrian crossings at the East Main/Webster Rd. intersection?

Pedestrian crossing will be incorporated into the final plans at all signalized intersections. A pick-up lane should be incorporated on the school campus.

The proposed design includes bicycle and pedestrian accommodations.

Q: Would Sylva/NCDOT like ADC to propose a pedestrian crossing and gateway plan?

Pedestrian crossings are not shown on the plans at this stage of the design but will be incorporated as the design work progresses. We would welcome input from ADC on pedestrian crossing design for the project.

Q: Can NCDOT help address school campus circulation issues outside the project area? Can on-campus improvements address circulation?

There is a NCDOT unit in Raleigh called the Municipal & School Transportation Assistance (MSTA) unit that looks at these issues upon request of the school. We would be happy to refer the school to MSTA.