



REEMS CREEK GREENWAY FEASIBILITY STUDY

June 2014

FOR THE:
TOWN OF WEAVERVILLE

PREPARED BY:

EQUINOX
ENVIRONMENTAL



Kostelec
PLANNING

balance through proper planning

S&S
SITE DESIGN STUDIO

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Acknowledgments

Thanks to the following members of Oversight Committee for this study. They include:

Doug Dearth, Town Council, Town of Weaverville

Michael Boaz, Town of Weaverville

Taylor Gupton, Town of Weaverville

Lucy Crown, Buncombe County

Lyubov Zuyera, French Broad River Metropolitan Planning Organization

Introduction

Executive Summary

Overview of Study Area

The Reems Creek Greenway Feasibility Study examines a corridor that has potential to become an iconic and destination greenway in Western North Carolina. The greenway has the potential to be a marquee project for the Town of Weaverville and its goals to promote economic development and continue to improve quality of life for its residents. What sets it apart is its historic character and natural beauty as it parallels Reems Creek. The milling history of Weaverville has left many remnant historic structures, mill wheels, and spillways along the creek as well as excellent wildlife viewing. The proposed greenway is relatively flat, allowing for enjoyment of users with any level of physical ability. The corridor is also a thread that connects several major employers as well as the potential to connect downtown and schools to surrounding residential areas.

The corridor study area starts at the western edge of Town property located just to the west of I-26 and extends an approximate 2.25 miles to Karpen Soccer Fields, a park managed by Buncombe County. When built, the preferred corridor options will complete the Reems Creek Greenway portion through the Town of Weaverville property. Future portion of the greenway would remain within Buncombe County jurisdiction. The corridor is bookended by two publicly owned properties, the majority of the proposed corridor options are within North Carolina Department of Transportation (NCDOT) right-of-ways or privately owned lands.

There are many historic and natural area opportunities for greenway users to interact with but there are also considerable environmental challenges. These challenges include significant portions of the greenway being in the floodplain, a potential impact to the floodway and Reems Creek's designated Trout Buffer, as well as some topographical challenges. Additionally, man-made constraints include the presence of Buncombe Metropolitan Sewer District (MSD) lines and easements and two major road crossings (Merrimon Avenue and Reems Creek Road) with high speed traffic.

It is important to note that this study only addresses a portion of the Reems Creek Greenway, which has been proposed to extend west to the French Broad River and east along Reems Creek to the Beech Community Club.

Recommendations

Overall recommendations are addressed in detail in Chapter 10 as detailed recommendations are given for each option and design standards. The summary of the overall recommendations are as follows:

Short Term:

- Adopt this plan— Study and request inclusion into the Long Range Transportation Plan (LRTP)
- Pursue immediate and future funding opportunities— pursue funding for design of the first phase and study of the pedestrian underpasses.
- Further study in partner with NCDOT the two major road crossings of Merrimon Avenue and Reems Creek Road to determine the best crossing option.
- Pursue master agreements with MSD and NCDOT.
- Identify partners that will aid in development of the greenway like a negotiating partner, the county, citizen groups, community foundations, businesses, and others.
- Develop a greenway committee/ commission.
- Begin an outreach campaign.

Long Term:

- Identify negotiators who can begin to build relationships with landowners.
- Develop common design standards for the greenway.
- Use planning tools to support the development of the greenway— use an incentives-based approach to get voluntary dedications of the greenway.
- Implement the greenway as transportation infrastructure— The connectivity of the greater pedestrian / bike networks is critical to making this happen.

Goals and Objectives of This Study

A feasibility study investigates viable options for the connection of a greenway through a study area. It is not intended to arrive at one design solution but to provide a menu of choices with details on both opportunities and challenges to implementation. While preferred options are chosen based on cost, constraints, opportunities, and public input, ultimately it is landowner willingness to embrace the greenway that will drive the location of the greenway. Since the majority of the corridor options are within private lands, the goal is to provide options if one solution cannot be reached. This study will also be used as a tool in negotiating with the public for a permanent alignment for the greenway. This document is the first step in the planning process and will be used to guide future phases of study.

Background

This study was overseen by the Town of Weaverville in partnership with Buncombe County and the French Broad River Metropolitan Planning Organization. The conversation about expanding greenways in the Weaverville area has been ongoing for many years, but forward movement really began to occur when the *Connect Buncombe-Buncombe County Greenway and Trails Master Plan* was developed in 2012. The plan identifies the Reems Creek Greenway with its landmarks, potential route, and a preliminary look at challenges.

Existing Plans That Relate to the Corridor

The Connect Buncombe Greenways and Trails Master Plan, 2012

This master plan identified the potential corridor of Reems Creek at a broader study level. The planning process included a public meeting in Weaverville to get input and support for several proposed greenway corridors; support was overwhelmingly positive.

French Broad River/ Highway 251 Greenway Feasibility Study and Master Plan, 2010

This study included connections from Weaverville to the greenway studied along the French Broad River, connecting Asheville to Weaverville with a corridor that would continue all the way to the county line.

Town of Weaverville Comprehensive Land Use Plan, 2012

The land use plan is vision for the future of the Town and identifies goals and objectives. Some of the goals and objectives and how it relates to the greenway study are as follows:

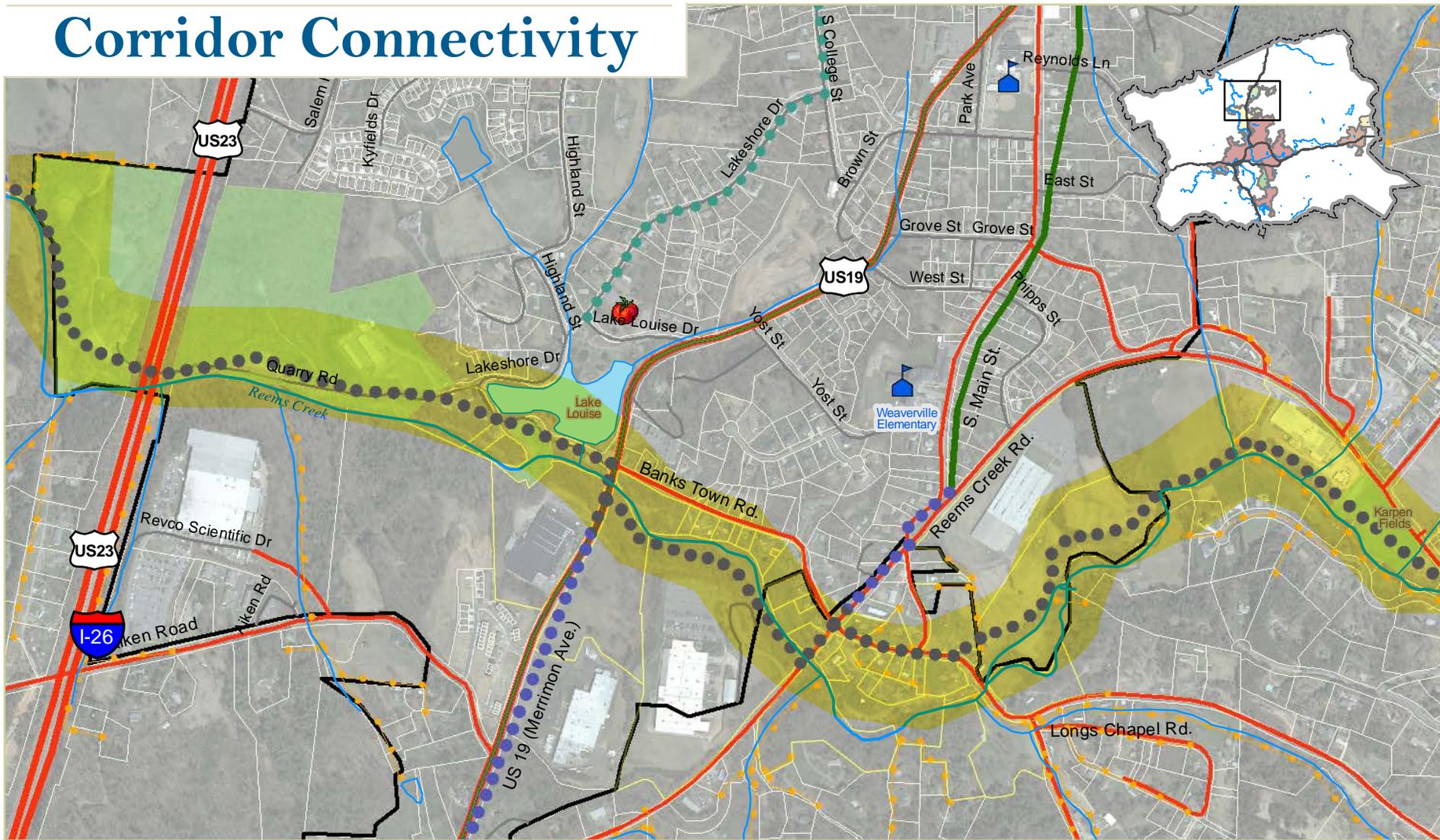
- Create strong identity through design guidelines and branding of the Town: The greenway can help reinforce the identity and character through architectural elements liked bridges, monuments, and signage. If design guidelines are developed for the Town, it can also be used to inform built elements on the greenway.
- Adopt NCDOT's Complete Streets Planning and Design Guidelines/ Improve walkability and bike-ability.
- Continue to build bicycle and pedestrian infrastructure and fund a bicycle and pedestrian plan.
- Study the option for incentive-based approaches: If the town uses a density bonus and/or provisions for cluster development along the future greenway, a corridor can be developed in partnership with private developers.
- Prepare a greenway master plan and require the preservation of identified corridors as part of the development approval process. Encourage the construction of trails in new developments.
- Develop branding and a tourism development plan for the Town. In the future Reems Creek can be listed as one of the Town's major tourism assets.

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CHAPTER 2

Existing Conditions of the Corridor

Corridor Connectivity



	Reems Creek / Weaverville Greenway Corridor		NCDOT State Maintained Roads (Primary)		Historic Site (National Register of Historic Places)
	Sidewalk Connection to Downtown		NCDOT State Maintained Roads (Secondary)		Historic Site (Other Points of Interest)
	Public Lands		Municipal Roads		Farmer's/Tailgate Markets
	Parcels of Interest to Reems Creek Corridor		MSD		Schools
	Weaverville Municipal Boundary				

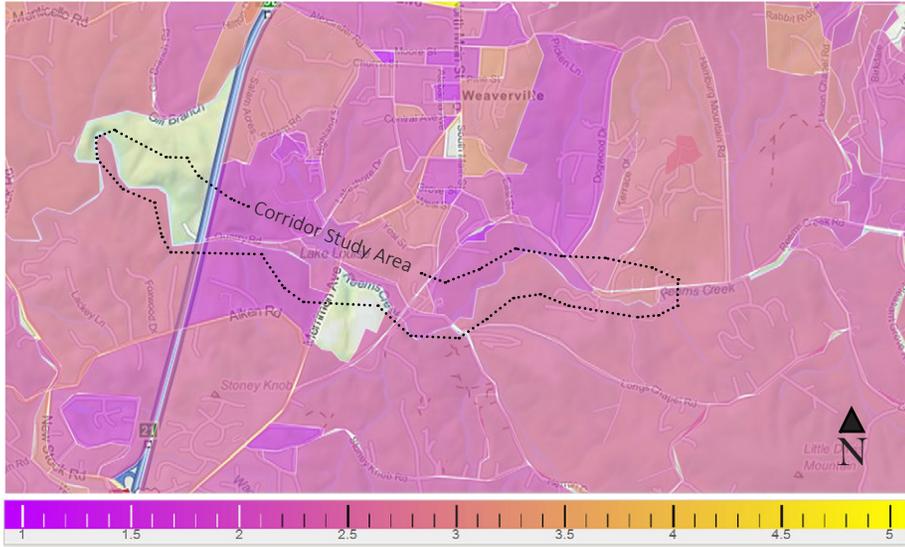


Corridor Context Map

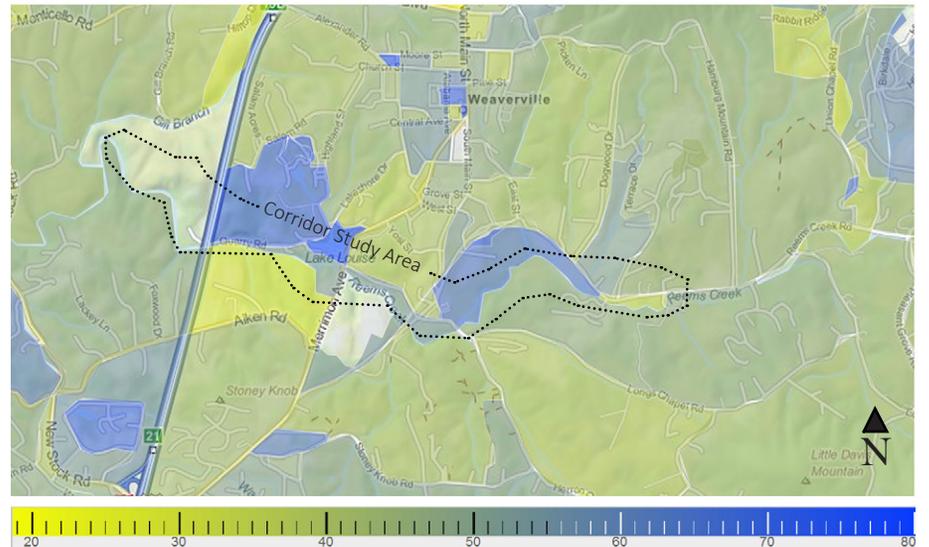
EXISTING CONDITIONS

Demographics

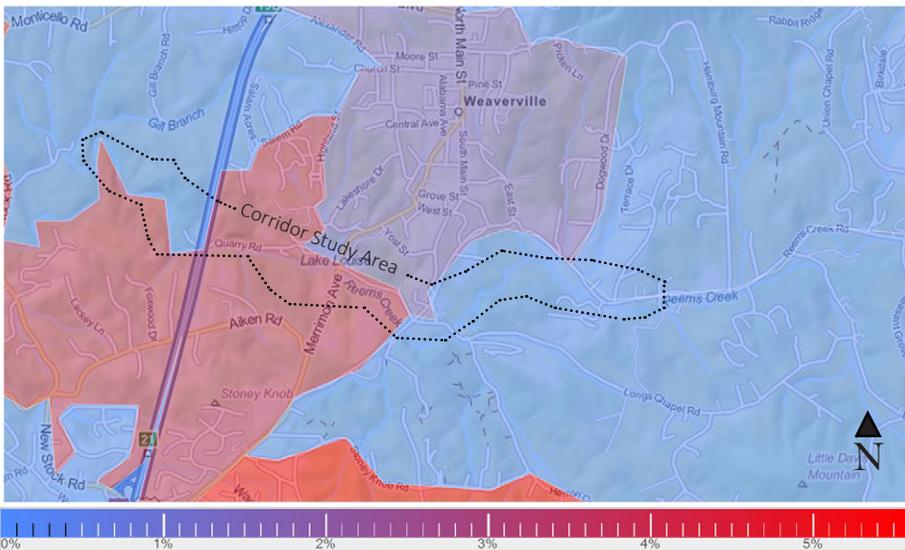
Average Household Size



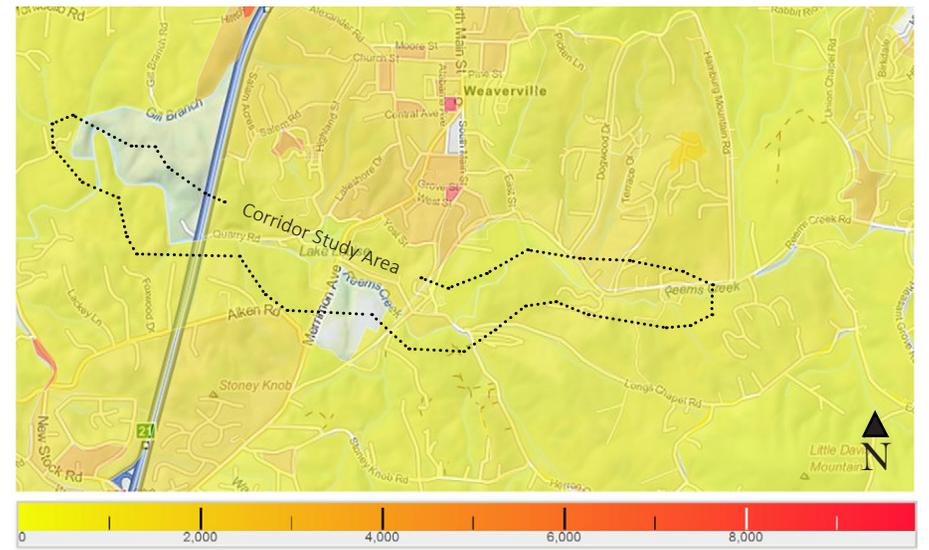
Median Resident Age



Percent Who Walk to Work



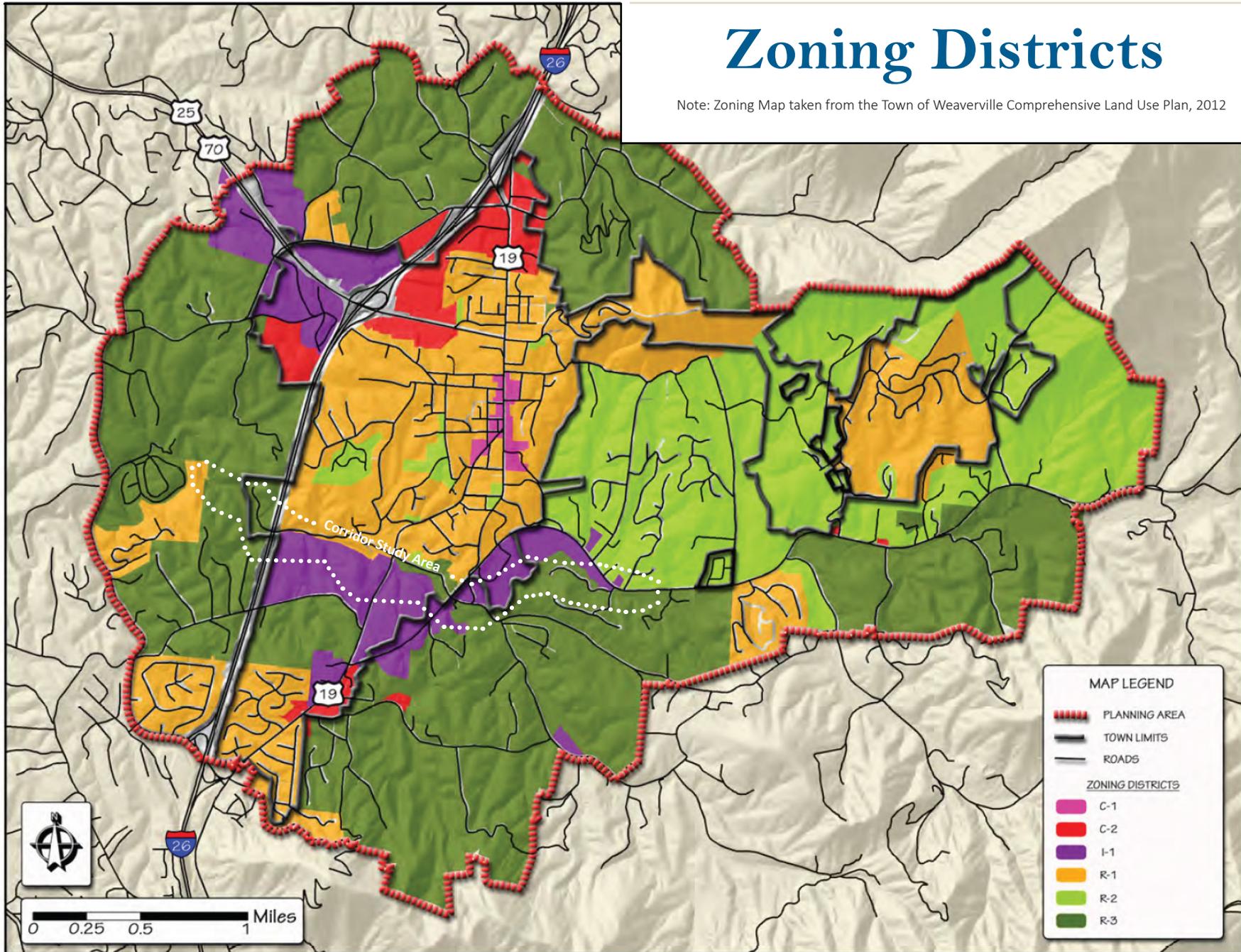
Population Density Per Square Mile



Note: Data from www.city-data.com and is created from 2000-2011 Census Data. Maps not to scale.

Zoning Districts

Note: Zoning Map taken from the Town of Weaverville Comprehensive Land Use Plan, 2012



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CHAPTER 3

Opportunities and Challenges

Opportunities and Challenges

Overview

This chapter provides a detailed focus on the opportunities and challenges of six different sections of the Reems Creek Greenway corridor. Optional routes are considered and analyzed based on their potential for future enhancements and attractions as well as challenges to safety, environmental hazards, and cost prohibitive conditions.

Weaverville Town Property to Lake Louise (Map 1)

Starting at the Weaverville Town Property and police shooting range, this end of the study area is typified by a close proximity to Reems Creek. This sections is almost all on Town property and has two potential routes.

POTENTIAL ROUTES:

- Option 1A (Road Route): This option would keep the greenway on the existing Quarry Road which is restricted to vehicles and has light traffic use for municipal purposes.
- Option 1B (MSD Route): The MSD easement, which connects midpoint to Quarry Road is currently mowed and at gentle grade. However, portions of the MSD easement may be in the floodway.



Much of the area between the Quarry Road and Reems Creek is within the floodway

OPPORTUNITIES

Parking:

- Potential parking and turnaround area under I-26 (NCDOT permitting) if Town wants to open area to car access once future connections are made.

Potential Routes:

- Option 1A (Road Route): Controlled access on Quarry Road would reduce conflict with vehicles and pedestrians.
- Option 1B (MSD Route): MSD Route is currently maintained/ mowed and is at a very gentle grade.

Enhanced Greenway Area:

- The Mill Park has potential to be an enhanced area, especially if a pedestrian bridge crossing of Reems Creek is possible above the Mill.

Connections:

- Future Reems Creek Greenway connection from Town property west towards the French Broad River.

CHALLENGES

Hydrology:

- The 100-year floodplain encompasses most of both options.
- The floodway overlaps parts of Option 1B (MSD Route).
- Bank instability of Reems Creek at certain locations implies the potential for the stream bed to shift into the corridor.

Topography:

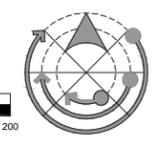
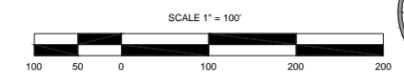
- Property is steeper in the northwest portion of Town property; may be a future connection issue.
- A constraint point east of I-26/ US 23 would force the greenway to be on Quarry Road or on the hillside above the road.
- The quarry and floodway allows for little room for greenway to be-off of Quarry Road.

Potential Routes:

- Option 1A (Road Route): Quarry Road has poor visibility for vehicles where it meets Lakeshore Drive.
- Option 1B (MSD Route): MSD Route is partially in the floodway.



FOCUS AREA MAP 1 | Weaverville Town Property to Lake Louise



Lake Louise Area (Map 2)

This portion of the study area presents many opportunities and challenges. Connecting to Lake Louise's amenities and the Mill Park is crucial.

POTENTIAL ROUTES:

- Option 1A (Road Route): Staying on Quarry Road and turning onto West Lakeshore Drive, users would have to stay on a very narrow 17' paved road with little or no shoulder.
- Option 1B (MSD Route): Traveling along this route the grade stays very flat but overlaps with portions of the floodway. At the intersection with Lake Louise Park (Mill Site), a gain of 20 feet of elevation would need to be achieved to make it up to West Lakeshore Drive.

ROAD CROSSINGS:

The Merrimon Avenue crossing also presents a challenge. The vehicular bridge crossing does not safely accommodate pedestrian/ bicycle traffic. Three options exist for crossing Merrimon Avenue:

- Greenway Underpass: Crossing Reems Creek at a rock abutment above the Lake Louise Park (mill site) and under the Merrimon Avenue bridge is one option. Only a small gain in elevation would be necessary to cross under the bridge; however, an above ground MSD pipe (unless buried or moved) may be a hazard for bicyclists.
- Mid-block crossing: This on-grade road crossing would have the greenway crossing just south of the Banks Town Road and Merrimon Avenue intersection.
- Fourway intersection crossing: This crossing would use the intersection of Banks Town Road and Merrimon Avenue.

OPPORTUNITIES

Parking: Lake Louise allows for some parking, but a marked pedestrian crossing should be installed.

Potential Routes:

- Option 1A (Road Route): A connection to multi-family units and downtown can be made.
- Option 1B (MSD Route): Route would keep greenway users completely off-road and minimize the amount of grade transitions.

Enhanced Greenway Area:

- The Mill Park has potential to become an enhanced node along the greenway, especially if a bridge crossing is possible above the Mill.
- A Reems Creek pedestrian bridge crossing would be highly visible and could be a landmark feature.
- The Mill falls area has a narrow gorge, stable banks, and slack water conditions that would allow for a pedestrian bridge crossing.

Connections:

- Connect to downtown Weaverville.
- Connect to multi-family and residential on both sides of greenway corridor.
- Connect to one major employer.

CHALLENGES

Hydrology:

- A required crossing of Reems Creek and Merrimon Avenue provide considerable corridor design challenges.

Road Crossing:

- The bridge crossing on Merrimon Avenue is not suitable for pedestrian/ bike access. There are no marked pedestrian crossings near this intersection.

Topography:

- Steep topography directly across from the Mill Park would require the greenway alignment to stay near Reems Creek.

Road Crossings:

- Option 1A (Road Route): Alternative would require a pedestrian bridge attachment to current bridge
- Crossing Under Merrimon Avenue Bridge: MSD pipes (approximately 8 feet of clearance) may be an obstacle for bicyclists.



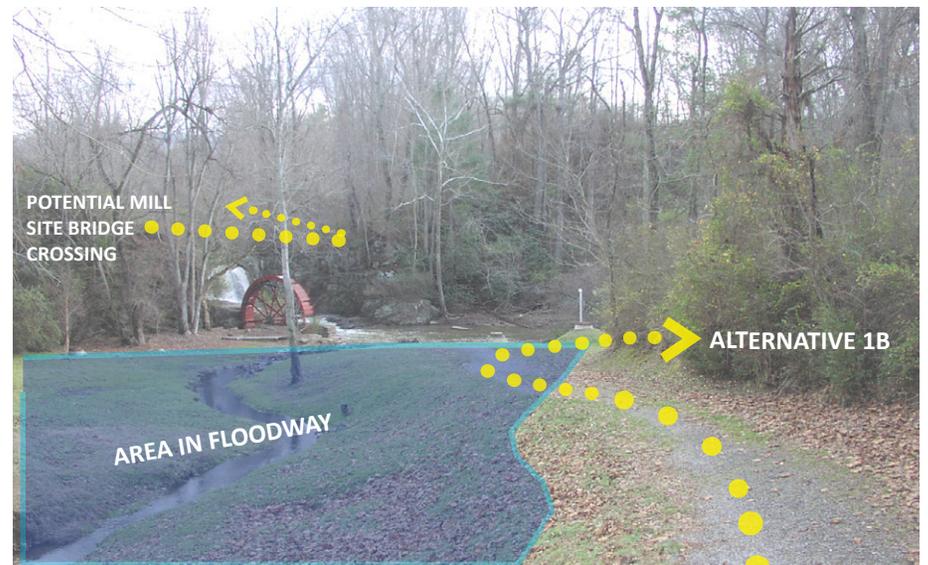
A view of the Mill near Lake Louise that has potential for a pedestrian bridge crossing.



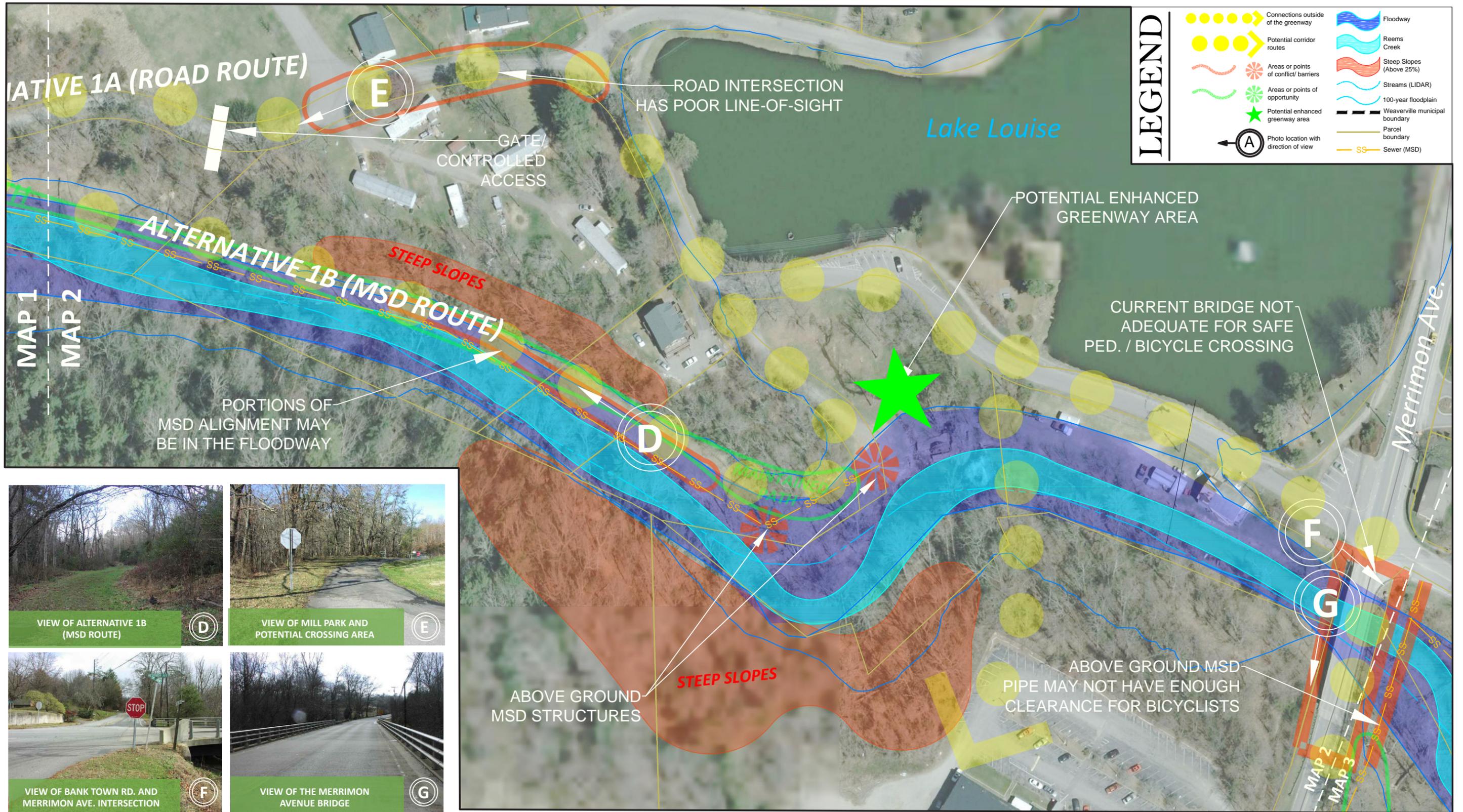
A view of the Mill near Lake Louise that has potential for a pedestrian bridge crossing.



The bridge crossing of Merrimon Avenue over Reems Creek currently does not accommodate pedestrians and bicyclists.



A view of the Mill near Lake Louise.



FOCUS AREA MAP 2 | Lake Louise Area |



Merrimon Avenue to Reems Creek Road - Baldor property (Map 3)

This portion of the study area has two options that are both scenic, have views of Reems Creek, but have challenges in either topography or hydrology.

POTENTIAL ROUTES:

- Option 2A (Lower Route): This option follows a floodplain bench that is near to being at grade with Reems Creek. This option becomes constrained because of the floodway.
- Option 2B (Upper Route): Utilizes a graded bench closer to the Baldor facility that is significantly higher (40 feet) than Reems Creek and allows for views of the surrounding neighborhood. This alternative would require a significant switchback/ grade change and add considerable trail length, but would remove the user completely from the 100-year floodplain. This route would require more land acquisition and would further bisect properties.

ROAD CROSSINGS:

(Reems Creek Road is addressed in Map 4 on page 23)

OPPORTUNITIES

Parking:

- No parking opportunities.

Potential Routes:

- Option 2A (Lower Route): This option crosses flat, gently rolling terrain that is close to Reems Creek.
- Option 2B (Upper Route): This route provides views of Reems Creek and more expanded views of Weaverville. This route provides a different experience than elsewhere in the corridor because of pine groves and views of town.

Enhanced Greenway Area:

- None

Connections:

- One major employment site (Baldor) and future connections to parcels that are zoned industrial.

CHALLENGES

Hydrology:

- Floodway covers some of the flat and lower area along Reems Creek.
- There is poor drainage along the south side of Reems Creek near the toe slope.

Road Crossing:

(Reems Creek Road addressed in Map 4)

Topography:

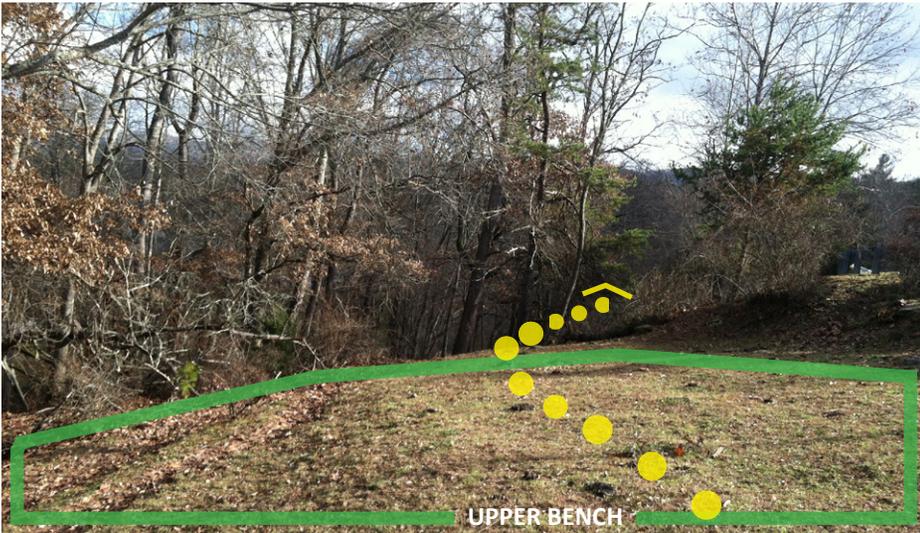
- Steep slopes could make staying out of the 100-year floodplain difficult.
- Floodway and steep topography create a pinch point near Reems Creek Road.

Potential Routes:

- Option 2A (Lower Route): Area consists of wet, poor draining, clay soils.
- Option 2B (Upper Route): Gaining elevation to the bench would require 600-1,000 feet with switchbacks.

Other:

- Area is actively being grazed; alignment should consider this as well as potential conflicts between livestock and greenway users.



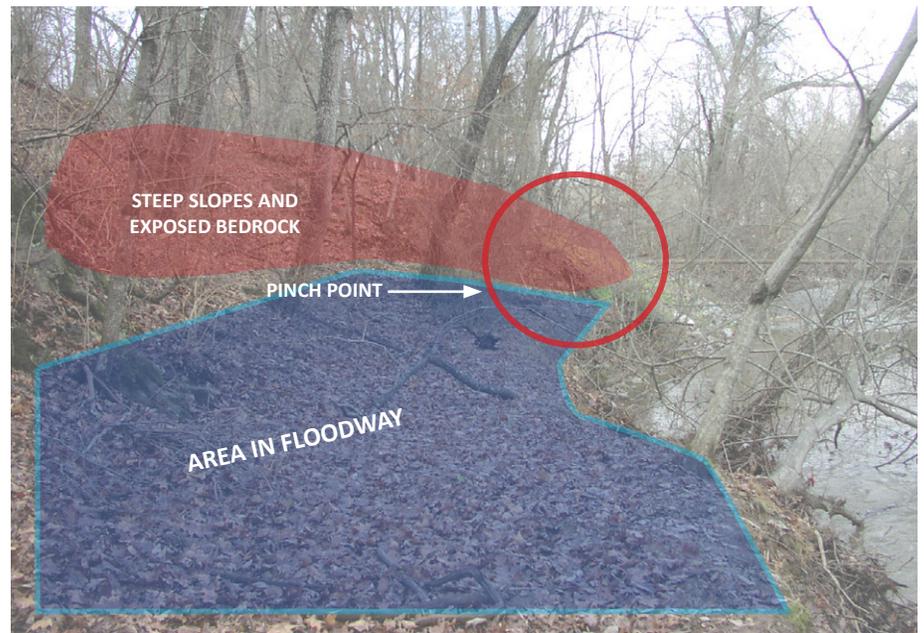
Option 2B (Upper Route)- A graded bench below the Baldor parking lot / fence provides a rolling and flat surface.



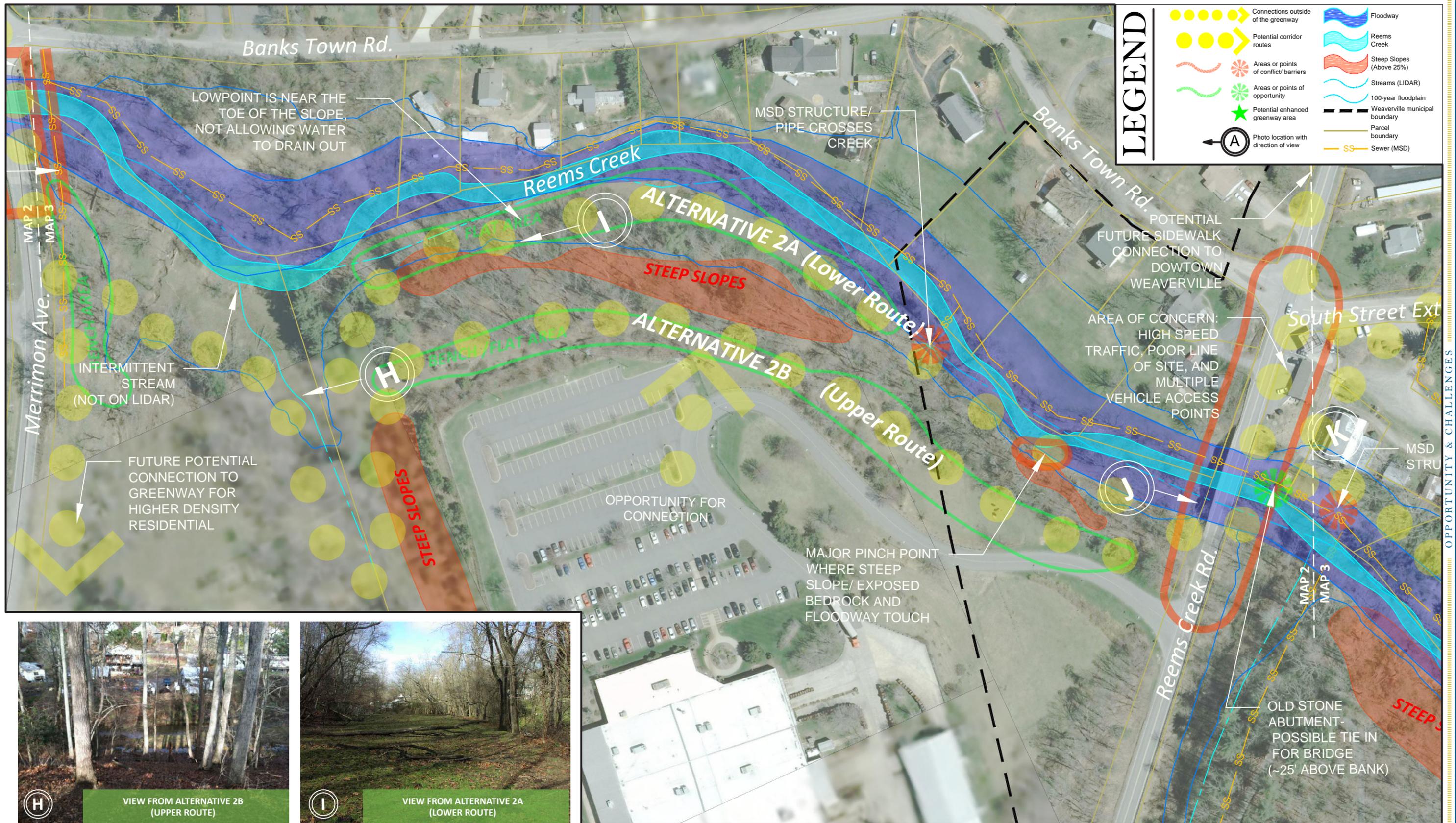
Option 2A (Lower Route)- The floodplain, erosion from grazing, and hydrological patterns all present challenges.



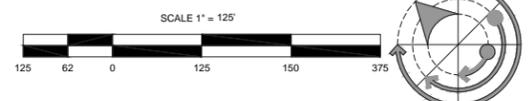
Option 2B (Upper Route)- Standing on the upper bench (Alternative 2B) and viewing Reems Creek and the steeper slope that drops off to the lower bench and Option 2A.



Option 2A (Lower Route)- A major pinch point occurs where steep slopes, exposed rock, and the floodway all converge.



FOCUS AREA MAP 3 | Baldor Property |



Reems Creek Road to Longs Chapel Road (Map 4)

The Reems Creek Road crossing is one of the most challenging barriers of the greenway study area. The road is a major collector for Reems Creek area residents. The road has a posted speed of 45 m.p.h., but both stakeholders and the public have commented they feel drivers go at much higher speeds. Additionally traffic conflicts have been known to occur on the corner of Longs Chapel Road. There is no controlled point of access to a gas station's parking area and the road itself. Because of these conditions, the stretch of Reems Creek Road from Baldor's entrance driveway to the gas station provides considerable hazards for pedestrian and bicyclists with an on-street greenway alignment.

POTENTIAL ROUTES:

- Option 3A (On-road Route): Once across Reems Creek Road (see road crossing addressed below), this route would follow Longs Chapel Road and use a narrow stretch of NCDOT's existing right-of-way.
- Option 3B (Mill Route): Once across the road, this alternative would continue to follow the north side of Reems Creek.

ROAD CROSSINGS:

Greenway Underpass with Stand Alone Pedestrian Bridge: Greenway users would cross under the Reems Creek Bridge and then use a new pedestrian bridge that connects to the Weaverville Milling Company.

Mid-block or Four-way Intersection Crossings: The least desirable of the alternatives, this option would require a signalized crossing at the bridge, or a signalized mid-block or intersection crossing.

OPPORTUNITIES

Parking:

- No obvious parking options, but negotiations with commercial landowners could open opportunities for parking.

Potential Routes:

- Option 3A (On-road Route): Narrow right-of-way (22-25 feet) and utility poles doesn't leave much room for a separation of greenway, but avoids private lands.
- Option 3B (Mill Route): Mill and gas station could become major stopping or starting point for greenway users and the Mill could provide a strong historic identity for the greenway.

Enhanced Greenway Area:

- Mill/ gas station could provide services to greenway users.
- Although invasive, bamboo "tunnels" create unique experience along Option 3B.

Connections:

- Connects to surrounding neighborhoods and provide a safe crossing for those coming from Banks Town Road.
- Connects to South Main Street which has sidewalks extending very close to Reems Creek Road (terminating at Weaverville Elementary School).

CHALLENGES

Hydrology:

- Stream connecting into Reems Creek (on the east side of Reems Creek Road) constrains options for crossing very far on that side.
- The floodway widens greatly adjacent to Option B, reducing amount of potential corridor.

Road Crossing:

- Reems Creek Road has high-speed vehicular travel and poor line of sight.
- The corner of Longs Chapel Road and Reems Creek Road (Market Center gas station) is reported to have a high amount of vehicular collisions.

Topography:

- Slopes on the south side of Reems Creek are steep and rocky, making it a poor alternative.

Potential Routes:

- Option 3A (On-road Route): Narrow right-of-way (22-25 feet) and utility poles don't leave much room for a separation of greenway from the road.
- Option 3B (Mill Route): Majority of the flat terrain on the north side of Reems Creek is in the floodway. Would require road crossing and no obvious connection through to Longs Chapel Road.



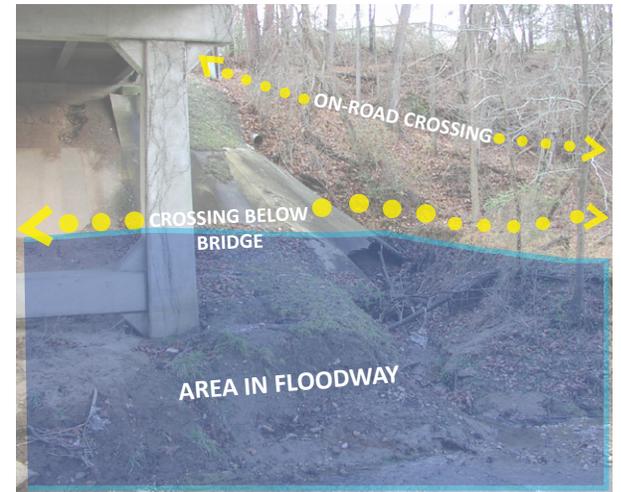
Options for the crossing of Reems Creek and Reems Creek Road.



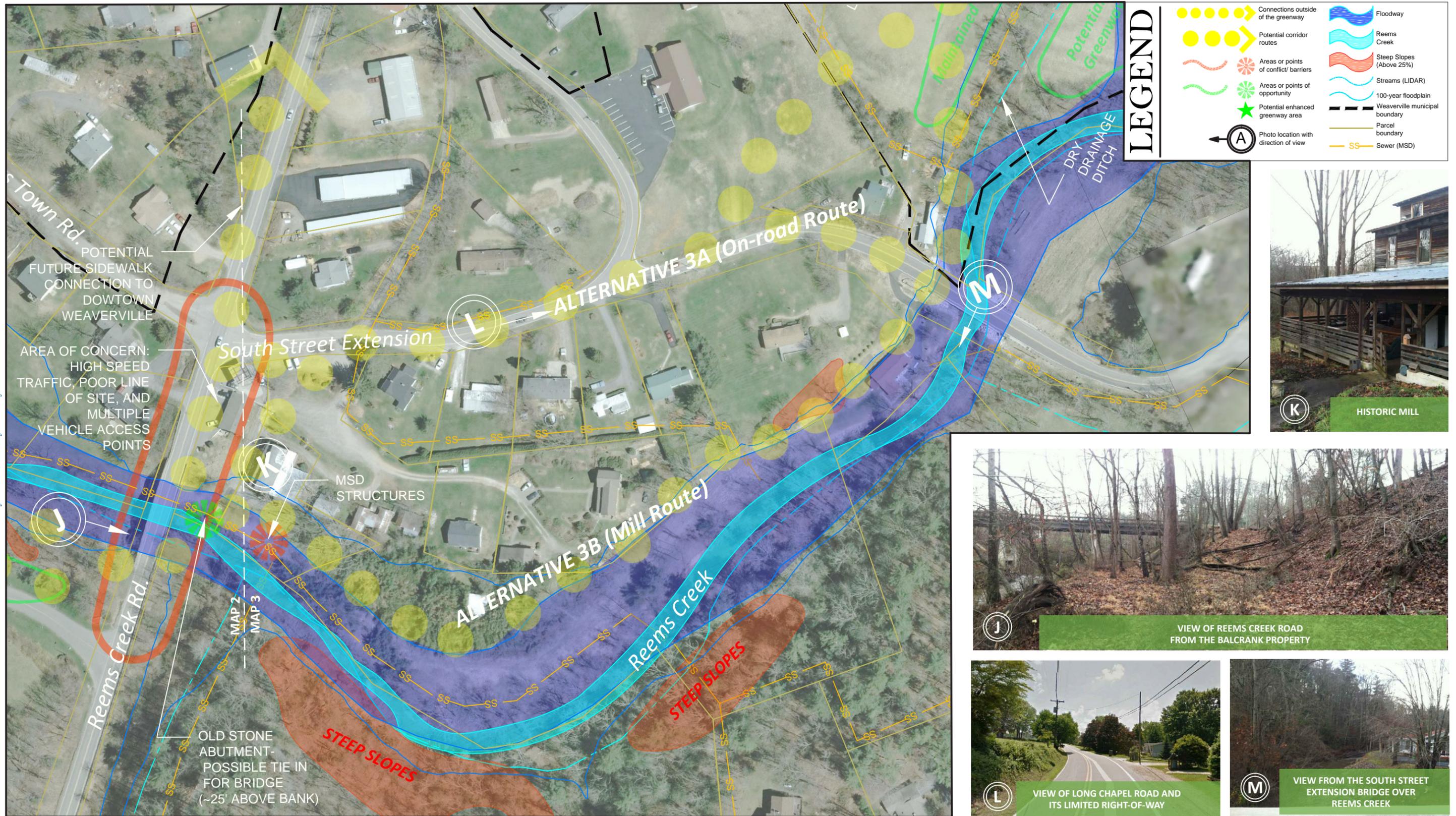
The Reems Creek Road bridge crossing with gas station in the distance.



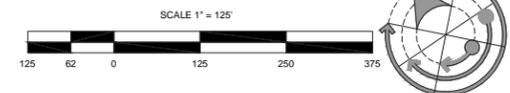
A view across Reems Creek to the Mill and a "historic" abutment made from stone.



The underside of the Reems Creek Road bridge provides potential for a greenway underpass.



FOCUS AREA MAP 4 | Reems Creek Road to Longs Chapel Road



The Balcrank Property (Map 5)

The Balcrank property is perhaps the most scenic section of the corridor, with rolling hills and open views, a meandering Reems Creek, and a concentration of wildlife that was not seen elsewhere in the corridor. This industrial site currently maintains multiple walking paths that provide potential options for greenway routing.

POTENTIAL ROUTES:

- Options 4A (Upper Route): A maintained path on the upper side of the tree line is closer to the Balcrank building, at times visible from each other. The grade undulates more than Alternative 4B and does not have many direct views of Reems Creek.
- Options 4B (Creek Route): This takes you close to Reems Creek, often crossing in and out of the floodway and multiple wet areas. There are several chances to engage great views of Reems Creek, especially at the mid-point of the property where an old dam (potentially old mill) that widens Reems Creek.



View from maintained path that connects to the Balcrank building. View looks onto a maintained path along the tree-line that is the best location for the greenway.

OPPORTUNITIES

Parking:

- No possible parking area unless agreement with landowners could be reached

Potential Routes:

- Alternative 4A (Upper Route): This options stays out of floodplain and has more expansive views.
- Alternative 1B (Creek/MSD Route): This route is close to creek with a considerable amount of wildlife viewing opportunities.

Enhanced Greenway Area:

- The area around an old dam and potential demolished mill (foundation walls intact) would be a likely area for a scenic stopping point with basic amenities (benches, table, etc).
- The potential greenway use at the northern part of the widest bend of Reems Creek and could serve as a passive recreation area. The majority of it is in the floodway.

Connections:

- Connection to one major employer (Balcrank).

CHALLENGES

Hydrology:

- Some sensitive wetland or wet areas should be avoided or impact minimized.
- Several small stream crossings require small bridges.
- Wetland area would require larger bridge span or boardwalk.
- The lower route (maintained path) is close to, or in the floodway.
- Reems Creek is experiencing bank erosion seemingly due to excessive storm events and lack of bank vegetation.

Topography:

- Both alternatives would include some gain and/or loss in elevation.

Potential Routes:

- Option 4A (Upper Route): This route would increase length of trail, likely require more grading to accommodate pedestrian accessibility, and will also encroach further into the property. This route would be visible from the Balcrank building.
- Option 4B (Creek/MSD Route): The MSD Route is partially in the floodway, and would impact several small wetlands.

Other:

- The Balcrank site is a designated brownfield. Implications on trail alignment and grading will need to be further explored. Several monitoring well locations are close to the proposed routes.



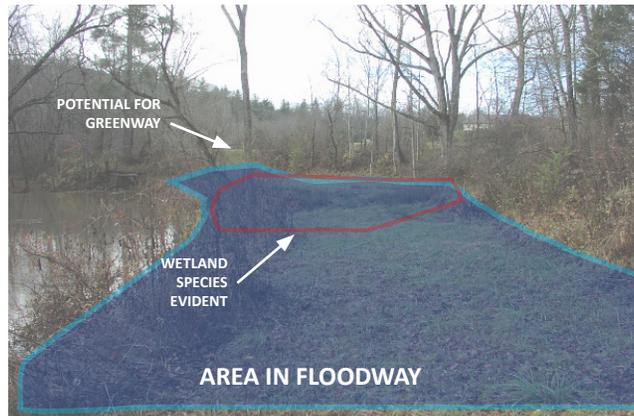
Option 4A (Upper Route)- Terrain is gently rolling and would require some room to navigate to keep grade accessible.



One option to connect to Option 4A or 4B (Connecting to South Street Extension Road).



Option 4B (Creek Route)-The view above a historic dam (potentially an old mill site) which could become an enhanced area of the greenway.



Option 4B (Creek Route)-This route may be in the floodway and has potential to impact wetlands.



View of the Balcrank building and a small intermittent stream/ditch (view from potential route).

Balcrank to Karpen Fields (Map 6)

Along the easternmost section of the study area there is only one recommended corridor for the greenway, which is out of the floodway but as close to Reems Creek as possible. This creates some significant challenges along the Karpen Steel industrial building since the floodway abuts the parking and has a narrow riparian buffer. An existing 6-8 foot fence has been placed in the area between the parking lot and floodway, creating an additional constraint. Otherwise, this section has little challenges in topography and would provide a visual connection to Reems Creek with other expanded views.

ROAD CROSSINGS: The study area ends at the Karpen Soccer Fields. Several higher-density residential development surround the fields and would be greatly served by a marked pedestrian crossing to the park. In the future this can also serve as a connection to the surrounding neighborhoods and downtown Weaverville.



Karpen Fields, a county owned park, is the eastern terminus of the study area.

OPPORTUNITIES

Parking:

- Available at Karpen Fields

Potential Routes:

- Alternative 4A (Upper Route): This option stays out of floodplain and has more expansive views.
- Alternative 1B (Creek/MSD Route): Route is close to creek with a considerable amount of wildlife viewed in this area.

Enhanced Greenway Area:

- The area around an old dam and potential demolished mill (foundation walls intact) would be a likely area for a scenic stopping point with basic amenities (benches, table, etc).
- The potential greenway use at the northern part of the widest bend of Reems Creek could serve as a passive recreation area. The majority of it is in the floodway.

Connections:

- Connect to several employment sites.
- Connect to multi-family and residential neighborhoods north of Karpen Fields.
- Future connection east onto Reems Creek Road's 65 foot right-of-way should be explored.

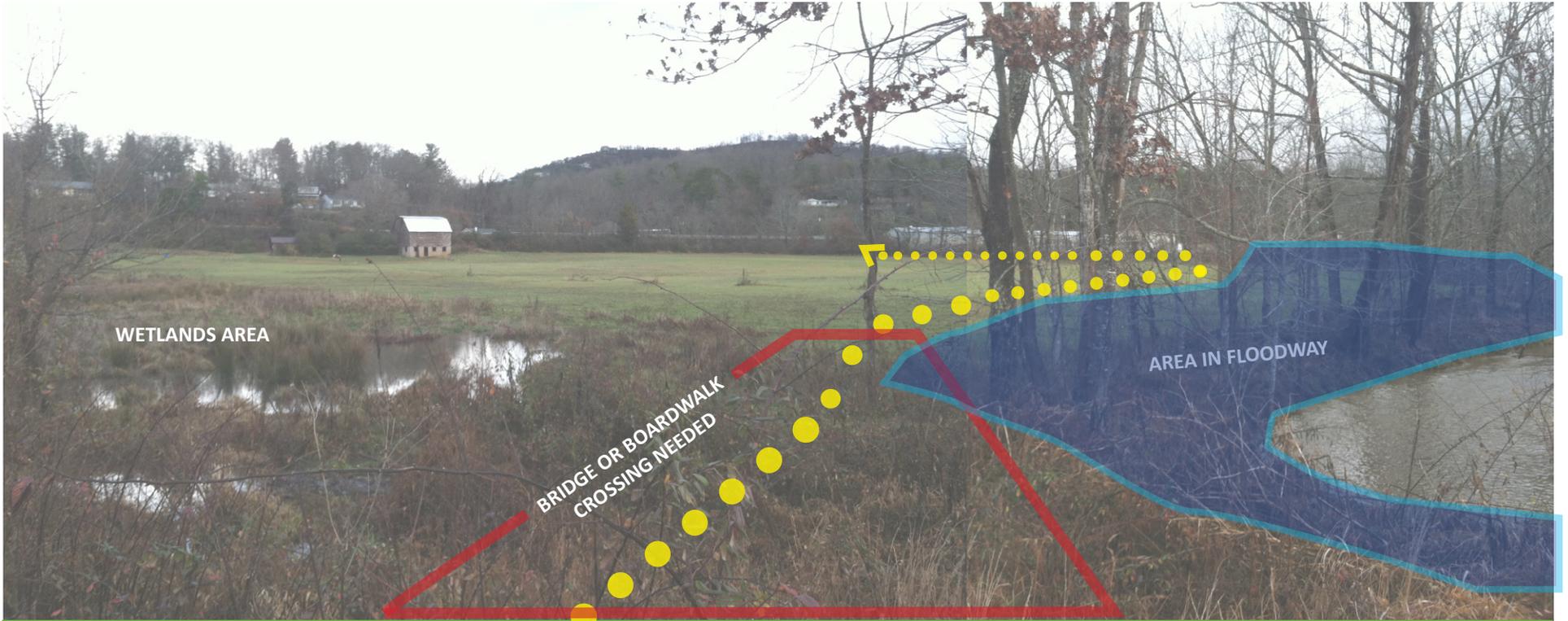
CHALLENGES

Hydrology:

- Floodway expansive in some parts of potential corridor subjecting trail to likely erosion and destabilization yielding long-term maintenance concerns.
- Soils along bank appear to be more sandy and highly erodible in this area.
- Reems creek is experiencing bank erosion seemingly due to excessive storm events and lack of bank vegetation.
- One bridge crossing may be required (the same stream has a 6'x6' box culvert above it near Reems Creek Road).
- Several water monitoring wells were identified in this area. Implications on trail alignment/grading will need to be further explored.

Other:

- Area is very constrained between Karpen metals and associated industrial buildings and Reems Creek. A fence has been constructed parallel (25-30') to the creek bank which provides an obstacle.



A view of the potential enhanced greenway area (at eastern edge of the Balcrank property). This wetland could provide a wildlife / boardwalk viewing area (as discussed in the section of Map 5).



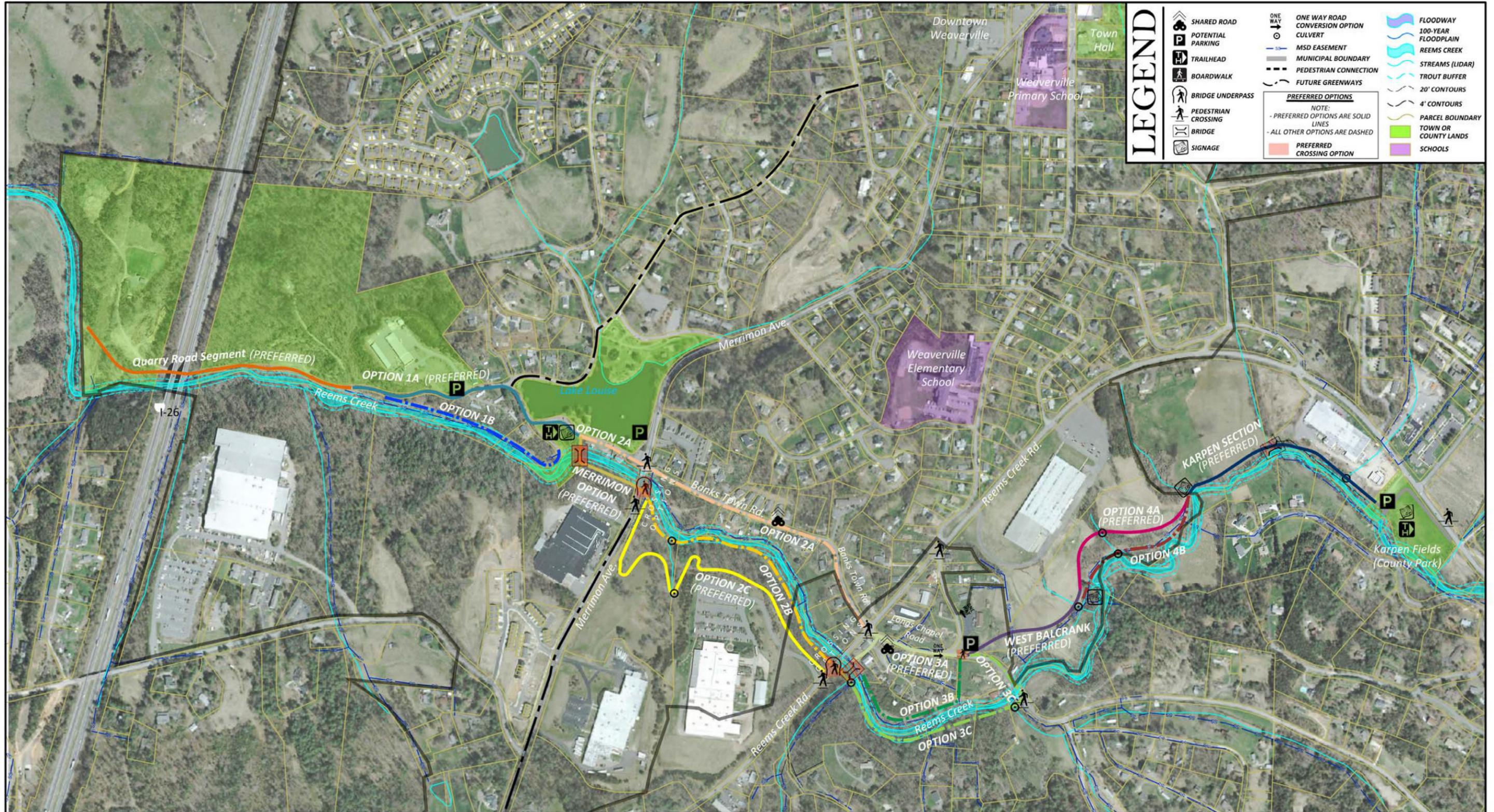
View from Reems Creek Road looking south onto the potential greenway corridor.



One of the more constrained areas of the whole study area is the area between the parking lot and floodway at Karpen Steel

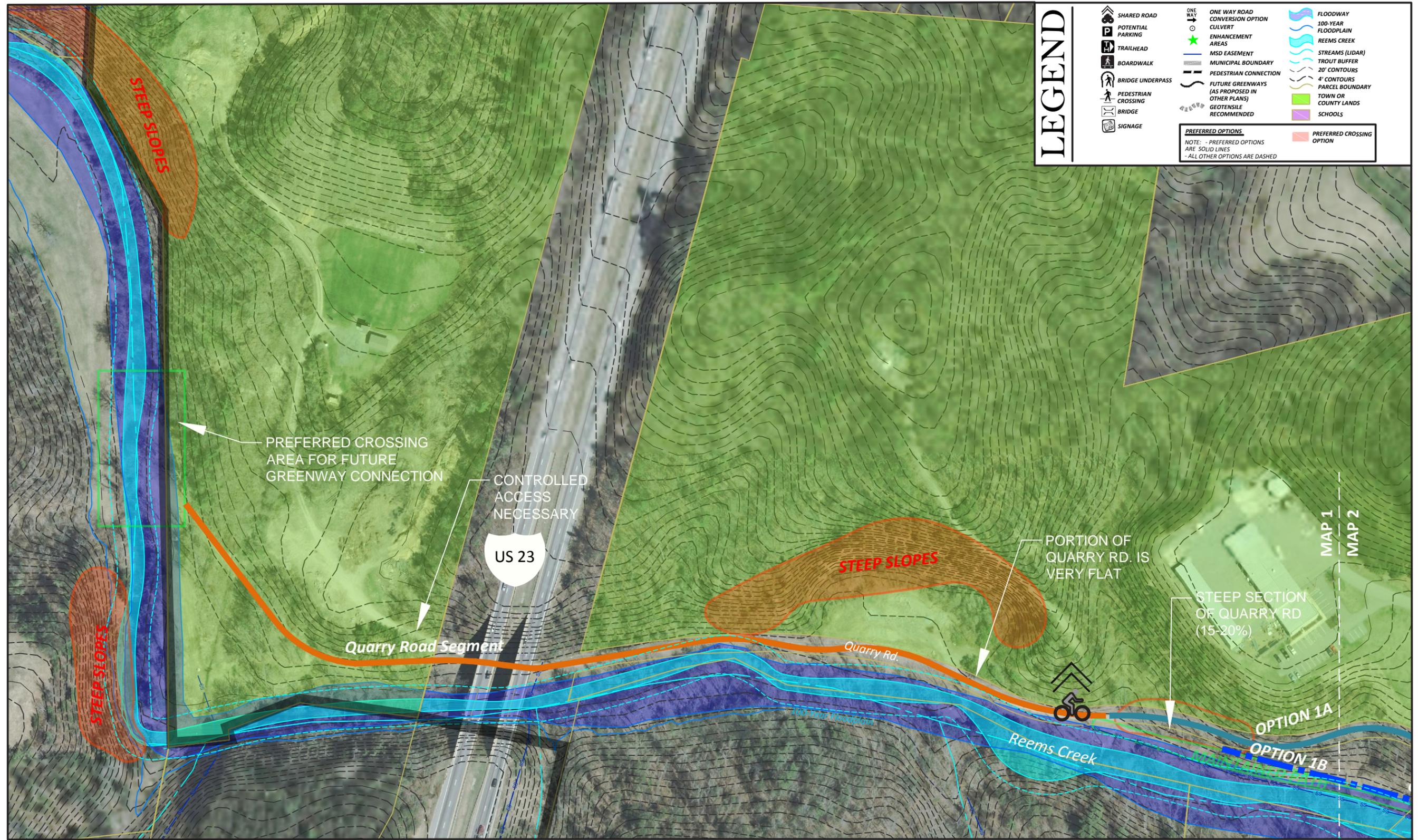
Chapter 4

Corridor Design Maps

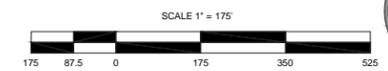


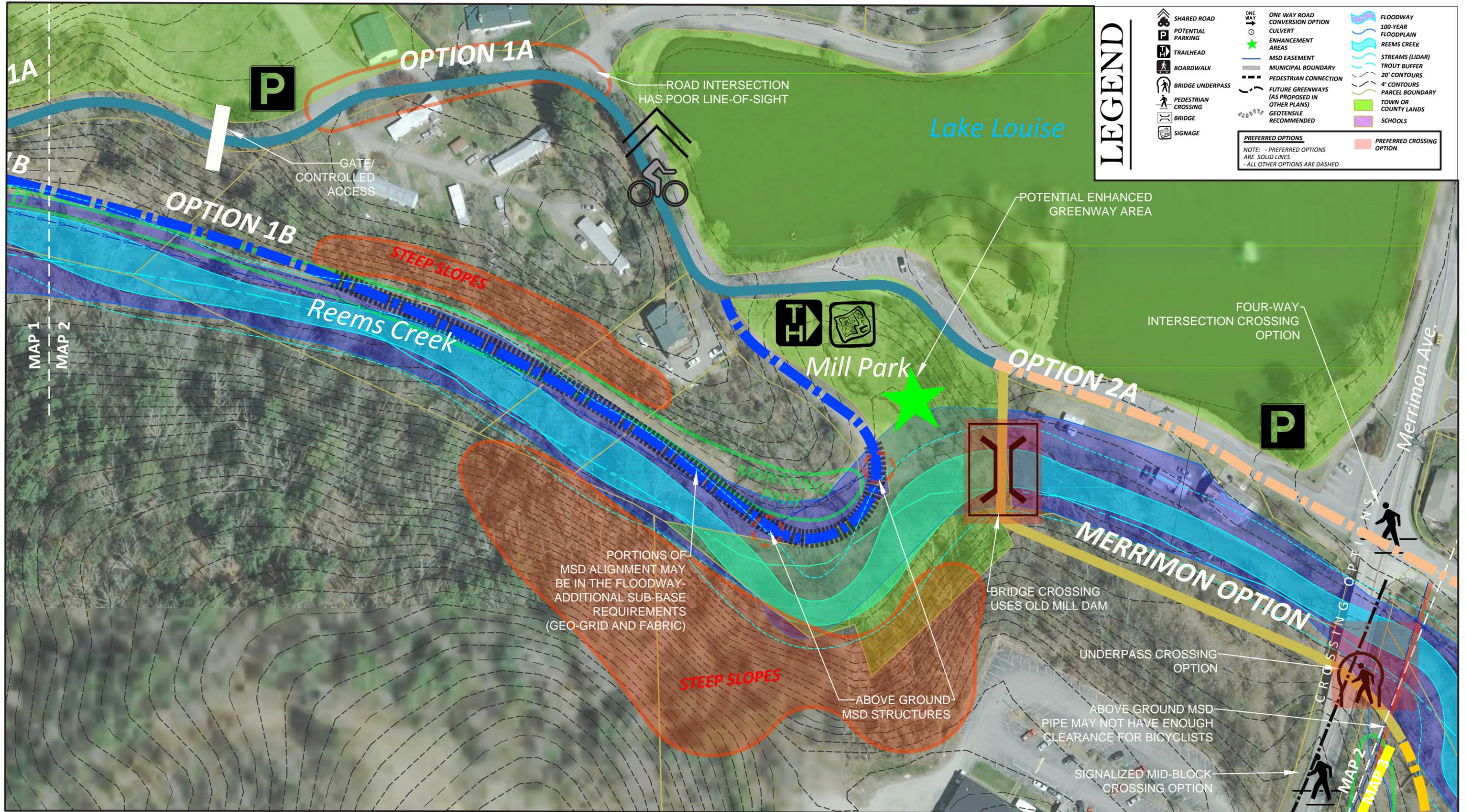
REEMS CREEK GREENWAY CONCEPTUAL PLAN WITH CORRIDOR OPTIONS



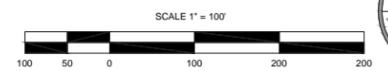


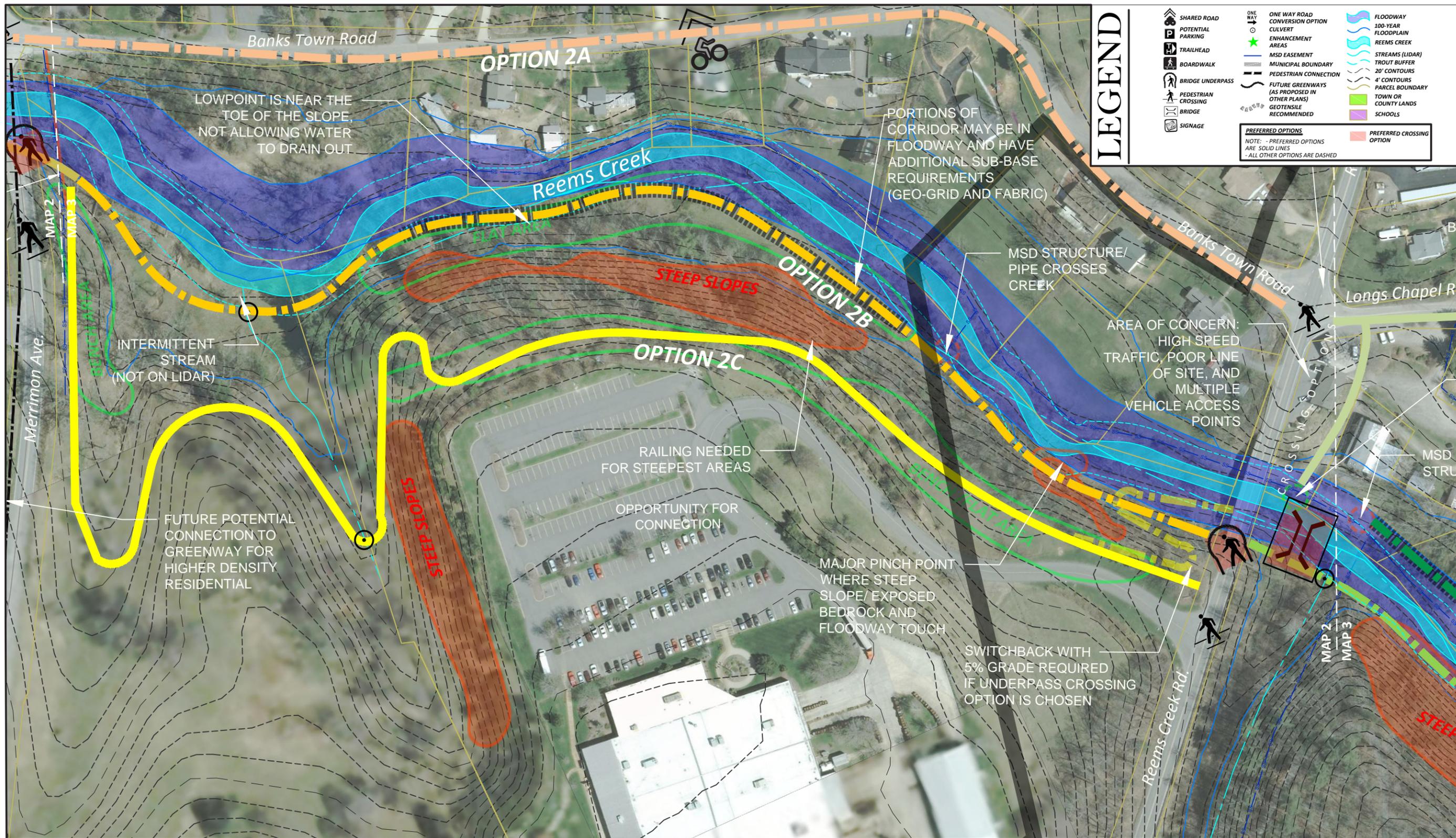
FOCUS AREA MAP 1 | Weaverville Town Property to Lake Louise



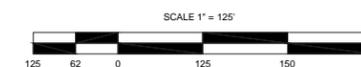


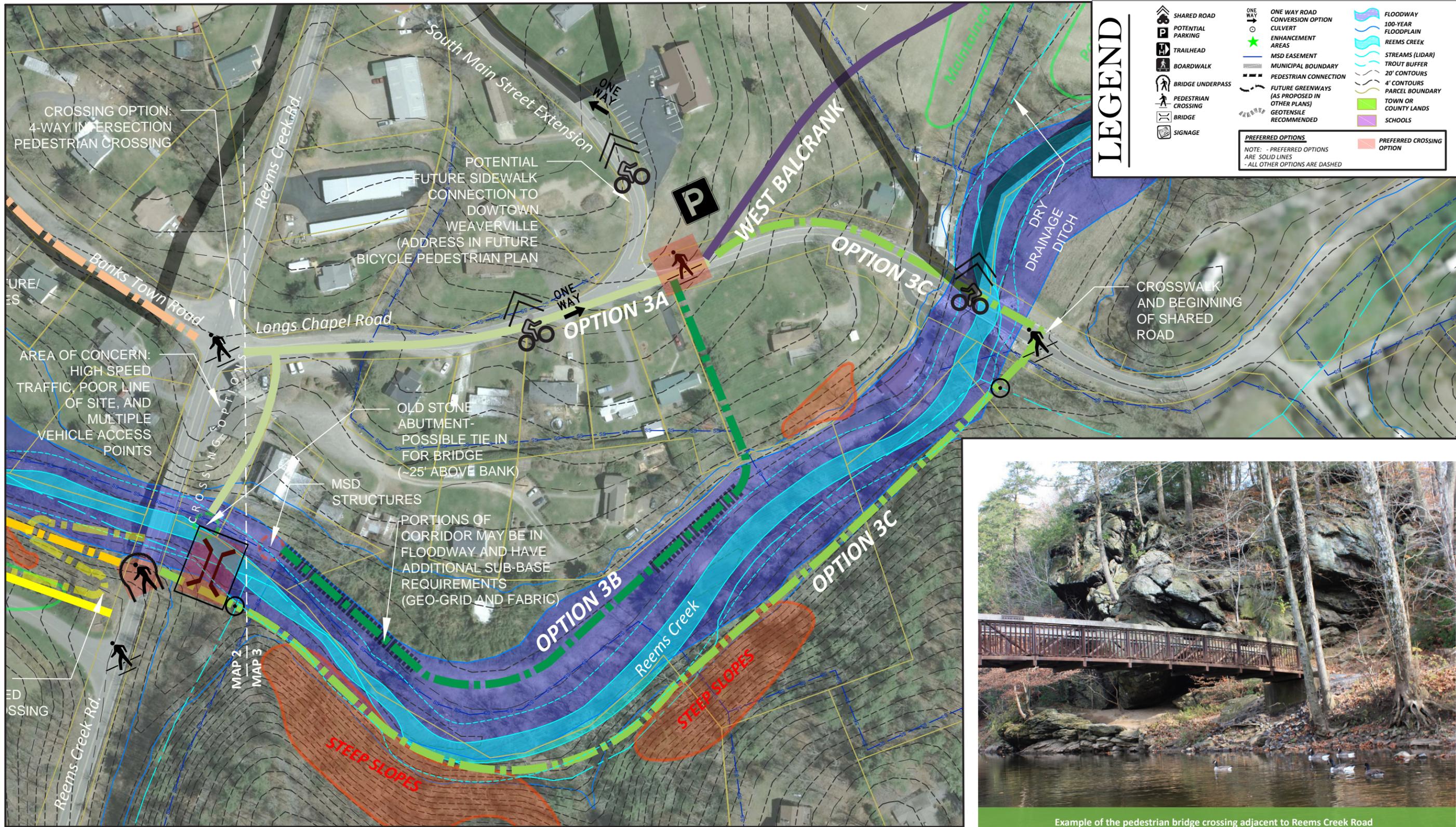
FOCUS AREA MAP 2 | Lake Louise Area |





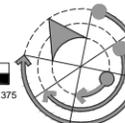
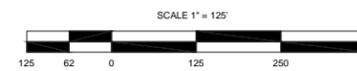
FOCUS AREA MAP 3 | Baldor Property |

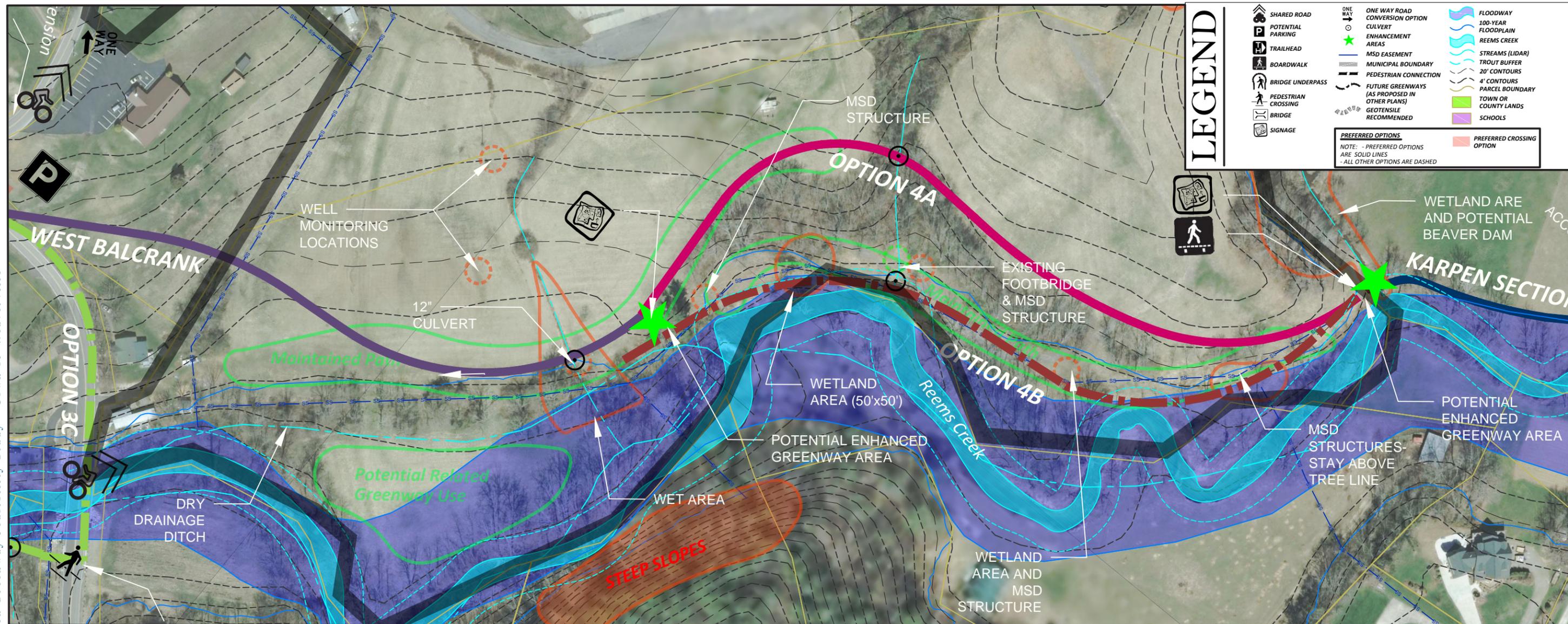




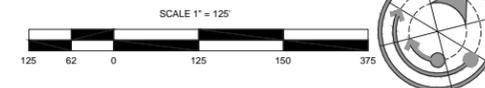
Example of the pedestrian bridge crossing adjacent to Reems Creek Road

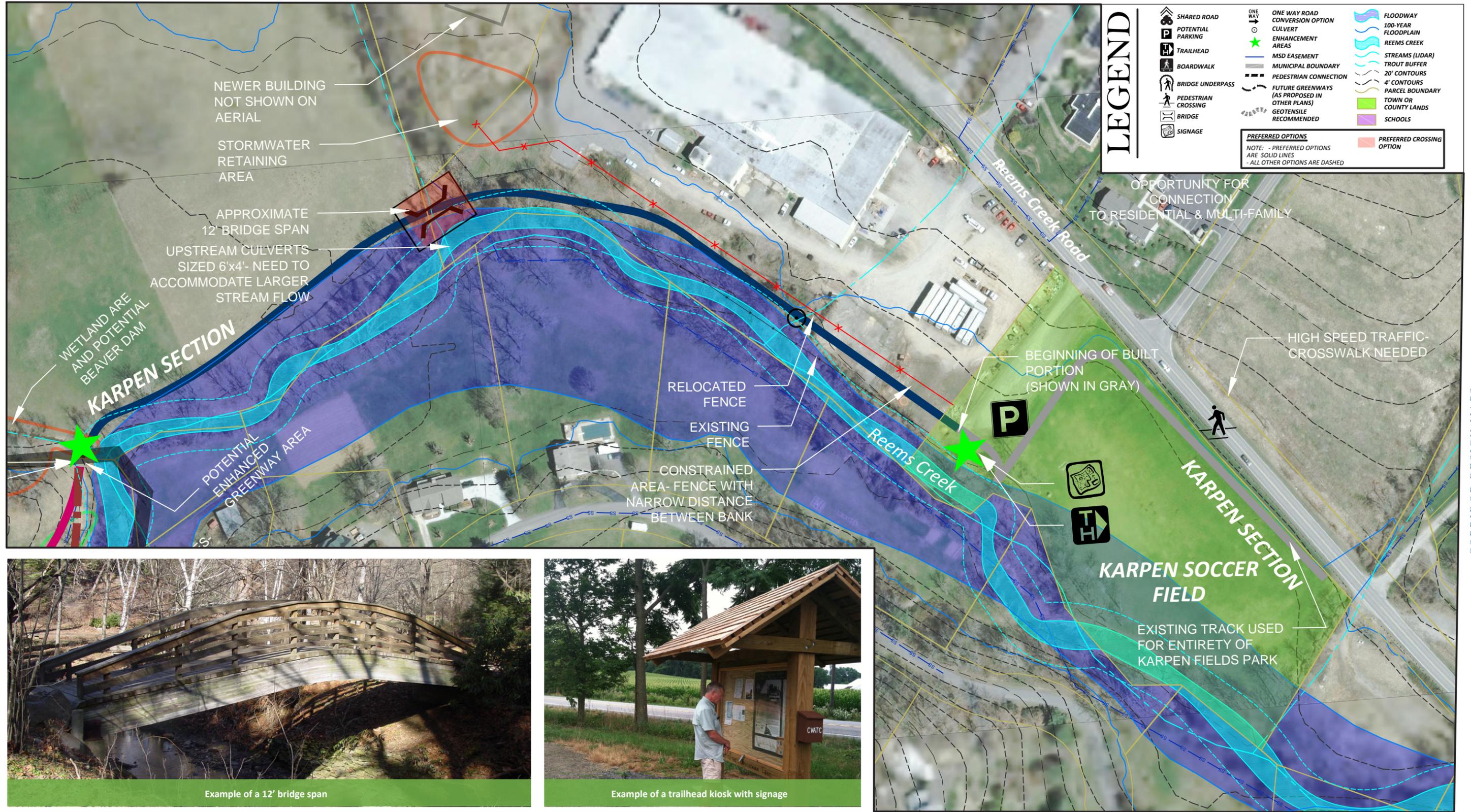
FOCUS AREA MAP 4 | Reems Creek Road to Longs Chapel Road



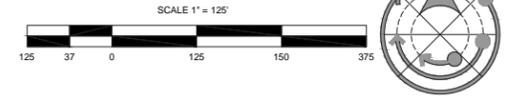


FOCUS AREA MAP 5 | Balcrank Property |





FOCUS AREA MAP 6 | Balcrank to Karpén Fields |



CHAPTER 5

Corridor Design Options

Design Considerations

ROAD CROSSINGS

Bridge Underpasses at Major Road Crossings

There are two areas to consider for a greenway underpass as a road crossing solution to keep greenways users off of roads and avoid automobile/pedestrian conflicts. While this solution is not widely used for greenways in North Carolina, there are some precedents which have been set for this. Bridge underpasses would require a no-rise study. Read more about this in this chapter's section on Greenways in the Floodplain.

Recommendations:

- Develop an underpass design that NCDOT is comfortable approving given others constraints and design considerations. This design should have no impact to the bridge fill slope and should not have an attachment to the bridge. If retaining walls are needed, the walls should show it has the same support as the fill slope. NCDOT's biggest concern is going to be the structural stability of the bridge and that a change to the structure or in the hydrological process of Reems Creek will not impact the structure.

Mid-Block Road Crossings

There are many instances along the corridor where a mid-block crossing serves as the actual greenway or to connect into the greenway. These crossings could range from a simple marked crosswalk to a HAWK signalized crossing paired with a marked crosswalk.

Recommendations:

- Place mid-block crossings at a location that maximizes visibility of trail users to motorists.
- Place stop signs along the trail at the roadway crossing.



MUTCD W11-15 Vehicular Traffic Warning Sign.



Crosswalk with HAWK signal.



Mid-block crossing approach from trail perspective.



Mid-block crossing approach from street perspective.



Two-stage-Z-crossing example

- Install pedestrian/bicyclist-actuated signal buttons at the crossing.
- Install lighting to illuminate the crossing at night.
- Use Manual on Uniform Traffic Control Devices (MUTCD) W11-15 signage as an advanced warning to motorists.
- Any crosswalks or ramps must be constructed to the same width (at minimum) as the trail (10 feet) to meet ADA requirements.
- Crossing times (if signalized) should be evaluated based on actual user crossing speeds rather than defaulting to MUTCD minimum standards.
- A two-stage z-crossing is preferred if the mid-block crossing is multi-lane (greater than two lanes with a two-way left turn lane). This option would only be considered if Merrimon Avenue or Reems Creek Road were proposed to have more lanes in the future.

Four-way Intersection Crossings

Option 2C would require two intersection crossings. These crossings would require...

Recommendations:

- Evaluate for pedestrian signal warrants and traffic signal warrants (if unsignalized)
- Evaluate for conversion to All-Way Stop Control (AWSC) if only Two-Way Stop Control (TWSC).
- Minimum 10-foot wide curb ramps (throat of the ramp) and corresponding crosswalk widths to accommodate multi-use trail users. Currently, NCDOT does not have a standard design for this that meets ADA requirements.
- Push-button actuated pedestrian signals and crossing phase (if signalized).
- Crossing times should be evaluated based on actual user crossing speeds rather than defaulting to MUTCD minimum standards.
- MUTCD W11-15 signage as an advanced warning to motorists.
- Install lighting to illuminate the crossing at night.

Use of NC Department of Transportation Right-of-way

Many of the streets in Weaverville that are under the jurisdiction of the North

Carolina Department of Transportation (NCDOT) do not have documented right-of-way, meaning there is no record of past right-of-way acquisition due to the age of the road. By law, NCDOT can claim right-of-way within the logical maintenance footprint of the road, typically defined as either edge of pavement or edge of the borrow ditch/drainage ditch. Without documented right-of-way beyond these limits, property acquisition will be required to construct a sidepath.

In cases of documented right-of-way wide enough to accommodate a sidepath, various improvements may be required, including:

- A clear zone of up to 30-feet from edge of pavement or construction of a vertical barrier between the travel-way and the sidepath.
- Right-of-way encroachment agreement from NCDOT to place structures within the public right-of-way.

Special precaution should be taken during the design phase to ensure compliance with the Americans with Disabilities Act (ADA). NCDOT will likely require conformance with the DOT’s design standards, however, NCDOT does not currently have design standards that applies to multi-use trail and is ADA compliant and conforms to AASHTO’s Guidelines for the Development of Bicycle Facilities (2012).

Given that the Town of Weaverville assumes maintenance responsibility for the sidepath even if placed within DOT right-of-way, it is imperative that the design and construction of it conform to prevailing ADA and AASHTO guidance in order to avoid potential litigation due to non-conforming design. This may mean working with NCDOT to acknowledge AASHTO and ADA as superseding NCDOT’s design opinion.

THE ENVIRONMENT

Greenways in the Floodplain

This feasibility study looks at a greenway corridor that largely parallels Reems Creek, which in many places has a substantial floodplain and floodway. When developing corridor options, the floodway was a major consideration that drove the alignment of several options.

A greenway can be located in a floodplain with the submittal of a flood permit application and requires: a plan for the greenway, structures to be located on the greenway, and the floodway and floodplain located on the plan. The floodway is of most concern for avoidance and considerable cost escalation can make building in the floodway less desirable. Alternations in the floodplain/ floodway can impact natural process and require permitting. Any structures located within the floodway such as a drinking fountain, kiosk, signage, and the trail itself would require a no impact / no rise study through the Federal Emergency Management Agency (FEMA). These studies can vary on cost but can range from \$2,500-\$15,000 depending on complexity. The State also regulates structures within 30 feet of a water body, but greenways can be allowed within this buffer if mitigation measures are taken to address stormwater with stormwater best management practices (BMPs).

Bridges or structure additions within the floodway requires a no-rise study. A no rise study uses stream modeling to reflect changes in water levels during flood events due to construction in the floodplain. If there is no increase in the water depth of the 100 year storm a permit can be approved. If the disturbance causes a rise, then a FEMA CLOMR (Conditional Letter of Map Revision prior to construction) and LOMR (Letter of Map Revision done post construction) is required. Both of these steps significantly increase costs and add time to the project.

Recommendations:

- Stay out of the floodway as much as possible.
- When the greenway is in the floodway and significant structures or fill is proposed, prepare for a likelihood of a no-rise study and design with in a 6" maximum fill allowance.
- Find design solutions for creek crossings that have minimal or no impact to the floodway and find solutions that place any structures above the floodway.

Trout Waters Designation and the Trout Buffer

Reems Creek is classified as a Trout Water as defined by the NC Department of Environment and Natural Resources. This designation requires a 25-foot buffer measured from top of bank, which must remain undisturbed. The goal of the buffer is to provide shade and keep sediment out of the stream. The

greenway can impact a maximum of ten percent of the total length of the buffer zone with no more than 100 linear feet of disturbance in each 1,000 linear feet. At any points where the greenway encroaches on this buffer, efforts should be taken to direct stormwater away from the river and into a swale or other stormwater BMP.

Recommendations:

- Avoid impact to the trout buffer.
- If some of the trout buffer is impacted, identify total area of impact, and implement mitigation measures such as stormwater BMPs.

Topography

Topographic challenges through the greenway corridor will increase the greenway's grade. In general, a maximum of less than 5% grade design standard should be set. The corridor design options all account for staying under 5% grade.

Recommendations:

- Set a design standard of a less than 5% grade.
- Balance cut and fill requirements.

Wetlands

No wetlands exist within the corridor according to the National Wetlands Inventory (NWI). However, the NWI does not always pick up smaller wetlands of which several potentially exist (specifically in the Balcrank property).

Recommendations:

- Survey and delineate wetlands as part of a future detailed study of corridor design. Any alignments close to Reems Creek are most likely to have wetlands.
- Avoid any impact to wetlands. If wetland impacts occur, a Section 401 Permit through the U.S. Army Corps of Engineers (USACE) is required and the State is also involved in 401 certification in partner with USACE.

EXISTING INFRASTRUCTURE

Sewer

Corridor alignment options parallel the Metropolitan Sewerage District (MSD) of Buncombe County’s sewer lines and easements in many areas. A master agreement between with The Town and the County should be reached with MSD for all greenways in Weaverville. Based on previous requests to MSD, it can take 3 months to 2 years to reach such an agreement. This agreement should be in place before the county accepts any easements or any financial exchange takes place. This agreement has a hold harmless clause, indemnifying MSD and clarifying they are not responsible for any costs incurred due to accident or injury.

Specific concerns for MSD easements in this study include:

- MSD does not allow any structures including retaining walls within the easement in less the sewer line is replaced by the owner.

All easement widths would need to be verified by looking at individual easement agreements, as widths are not in a GIS database.

THE CHARACTER AND AESTHETIC QUALITIES OF THE GREENWAY

Historic and Rustic Character

The Town of Weaverville has a strong identity and appealing visual character. Lake Louise, downtown, and properties like the Weaverville Mill create a strong sense of place and should be iterated in amenities and character of the greenway. As part of future planning of the greenway, a concept for visual character of kiosks, wayfinding signage, bridges, and other built amenities should be developed.

Recommendations:

- Determine a “palette” or design guidelines of materials and visual character. These guidelines will reinforce Weaverville’s aesthetic and historic character and provide visual cohesiveness to the greenway.

Corridor Design Options

Weaverville Town Property to Lake Louise (Map 1)

POTENTIAL ROUTES:

Quarry Road Segment *PREFERRED ROUTE*

This segment is the preferred and only option selected.

Recommendations:

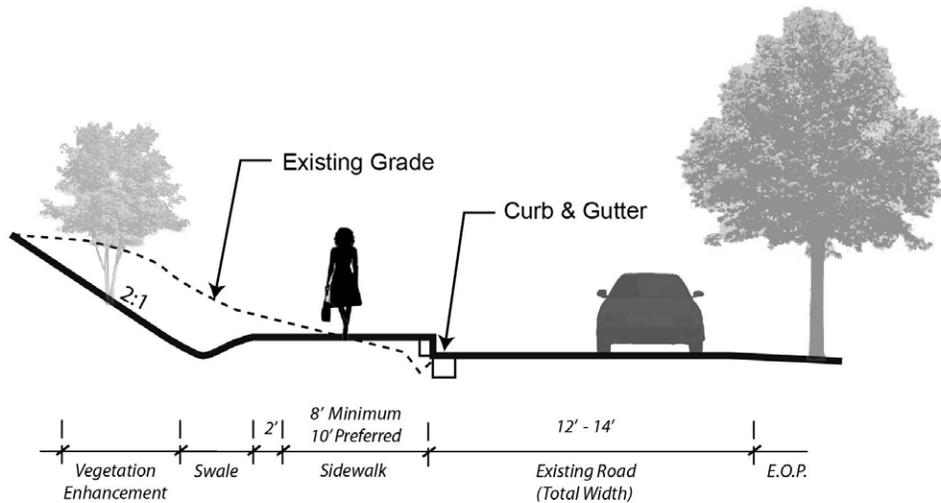
- **Plan for future greenway connections.** This study recommends a general area (see Map 1) that is most suitable for a future crossing on the western edge of the Town property. It is not recommended to cross further north of the property due to steeper topography.
- **Control access from the greenway.** An additional gate or “Do Not Enter” signage located along the greenway should direct people to stay on the greenway west of I-26/US 23.
- **Determine if an encroachment agreement is necessary for improvements under I-26/US 23.**

Lake Louise Area (Map 1 & 2)

POTENTIAL ROUTES:

Option 1A (Road Route) *PREFERRED ROUTE*

This route retrofits Quarry Road with a 12 foot asphalt greenway. It is the preferred route due to the lower costs and fewer environmental constraints.



XS1: Option 1A

Recommendations:

- **Utilize existing road and resurface with 12' asphalt, improved subgrade, and ditches.** A 12 foot asphalt width and 2 foot shoulder and would accommodate the Town's vehicles.
- **Keep greenway running grades below 5% and cross slopes less than 2%.** If Quarry Road is used; a short portion of the road exceeds the 5% rule (based on LIDAR it is around 8%). Anything steeper makes biking more difficult and would not be ADA compliant without accompanying flat landings (e.g. no more than 2% cross slope in any direction) and railings. The alignment of the road and greenway may need to be readjusted, lengthened, or cut and fill altered so that the grade is lessened.

For the following recommendations, refer to XS1: Option 1A.

- **Begin 8' sidewalk at Town Public Works Complex and extending to West Lakeshore Drive.**
- **Widen the section from Town Public Works Complex to West Lakeshore Drive.** At the junction of West Lakeshore Drive and Quarry Road a blind corner occurs. Widening and pulling back the slopes (as

indicated on the map) would increase site visibility.

- **Look to the Town's Public Works Complex as a future parking area:** Parking may become a premium and is somewhat limited on the South side of Lake Louise. Parking near the Public Works building would be the closest option for increasing parking capacity.

Option 1B (MSD Route):

This route would split off Quarry Road and follow along the MSD right-of-way. While there is a nice benched and maintained area where Option 2B is proposed, the floodway brings environmental, construction, long-term maintenance, and cost challenges. If chosen, a thorough study of this route would have to look at minimizing impact to the floodway, and a no-rise certificate would likely be required. While this option is more costly, it would provide a more enjoyable experience for the user.

Recommendations (if option is chosen as preferred):

- **Keep the corridor out of the floodway as much as possible, even if it means grading a new bench for the greenway out of the floodway.** Where Option 1B lies within the floodway additional sub base requirements are needed to allow for adequate drainage. This includes cross pipes, geo-grid, and filter fabric, which will all lead to better drainage, stability, and long-term sustainability. Keeping fill to a minimum as required in floodways will be a challenge in this option.
- **Avoid multiple crossings of the MSD easement and impact to manholes.** Read more information about MSD constraints in the Design Considerations, Existing Infrastructure section on page 53.
- **Keep greenway grades below an average 5% grade.** The existing path near the Mill Park that connects the MSD easement to Lake Louise is approximately at 10% average grade. A realignment with cut and fill adjustments may be needed to lessen the grade.
- **Enhance Lake Louise Park (mill area) with more "park-like" elements that pay homage to the site's historic features.** This could include dry stack stone retaining walls that mimic the remnant mill's stonework. Any kiosk structure should have interpretive and wayfinding signage. The pedestrian bridge (see Merrimon Option for details) would become an iconic focal point to the park and should have historic character.

Lake Louise and Baldor Property Area

(Maps 2 & 3)

POTENTIAL CROSSING OPTIONS FOR MERRIMON AVENUE:

Bridge Underpass Crossing Option **PREFERRED CROSSING**

This is the recommended crossing to keep greenway users off-road. There is ample clearance under the bridge for this option. Underpass crossing are addressed in more detail on page 50.

Recommendations:

- **Complete a further engineering / hydrologic study and survey.** To determine if this is a feasible crossing solution, a full study should be completed. There is a chance the study could find the underpass not feasible.

Signalized Mid-block Crossing Option

This option is the least preferred because it is least desirable from the user experience and less likely to be accepted by NCDOT. This option should only be considered if the bridge underpass is not feasible, but Options 2B or 2C are the preferred routes to travel East. Mid-block crossing are addressed in more detail on page 50.

Recommendations (if this option is chosen as preferred):

- **HAWK signal or similar flashing signal is a MUST.** If this is the only feasible crossing option, a signalized and marked crosswalk crossing should be installed.

Four-Way Intersection Crossing Option

This option is only suitable if Option 2C is chosen. Four-way intersections are addressed in more detail on page 51.



Underpass Crossing Option- Examples from the City of Raleigh's Crabtree Creek Trail



Underpass Crossing Option- Examples from the City of Raleigh's Crabtree Creek Trail

POTENTIAL ROUTES:

Merrimon Option

This route would include the pedestrian bridge crossing at the Mill Park, crossing to the south side of Reems Creek, and then traveling to Merrimon Avenue. This route is preferred as it is the best way to keep greenway users off road and there is a viable narrow creek crossing at the old mill site. See the image below for further detail of the bridge crossing of Reems Creek.

Recommendations:

- Choose a greenway bridge with historic character that matches the Mill site.
- Stay above the floodway once on the south side of Reems Creek.
- Bridge could become a landmark feature for the Town of Weaverville.

Option 2A (Road Route On Banks Town Road)

This route would require the construction of an 8 foot sidewalk with a 5-7 foot shoulder and a drainage ditch on the north side of Banks Town Road. While NCDOT right-of-way is unknown, it appears a 15' easement is likely needed to accommodate the sidewalk and shoulder. Mailboxes and driveway cuts would need to be altered or relocated to accommodate the sidewalk; existing drainage ditches would either need to be piped or moved back.

This route is not preferred because of the intersection crossing of Merrimon Avenue and Reems Creek Road, which increases the possibility of pedestrian-vehicular accidents.

Recommendations (if this option is chosen as preferred):

- **Further study NCDOT right-of-way and landowner property lines.** According to correspondence with NCDOT, research of deeds as well



Photo simulation of Merrimon Option's pedestrian bridge crossing of Reems Creek at the Lake Louise Park Mill area

as a surveys may be necessary to understand NCDOT right-of-way and property lines.

- **Consider a future sidewalk even if this option is not chosen.** This will allow residents easier and safer access to the greenway and Lake Louise.

Option 2B (Lower Route)

This route travels along the lower bench from Merrimon Avenue to Reems Creek Road. It is not the recommended route because of higher cost due to construction potentially in the floodway and long-term maintenance issues such as water damage and drainage issues over time.

Recommendations (if this option is chosen as preferred):

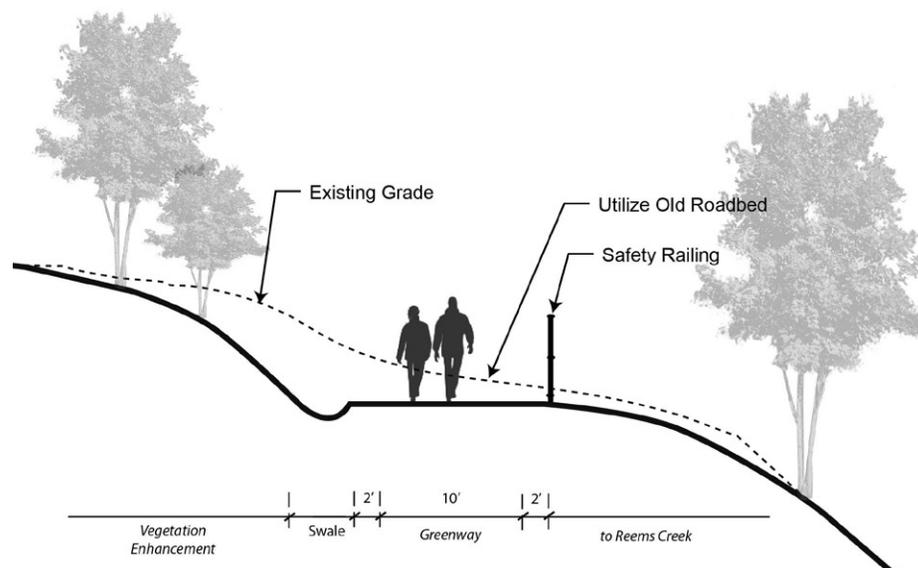
- **Keep the corridor out of the floodway as much as possible, even if it means grading a new bench for the greenway out of the floodway.** Where Option 2B lies within the floodway additional sub-base requirements are needed to allow for adequate drainage. This includes cross pipes, geo-grid, and filter fabric, which will all lead to better drainage, stability, and long-term sustainability.
- **Utilize drainage ditches and minimize fill.** Where the greenway isn't benched into a slope, utilize drainage ditches. Ditches that parallel the greenways allow water to flow parallel to and then be cross-piped under the greenway. This can present an issue in that cross-piping requires the greenway to be slightly elevated. Fill in the floodway is only allowed if there is a no-rise certificate and a maximum 6" fill is allowed in the floodway and is generally discouraged.
- **Develop a design solution to get past the narrow "pinch point" towards Reems Creek Road.** This pinch point may present a challenge as there is significant exposed bedrock. This may involve constructing retaining walls and significant cut and fill.

Option 2C (Upper Route) *PREFERRED ROUTE*

This is the preferred route as long-term maintenance costs will be less and the user experience will be appealing. The segment is longer compared to Option 2B, but has less associated structures. See XS2 for details.

Recommendations:

- Put a rail on the downhill side of greenway in the steepest areas.
- Plant a vegetative buffer offset from the existing chain link fence.
- Utilize the existing bench for a majority of the route. Once the route nears Reems Creek Road a switchback would be necessary if the bridge underpass crossing option is chosen.
- Keep greenway running grades below 5%. Switchbacks that increase cost and also require greater use of land (and easement) but should still be kept to a 5% running grade.



XS2: Option 2C (Upper Route)

Baldor Property Area to Balcrank

(Maps 3 & 4)

POTENTIAL CROSSING FOR MERRIMON AVENUE:

Bridge Underpass Crossing Option **PREFERRED CROSSING**

This is the recommended crossing to keep greenway users off-road. Underpass crossings are addressed in the Design Consideration section of this chapter. This crossing would be more complicated than the Merrimon Avenue crossing because a pedestrian bridge immediately upstream is required to provide access to the north side of Reems Creek. This option is also contingent on whether or not the greenway alignment can go through the Weaverville Mill property.

Recommendations:

- Complete an engineering / hydrologic study and survey to determine the feasibility of a crossing solution. The study could find the underpass not feasible. Include the pedestrian bridge and stream crossing as part of this study.
- Determine the feasibility of pedestrian bridge placement. If landowner negotiations allow for a pedestrian bridge crossing, study the existing abutments on the Weaverville Mill Property. The historic looking abutments may have been used for an older road/ bridge. The study would determine if the abutments are structurally sound enough to support the pedestrian bridge.

Signalized Mid-block Crossing Option

This option is the least preferred because it would provide a less desirable user experience and is less likely to be accepted by NCDOT. It should only be considered if the bridge underpass crossing is not feasible. Options 3B or 3C are the preferred routes to travel east. Read more about mid-block crossings in the Design Considerations section of this chapter.

Recommendations (if option this is chosen as preferred):

- Placement of a HAWK signal or similar pedestrian flashing signal is a must. If this is the only feasible crossing option, a signalized and marked

crosswalk crossing should be installed.

- If Option 3B is preferred, a pedestrian bridge (as outlined in the underpass option) would be required.

Four-Way Intersection Crossing Option

This option is only suitable if Option 3A (Banks Town Road) is chosen. Read more about four-way crossings in the Design Considerations section of this chapter.

POTENTIAL ROUTES:

Option 3A (Longs Chapel Road) **PREFERRED ROUTE**

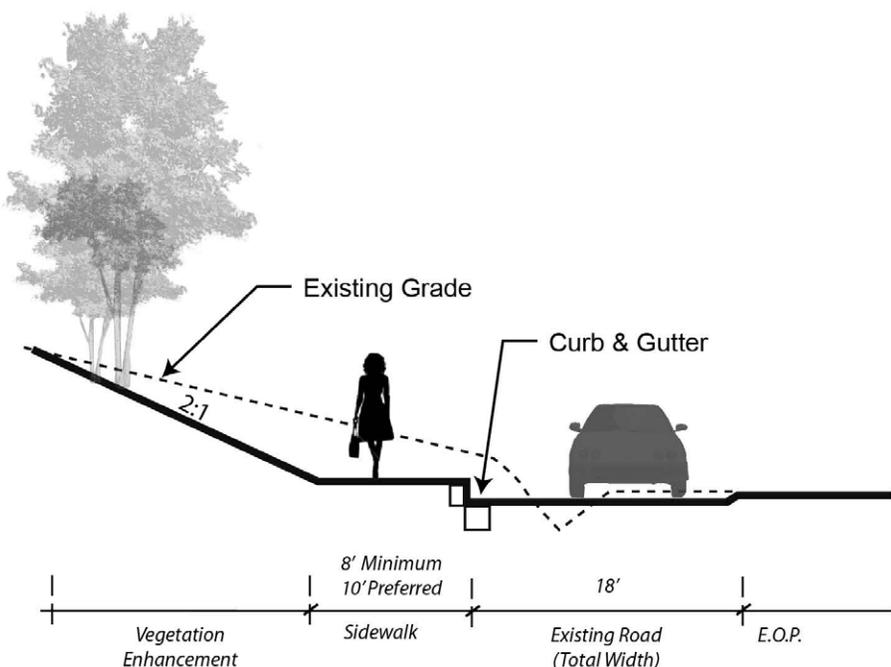
This is the recommended route because Options 3B and 3C require negotiations with multiple private landowners. Both options could be prevented by one landowner who is not interested in negotiating. That being said, access to Longs Chapel Road can only occur if access is permitted through the Weaverville Mill Property. Two options listed below would convert Longs Chapel Road into a more pedestrian friendly and greenway compatible road.

Option 3A Sidewalk Scenario **PREFERRED ROUTE**

This option would use an 8 foot sidewalk with curb and a retaining wall to minimize impact to properties on the northern side of Longs Chapel Road. See XS3 for details.

Recommendations:

- **Further study NCDOT right-of-way and landowner property lines.** According to correspondence with NCDOT, research of deeds as well as a survey may be necessary to understand NCDOT right-of-way and private property lines.
- **Utilize a crosswalk** near the Weaverville Mill that crosses Longs Chapel Road and connects with the sidewalk on the north side.
- **Use a retaining wall and curb and gutter** to minimize impact to private



XS3: Option 3A Sidewalk Scenario of Longs Chapel Road

landowners.

- **Realign the intersection of North Main Street Extension as a T-intersection.**
- Extend the sidewalk on South Main Street Extension towards downtown and Reems Creek Road. Further study of safest crossing at Reems Creek Road is needed.
- Option 3A Shared Road Scenario: This route would change the current use of Longs Chapel Road from Reems Creek Road to South Main Street Extension into a one-way street. This would allow for shared use of the greenway adjacent to cars.

Recommendations:

- **Convert short section of Longs Chapel Road into a one-way street (see Focus Area Map 4).** This would also help alleviate traffic safety at the

intersection of Longs Chapel Road and Reems Creek Road. The design of the one-way road should accommodate the following:

- **Maintain access to all houses.**
- **Look at a design solution allowing for separation of greenway users and cars. This solution could include striping, railing, or even pavement cuts with vegetative buffers.**
- **Convert the section of South Main Street Extension from Longs Chapel Road to Reems Creek Road into a one-way street.** This would prevent the issue of cars trying to drive West onto Long Chapel Road with no ability to turn around
- **Realign the intersection of North Main Street Extension and Longs Chapel Road as a T-intersection for better crossing safety.**

Option 3B (Lower Creek Route)

Although this route is perhaps the most scenic of the options in this section, it is not preferred due to considerable environmental and private property constraints. This route would parallel or travel across MSD easements and would be in the floodway through a large part of the route.

Recommendations:

- **Reach out to landowners as a first priority to discuss potential for easements, purchase, or first right of refusal for the greenway corridor.** If this is identified as the preferred option, prioritize these landowners for outreach. Negotiations and methods to acquire the corridor would be varied and would be a long-term endeavor.
- **Keep the corridor out of the floodway as much as possible, even if it means grading a new bench for the greenway out of the floodway.** Where Option 3B lies within the floodway additional sub-base requirements are needed to allow for adequate drainage. This includes cross pipes, geo-grid, and filter fabric, which will all lead to better drainage, stability, and long-term sustainability.
- **Avoid multiple crossings of the MSD easement and impact to manholes.** Read more information about MSD constraints in the Design Considerations, Existing Infrastructure section.



Example of amenity area with overlook and signage at remnant mill site on Reems Creek

- **Utilize vegetative screening, fencing, and signage to keep users on the greenway as the easement would be narrow and potentially close to houses in this section.**

Option 3C (Upper Creek Route)

This option is the least viable of the routes because of topography, private property constraints, and cost. This route should only be considered if an on-road route is not desired and/or a pedestrian bridge crossing to the north side of Reems Creek is not feasible.

Recommendations (if this option is chosen as preferred):

- **Further study the design of the corridor that examines retaining wall and excavation (cut/fill) requirements.** This corridor would require significant amounts of retaining walls and cuts and fill as the slope averages above 30% in many places.
- **Further study the on-road portion of Longs Chapel Road.** This corridor option would call for share use of this road, which in this area is quite

narrow and has poor line-of-site. This is another reason why Option 3B is not preferred.

Balcrank Property (Map 5)

POTENTIAL ROUTES:

West Balcrank *PREFERRED ROUTE*

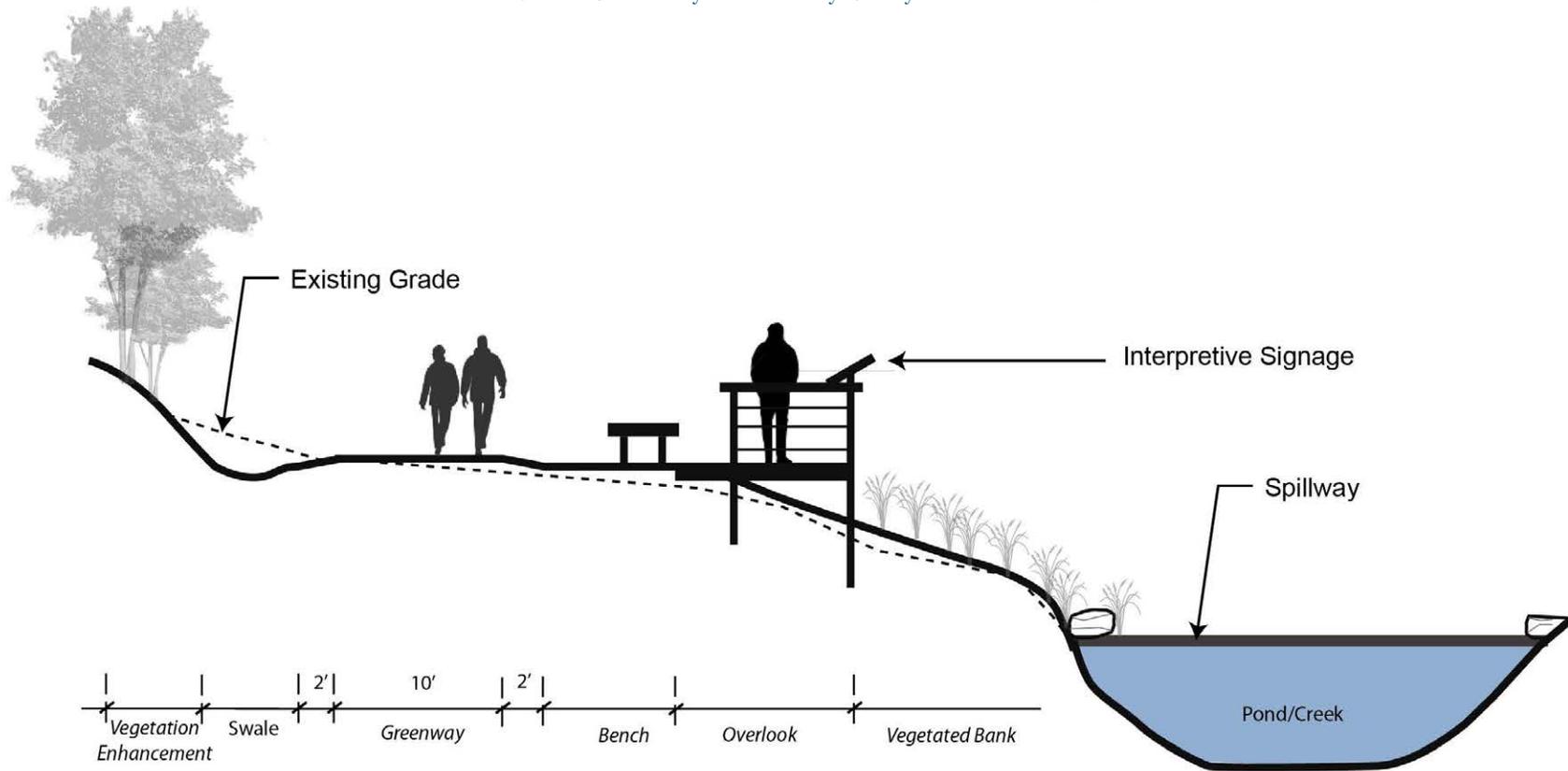
This route is identified as the only route to connect into the Balcrank property from the western side.

Recommendations:

- **Stay in lower Balcrank Parcel.** Upon Balcrank's request the greenway study should only consider the parcel closer to Reems Creek.
- **Develop parking within proximity of the western portion of this route.** Parking is needed at the center point of the trail corridor, which would lie about 1.1 mile from the end of the corridor study area. Proposed parking is on private property, so it is recommended that negotiation for purchase, an easement, shared use parking agreement, or some other type of agreement be reached to allow for parking of 5-10 cars and a trailhead kiosk or wayfinding signage.
- **Avoid well monitoring locations.** Once the corridor travels onto the Balcrank property, well monitoring locations should be avoided. These wells are set off from the proposed alignment based on the field visit, but further verification should occur. The well locations shown on Map 5 were located from aerial photos and should not be considered an accurate assessment. A map with the exact well locations has been provided from Balcrank to the Town of Weaverville.
- **Soil disturbance should be kept to the minimum.** Grading disturbance should be minimized. If fill is removed from this brownfield site, it will require testing.

Option 4A (Upper Route) *PREFERRED ROUTE*

This route is preferred, having less environmental impact and lower costs when compared to Option 4B. This route gains grade at the point of the



XS4: Option 4A (Upper Route) Overlook of remnant mill site

remnant mill site at the big bend of Reems Creek. The route would hug the treeline and use a portion of an existing mowed path. This option would require more cut and fill than Option 4B. Extra considerations should be taken to minimize impacts in the design and construction document phase.

Recommendations:

- **Follow similar recommendations as the West Balcrank portion.** Upon Balcrank’s request the greenway study should only consider the parcel closer to Reems Creek. Stay in the lower parcel, minimize cur fill, maintain fill on site, and avoid groundwater well monitoring locations.
- **Work with Balcrank to determine exact alignment and consider long-term maintenance.** Maintenance and mowing should be considered; the alignment should be along the treeline / edge of field if maintenance is easier.

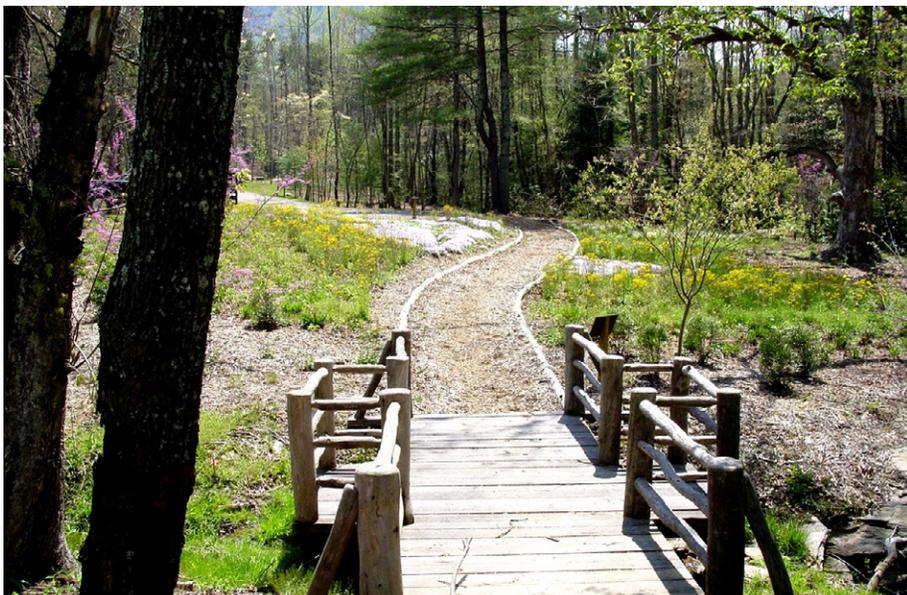
- **Showcase and enhance the remnant mill site on the west side and the wetland area on the east side of this section.** Site visits revealed an abundance of wildlife and views of Reems Creek. Enhancement areas could include:
 - **An overlook or seating area above the remnant mill.** This could include an interpretive panel about the history of the Mill or Reems Creek.
 - **A boardwalk also with the opportunity for interpretive signage that allows crossing over the wetland and beaver dam area.**

Option 4B (Lower Route)

This route is not preferred because of the numerous environmental constraints including intrusion into the floodway, several potential small wetlands / wet depressions, and potential for long term maintenance issues related to flooding. Additionally, an MSD easement would need to be negotiated.

Recommendations:

- **Use this route as a side-trail that reconnects to Option 4A.** If agreeable to Balcrank, this path could be a more informal gravel, wood-chipped, or natural surface path that reconnects with Option 4A near the proposed boardwalk. See in example of this in the image below. This section is truly one of the most beautiful section of the entire greenway.
- **Follow similar recommendations as West Balcrank and Option 4A (based on feedback from Balcrank).**
- **Showcase and enhance the remnant mill and the wetland area on the east side of this section.** See more information about this recommendation in Option 4A.



Example of Option 4B as a side route with a natural surface, wood chipped , or graveled path

Balcrank to Karpen Fields (Map 6)

POTENTIAL ROUTES:

Karpen Section *PREFERRED ROUTE*

This section is listed as the only route from the property line of Balcrank to the terminus of the corridor study area at the Karpen Soccer Fields. Key to completing this section is landowner negotiations to obtain easements.

Recommendations:

- **Keep the corridor out of the floodway as much as possible.** This may require locating the greenway away from the creek and further into parcels.
- **Work with landowners to address relocation of fencing and staged materials that currently lie in the proposed greenway alignment.**
- **Purchase a 12 foot span prefabricated bridge at stream crossing shown in Map 6.**
- **Keep the greenway out of floodway in Karpen Fields and connect to existing path on the north side of the fields.**
- **Address the pedestrian crossing needed across Reems Creek Road.** Higher density residential development is adjacent to Karpen Fields and in the next few years will likely see a huge increase of pedestrians crossing Reems Creek Road to get to Karpen Fields and the greenway. Safety is a major concern for these pedestrians and the need for safe crossing should be addressed.

CHAPTER 6

Public Input Process

Public Process

The Landowner Workshop

The landowner workshop held on January 30, 2014 was intended to reach out to landowners who’s property was in anyway connected to proposed corridor options. It served as a beginning step of gaging landowner interest in providing greenway easements. Attendance was approximately 15-18 people. A presentation about greenways and their benefits was given. Breakout groups were used to give attendees the chance to identify opportunities and challenges they saw in the corridor study area. Their input has been integrated into the Opportunities and Challenges Chapter. Attendees were then given a brief personal survey that asked the following:

Question to attendees:

1) INTEREST: If you were approached by the Town of Weaverville, the County, or a non-profit about the potential use, sale, or easement of some of your property for benefit of the greenway, would you be open to discussions?

The options to pick: Open and interested, interested but with concerns, not interested, or strongly against a discussion.

2) COMMENTS: What are your overall thoughts on the greenway?

3) QUESTIONS / COMMENTS: If you have concerns, what would they be?

The result of the survey are listed to the right.

The following page is a set of frequently asked questions that were derived from many questions that arose at the landowner workshop.

Result of the Landowner Workshop Survey		
Interest	Comment	Question or Concern
Open and interested	I think it would be a great- good addition to Weaverville	Who will keep it up
Interested but with concerns	Interested	More info on legal issues and responsibilities
Interested but with concerns	Would like to know how exact location would effect proptry	Difficult to determine until location decided
Not interested	Good	Property is outside of greenway potential routes
Interested but with concerns	Excellent idea, main concerns are privacy	privacy, security, timeframe, and easements
Interested but with concerns	Positive but with concerns, opening access to anyone, would it be well kept and clear?	Concerns about crime loitering
Interested but with concerns	Positive at this point, would have some concerns if route was already chosen without discussion with property owners	Not enough at this time to have major concerns
Interested but with concerns	Sounds like a good idea but there are pros and cons	
Interested but with concerns	Why do we need a greenway, Back yard privacy gone, water pollution, taxes, liable for injuries, is there going to be a barrier between my property and the greenway, who maintains, when the creek washes out who maintinas and will you keep coming on my property, how to keep people off property, who polices, how wide is greenway and how much property would you be taking, how is this being paid for and will taxes go up, will there be posted rules, parking, will the greenway be owned by Weaverville or a third party, what if ten years down the road the town finds the greenway is not cost effective- what happens to the property, what is fair and reasonable compensation to the landowner	
Open and interested	Favorable- link Karpen with Lake Louise and Weaverville's Main Street	
No answer	Don't think it is needed. Who will maintain it, and what will it cost?	We are against the greenway if it involves our property

A Greenway in Your Community

Frequently Asked Questions

Land along the greenway is typically acquired through a voluntary sale or easement (donation or purchase) of land.



Why do we need a greenway?

Greenways are considered “linear parks” that serve several functions related to transportation, environmental stewardship, conserving water quality, and attracting businesses and residents. The need for a greenway is established through a community planning effort.

Who owns and maintains the greenway?

County and municipal governments are the responsible agency for owning, managing and maintaining a greenway just as agencies such as Metropolitan Sewerage District are responsible for sewer lines. Land along the greenway is typically acquired through a voluntary sale or easement (donation or purchase) of land. Oftentimes, the easement is managed by the public agency just as a sewer line or utility easement. Areas such as trailheads, parking lots, and adjacent parks are typically owned or leased by the public agency.

What is a greenway?

A greenway is a linear route along an open space. This corridor can serve as a park, a transportation corridor, and can connect open spaces and can help conserve natural and historic areas.



What will the greenway cost?

Greenway costs vary greatly based on many factors. In general, a 10-foot wide paved greenway costs between \$600,000 to \$1 million per mile. Variables such as land acquisition costs, topography, width of the greenway corridor (trail + buffer from a stream or nearby property), and the type of amenities provided will impact the cost of a greenway.

How do you address concerns from property owners about security, privacy, loitering, legal issues and responsibilities of adjacent property owners?

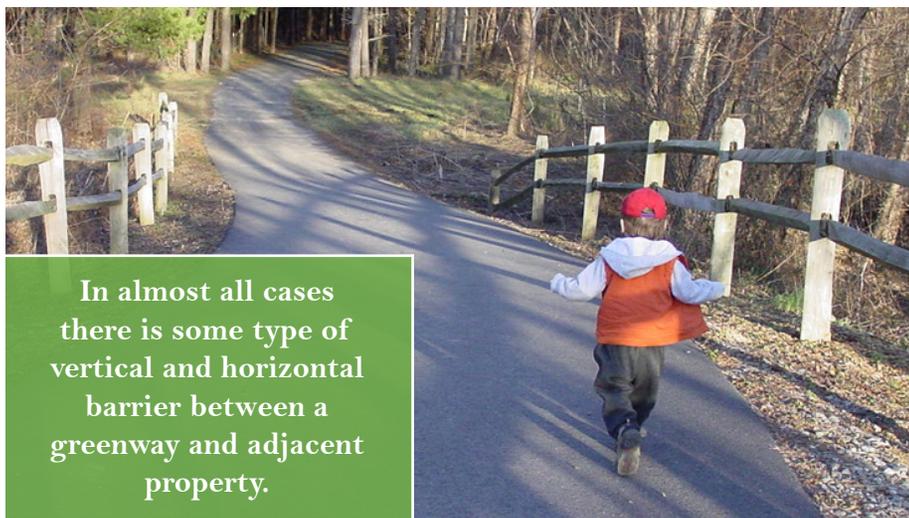
There are several ways to answer this question. The short answer is that the county or municipal government is responsible for providing security. However, much like a community watch program, the safety and security of a greenway is a community endeavor where “eyes on the trail” in the form of users and adjacent property owners greatly contribute to the sense of security along the greenway. Often the public agency that owns a greenway easement will indemnify the property owner from legal liabilities arising from use within the easement. Greenways are also designed in a way that is intended to minimize concerns about security and privacy. The width of the corridor and the materials used to screen adjacent properties from the trail are integrated into the design and maintenance of the greenway. Significant studies have indicated that crime is not typically an issue on greenways.

How do the results of the feasibility study drive the greenway's location and how will that affect property owners?

The results of a planning or feasibility study are intended to provide options and assess if the greenway is doable based on landowner interest, constraints, and cost. When a greenway has to be “squeezed” between a river or street and nearby houses or businesses, the feasibility study will identify these constrained areas and seek solutions to potential conflicts to minimize impacts. The actual detailed location will not be known until detailed design or engineering of the greenway occurs as a follow-up to the feasibility study. Public agencies will often engage landowners for their interest in providing a greenway easement prior to the more detailed study. If the landowner is willing, a survey of the property is conducted and detailed measurements related to the width required for the trail buffers, floodplains and other constraints will be a part of the detailed design drawings. This detailed study will also be used to inform the exact area that is needed for the greenway and informs negotiations on the purchase or easement of land.

Will there be a barrier between my property and the greenway?

In almost all cases there is some type of vertical and horizontal barrier between a greenway and adjacent property. They are many ways to accomplish this. Some adjacent property owners want to have direct access to the greenway via a gate or stairway; these are either constructed as part



In almost all cases there is some type of vertical and horizontal barrier between a greenway and adjacent property.

of the project or funded by the property owner and can vary based on how property acquisition is negotiated. Some property owners prefer to have their view of the trail or stream preserved while others prefer fencing, shrubs and other vertical elements to obstruct views from the trail and vice versa.

Who will rebuild the greenway and nearby land in the event of a flood?

The public agency is typically responsible for reconstructing the greenway if they own the property or the easement associated with it. However, greenway are designed for low maintenance and to handle flooding without suffering damages to the infrastructure.

How will the greenway be paid for? Will it lead to an increase in taxes?

Most communities seek grants from state or federal agencies to partially fund a greenway. Most grants usually require a local match. The match percentage can range from 20%- 50% of the total project cost. Some county or municipal governments fund greenways through more conventional methods such as bonding or through general revenues as part of their annual budget just as they would fund a new park or street. Non-profit organizations, foundations, churches, businesses and property owners may pay for some segments of a greenway. New greenways can also be constructed by developers if a municipality incentivizes this approach.

Greenways are not typically tied to tax increases as they do not have a dedicated funding source. Communities may pass referendum to construct greenways or similar projects and that could result in a direct tax increase or establishment of a new fee or tax approved by voters.

What is fair and reasonable compensation for the landowner?

By law, compensation is required to be commensurate with “fair market value,” the same as if the property owner sold the land on the open market. Areas near rivers and streams may already have restrictions placed upon them due to floodplain and floodway issues. If this is the case, structures such as houses or sheds may not be constructed in these buffers; therefore the land adjacent to rivers or streams may have less value per acre when compared to more buildable land on higher ground or near a roadway. Donated easements for the greenway are a great way to provide tax breaks for individuals and can often occur on lands that are otherwise unbuildable (i.e the floodplain).

The Public Open House

FEEDBACK ON DESIRED AMENITIES, CROSSINGS, AND USE

Desired Major Amenities

- Connections to the greenway
- Planting enhancements*
- Trailhead parking
- Unpaved sidepaths
- Creek overlook
- Gateways
- Boardwalks
- Nearby dining

Desired Minor Amenities

- Directional signage
- Trash / recycle facilities
- Dog “clean-up” stations
- Benches
- Interpretive signage

Comments include:

* “Garden Clubs would volunteer help- I’m in the Asheville E-Z Gardeners and several of us live in Weaverville.”

Desired Use

- Dog walking**
- Biking
- Jogging
- Commuting to work or school
- Casual walking
- Wildlife Viewing
- Creek Access

Comments include:

** “Dogs are shut out at Lake Louise, so we really need a place to be!”

Legend:

- Most preferred
- Less preferred
- Least preferred

Note: Circles indicate actual number of votes.

The Reems Creek Greenway Feasibility Study Open House occurred on May 14th, 2014. Participants were asked to vote on their preferred options for the greenway amenities, preferred amenities, and what uses they would be using the greenway for

Desired Amenities and Uses



Connections to the greenway



Planting enhancements



Directional signage



Dog walking

PREFERRED ROUTING FOR THE GREENWAY

Preferred Route Options

- ⊙⊙⊙⊙⊙⊙⊙⊙ 1B (Lower MSD route)
- ⊙⊙⊙⊙⊙⊙ Merrimon
- ⊙⊙⊙⊙⊙ 2B (Lower option)
- ⊙⊙⊙⊙⊙ 3C
- ⊙⊙⊙⊙⊙ 4B

Less Preferred Route Options

- ⊙ 1A (Upper Route)
- ⊙⊙ 2A (Upper Route)
- ⊙⊙ 2C
- ⊙⊙ 3A
- ⊙⊙⊙ 3B
- ⊙⊙ 4A (Upper Route)

Desired Means for Road Crossing

- ⊙⊙⊙⊙⊙⊙⊙ Bridge Underpass Crossing
- ⊙⊙⊙⊙⊙ Signalized on-street crossing
- ⊙⊙⊙⊙⊙ Four-way Improved Crossing** *

Comments include:

*** “This will only work with a light included. If there is no light, this will not work.” “I doubt people on Reems Creek will be OK with stopping- no single stop on the road”.

COMMENTS ON THE PROPOSED ROUTES

- “I would be happy with any route, as long as it gets built while I can still use it!”
- “Just build it. As Kevin Costner said in Field of Dreams, build it and they will come.”
- “Would prefer the route adjacent to the Creek but understand floodplain/floodway concerns.”
- “Avoid at-grade crossings on Reems Creek Road.”

- “Keep it close to the Creek- walking biking, etc. Next to the water is best!”
- “So glad Weaverville is working on this.”
- “I’d definitely love to be able to walk dogs and bike on the greenway (the less hilly the better).”
- “Can there also be a greenway from downtown to Lake Louise along Merrimon?”

INFORMATION ON PUBLIC OPEN HOUSE ATTENDEES

Number of attendees who live in Weaverville: 7

Number of attendees who live in Buncombe County: 4

Total attendees: ~20 people



The preferred type of road crossing is the greenway underpass. Image is a view of the Merrimon Avenue Bridge. The Underpass is proposed on the near side. Image courtesy of NCDOT

CHAPTER 7

Cost Estimates

Cost Comparison of Corridor Options

Corridor Option Section or Crossing Options	Total Cost of Construction & Permitting	Cost of Land Acquisition (30' Easement)	Total Cost (construction & acquisition)	Cost Per Linear Foot (for construction only)	Cost Per Mile (for construction only)
CORRIDOR OPTIONS					
Quarry Road Section	\$114,151	\$0	\$114,151	\$63	\$330,076
Option 1A	\$115,344	\$0	\$115,344	\$71	\$375,705
Option 1B	\$161,158	\$249,433	\$495,568	\$108	\$569,553
Merrimon Option	\$40,968	\$86,550	\$135,018	\$85	\$450,649
Option 2A	\$533,849	\$146,629	\$680,478	\$309	\$1,634,041
Option 2B	\$208,860	\$493,074	\$701,934	\$87	\$457,206
Option 2C	\$140,531	\$262,273	\$575,904	\$61	\$322,610
Option 3A	\$140,656	\$14,532	\$155,187	\$216	\$1,142,556
Option 3B	\$64,961	\$192,095	\$294,584	\$61	\$322,059
Option 3C	\$1,486,939	\$20,792	\$1,770,159	\$1,081	\$5,705,694
West Balcrank	\$50,510	\$56,174	\$118,640	\$58	\$304,099
Option 4A	\$105,506	\$68,345	\$207,027	\$100	\$525,539
Option 4B	\$375,198	\$89,879	\$545,131	\$365	\$1,927,087
Karpen Area Section	\$114,304	\$91,667	\$277,773	\$82	\$434,189

TOTAL (CHEAPEST OPTION)* \$2,037,373

TOTAL (PREFERRED)* \$2,352,013

*Costs include crossing options

Cost Comparison of Crossing Options

Crossing Options	Total Cost of Construction & Permitting	Associated Corridor Options	Cost Per Linear Foot (for construction only)
CROSSING OPTIONS			
Pedestrian bridge near Lake Louise	\$276,179	1A & 1B	\$1,381
Merrimon Ave. (underpass crossing)	\$86,291		\$431
Merrimon Ave. (midblock signalized road crossing)	\$82,421		\$412
Merrimon Ave. & Banks Town Rd. (intersection improvements)	\$27,824		\$139
Reems Creek Road (underpass crossing and pedestrian bridge)	\$283,997	2A, 2B, 3A, 3B, 3C	\$947
Reems Creek Road (midblock signalized road crossing)	\$286,757	2A, 2B, 3A, 3B, 3C	\$956
Reems Creek Rd. & Banks Town Rd. (intersection improvement)	\$27,824	2C & 3A	\$93
South Main Street Extension (crosswalk)	\$6,500	3A, 3B, 3C, West Balcrank	\$65

Quarry Road Section

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
No acquisition cost in Town property	AC	0	\$0.00	\$0 Uses current deed price of properties averaged
Grading & Greenway Construction				
Mobilization	LS	1	\$199.32	\$1,478 2% of construction cost
New asphalt (10 foot width)	LF	1,826	\$35.00	\$63,910 Includes base course & standard earthwork
Stormwater BMPs/Storm drainage	MI	0.17	\$60,000.00	\$9,966
			<i>SUB-TOTAL</i>	\$75,353
			<i>15% contingency</i>	\$11,303
			<i>TOTAL w/ CONTIGENCY</i>	\$86,656
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
<i>Flood study / No-rise permitting</i>	LS	1	\$8,000.00	\$8,000
<i>Construction Documents & Engineering</i>		20%		\$15,070.69 (20% of Construction)
Surveying	LF	1,826	\$0.78	\$1,424
			<i>SUB-TOTAL</i>	\$27,495
			TOTAL	\$114,151

Italicized cells indicate items considered as an element that will require design & engineering

*Anticipated permitting includes erosion control, right of way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

EA= each

LS= lump sum

LF= linear foot

TN= ton

SY= square yard

MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 1A

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
No acquisition cost if in DOT/ town right-of-way	AC	0	\$0.00	\$0 Uses current deed price of properties averaged
Grading & Greenway Construction				
Mobilization	LS	1	\$547.21	\$547 2% of construction cost
Earthwork/Shoulder widening	LF	500	\$15.00	\$7,500
Pedestrian Pavement Marking Symbol	EA	8	\$180.00	\$1,440
Stormwater BMPs/Storm drainage	MI	0.31	\$60,000.00	\$18,420
			<i>SUB-TOTAL</i>	\$27,908
			<i>15% contingency</i>	\$2,763
			TOTAL w/ CONTIGENCY	\$58,578
Trailhead				
Information/Map Kiosks	EA	1	\$7,500.00	\$7,500
			<i>SUB-TOTAL</i>	\$7,500
Amenities				
Landscape/Plantings Enhancements	EA	2	\$15,000.00	\$30,000
Bicycle Rack	EA	2	\$800.00	\$1,600
			<i>SUB-TOTAL</i>	\$31,600
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
<i>Construction Documents & Engineering</i>		20%		\$13,402 (20% of Construction)
Surveying	LF	1621	\$0.78	\$1,264
			<i>SUB-TOTAL</i>	\$17,666
			TOTAL	\$115,344

Italicized cells indicate items considered as an element that will require design & engineering

*Anticipated permitting includes erosion control, right of way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 1B

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs	Notes:
Corridor Acquisition					
Easement purchase (30' easement)	AC	1.03	\$242,167.88	\$249,433	Uses current deed price of properties averaged 30' x 1,494' LF is 1.03 Acres, most of which is within the current msd easement
Grading & Greenway Construction					
Mobilization	LS	1		\$1,316	2% of construction cost includes base course, standard earthwork, geotensile
10' aphalt new with geotensile and geotextile fabric	LF	1,265	\$52.00	\$65,780	and geotextile fabric
New asphalt (10 foot new)	LF	229	\$35.00	\$8,015	includes base course & standard earthwork
			<i>SUB-TOTAL</i>	\$75,111	
			15% contingency	\$9,867	
			<i>TOTAL w/ CONTIGENCY</i>	\$84,978	
Trailhead					
Information/Map Kiosks	EA	1	\$7,500.00	\$7,500	
			<i>SUB-TOTAL</i>	\$7,500	
Amenities					
Landscape/Plantings Enhancements	EA	2	\$15,000.00	\$30,000	
Bicycle Rack	EA	2	\$800.00	\$1,600	
			<i>SUB-TOTAL</i>	\$31,600	
Planning, Design, Permitting & Engineering					
Permitting*	LS	1	\$3,000.00	\$3,000	
Flood study / No-rise permitting	LS	1	\$8,000.00	\$8,000	
Construction Documents & Engineering		20%		\$24,815.52	(20% of Construction)
Surveying	LF	1621	\$0.78	\$1,264	
			<i>SUB-TOTAL</i>	\$37,080	
			TOTAL	\$495,568	

Italicized cells indicate items considered as an element that will require design & engineering

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Merrimon Option

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Easement purchase (30' easement)	AC	0.33	\$262,273.23	Uses current deed price of properties \$86,550 averaged 30' x 480' LF is 0.33 Acres
Grading & Greenway Construction				
Mobilization	LS	1	\$199.32	\$699 2% of construction cost
10' aphalt new with geotensile and geotextile fabric	LF	480	\$52.00	includes base course, standard earthwork, \$24,960 geotensile and geotextile fabric
Stormwater BMPs/Storm drainage	MI	0.17	\$60,000.00	\$9,966
			<i>SUB-TOTAL</i>	\$35,624
			15% contingency	\$5,344
			<i>TOTAL w/ CONTIGENCY</i>	\$40,968
Planning, Design, Permitting & Engineering				
<i>Construction Documents & Engineering</i>		20%		\$7,124.89 (20% of Construction)
Surveying	LF	480	\$0.78	\$374
			<i>SUB-TOTAL</i>	\$7,499
			TOTAL	\$135,018

Italicized cells indicate items considered as an element that will require design & engineering

*Anticipated permitting includes erosion control, right of way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 2A

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Need to determine ROW width and research tax values	AC	0.79	\$185,606.06	\$146,629 Uses current deed price of properties averaged
Grading & Greenway Construction				
Mobilization	LS	1	\$7,422.73	\$7,423 2% of construction cost
8' Concrete sidewalk with curb and gutter	LF	2300	\$150.00	\$345,000
Stormwater BMPs/Storm drainage	MI	0.44	\$60,000.00	\$26,136
			<i>SUB-TOTAL</i>	\$378,559
			15% contingency	\$56,784
			<i>TOTAL w/ CONTIGENCY</i>	\$435,343
Amenities				
Interpretive/ wayfinding signage	EA	1	\$3,000.00	\$3,000
Landscape/Plantings Enhancements	EA	2	\$7,500.00	\$15,000
			<i>SUB-TOTAL</i>	\$18,000
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
<i>Construction Documents & Engineering (12% of Construction)</i>		20%		\$75,711.82 (20% of Construction)
Surveying	LF	2300	\$0.78	\$1,794
			<i>SUB-TOTAL</i>	\$80,506
			TOTAL	\$680,478

Italicized cells indicate items considered as an element that will require design & engineering

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

EA= each

LS= lump sum

LF= linear foot

TN= ton

SY= square yard

MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 2B

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs	Notes:
Corridor Acquisition					
Easement purchase (30' easement)	AC	1.88	\$262,273.23	\$493,074	Uses current deed price of properties averaged 30' x 1,725' LF is 0.6 Acres
Grading & Greenway Construction					
Mobilization	LS	1	\$199.32	\$2,811	2% of construction cost
10 foot asphalt new with geotensile and geotextile fabric	LF	1,725	\$52.00	\$89,700	Includes base course, standard earthwork, geotensile and geotextile fabric
Stormwater BMPs/Storm drainage	MI	0.17	\$60,000.00	\$9,966	
Bridge span 36" culvert	SF	480	\$85.00	\$40,800	2 crossings @ 40' lf
Cattle exclusion fencing (slit rail)	LF	15	\$4.50	\$68	
			<i>SUB-TOTAL</i>	\$143,344	
			<i>15% contingency</i>	\$21,502	
			<i>TOTAL w/ CONTIGENCY</i>	\$164,846	
Amenities					
Interpretive/ wayfinding signage	EA	1	\$3,000.00	\$3,000	
Planning, Design, Permitting & Engineering					
Permitting*	LS	1	\$3,000.00	\$3,000	
<i>Flood study / No-rise permitting</i>	LS	1	\$8,000.00	\$8,000	
<i>Construction Documents & Engineering</i>		20%		\$28,668.82	(20% of Construction)
Surveying	LF	1,725	\$0.78	\$1,346	
			<i>SUB-TOTAL</i>	\$41,014	
			TOTAL	\$701,934	

Italicized cells indicate items considered as an element that will require design & engineering

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 2C

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs	Notes:
Corridor Acquisition					
Easement purchase (30' easement)	AC	1.66	\$262,273.23	\$435,374	Uses current deed price of properties averaged 30' x 2,412' LF is 0.6 Acres
Grading & Greenway Construction					
Mobilization	LS	1	\$199.32	\$1,970	2% of construction cost
10' aphalt new	LF	2,412	\$35.00	\$84,420	includes base course & standard earthwork
Stormwater BMPs/Storm drainage	MI	0.17	\$60,000.00	\$9,966	
Railing	LF	1500	\$2.75	\$4,125	
			<i>SUB-TOTAL</i>	\$100,481	
			<i>15% contingency</i>	\$15,072	
			TOTAL w/ CONTIGENCY	\$115,553	
Planning, Design, Permitting & Engineering					
Permitting*	LS	1	\$3,000.00	\$3,000	
<i>Construction Documents & Engineering</i>		<i>20%</i>		\$20,096.23	(20% of Construction)
Surveying	LF	2,412	\$0.78	\$1,881	
			<i>SUB-TOTAL</i>	\$24,978	
			TOTAL	\$575,904	

Italicized cells indicate items considered as an element that will require design & engineering

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 3A

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs	Notes:
Corridor Acquisition					
No acquisition cost if in DOT right-of-way	AC	0.18	\$80,732.11	\$14,532	Uses current deed price of properties averaged
Grading & Greenway Construction					
Mobilization	LS	1	\$1,694.32	\$1,694	2% of construction cost
8' Concrete sidewalk with curb and gutter	LF	525	\$150.00	\$78,750	
Stormwater BMPs/Storm drainage	MI	0.10	\$60,000.00	\$5,966	
			<i>SUB-TOTAL</i>	\$86,410	
			<i>15% contingency</i>	\$12,962	
			<i>TOTAL w/ CONTIGENCY</i>	\$99,372	
Amenities					
Interpretive/ wayfinding signage	EA	1	\$3,000.00	\$3,000	
Landscape/Plantings Enhancements	EA	2	\$7,500.00	\$15,000	
			<i>SUB-TOTAL</i>	\$18,000	
Planning, Design, Permitting & Engineering					
Permitting*	LS	1	\$3,000.00	\$3,000	
<i>Construction documents & engineering (12% of Construction)</i>		20%		\$19,874.35 (20% of Construction)	
Surveying	LF	525	\$0.78	\$410	
			<i>SUB-TOTAL</i>	\$23,284	
TOTAL				\$155,187	

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 3B

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Easement purchase (30' easement)	AC	0.73	\$263,144.40	Uses current deed price of \$192,095 properties averaged 30' x 1,065' LF is 0.73 Acres
Grading & Greenway Construction				
Mobilization	LS	1		\$1,108 2% of construction cost Includes base course, standard earthwork, geotensile and geotextile fabric
10 foot aphalt new with geotensile and geotextile fabric	LF	1,065	\$52.00	\$55,380
			<i>SUB-TOTAL</i>	\$56,488
			<i>15% contingency</i>	\$8,473
			<i>TOTAL w/ CONTIGENCY</i>	\$64,961
Amenities				
Stone and masonry	EA	6	\$2,000.00	\$12,000
Buffer fencing & planting	LS	1	\$5,500.00	\$5,500 Privacy for adjacent residences
			<i>SUB-TOTAL</i>	\$12,000
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
<i>Flood study / No-rise permitting</i>	LS	1	\$8,000.00	\$8,000
<i>Construction Documents & Engineering (12% of Construction)</i>		20%		\$13,697.52 (20% of Construction)
Surveying	LF	1,065	\$0.78	\$831
			<i>SUB-TOTAL</i>	\$25,528
TOTAL				\$294,584

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc)

Units:

EA= each

LS= lump sum

LF= linear foot

TN= ton

SY= square yard

MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 3C

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Easement purchase (30' easement)	AC	0.95	\$21,886.57	\$20,792 Uses current deed price of properties averaged 30' x 1,065' LF is 0.95 Acres
Grading & Greenway Construction				
Mobilization	LS	1	\$25,353	\$25,353 2% of construction cost
10 foot asphalt new	LF	1,065	\$35.00	\$37,275 Includes base course & standard earthwork
Grading/ blasting and cantilever 700'	SF	8520	\$133.00	\$1,133,160 8' deck
Bridges (tributary crossings)	SF	960	\$85.00	\$81,600 3 crossings @ 40' lf @ 12' clear deck
Stormwater BMPs/Storm drainage	MI	0.20	\$60,000.00	\$12,102
Pedestrian crossing improvements (South St. Extension Rd.)	EA	1	\$3,500.00	\$3,500 Striping / aprons
			SUB-TOTAL	\$1,292,990
			15% contingency	\$193,949
			TOTAL w/ CONTIGENCY	\$1,486,939
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
Construction Documents & Engineering (12% of Construction)		20%		\$258,598.00 (20% of Construction)
Surveying	LF	1065	\$0.78	\$831
			SUB-TOTAL	\$262,429
			TOTAL	\$1,770,159

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, stream crossing, etc)

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Balcrank Western

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Easement purchase (30 foot easement)	AC	0.6	\$93,623.94	\$56,174 Uses current deed price of properties averaged 30' x 877' LF is 0.6 Acres
Grading & Greenway Construction				
Mobilization	LS	1	\$861.22	\$861 2% of construction cost
10 foot asphalt new	LF	877	\$35.00	\$30,695 Includes base course & standard earthwork
24" culvert	EA	2	\$1,200.00	\$2,400 Cost includes installation, grading, and outlet protection
Stormwater BMPs/Storm drainage	MI	0.17	\$60,000.00	\$9,966
			<i>SUB-TOTAL</i>	\$43,922
			<i>15% contingency</i>	\$6,588
			<i>TOTAL w/ CONTIGENCY</i>	\$50,510
Amenities				
Interpretive/ wayfinding signage	EA	1	\$3,000.00	\$3,000
			<i>SUB-TOTAL</i>	\$3,000
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
<i>Construction Documents & Engineering (12% of Construction,</i>		<i>20%</i>		<i>\$5,271 (20% of Construction)</i>
Surveying	LF	877	\$0.78	\$684
			<i>SUB-TOTAL</i>	\$8,955
			TOTAL	\$118,640

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, USACE 401/404, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 4A

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Easement purchase (30 foot easement)	AC	0.73	\$93,623.94	\$68,345 Uses current deed price of properties averaged 30' x 1,060' LF is 0.73 Acres
Grading & Greenway Construction				
Mobilization	LS	1	\$1,798.91	\$1,799 2% of construction cost
10 foot asphalt new	LF	1,060	\$35.00	\$37,100 Includes base course & standard earthwork
36" culvert	SF	480	\$85.00	\$40,800 1 crossings @ 40' lf @ 12' clear deck
Grading				
Stormwater BMPs/Storm drainage	MI	0.20	\$60,000.00	\$12,045
			<i>SUB-TOTAL</i>	\$91,744
			<i>15% contingency</i>	\$13,762
			<i>TOTAL w/ CONTIGENCY</i>	\$105,506
Amenities				
Interpretive/ wayfinding signage	EA	1	\$3,000.00	\$3,000
			<i>SUB-TOTAL</i>	\$3,000
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
Flood study / No-rise permitting	LS	1	\$8,000.00	\$8,000
Construction Documents & Engineering (12% of Construction)		20%		\$18,348.87 (20% of Construction)
Surveying	LF	1060	\$0.78	\$827
			<i>SUB-TOTAL</i>	\$30,176
			TOTAL	\$207,027

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, USACE 401/404, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Option 4B

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Easement purchase (30' easement)	AC	0.96	\$93,623.94	\$89,879 Uses current deed price of properties averaged
Grading & Greenway Construction				
Mobilization	LS	1	\$6,397.24	\$6,397 2% of construction cost
10 foot asphalt new	LF	1,028	\$35.00	\$35,980 Includes base course & standard earthwork
Boardwalk, poor draining wetland areas	LF	100.00	\$250.00	\$25,000 8' deck
36" culvert	SF	480	\$85.00	\$40,800 1 crossings @ 40' lf @ 12' clear deck
24" culvert	EA	2	\$1,200.00	\$2,400 Cost includes installation, grading, and outlet protection
Bridges (tributary crossings)	SF	2400	\$85.00	\$204,000 5 crossings @ 40' lf @ 12' clear deck
Stormwater BMPs/Storm drainage	MI	0.19	\$60,000.00	\$11,682
			<i>SUB-TOTAL</i>	\$326,259
			<i>15% contingency</i>	\$48,939
			<i>TOTAL w/ CONTIGENCY</i>	\$375,198
Amenities				
Interpretive/ wayfinding signage	EA	1	\$3,000.00	\$3,000
			<i>SUB-TOTAL</i>	\$3,000
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
Flood study / No-rise permitting	LS	1	\$8,000.00	\$8,000
Construction Documents & Engineering (12% of Construction)		20%		\$65,251.81 (20% of Construction)
Surveying	LF	1028	\$0.78	\$802
			<i>SUB-TOTAL</i>	\$77,054
			TOTAL	\$545,131

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, USACE 401/404, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Karpen Area Section

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

	Units	Quantity	Cost Per Unit	Costs Notes:
Corridor Acquisition				
Easement purchase (30 foot easement)	AC	0.96	\$95,486.00	\$91,667 Uses current deed price of properties averaged 30' x 1,390' LF is 0.96 Acres
Grading & Greenway Construction				
Mobilization	LS	1	\$1,948.91	\$1,949 2% of construction cost
10' asphalt new	LF	1,390	\$35.00	\$48,650 Includes base course & standard earthwork
Boardwalk at beaver pond	LF	100.00	\$250.00	\$25,000 8' deck
Stormwater BMPs/Storm drainage	MI	0.26	\$60,000.00	\$15,795
Fence relocation	LF	500	\$16.00	\$8,000 \$8/ ft to take out \$8/ ft to install
			<i>SUB-TOTAL</i>	\$99,394
			<i>15% contingency</i>	\$14,909
			TOTAL w/ CONTIGENCY	\$114,304
Trailheads				
Restrooms (vaulted toilet)	EA	1	\$15,000.00	\$15,000
Information/Map Kiosks	EA	2	\$7,500.00	\$15,000
Bicycle Rack	EA	4	\$800.00	\$3,200
			<i>SUB-TOTAL</i>	\$33,200
Planning, Design, Permitting & Engineering				
Permitting*	LS	1	\$3,000.00	\$3,000
<i>Flood study / No-rise permitting</i>	LS	1	\$8,000.00	\$8,000
<i>Construction Documents & Engineering (12% of Construction)</i>		20%		\$26,518.87 (20% of Construction)
Surveying	LF	1390	\$0.78	\$1,084
			<i>SUB-TOTAL</i>	\$38,603
			TOTAL	\$277,773

*Anticipated permitting includes erosion control, right-of-way encroachments, regulatory environmental (buffer encroachment, USACE 401/404, etc),

Units:

- EA= each
- LS= lump sum
- LF= linear foot
- TN= ton
- SY= square yard
- MI= Mile

Notes: 1) Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2) Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

Crossings

Probable Cost Estimate, 2014

Cost estimates are preliminary and subject to change

Units:

EA= each
 LS= lump sum
 LF= linear foot
 TN= ton
 SY= square yard
 MI= Mile

Notes: 1.)Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes. 2.)Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3.) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

	Units	Quantity	Cost Per Unit	Costs Notes:
Minor Road Crossings				
Intersection Improvements (South Main St. Extension)	EA	1	\$6,500.00	\$6,500 Stamped concrete, approach & aprons
Pedestrian crossing improvements (Reems Creek Road at Karpen Park)	EA	1	\$6,500.00	\$6,500 Stamped concrete, approach & aprons
			<i>SUB-TOTAL</i>	\$13,000
			<i>15% contingency</i>	\$1,950
			TOTAL w/ CONTIGENCY	\$14,950

Pedestrian Bridge Adjacent Temnant Mill Site Near Lake Louise

Pedestrian Bridge adjacent remnant Mill site near Lake Louise	EA	1	\$200,000.00	\$200,000 80' bridge span (based on Mecklenburg Co. study)
<i>Construction Documents & Engineering (12% of Construction)</i>		20%		\$40,000.00 (20% of Construction)
Surveying	LF	200	\$0.78	\$156
			<i>SUB-TOTAL</i>	\$240,156
			<i>15% contingency</i>	\$36,023
			TOTAL w/ CONTIGENCY	\$276,179

**Note: a flood study and no-rise permit required unless paired with study done adjacent to crossing

Merrimon Avenue Crossing Options

Merrimon Avenue and Reems Creek (underpass crossing)

Pedestrian underpass conversion	EA	1	\$60,000.00	\$60,000 (based on Mecklenburg Co. study)
stormwater BMPs/Storm drainage	MI	0.04	\$60,000.00	\$2,400
<i>construction Documents & Engineering (12% of Construction)</i>		20%		\$12,480.00 (20% of Construction)
surveying	LF	200	\$0.78	\$156
			<i>SUB-TOTAL</i>	\$75,036
			<i>15% contingency</i>	\$11,255
			TOTAL w/ CONTIGENCY	\$86,291

**Note: a flood study and no-rise permit required unless paired with study done adjacent to crossing

Merrimon Avenue and Reems Creek (on-grade mid-block signalized road crossing)

on grade signalized crossing (Hawk Signal)	EA	1	\$52,500.00	\$52,500 (based on Ecusta Rail Trail Study)
crosswalk	EA	1	\$1,500.00	\$1,500
stormwater BMPs/Storm drainage	MI	0.09	\$60,000.00	\$5,400
<i>construction Documents & Engineering (12% of Construction)</i>		20%		\$11,880.00 (20% of Construction)
surveying	LF	500	\$0.78	\$390
			<i>SUB-TOTAL</i>	\$71,670
			<i>15% contingency</i>	\$10,751
			TOTAL w/ CONTIGENCY	\$82,421

Merrimon Avenue and Banks Town Road four-way interstecion improvements

enhanced crosswalks (stencils, signage, etc)	EA	4	\$5,000.00	\$20,000
<i>construction Documents & Engineering (12% of Construction)</i>		20%		\$4,000.00 (20% of Construction)
surveying	LF	250	\$0.78	\$195
			<i>SUB-TOTAL</i>	\$24,195
			<i>15% contingency</i>	\$3,629
			TOTAL w/ CONTIGENCY	\$27,824

Reems Creek Road Crossing Options

Reems Creek Road Crossing at Baldor (Underpass Crossing)

Pedestrian bridge with ramp adjacent to Mill off of Reems Creek Road	EA	1	\$142,000.00	\$142,000	80' bridge span (based on Mecklenburg Co. study)
Pedestrian underpass conversion	EA	1	\$60,000.00	\$60,000	(Based on Mecklenburg Co. study)
Stormwater BMPs/Storm drainage	MI	0.06	\$60,000.00	\$3,600	
<i>Construction Documents & Engineering (12% of Construction)</i>		20%		\$41,120.00	(20% of Construction)
Surveying	LF	300	\$0.78	\$234	
			<i>SUB-TOTAL</i>	\$246,954	
			<i>15% contingency</i>	\$37,043	
			<i>TOTAL w/ CONTIGENCY</i>	\$283,997	

**Note: a flood study and no-rise permit required unless paired with study done adjacent to crossing

Reems Creek Road Crossing at Baldor (on-grade road crossing)

Pedestrian Bridge adjacent to Mill off of Reems Creek Road	EA	1	\$150,000.00	\$150,000	80' bridge span (based on Mecklenburg Co. study)
Culvert (stream crossing)					
On grade signalized crossing (Hawk Signal)	EA	1	\$52,500.00	\$52,500	(Based on Ecusta Rail Trail Study)
Crosswalk	EA	1	\$1,500.00	\$1,500	
Stormwater BMPs/Storm drainage	MI	0.06	\$60,000.00	\$3,600	
<i>Construction Documents & Engineering (12% of Construction)</i>		20%		\$41,520.00	(20% of Construction)
Surveying	LF	300	\$0.78	\$234	
			<i>SUB-TOTAL</i>	\$249,354	
			<i>15% contingency</i>	\$37,403	
			<i>TOTAL w/ CONTIGENCY</i>	\$286,757	

**Note: a flood study and no-rise permit required unless paired with study done adjacent to crossing

Banks Town Road four-way interstecion improvements

enhanced crosswalks (stencils, signage, etc)	EA	4	\$5,000.00	\$20,000	
<i>construction Documents & Engineering (12% of Construction)</i>		20%		\$4,000.00	(20% of Construction)
surveying	LF	250	\$0.78	\$195	
			<i>SUB-TOTAL</i>	\$24,195	
			<i>15% contingency</i>	\$3,629	
			<i>TOTAL w/ CONTIGENCY</i>	\$27,824	

Units:

EA= each

LS= lump sum

LF= linear foot

TN= ton

SY= square yard

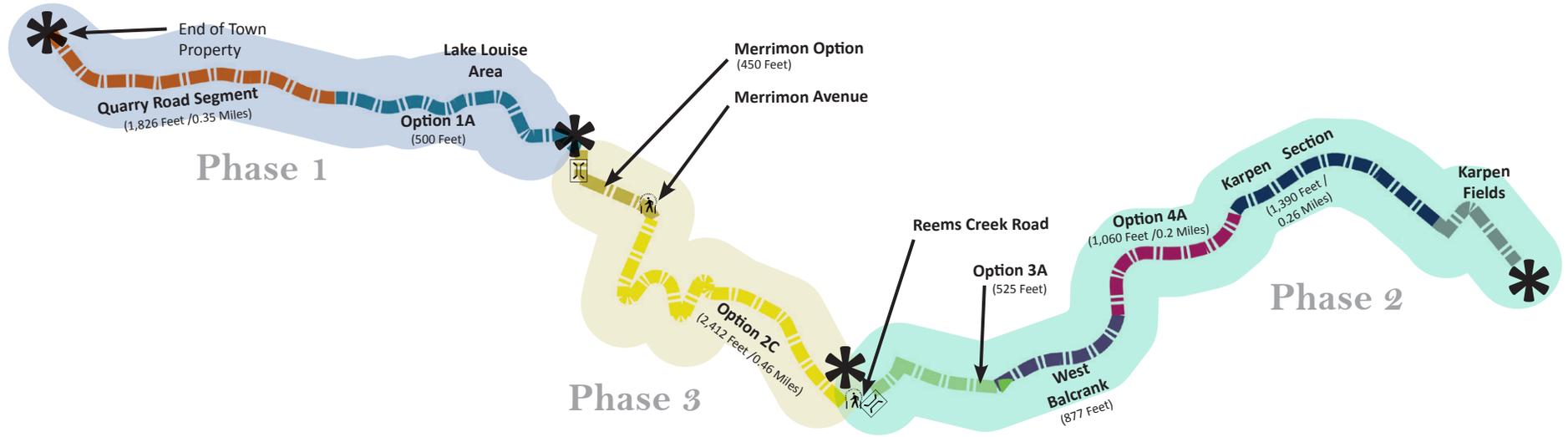
MI= Mile

Notes: 1.)Cost estimate does not include: landowner outreach, traffic impact studies, land acquisition, wetland determination/delineation, potential rock and unsuitable soils excavation, permitting fees, mobilization, utility coordination, attorney costs, transactional fees and taxes 2.)Trail costs are based on historic project costs with varying conditions. Costs include clearing and grubbing, paving, base, geogrid, minor storm drain pipe, erosion control features, plantings, signs, pavement markings, minor modular retaining walls. 3.) This section includes estimates for major retaining walls (taken into account under "Grading" cost per unit).

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CHAPTER 8

Phasing and Land Acquisition



Phasing Diagram of Preferred Options

Phasing

Phase 1

THE WESTERN PORTION

The western portion of the greenway is recommended to be the first phase as it has the least cost and site constraints and can largely be achieved in-house with the Town of Weaverville’s road construction crew. This phase includes the Quarry Road Segment and Option 1A and does not include the pedestrian bridge over Reems Creek at the Town’s Mill Park area.

Phase 2

THE EASTERN PORTION

The eastern portion includes securing a right-of-way and negotiation with landowners before environmental permitting and more detailed design can occur. This portion includes developing the trailhead amenities at Karpén Fields, the Karpén Section, Option 4A, West Balcrank, and Option 3A.

Potential Cost Per Phase

PHASE	COST
Phase 1 - The Western Portion (Quarry Road Segment and Option 1A)	\$229,500
Phase 2 - The Eastern Portion (Option 3A, West Balcrank, Option 4A and Karpén Section)	\$758,600
Phase 3 - The Middle Portion (Merrimon Option, Option 2C, two major pedestrian Reems Creek bridge crossings, and two pedestrian bridge underpasses)	\$1,363,900
TOTAL	\$2,352,000

Note: Estimates have been rounded

Phase 3

THE MIDDLE PORTION

The middle portion of the greenway is by far the most complicated and costly section. This phase is located on either private or NCDOT properties and right-of-way negotiations and more detailed design are necessary. Environmental permitting and agreeable design solutions within NCDOT right-of-way are critical pieces. It is recommended that studies of the pedestrian underpasses at Merrimon Avenue and Reems Creek Road begin immediately upon the completion of this feasibility study. These underpasses are the “clinch pin” of the greenway. The options included in this phase are: the Reems Creek pedestrian bridge and associated Reems Creek Road pedestrian underpass, Option 2C, the pedestrian underpass at Merrimon Avenue, the Merrimon Option, and the pedestrian bridge to the Mill Park and Lake Louise.

Land Acquisition

In order to avoid challenges later in the greenway development process, strategies for acquisition of land must be considered during both the initial planning process and throughout each phase, including construction and maintenance of the trail. An understanding of the acquisition strategies and wise use of the funds available for property acquisition adds significantly to the success of a greenway program.

The Town of Weaverville and Buncombe County may face obstacles in securing a corridor and the intent of this study is to provide options if securing a right-of-way through private land in a particular option is not feasible. The strategies outlined in this section are the most commonly used tools available via prevailing laws, although some tools may not be possible or desired at the time of acquisition. The use of some tools may vary based on funding source restrictions, availability of funding, and political considerations.

Acquisition of property for the development of a greenway is critical and often considered the most difficult element of implementing a greenway program. Alternative routes that avoid those properties that may be difficult

to obtain should be identified during the initial planning phase. This will decrease the chance of the greenway being delayed due to the inability to gain access across a single property.

Acquisition Tools and Methods

Strategies for acquiring property range from the fee simple purchase of property at its fair market value to agreements for the use of property encumbered by other easements, such as a sanitary sewer easement, that is donated due to its reduced value for development.

Advantages / Disadvantages of Various Land Acquisition Methods

Land Acquisition Method	Range of Uses	Time to Complete	Complexity	Legal Exposure	Expense
1. Fee Simple Acquisition	●	⊙	●	●	○
2. Acquisition by Non-Profit Foundation	●	⊙	⊙	⊙	●
3. Negotiated Sale	●	○	○	●	⊙
4. Bargain Sale	●	●	⊙	●	⊙
5. Option/First Right of Refusal	●	○	⊙	⊙	⊙
6. Easement Purchase	⊙	⊙	⊙	⊙	●
7. Shared Easement	○	⊙	○	⊙	●
8. Donation	●	○	●	⊙	●
9. Required Dedication of Property or Easements	●/⊙	●	●	⊙	●
10. Eminent Domain of Property or Easements *	●/⊙	○	○	○	○

Key: ○=Poor / Difficult; ⊙=Moderate; ●=Good / Favorable

* Use of eminent domain is not proposed as a tool for greenways land acquisition.

Familiarity with all the acquisition strategies is necessary due to the variety of situations that will confront those charged with responsibility for acquiring land for greenways. The following is a more detailed explanation of the tools and methods for corridor acquisition:

FEE SIMPLE ACQUISITION

Possibly the least complicated, but often the most expensive method for acquiring property for a greenway is the fee simple acquisition (purchase) of the property. In this method the greenway program purchases the title, with all rights, to the property at the fair market value. The first step in determining the fair market value of the property is identification of the property required for the greenway, which usually involves a survey once the desired area is delineated. Lands may be valued higher than property not fronting a water feature, but if it is unbuildable due to flood plain restrictions it may be valued lower. Although an important strategy, fee simple purchase should be considered as a last resort and can drive costs up considerably.

ACQUISITION BY NON-PROFIT FOUNDATION

An approach used by many greenway programs is the establishment of a non-profit foundation to raise funds for property acquisition and to purchase property or partnering with an existing non-profit who may be interested in protecting property for its natural resources or recreation values. Donations and contributions to the foundations typically can be deducted from the taxes of those persons who contribute, which make them more successful in raising funds than a government entity. In addition, some funding sources will provide funds to foundations, but will not provide them to local governments. Donations of land made to foundations also are tax-exempt, making the foundations more successful in negotiating the purchase of properties. The flexibility of foundations in negotiating the purchase of property is heightened by the fact that they are not bound to the same limitations as local governments. Also, some property owners are more comfortable in negotiating with a foundation than with a government agency.

NEGOTIATED SALE

Under this option the price for the property is negotiated and an agreement is reached to purchase at a price below the fair market value. Numerous

factors come into play during this process, with the key one being that the property owner must be willing to negotiate.

An understanding on the part of the property owner that the property needed for the greenway is worth less than the balance of the owner's property and/or the greenway brings certain benefits to the balance of the property and may motivate the property owner to negotiate. Factors to consider in a negotiated sale include :

- Property that has limited development value due to floodplain and trout buffer restrictions.
- New developments that are planned or underway may see the added value of an adjacent greenway and connection and agree to reduce cost in a negotiated sale as the greenway typically increases the value of units sold.

BARGAIN SALE

In this case, the asking price of a property is reduced in response to some characteristic of the property that is perceived as affecting the value of the property. The factors that may result in a property being offered at a bargain price are varied, and could include:

- Need of the owner(s) to obtain funds quickly;
- Burdening of the property with challenges such as the need for an environmental clean up, which the owners do not want to undertake; or
- Limited development potential of the property due to its size, access, etc.
- Tax advantage to the owner.

Opportunities for a bargain sale are infrequent and the agency charged with the responsibility for acquiring property for the development of greenways should be prepared to act on these opportunities when they become available. The identification of properties required for greenway development during the initial greenway planning efforts and continued contact with the property owners are essential to knowing when properties may be available through a bargain sale.

OPTION/FIRST RIGHT OF REFUSAL

In some cases, the property owner may not wish to sell the property required for greenway development at a time compatible with the phasing schedule identified in the greenway plan. The owner may, however, be willing to consider the sale of the property at a future date. In these situations, the alternative of an option to purchase the property at some future date or a first right of refusal should be considered. Although similar, these two methods have differences that make them unique.

An option for the purchase of a property acknowledges that the owner (optioner) will sell the property to the greenway program (optionee) at some agreed upon time or upon the completion of an identified action. A formal and legally binding agreement establishes all the parameters for the option and identifies the time when the option will be exercised, at which time the purchase will be completed.

A first right of refusal is an agreement entered into between the prospective purchaser of the property and the prospective seller. This agreement differs from an option in that it does not commit the owner to sell the property nor does it commit the greenway program to purchase it.

EASEMENT PURCHASE.

An easement provides the right to use the land of another for a specified purpose, as distinguished from the right to possess that land. An easement agreement permits the use of a property for a specific purpose.

The acquisition of an easement to locate, construct, and maintain a greenway should be explored in an effort to reduce the cost of obtaining property. Rather than acquiring all the rights to a property, with the ability to use the property for any legal purpose, the acquisition of an easement limits the use of the property. The value of an easement typically is significantly less than the fee simple value of the property in recognition of the limits on the use of the property imposed by the easement agreement.

Easements obtained for greenway are considered express easements, as the terms are set forth in a written agreement. The easement agreement entered into for a greenway should specify adequate room for the construction and maintenance of the greenway. The agreement may specify an easement of a certain width to permit the greenway's construction, with a lesser width

identified for the greenway's permanent easement. The agreement may also establish a time period within which construction must be initiated.

SHARED EASEMENTS

Land on which a greenway route is proposed is sometimes encumbered by an existing easement, most commonly for the location of utilities. During the planning of a greenway, all utility easements located within the trail corridor should be explored for the feasibility of locating the greenway within the existing utility easements.

Sanitary sewer easements are the easements most commonly shared by greenways, but any easement that permits the location of a trail could be the potential location of a greenway. Because the use of the property is limited by an existing easement, it may be easier and less expensive to obtain an additional easement for the greenway. Due to the specificity of easement agreements in identifying the use of an easement and limiting the use of the easement to that identified in the agreement, an additional easement will have to be obtained for the location of the green-way.

Negotiations with the property owner will be necessary to obtain the additional easement required for the greenway. The holder of the existing easement will also have to be involved in the negotiations, as their use of the easement may necessitate certain standards or restrictions on the use of the property.

Many municipalities in Buncombe County have signed an agreement with the Metropolitan Sewerage District (MSD) permitting the shared use of their sewer easements for the construction and maintenance of greenways. It identifies the rights and responsibilities of MSD and of the local government constructing the greenway. It is recommended that the Town of Weaverville seek an agreement with MSD.

DONATION OF PROPERTY

Efforts to obtain donation of easements or properties for greenways should be given high priority. While the costs of negotiating the donation and the potential legal fees involved are incurred in this approach, significant property costs are avoided. Concerns that the property owner may have regarding the construction and/or use of the greenway should be addressed completely.

The ability to receive favorable tax benefits as a result of the donation of the easement and/or property may be the deciding factor in whether or not someone makes a donation. A partnering non-profit is needed in order for the donor to receive the tax benefit.

REQUIRED DEDICATION OF PROPERTY OR EASEMENTS

The requirement by a local government that land identified in an adopted plan for the location of a greenway be dedicated as a condition of the development of that property is becoming more common. This requirement typically is part of the open space standards found in the land development ordinance for the local jurisdiction. Open space standards require a certain amount of land within a property being developed or redeveloped be set aside as open space to meet the recreation needs of the future residents or users of the proposed development.

The standards can require that land identified as a greenway route be dedicated to the local jurisdiction and that the area be counted toward the open space requirement for the proposed development. The local jurisdiction (county or city/town) would be responsible for constructing and maintaining the greenway, but would not incur the expense of purchasing the property.

FEE IN LIEU REQUIREMENT

Local governments that require the dedication of land identified in an adopted plan for the location of a greenway as a condition of development approval often have a fee in lieu option that can be exercised by the developer. This option allows the developer to pay a fee in lieu of dedicating the land needed to meet open space and/or greenway requirements.

EMINENT DOMAIN

Eminent domain is not a recommended strategy for this greenway.

Landowner Outreach

Developing a Strategy

The most critical piece to the success of the greenway is landowner outreach. The following steps are recommended to successfully garner public support and to negotiate with landowners.

1. EDUCATION

The feasibility study is only the beginning of outreach. Continued education to the public on the study and vision of the greenway is needed. Talking with landowners and addressing concerns about liability, crime, and safety is important.

2. OWNERSHIP

A listing of landowner contacts along the greenway corridors will be necessary for communication and outreach work. The database should prioritize landowners and identify preferred property/easement characteristics. The preferred properties are those that offer the greatest degree of connectivity. Regular communications with Buncombe County should ensure that the greenway is considered in land use planning and development activities.

3. PRIORITIZATION

Once the preferred property characteristics have been identified, acquisition ranking criteria can be applied to identify the highest priority properties within the focus corridor areas. Ranking criteria should look at key properties for connectivity and apply probable acquisition methods for properties.

4. COORDINATION WITH LEADERS

Ongoing outreach and education with Town and County leaderships should occur to assure support, ensure there are no misunderstandings, and allow them to be well informed if conflict does arise.

5. CONDUCT OUTREACH AND EDUCATION

The information gained from previous tasks can be presented to landowners within the greenway corridor. During outreach efforts it will be important to enhance dialogue with landowners by asking about their specific concerns they may have with the greenway project. Direct personal communication is often the most effective, but requires significant allocation of time and resources, which may be necessary for larger properties or owners with more potentially sensitive or substantive impacts. This type of communication may require a combination of a County staff, an elected official, an outside consultant, and/or a landowner outreach committee to coordinate the effort.

6. ENCOURAGING PARTICIPATION

This element addresses the details and provides for resolution of landowner concerns – if possible. An authorized representative that can make decisions and enter into an agreement with landowners should be involved. This is where landowners need to know if their concerns have been addressed and options clearly understood for the various methods for providing access through their properties for a greenway.

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CHAPTER 10

Recommendations

Recommendations

Short Term

ADOPT THE PLAN. Adopt this Plan / Study and Request Inclusion in the Long Range Transportation Plan (LRTP) - The Town of Weaverville, by adopting this study via resolution, indicates its willingness to work toward implementation of the greenway. Weaverville should request the NC 280 project be included as a project in the LRTP. The French Broad River Metropolitan Planning Organization (FBRMPO) is updating the LRTP in 2014. To be eligible for federal funding, projects must be identified or be consistent with the LRTP document. See Chapter 10, Funding Sources, for more information.

Further, the methods employed by the North Carolina Department of Transportation (NCDOT) and FBRMPO for prioritizing projects, award additional points for projects that are part of an endorsed plan or study. Therefore, adoption of the study positions Weaverville for higher ranking with the State's/FBRMPO's evaluation processes and thus in a better position to take advantage of potential funding sources.

PURSUE IMMEDIATE AND FUTURE FUNDING OPPORTUNITIES.

Pursue Funding for Design of the First Phase and the Pedestrian

Underpasses - The Corridor Study provides baseline parameters by which Weaverville can secure funding for design and engineering services for the corridor. It is recommended to immediately pursue funding for design and construction of Phase One (the western portion). The estimated cost of designing this phase (see Chapter 8 for phasing) of the project is \$229,500. The FBRMPO has funding available that requires immediate application. It is also recommended that funding for the study of the bridge underpasses be pursued immediately as all the preferred alignments are dependent on the viability of the underpasses.

FURTHER STUDY OF MAJOR ROAD CROSSINGS. The crossing of Merrimon Avenue and Reems Creek Road are the key ingredients to the successful completion of the greenway and further detailed study of the preferred options of the pedestrian underpass and associated crossing features is needed. As part of this further study, a FEMA no-rise study would also be needed as these crossings are in the floodway.

PURSUE AGREEMENTS. Create a master agreement with MSD. Encroachment Agreements are likely needed with NCDOT. Build a partnership in providing greenway easements when acquiring rights-of-way or easements. This process could take up to a year to complete.

IDENTIFY PARTNERS. Identify and strengthen partnerships that will aid in development of the greenway - This list of partners could include:

- **A Negotiation Partner-** This partner could be a land trust, a consultant, Buncombe County, or another identified organization that can collaborate with the Town in outreach to landowners and identifying land acquisition strategies. Often times a third party can be helpful by working with landowners to sign letters of intent and are knowledgeable in the details of acquisition strategies. Additionally, it may be valuable to identify a partner that can hold easements for the Town.
- **The County-** Portions of the proposed greenway pass through Buncombe County jurisdiction. It is critical the Town of Weaverville and the County collaborate and coordinate efforts.
- **Citizen Groups-** Groups like the Friends of Connect Buncombe can aid in outreach, advocacy, and may eventually be a source of funding. Other civic, recreation, and business groups can assist in advocacy and funding as well.
- **Community Foundations-** Often there are "less strings" attached with community foundations and this potential funding source should be identified.
- **Business-** Support and partnership with businesses surrounding the greenway are crucial. Businesses can financially sponsor portions of the greenway, donate right-of-way, and become influential advocates.

DEVELOP A GREENWAY COMMITTEE/ COMMISSION. Identifying a committee can alleviate pressure and decision making on municipal staff and allow for delegation of tasks. This committee could include citizens, elected officials, county representatives, transportation officials, and non-profits representation. This committee can help advocate for the greenway and help prioritize landowner outreach and methods for corridor acquisition. This committee can also assist in researching and applying for funding opportunities.

BEGIN AN OUTREACH CAMPAIGN. An outreach campaign should be directed to the public as a whole, as well as to individual landowners. The greenway committee could help develop the outreach strategy. Efforts such as public crowd funding have recently been successful at generating income for greenway efforts, and may also serve as a way to identify potential partnerships.

Medium to Long Term

IDENTIFY NEGOTIATORS. Whether landowner negotiations happen through municipal staff or land trusts, long-term relationships should start in the early stages but extend over time by the same people or organization, as relationship building is key in negotiations and may sometimes take years to see through to completion.

DEVELOP COMMON DESIGN STANDARDS. The Town and the proposed greenway committee should consider developing greenway standards that can inform future greenway design. This could include a common material palette, signage guidelines, accessibility standards, and other considerations such as safety, aesthetics, and cohesiveness.

EXECUTE DETAILED STUDIES OF FUTURE PHASES. Further study at the Design Development and Construction Document level is usually required by many funding sources and will be critical in addressing the many environmental constraints that exist in the Reems Creek Greenway corridor. These studies are also critical in determining this best location for the greenway on individual properties and can inform the land acquisition process.

USE PLANNING TOOLS TO SUPPORT THE GREENWAY. The Town of Weaverville's desire to develop a pedestrian bicycle plan is critical to the connectivity of the greenway to the community and adjoining neighborhoods. One of the Town's greatest tools could be incentives for landowners to dedicate a right-of-way for the greenway in the early development process. One example of the incentive-based approach could allow for a higher density of development in exchange for a dedicated right-of-way. The Town should consider encouraging concentrated growth around the greenway, creating a transportation and recreation spine for the community. Incentives for infill, business development (especially recreation based retail or larger employers), and more concentrated residential development should be considered.

IMPLEMENT THE GREENWAY AS TRANSPORTATION

INFRASTRUCTURE. This study recommends connections (sidewalks and street crossings) to allow the greenway to be a walkable destination and serve as a recreation corridor but even more importantly, it should serve as a key arterial for pedestrian and bicycle connectivity. This greenway can be used by commuters to bike to the surrounding employment center, as a route for children to walk to school, and as a way for residents to bike and walk to Lake Louise or Karpen Fields. Key connections to the greenway should be implemented at the same time as the construction of the Reem's Creek Greenway corridor itself.

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CHAPTER 10

Funding Sources

Source	Eligibility	Description	Project Type	More info
Municipal and County Bonds	■ County	Revenue, general obligation, special assessment and GARVEE bonds are used by various government entities – after a public referendum approving the bond proposal – to construct a variety of transportation improvements.	■ Greenway	NC G.S. 159-43 through 159-79 (GO Bonds)
	■ Cities / Towns		■ Bicycle	
	Non-Profits		■ Pedestrian	
	Transit Operators		■ Amenities	
	School Districts		■ Connectivity	
	Other:		Other	
Property Tax	■ County	Property taxes are the primary source of revenue for city and county governments and are used as part of their general funds. There is partnership potential in the use of these funds among the county, cities and towns.	■ Greenway	NC G.S. 150 § 161.7
	■ Cities / Towns		■ Bicycle	
	Non-Profits		■ Pedestrian	
	Transit Operators		■ Amenities	
	School Districts		■ Connectivity	
	Other:		Other	
County Sales Tax	■ County	Any sales tax increase would require a popular referendum vote by the population of Buncombe County. Most counties (83) have the same 2% sales tax rate as Buncombe; 17 have 8% with Mecklenburg at 8.25% due to a .5% transit sales tax already in place.	Greenway	NC Department of Revenue
	Cities / Towns		Bicycle	
	Non-Profits		Pedestrian	
	■ Transit Operators		Amenities	
	School Districts		■ Connectivity	
	Other:		Other	
Municipal or County Service (Business Improvement) District	■ County	Cities can form special tax improvement districts for downtowns; counties may apply them anywhere. In both cases, infrastructure is the intended use, which may include transportation projects including sidewalks.	■ Greenway	NC G.S. 160A-535 § 153A-300
	■ Cities / Towns		■ Bicycle	
	Non-Profits		■ Pedestrian	
	Transit Operators		■ Amenities	
	School Districts		■ Connectivity	
	Other:		Other	
Tax Increment Financing (TIF)	■ County	Generally encouraging redevelopment, TIFs (and synthetic TIFs) use marginal property value increases to pay off debt from private infrastructure investment.	■ Greenway	NC G.S. 159C-103
	■ Cities / Towns		■ Bicycle	
	Non-Profits		■ Pedestrian	
	Transit Operators		■ Amenities	
	School Districts		■ Connectivity	
	Other:		Other	

Source	Eligibility	Description	Project Type	More info
Occupancy Tax	■ County	Buncombe has a fairly typical hotel occupancy tax rate of 4%, in a range of 3% to 6% in almost every county. Uses are very broad as long as they are not applied to the construction of another hotel.	■ Greenway	NC G.S. 153A-155 § 160A-215
	■ Cities / Towns		■ Bicycle	
	Non-Profits		■ Pedestrian	
	Transit Operators		■ Amenities	
	School Districts		Connectivity	
	Other:		Other	
Spot Safety, Hazard Elimination & Small Urban Project (NCDOT)	■ County	The NCDOT sponsors these three programs through the NC Highway Safety Improvement Program. The Spot Safety program focuses on smaller (\$250,000 or less) projects and mentions pedestrian facilities by name. Small urban funds are a similar source, but not often used for trails projects.	■ Greenway	NCDOT Highway Safety Improvement Program
	■ Cities / Towns		■ Bicycle	
	Non-Profits		■ Pedestrian	
	Transit Operators		Amenities	
	■ School Districts		■ Connectivity	
	Other:		■ Other: Intersections	
Powell Bill Funds	County	This program is paid to municipalities for the purposes of maintaining or constructing local streets that are the responsibility of the municipalities or for planning, construction, and maintenance of bikeways and sidewalks that connect to greenways within municipal boundaries.	Greenway	NCDOT Powell Bill Program
	■ Cities / Towns		■ Bicycle	
	Non-Profits		■ Pedestrian	
	Transit Operators		Amenities	
	School Districts		■ Connectivity	
	Other:		Other: Grade Crossing Closures	
Conservation Tax Credits	■ County	Persons donating their land through conservation easements for public trails (among other uses) can receive up to \$250,000 or 25% of the fair market value of the land conserved. Credits are not transferable to new property owners.	■ Greenway	One North Carolina Naturally Conservation Tax Credit; NC G.S. 113A-231
	■ Cities / Towns		Bicycle	
	■ Non-Profits		Pedestrian	
	Transit Operators		Amenities	
	School Districts		Connectivity	
	■ Other: State		Other:	

Source	Eligibility	Description	Project Type	More info
Land and Water Conservation Fund	■ County	The LWCF program is managed by NCDENR for acquiring land at a single site with grants up to \$250,000 for permanent outdoor recreation uses.	■ Greenway	LWCF Overview by NC Division of Parks and Recreation
	■ Cities / Towns		Bicycle	
	Non-Profits		Pedestrian	
	Transit Operators		Amenities	
	School Districts		Connectivity	
	■ Other: Tribal		■ Other: Land	
North Carolina Recreational Trails Program Grant	■ County	NCDENR manages a trails grant program with amounts up to \$75,000 with a 25% match requirement. All grants are matched 1:1 with cash, donated property value, or in-kind services.	■ Greenway	North Carolina Recreational Trails Program Grant General Information
	■ Cities / Towns		Bicycle	
	■ Non-Profits		Pedestrian	
	Transit Operators		Amenities	
	School Districts		Connectivity	
	Other:		■ Other: Land	
Clean Water Management Trust Fund	■ County	The CWMTF can be used to plan and design greenways or acquire land (fee simple or conservation easement) for them in riparian areas ONLY. Construction costs are not eligible, but utilities are allowed in the corridor.	■ Greenway	Clean Water Management Trust Fund
	■ Cities / Towns		Bicycle	
	Non-Profits		Pedestrian	
	Transit Operators		Amenities	
	School Districts		Connectivity	
	Other:		■ Other: Land	
Community Development Block Grant Program	■ County	CDBG funds have been used to construct trail projects, such as the Boulding Branch Greenway in High Point, NC. Amounts are typically between \$50,000 and \$200,000. Projects should benefit low- and moderate-income persons.	■ Greenway	CDBG Information Website
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	Transit Operators		Amenities	
	School Districts		■ Connectivity	
	Other:		Other:	
Parks and Recreation Trust Fund	■ County	NCDENR also matches the venerable PARTF grants, but these go to trail projects only infrequently as they are associated with parks facilities. The matching requirement is 50/50 in cash (no in-kind services) but land value can be used in lieu of cash.	■ Greenway	NC Parks and Recreation Trust Fund Website
	■ Cities / Towns		Bicycle	
	Non-Profits		Pedestrian	
	Transit Operators		Amenities	
	School Districts		Connectivity	
	Other: Public Authority		■ Other: Land	

Source	Eligibility	Description	Project Type	More info
State Transportation Improvement Program Projects (NCDOT)	■ County	NCDOT funds projects both incidental to highway construction / widening and independent bicycle/pedestrian projects based on established project selection criteria. The direct allocation funds (STP-DA) are an option through the MPO's Transportation Improvement Program updates.	■ Greenway	NCDOT Bicycle and Pedestrian Transportation Funding Information.
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	■ Transit Operators	Approval of metropolitan or rural planning organizations is required.	■ Amenities	STP-DA funds through the MPO
	■ School Districts		■ Connectivity	More opportunities from MPO listed on the last funding table
	■ Other: Tribal		■ Other: Land	
Payment-in-Lieu Fees	■ County	Communities may choose to allow developers to pay a fee for future improvements required by the government that the development is located within instead of constructing the improvement. Note that private developers can often construct more for less money than their public sector counterparts due to mobilization and other costs.	■ Greenway	Buncombe County would need to address this through an ordinance.
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	■ Transit Operators		■ Amenities	
	■ School Districts		■ Connectivity	
	■ Other:		■ Other: Land	
Foundation Grants	■ County	Like other grants, foundations issue funds for projects that meet specific requirements – and they are highly competitive. Deadlines, submission requirements, degree of interagency collaboration desired, and match characteristics vary greatly.	■ Greenway	Bikes Belong
	■ Cities / Towns		■ Bicycle	International Mountain Biking Association
	■ Non-Profits		■ Pedestrian	Rails-to-Trails
	■ Transit Operators		■ Amenities	Pigeon River Trust Fund
	■ School Districts		■ Connectivity	
	■ Other: Non-Profit Organizations		■ Other: Education	
	■ School Districts		■ Other: Education	
Safe Routes to Schools	■ County	SRTS funding is distributed by NCDOT for the purpose of funding education programs, school-based audits that lead to infrastructure improvements within two miles of an elementary or middle school.	■ Greenway	www.saferoutesinfo.org
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	■ Transit Operators		■ Amenities	
	■ School Districts		■ Connectivity	
	■ Other:		■ Other: Education	

Source	Eligibility	Description	Project Type	More info
Surface Transportation Program (STP-DA) (FHWA)	■ County	Approximately \$3 million/ year available to MPO members. Funds bicycle and pedestrian capital projects, ADA sidewalk modifications, as well as environmental restoration. Covers planning, engineering, construction drawings, and construction.	■ Greenway	Application process administered by the French Broad Metropolitan Planning Organization (MPO) through FHWA
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	■ Transit Operators		■ Amenities	
	■ School Districts		■ Connectivity	
	■ Other:		■ Other	
TAP (Transportation Alternatives Program)	■ County	Applicable for bicycle and pedestrian projects, including safe routes to school, greenways, scenic lookouts, projects, and rehabilitation of historic transportation structures, and environmental mitigation. There was around \$283,000/ year for FY 2013 and 2014.	■ Greenway	Application process administered by the French Broad Metropolitan Planning Organization (MPO) through FHWA
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	■ Transit Operators		■ Amenities	
	■ School Districts		■ Connectivity	
	■ Other:		■ Other	
Unified Planning Work Program (UPWP)	■ County	Funding amount available for \$10,000-\$250,000 for MPO members. Funding can be used for studies and planning of greenways, multi-modal transportation planning, and bike and pedestrian planning. A 20% local match is required.	■ Greenway	Application process administered by the French Broad Metropolitan Planning Organization
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	■ Transit Operators		■ Amenities	
	■ School Districts		■ Connectivity	
	■ Other:		■ Other	
NCDOT STI (SPOT)-Funding for Project in the STIP	■ County	Funding available for MPO members and is submitted through the MPO for bicycle, pedestrian, and Safe Routes to School projects. A 20% local match is required. Projects should already be identified in the local or regional adopted plan.	■ Greenway	Application process administered by the French Broad Metropolitan Planning Organization
	■ Cities / Towns		■ Bicycle	
	■ Non-Profits		■ Pedestrian	
	■ Transit Operators		■ Amenities	
	■ School Districts		■ Connectivity	
	■ Other:		■ Other	