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1.0 Project Goals and Objectives

At Yellow River Park, Gwinnett County is seeking to address countywide recreational needs in a manner compatible with the sustainable preservation and interpretation of unique cultural and natural resources. Additionally, this Master Plan seeks to incorporate existing park use and new land acquisitions. The principal goals of the Master Plan are as follows:

- Preserve the natural resources associated with the park.
- Provide well-built trails for mountain bikers, equestrian riders, and pedestrians.
- Provide amenity areas to service surrounding neighborhoods and a variety of user groups.
- Provide a safe, environmentally sustainable and usable environment for passive park activities.

2.0 Site Context

The 565-acre Yellow River Park site was originally assembled by the Gwinnett County Department of Public Utilities (DPU) for use as a waste water reclamation facility. In 1998 the Board of Commissioners purchased the site from DPU for use as an open space park. Prior to the county’s acquisition, DPU had allowed equestrian and mountain biking groups to create trails for their use on the portion of the site west of the Yellow River, which is accessible from Juhan Road. An additional parcel was recently acquired on Spain Road, which allows for a public entry point to approximately one-third of the park site separated by Yellow River. Although this land has been inaccessible, people are finding ways in through the neighborhood and have begun to develop some rough trails.
3.0 Methodology

Using a traditional approach to the park planning process, the project progressed through a series of interim tasks to arrive at a consensus Master Plan. The sequence of tasks performed to develop the Master Plan included:

- Program Confirmation based on input of staff as well as the Steering Committee.
- Inventory and Analysis of the site, including topography, vegetation, hydrology, and soils.
- Alternative Development Concepts were prepared to test a variety of design concepts.
- A Preliminary Master Plan that blended elements from multiple concepts was developed.
- A Draft Master Plan was developed as a refined preliminary plan with a preliminary Cost Estimate.
- A final Master Plan was developed with refined, phased Cost Estimate.
- Presentation of the final products to The Gwinnett County Recreation Authority and The Gwinnett County Board of Commissioners.

The following provides additional brief description of the methodology and timeline:

**Public Input Meeting (12.03.01):**

The advertised public meeting was well attended, and included remarks by the Director of Parks & Recreation Project Administration and the Principal Community Planner. Attendees were invited to fill out a Community Interest Form and applications for becoming a member of the Master Plan Citizen Steering Committee. General comment was invited from all present.

Completed Community Interest forms were collected and tabulated by The Jaeger Company *(see Appendix A)*. Completed Citizen Steering Committee forms were collected by the county and used to determine membership of the committee. The committee of twenty-three members represented a fair cross-section of interested parties.

**Base Plan Development (December 2001):**

Using DXF files obtained from the County GIS System, The Jaeger Company prepared a composite AutoCad base plan for the site.

**Site Visit (12.11.01):**

Members of The Jaeger Company and their sub-consultant, Pond & Company (civil engineering) met at the site to determine several feasible locations for bridge crossings on Yellow River. Based on natural features and desired trail linkage, three sites were identified that would yield the shortest crossing lengths. The engineers evaluated the hydraulic performance of Yellow River for 50, 100 and 500 - year floods and calculated...
required spans with cost implications for construction at each location. These estimates were based on an 8’ wide pedestrian bridge construction with an “at grade” approach on both sides.

**Scheduling (12.13.01)**

The plan development process began by creating a schedule. In attendance were Rex Schuder, a representative from The Jaeger Company and Steering Committee Members who determined dates for progress meetings. Tabulated results of the community interest forms were distributed and general objectives were outlined by all present.

**Site Visit (1.12.02):**

The Steering Committee, The Jaeger Company and Rex Schuder performed a walking tour of the park site and made observations as to the current state of the trail systems and conditions along the river corridor. Despite inclement weather, both sides of Yellow River were explored.

**Recreation Facilities Tour (1.19.02):**

The Steering Committee also attended a bus tour of Gwinnett Parks as well as parks in Hall County with particular relevance to Yellow River Park. Members visited a variety of passive recreation facilities and discussed park program options including:

**Gwinnett County**
- Mountain Park: Gwinnett County standard playground
- Bethesda Park: multi-purpose trail
- Pinckeyville Park: pedestrian bridge, standard pavilion, restroom

**Hall County**
- Gainesville College: mountain bike trails
- Chicopee Industrial Park: boardwalks
- Chicopee Woods Regional Park: mountain bike trailhead, changing station
- Elachee Nature Center: nature trails, pavilions
- Agricultural Center: steep mountain bike trails
- Rock Creek Park: bioengineering techniques

**Inventory and Analysis (January 2002):**

Aerial photographs from 1939 and 1960 were compared with recent aerial photographs to document the evolution of land use and vegetation patterns on the site. A series of graphics and tables were prepared to record the findings organized under the headings of:

- Topography
- Circulation
- Views and Spatial Relationships
Conceptual Plan Development (2.06.02):

Three alternative concept plans were developed from a charrette held at The Jaeger Company. A variety of options were explored, resulting in diverse solutions, which satisfied the project goals and objectives, but differed principally on the basis of trail designation, amenity area locations, and access points to the site. After the options were presented and reviewed by the committee, program elements were more clearly defined and a hybrid of all three schemes was decided.

Also covered at this meeting was the interest in providing one or more bridge crossings on Yellow River for access to both sides of the park. Concept Plan Options identified where these crossing points could tie into the trail network and be best located based on topography, natural features and spacing along the river corridor. Because of assumed cost implications, The Steering Committee decided not to include the bridge(s) as part of the preliminary design development programming, (see Appendix B for Hydraulic Bridge Analysis/Feasibility Study).

Preliminary Master Plan (2.20.02):

Prior to the presentation, minor plan revisions were incorporated into the design. These revisions were based on comments from members of the Steering Committee at the last presentation and staff review, which emphasized using a greater percentage of existing mountain bike trails in the proposed trail alignment on both sides of Juhan Road. Other adjustments included a reconfiguration of the horse parking loop, relocating a restroom at the bike parking lot, making the multi-purpose trail exactly one-mile long, making a multi-purpose trail spur connection to bike & equestrian trails and changing the pavement surface of the Spain Road pavilion area parking from gravel to asphalt due to maintenance issues. Additions included two more designated crossing points on Juhan Road, a council ring/overlook at the perimeter of the meadow, a small shelter with picnic tables at the group camping area, water fountains, security gates and reinforced turf.

The Preliminary Cost Estimate was distributed and costs were discussed in general terms.

Final Master Plan (3.05.02)

The Final Master Plan, Cost Estimate, and Budget Analysis were presented to the Steering Committee. At this same meeting a revised Cost Estimate (prepared by The Gwinnett County Department of Parks and Recreation) was presented to illustrate how to get the costs within the budget by deleting certain program elements and costs. Steering Committee members were then able to react to the proposed cuts and make recommendations about where they would like to see some of money shifted for various
purposes. In some cases, the elimination of certain elements led to the elimination of other connected items that formed a ‘package deal.’ For example, taking out the restroom facility at the main pavilion area meant losing all its required utility services, the septic field and other program elements that would need a restroom in close proximity in order to be useful. The proposed pavilion and playground would not be viable in this location without a restroom nearby. In general, everyone agreed on the items to be removed from this phase of work and only a few adjustments were made to allow for a more strategic use of funds allocated for landscaping. In conclusion, the committee identified several things that they would like to see added back into the budget, should bids come in lower than expected or should more monies be allocated for Phase One Construction. These choices are listed below in order of importance:

1. Restroom and associated utilities at main pavilion area
2. Pavilion and playground at main pavilion area
3. Realignment of Juhun Road (if GDOT is unwilling to provide)
4. Council ring/overlook at meadow (low cost item)

4.0 Site Inventory and Analysis

The following constitutes a summary of the inventory and analysis process. Each major category of discussion is supplemented by an illustrative graphic.

Topography

Topographic information was obtained from the County GIS system and included data at a four-foot contour interval. A majority of the park is fairly steep and is divided by Yellow River. The site has a net 200-foot grade change with elevations ranging from the highest of 930 feet to the lowest of 702 feet (at the river’s edge). A majority of the site has over a 10% grade, with some areas terraced from former agricultural occupation. Naturally flat areas parallel some parts of the river in the floodplain. Also, a few acres of level ground are associated with the flat-topped ridge on the east side of the river.

Circulation

The existing vehicular circulation in the site includes Juhun Road, which runs through the west side of the park. This road serves as the primary point of pedestrian access for most park visitors. A small piece of the park touches South Rockbridge Road on the westernmost side of the park and was considered as a point of access during the design phase. Spain Road serves as a border to the easternmost access point.

Mountain Bike and Equestrian trails are well established on the site and are fairly well organized west of the river. Trails east of the river are more haphazard and were created by resident use of ATVs, pedestrians, and mountain bikers. Users on the west side of the river find a complex network of equestrian and bike trails which pedestrians share. Bike trails range in width from less than a foot to nearly eight feet. Horse trails are significantly wider in most parts, but may be as narrow as three feet wide in some areas.
Trail conditions vary. Some well-established trails meander over slopes and drain well without soil disruption. However, during rain events, some trails have low spots that collect water or soils that erode and make their way into the river. Trails that meander along the riverbank often come dangerously close to the river and erosion is a problem in many of these areas. As a general rule of thumb, all trails near the river must be a minimum of fifty feet back from the top of bank.

**Views and Spatial Relationships**

Despite adequate changes in elevation, view range is limited due to the dense tree cover. Natural site amenities include a stream at the north end of the park property and Yellow River, which runs through the entire park site. Trails that either traverse or follow along these water features offer opportunities for scenic views. The clearing presently supporting a parking area on the east side of Juhan Road offers the most opportunities for viewing the river because of its proximity to the water and for its level and open characteristics. A grassed clearing that presently supports a maintenance trailer on the west side of Juhan Road provides an opportunity for viewing wildlife. And finally, an existing hilltop clearing for group camping could benefit from selective clearing to create views to the river and the surrounding forest.

**Watershed**

The Yellow River Watershed is part of the larger Upper Ocmulgee Watershed, which also includes the South and Alcovy Rivers. The Yellow River is sourced from a number of tributaries north of the park site. Those immediately impacting the area are Pounds Creek from the northwest and Jacks Creek from the northeast. For a more complete identification of tributaries see Gwinnett County Flood Insurance Maps.

The entire site is within the Yellow River drainage basin. Nearly all stormwater drains into the river through a well-defined series of unnamed tributaries and intermittent swales (*see Illustration A*). Some swales remain dry except during rain events while others have water in them at all times and are presumably spring fed. During rain events the water level of the river can rise very dramatically.

Where proposed pavements and roofs are concentrated on site, compliance with the new County stormwater regulations will be required. All development must be limited to constitute no more than 10% of the total acreage, per county standards.

**Vegetation**

Yellow River Park is situated in the Upper Piedmont of Georgia. The Yellow River bisects the park from the north to the south, forming a narrow valley bordered by hills. The site is a mixture of mature mixed hardwood or late successional forest, successional forest, and managed lawn, (*see Illustration B*).
Pastures & Fields
Few maintained open areas exist on site and are primarily used for parking, maintenance, or group camping. Less than 5% of the site contains open space. Current maintenance procedures include mowing of lawn areas as needed.

Woodland
Oak-Hickory Forest
The oak-hickory forest occurs on the drier uplands and hilltops. Southern red oak, white oak, post oak, hickory, and dogwood are characteristic of this habitat. On the drier slopes, southern red oak, post oak, and blackjack oak grow in greater abundance. The hilltops east of the river support a scattered groundcover of prickly pear.

Bluff Slope Ravine Forest
The bluff slope forest is also prevalent, especially on lower, mesic slopes. Characteristic canopy trees of this habit include American beech, tulip poplar, and white oak. The understory is composed of flowering dogwood, hop hornbeam, ironwood, chalk maple, southern sugar maple, and an occasional umbrella magnolia.

Bottomland/Floodplain Forest
The Yellow River, and some of its tributaries, creates an environment suitable to floodplain species. Indicator species include: sycamore, river birch, tulip poplar, green ash, and ironwood. The riverbank supports beautiful stands of mountain laurel, especially over sandy and rocky soils. Rivercane and river oats are prevalent near the river. Many of the larger trees of the park are found along the river’s edge.

Successional Forest
Loblolly pine is an indicator of past disturbance and is a pioneer tree in the stages of succession. Successional forests in the Yellow River Park are found along the terraced uplands and hilltops. These lands were probably farmed and have encountered varying degrees of erosion.

Invasive Exotics
Invasive exotics grow in localized areas of the park especially in disturbed and floodplain areas. Privet and honeysuckle grow in moist soils, especially along streams and floodplains. Privet often takes over the woodland understory and out-competes native shrubs. Privet and honeysuckle occur in the woodland streams at the very north of the park and south of the main parking lot. (See Photo) Kudzu grows extensively in a clearing near the southwestern border of the park.

The southern pine beetle has killed small areas of mature pine in the successional forest. Infested areas have little or no vegetation to prevent soil erosion. Dense stands of loblolly pine are especially vulnerable to the southern pine beetle.
Soils

Soils in the Yellow River Park are distributed relative to the topography. Clay loams and sandy clay loams are generally found along the hilltops. Floodplain soils consisting of alluvial sand, silt, and clay are deposited into narrow flats along the Yellow River. Local alluvial soils along smaller streams have been washed down from the uplands. Stripped topsoil and gullies are visible remnants of past agricultural practices.

A soils map of the park was created to assess the suitability of proposed uses to the soil types present, (see Illustration C). A table was also prepared to summarize physical attributes of soils found on site, (see summary chart). Soils found unsuitable to trail usage are those prone to frequent flooding, of slopes greater than 25%, are located over a high water table, or have a surface layer hazardous to foot traffic. Soils found to provide severe limitations upon recreational building uses are those subject to flooding or are generally wet, of a slope greater than 15%, or less than three feet depth to bedrock.

Fortunately a majority of soils at the Yellow River site are sandy loams and do not pose any serious problems to any of the proposed construction. New parking lots are slated to have restroom facilities with associated septic fields. These fields will have to be properly located, according to soil permeability and natural slope for good drainage. Many existing trails are prone to erosion and flooding, but this can be attributed to inadequate grading, not the soil type. Proper trail construction techniques will be crucial to the future long-term success of the system network.
Cultural Resources

Cultural resources on site are limited to scattered remnants of former agricultural and residential use of the property. An abandoned house and a collection of several shed-like structures exist on the north end of the park property, just west of Juhan Road. Terraces for cotton farming that have succumbed to erosion are apparent on both sides of the river, within the woodland slope areas. The east side of the river contains the site of a former farmstead, with remnants of a stone building foundation. Also found on site are the scattered remains of several junked cars, which do not offer any specific aesthetic contributions. (See Illustration D for cultural resource locations).

5.0 Development Program

Working with the Steering Committee and DCS staff, a finalized program for park development was prepared. There was an in-depth discussion of this program with the Steering Committee in order to carefully consider the immediate and long-range goals of the park plan.

Program Elements

The park will be supported by a variety of improvements that facilitate access, visitor comfort and use of the property. The overall concept for park development will be to preserve the integrity of the park as a passive use space and enhance views of natural features. Clearing of trees will be selective and grading limited to locations designated for parking and amenity structures. Realignment of trails will be strategic, using as much of the existing network as possible, and coincide with the topography in order to minimize erosion problems. Efforts will be made to revitalize areas that show signs of stress due to inadequate design and excessive usage.

Vehicular Circulation

In general, the circulation within the park does not vary greatly from its current configuration. New parking areas will provide trailhead access for different user groups. Road spurs will provide access to these parking areas and to the existing campground clearing. A realignment of Juhan Road is proposed to create a safer intersection at the crossing point of access roads connecting to the horse parking to the west and to the bicycle parking to the east of Juhan Road.

Desired Parking Allotment for Proposed Park Facilities

<table>
<thead>
<tr>
<th>Facility</th>
<th>Parking Spaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mountain Bike Trailhead</td>
<td>60</td>
</tr>
<tr>
<td>Equestrian Trailhead</td>
<td>30</td>
</tr>
<tr>
<td>West Side Amenity Area</td>
<td>50</td>
</tr>
</tbody>
</table>
Native hardwood shade trees planted in islands or in close proximity to the parking lots will help to cool the expanse of asphalt paving. Overflow parking at the mountain bike parking area will consist of a gravel lot with approximately 25 spaces.

**Boat Access**

A reinforced turf drive access route off Juhan Road will allow maintenance vehicles transporting boats to briefly traverse the open lawn space to the multi-purpose trail and drive on it until reaching the boat access point at the river’s edge. An overlook will be designed with steps to allow access down to the river’s edge for launching or disembarking boats.

**Trail Network**

The following breakdown of trails and their distance totals have not been field verified and therefore do not reflect accurate lengths or locations. Total lengths of trails may increase from the amount shown on the plan. Wherever possible as much of the existing trail network will be utilized.

**Multi-Purpose Trail**

An asphalt-paved, 12’ wide, one-mile loop will be accessible from the west side of Yellow River parking lot, circulate through the existing open field area, along the river, and through a portion of the woodland area. Connected to the loop is a paved spur, which leads to the “shoals” area with an overlook deck structure (as mentioned above).

**Pedestrian Trail, East Side of River**

A natural surface trail network for pedestrian use only will occupy the entire eastern portion of the site. A northern loop consists of 2.7 miles of trails and a southern loop covers 2.5 miles. Both loops lead to an overlook area and connect in the middle of this eastern portion. Footbridges are located within the trail system to traverse swales that tend to hold water during rain events.

**Equestrian Trails**

Natural surfaced Equestrian Trails consist of two loops on either side of Juhan road. The western loop is 2.7 miles long and the eastern loop covers 2.4 miles. A majority of the equestrian trail system will be maintained in its current park configuration, with a few revisions needed to preserve natural features or to make connections to the new parking lot. Equestrian trails will be designated for both equestrian and pedestrian use.
Mountain Bike Trails

The natural surfaced Mountain Bike trail system encompasses areas on both the east and west side of Juhan road. East side trails total 2.7 miles and west side trails total 2.8 miles. Much of the existing network will be utilized in the new trail scheme. Portions of the trails that are too close to the river’s edge, have severe erosion problems, and/or are in conflict with other user groups will be relocated. (See Photo)

Wildlife Viewing Area/Meadow Restoration

The existing open field area west of Juhan Road in proximity of the current maintenance shed will be maintained as a wildlife viewing area and meadow restoration project. Strategic plant species choices will provide appropriate food and cover for fauna, as well as maximize visitors’ viewing experiences.

Council Ring

A council ring is proposed for the meadow restoration area west of Juhan Road. This circular structure would be made of stacked stone and positioned at the top of the slope just above the meadow. The intent of this structure is to provide an informal gathering place for picnics and an overlook for wildlife observation. Groups of naturalists may want to use this space as an outdoor classroom.

River Overlooks

River overlooks will provide opportunities for closer observation of the river and provide a place to rest and reflect. The overlooks will consist of elevated wooden deck structures, connected to land by wooden boardwalks and linked to the park trail system by trail.
spurs. The trail spurs will be either paved or of a natural surface material (depending on which trail system they connect to) and will provide single, controlled access points to the river. Sensitive design must be a consideration for these overlooks so as not to impact the natural conditions of the river’s edge more than necessary. The structures will require proper footing for under water conditions and for supporting the load of large groups. Benches or other seating should be integrated into the deck design to allow for riverside seating. (See Photo)

Pavilions

Three different types of pavilions are proposed for the park plan. The largest would be a 2800 SF rustic-style structure located at the main parking area east of Juhan Road; a medium 600 SF rustic-style pavilion is called out for the amenity area east of the river; and a smaller 400 SF covered shelter is slated for the group camping area. All three structures will be supported on concrete pads, contain picnic tables, outdoor grills and some type of security lighting.

Other Structures

Orientation kiosks will be placed at all four parking areas. These custom kiosks will be two-sided and can support interpretive site-specific information of that particular location on one side, and contain a park map detailing trail systems, hours of operation, park rules, and general information on the other side. Notifications of trail closing due to inclement
weather, scheduled maintenance work, or special events could also be posted at these locations.

**Playgrounds**

Two large play areas are sited in the park to help assure a constant flow of responsible adults during daylight hours able to observe the activity within the parking lot. The play areas would be located within 300 feet of the parking areas and restroom facilities, and be partially enclosed by stone or timber seatwalls. Playground equipment will include a variety of components that appeal to different age groups and will be in keeping with the naturalistic style of proposed architectural elements. Each of these areas will also support an open lawn space and groupings of shade trees.

**Restrooms and Changing Station**

The county standard restroom facility of an approximate 600 SF building is specified for three amenity area locations: the main parking lot east of Juhan Road, the parking area east of Yellow River and accessed by Spain Road, and the bicycle parking lot. The bicycle parking lot restroom facility will also service equestrian and group camping. The restroom is located at the far end of the parking lot for convenience to the camping area.

Also included at the bicycle parking area is a 200 SF changing station building for bicyclists to change in or out of riding clothes.

**Maintenance Area**

The proposed 1800 square foot maintenance facility building will house park-related equipment and storage, with space allocated for offices and restroom facilities. A gravel parking area adjacent to the building will be for staff vehicles only and this entire area will be secured with chain link fencing.

**Caretakers Residence**

A caretaker’s residence has been proposed for a site west of Juhan Road, on the fringes of the meadow restoration area and edge of an existing forest. The house will be tucked away for privacy with a gravel access drive perpendicular to Juhan Road. The drive will provide a high visibility location to park a police vehicle, establishing a presence of security.

**Utilities**

There are presently no utilities on site for park use. The addition of utility service to the park should be non-impacting to the site and existing utilities along Juhan Road should be buried to minimize the visual clutter. The water main on Juhan Road could be tapped into for providing service to new restroom facilities, drinking fountains, and hose bibs for watering horses or washing bikes. Conduit for electricity would also originate from Juhan
Road and connect to new facilities for power. Wastewater would be handled with new septic fields located in proximity to restroom buildings. Service to the amenity area facilities east of Yellow River would be provided from Spain Road.

**Furnishings**

In general furnishings will be spare and modest. Six benches on concrete pads are specified for the multi-purpose trail area.

Picnic tables will be provided, including four to six at the mid-sized pavilion on the east side of Yellow River, four at the covered shelter next to group camping, and an additional ten tables placed for individual picnicking within the multi-purpose trail/open field area.

Trash receptacles will be provided only where there is already vehicular access to pick up the trash. The parking areas, picnic facilities, playgrounds, group campsite, and spots along the 12’-wide multi-purpose trail would be the only areas with refuse pick-up service. Other areas would have signage to indicate a carry-in/carry-out trash policy.

**Signage**

Signage indicating entrances and parking areas will be placed strategically along Juhan Road to announce park entrance. Specially crafted signage will have to be designed for trail usage separation and to prevent user conflicts. Signage will be placed at intersections of all trails and strategically along longer stretches of single-use trails, approximately every 1000 feet. *(See Photo)*

![Existing Park Signage is Inadequate for Preventing User Conflicts](image)

**Perimeter Security**

There is evidence of unauthorized All Terrain Vehicle traffic and unauthorized access on the east side of the Yellow River. Proposed trails for this section of the park are for
pedestrian use only. It is our hope that an official access drive to this portion of land, clearly marked trails and the subsequent presence of pedestrians on trails, will discourage other types of use. A security gate will be installed at the Spain Road access point and locked at night. In addition, security gates will be installed at all entry points to the park: two for each drive off Juhan Road to the pavilion area parking lot; one for the boat drop off/pick up drive access to river; one for the equestrian parking loop; one for the bicycle parking lot; and one for the overflow parking area (past the bicycle parking lot).

**Landscape Management**

Landscape Management will consist of regular mowing of open turf areas, prescribed burns or mowing of the meadow on an annual basis and general maintenance of the campsite clearing.

**Forest Management**

Forest Management will consist of pruning or removing trees that obstruct trails, roadways and parking lots; threaten buildings and other structures; or interfere with any other type of circulation activity. Diseased trees should be monitored and removed if the spread cannot be controlled. Efforts to preserve healthy trees will be a high priority in all areas, as well as preservation and restoration of the understory woodland shrub layer.

**Streambank Stabilization**

Due to the frequent water level fluctuation and high volume capacity, many locations along the river corridor have scoured banks devoid of vegetation. Erosion is also a problem where trails are too close to the top of bank, requiring the establishment of a setback and buffer zone. Efforts to stabilize these slopes with bioengineering techniques and re-vegetating with native plant species should also be explored.

Assistance from volunteer groups or other resources for removal of invasive exotics such as privet and honey suckle should be explored. Reestablishing native plant material to replace what was eradicated should immediately follow removal efforts. Acquisition of native shrubs, ground cover and other understory plants could come from plant rescue efforts coordinated through organizations such as The Native Plant Society. *(See Photo)*
Park Expansion Opportunities

There is presently a portion of land on the south end of the park that is inaccessible due to a bend in the river and the close proximity of the present property line. Acquisition of the parcel just south of this would allow more room for trail expansion into this area, as well as potential future regional trail/greenway.

6.0 Alternate Development Concepts and Master Plan

A total of three alternative concept plans were explored and presented to the Steering Committee. Following this, a hybrid version to encompass all the desired elements was developed as the Preliminary Design Plan. After more refinement, the Final Master Plan was prepared.

Concept Plans A, B & C

All three concept plans (Illustrations E, F, G) represent the same overall program development but differ in terms of trail routing and distances; amenity and parking area locations; park entry locations; and bridge crossing points. Also explored was the possible realignment of Juhan Road.

The following comments and suggestions resulted from this meeting:

East Side of River

- Pedestrian only with no bridge crossing
- Plan B trail configuration
  - Allowing for additional future uses
  - Allowing for wildlife conservation with a wilderness experience with trail configuration to maximize habitat
- Plan B parking lot configuration (gravel drive & parking for 20-25 cars)

Interior Section of Park (West of River, East of Juhan Road)

- Amenity areas and parking as in Plan A
  (Except that vehicular access to equestrian parking shall be from Juhan Road, across from the group camping/bike parking drive, creating a 4-way stop)
- Water at Equestrian Parking Area
- Realignment of Juhan Road to straighten and create better sight-lines for safer crossing point at 4-way stop
- Access for equestrians to camping area
- Multi-Purpose Trail and Pavilion Area as in Plan A
- Multi-Purpose spur to shoals overlook, sensitive to streambank environment
- Gate off camping area so access is limited
- Equestrian Trails/Pedestrian Trails combined, as in Option C
- Beginner/Moderate Mountain Bike Trails
- Cross Country Course Loop (may use part of multi-purpose trail)
West Side of Park (West of Juhan Road)
- Plan C Trail Configuration
  - Equestrian Trails/Pedestrian Trails combined
  - Advanced Mountain Bike Trails

General Park Amenities to Consider:
- Advanced Signage System
- Kiosks at each parking zone

Concept A
- Not wise to segregate the trails like this
- Eliminates literally miles of bike trails presently at park
- Concern about clearing trees for pavilion area (for security)
- Trail totals for this option:
  - Pedestrian (3.4 miles + multi-purpose)
  - Equestrian (3.6 miles)
  - Bike (3.6 miles)

Concept B
- Joint use could occur between pedestrians and equestrians
- Trail totals for this option:
  - Pedestrian (8 miles + multi-purpose)
  - Equestrian (5 miles)
  - Bike (5.5-6 miles)

Concept C
- Bathroom facility needed near campground area
- Realignment of Juhan Road would come out of park budget, if included in this phase
- Trail totals for this option:
  - Pedestrian (6.2 miles + multi-purpose)
  - Equestrian (4.6 miles)
  - Bike (5.9 miles)

Preliminary Master Plan

The Preliminary Master Plan (Illustration H) was presented and received the following input from the steering committee and staff, (to be incorporated in the Final Master Plan):

- Make 12’ wide paved multi-purpose trail exactly one-mile long.
- Add pay phones and vending machines to amenity areas
- Add lighting from camping area to restroom building in bike parking lot
- Move restroom building closer to camping area
- Add speed bumps on Juhan Road at crossing points
• Maintain “bail out” for bikes crossing Juhan Road at north end of the park
• Have a multi-purpose trail spur connection to the bike and horse trails from the one-mile loop
• Add a security gate to the Spain Road access point
• Consider relocating equestrian trail segment that goes through the proposed meadow restoration area – erosion concerns
• Add another sub loop to bike trails west of Juhan Road
• Add another crossing point with speed bumps on Juhan Road for pedestrians at the main pavilion area
• Allow bike access from Rockbridge Road
• Widen driveway into group camping area (from 18’ to 24’)
• Add water fountains at all 4 amenity areas
• Add an overlook/council ring at the top of meadow restoration area
• Include a 20’ x 20’ shelter w/ 4 picnic tables to the group camping area
• Add a bike wash with a winterized valve box at the bicycle parking area
• Parking area at Spain Road should be paved, not gravel
• Try to reuse more of the existing bike and equestrian trails
• East side of Yellow River for pedestrians only

Also presented with the Preliminary Master Plan was a Preliminary Cost Estimate. The steering committee was informed of what various abbreviations stood for and the following information was confirmed:

• Phase 1 Construction Budget = $2.37 million.

• Construction Costs for an 8’ wide bridge across Yellow River = $675,000. Fee not justified for Phase 1, especially since it only connects pedestrian trails and would not service any other types of circulation. This might be a viable project in the future if bridge and supporting trails could connect to a much greater trail system, linking multiple park sites in Gwinnett County.

Final Master Plan:

Upon presentation of the Final Master Plan and the Final Cost Estimate, the following requests were made:

• Make one final adjustment to the equestrian trail layout (west of Juhan Road):
  o Move trail to top edge (outside) of meadow restoration area
  o Create a more generous secondary loop

• Why $9000 for landscaping at main pavilion area?
  o $4000 retained for parking lot shade trees
  o $5000 shifted to meadow restoration project:
    ▪ Establish perimeter understory habitat to attract birds
      • Mulberry, blueberry, dogwoods, etc.
• Annual mowing regime to rejuvenate meadow plants

• $6000 more can be shifted from costs associated with Pavilion Area:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$5000</td>
<td>for landscaping Pavilion Area</td>
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<tr>
<td>$6000</td>
<td>for clearing and grubbing</td>
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<tr>
<td>$11,000</td>
<td>Meadow Restoration Project</td>
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</table>

• Streambank Restoration – Restabilization Effort
  - Planting along river
    - Use $ for removing privet & adding native plants
  - Small budget item - implement w/ volunteer labor

<table>
<thead>
<tr>
<th>Cost</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>$2000</td>
<td>hardwood seedlings</td>
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<tr>
<td>$1000</td>
<td>mountain laurels</td>
</tr>
<tr>
<td>$3,000</td>
<td>River Trail Reforestation</td>
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</table>

○ After meeting with park police officers, staff requested that the final budget include additional security gates so that all entry points to the park could be locked. A total of seven security gates were included in the Final Cost Estimate, (Appendix C).

7.0 Development Budget Summary
(Italicized items are not included in Phase 1 Construction)

Phase 1 Construction will include rehabilitation and realignment of portions of existing equestrian and mountain bike trails for erosion control and to improve drainage. The construction of new trails will be needed in some locations, to increase safety by minimizing crossing point conflicts with other trail use types, to create linkage opportunities and to provide different challenge level experiences. Pedestrian use will be accommodated on the West side of Juhan Road with a minimal amount of new trail construction, making connections to equestrian trails for shared use. On the East side of Yellow River all trails will be for pedestrian use only. Factors for determining locations of new trails included topography, natural features, streambank preservation, linkage opportunities and ease of circulation. Designated crossing points with speed bumps on Juhan Road and security gates at park entrances have been included to increase safety. Footbridges and deck overlook structures have been incorporated to help traverse and/or observe water as a natural site feature. New signage will be an important component to the success of the trail network. Amenity areas with new parking lots have been tailored for specific user group activities and typically include an information kiosk, a restroom facility, drinking fountain, pavilion, picnic tables and a playground with seatwall.

Pavilion Area

The pavilion area comprises approximately thirty-four acres of the total park property and presently contains a large clearing with a gravel loop used for parking. This site will be
reconfigured to maintain a parking lot to be entered from Juhan Road. A reinforced turf driveway will be added to the north of this area, also off Juhan Road, for service vehicle access down to the river’s edge to load or unload boats. Security gates will be installed at all entry points. The main passive recreational element for this location will be a one-mile long, twelve-foot wide, paved, multi-purpose trail loop. Connectors from the trail loop will access the parking lot, an overlook on the river and the equestrian and bike trails south of this area. Landscaping for the parking lot, picnic tables, trash receptacles, an information kiosk and signage will also be included.

The ‘package deal’ grouping of a large pavilion, playground and restroom facility will be developed in a future phase of construction along with associated electrical, sewer and water service, a drinking fountain and septic field. A retaining seatwall connected to the playground, benches and an overlook/deck structure were also deducted. Demolition of existing structures in this area will be postponed.

Bicycle Parking Area

A new parking lot with an information kiosk, restroom, drinking fountain, bike wash and changing facilities will be constructed for mountain bikers. Access to the bicycle parking lot will be accommodated from a drive off Juhan Road. A maintenance compound and an overflow parking lot for campers will also be constructed in this area. An existing clearing further into the park site, that supports group camping, will be enhanced with the inclusion of a covered shelter and four picnic tables.

Equestrian Parking Area

An equestrian parking loop will be constructed west of Juhan Road in the narrow land parcel that was originally slated for property access. The access drive from Juhan Road to the to the loop will be paved and the loop is to be surfaced with gravel. The loop will accommodate approximately thirty vehicles with horse trailers and connect directly to equestrian trails. Also located here will be an information kiosk, signage and a hose bib for watering horses.

Spain Road Amenity Area

This amenity area will be accessed by a security-gated drive off Spain Road and will contain a parking lot for forty cars, a rustic pavilion structure, playground with seatwall, restroom facility, drinking fountain, information kiosk, signage, picnic tables, trash receptacles and landscaping.

Trails West of Juhan Road

A majority of existing bike and equestrian trails will be reused in this area. Some routing modifications will be made in order to enhance flow and for erosion control. Pedestrian use will be accomplished by a few connector links that tie into the equestrian network for shared use. A meadow restoration effort will take place in a clearing off Juhan Road,
which is presently maintained as a lawn. Also included are several footbridges for traversing a stream and swales, and signage.

_the 6’ wide pedestrian trail into the park from Rockbridge Road will be added in a future phase. Costs for the meadow restoration were adjusted and the council ring was omitted from this phase. Demolition of existing structures will also be postponed._

**Trails East of Juhan Road**

A majority of bike and equestrian trails will be reused in this location. Some adjustments will be made to decrease user conflict and to respect an adequate setback from the river’s edge. Trails will connect to the group camping area and to the new bicycle parking lot. Also included will be footbridges, an overlook structure on the river and signage.

**Trails East of Yellow River**

All trails on this side of the river will be for pedestrian use only. Also included are footbridges, signage and an overlook structure on the river.

*Secondary trail loop connections and a second overlook have been eliminated from this phase of construction.*

**Trails on Juhan Road**

Crosswalks with speed bumps will be added at three different locations along Juhan Road: for bike crossing at the north end of the park, for pedestrian crossing at the main pavilion parking area and for all types of user groups at the intersection for the new access road that goes to equestrian parking on the west side of Juhan Road to the bicycle parking on the east side of Juhan Road.

The potential realignment of a section of Juhan Road, to include bike lanes along Juhan Road within the park boundary, has been included in the total Master Plan budget, but not included in Phase 1 Construction.

**Prioritized list of items to be added back into the budget (if bids are low):**

- Restroom facility and associated utilities at the Pavilion Area (west of the river)
- Pavilion structure and playground at Pavilion Area (west of river)
- Realignment of Juhan Road (if not covered by GDOT)
- Council Ring/Overlook (west of Juhan Road)
COST ESTIMATE SUMMARY

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<th>Item</th>
<th>Total</th>
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<td>Spain Road Amenity Area</td>
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<td>Trails West of Juhan Road</td>
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<td>Trails East of Juhan Road (and west of river)</td>
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<td>Trails East of Yellow River</td>
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<td><strong>SUBTOTAL</strong></td>
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<td>Contingency (15%)</td>
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<td>L. Arch/Eng/Arch/Survey fees (12%)</td>
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<td><strong>TOTAL</strong></td>
<td><strong>$3,872,477</strong></td>
<td><strong>$2,367,505</strong></td>
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POTENTIAL ADDITIONAL CONSTRUCTION ITEMS $1,288,465

- Pedestrian bridge over river
- Bike lanes - Juhan Road (N. to Anniston Rd.)
- Caretaker Residence and Driveway
- Contingency, bonds, insurance, design fees

REVISED TOTAL $5,160,942 $2,367,505

A more detailed cost estimate is in the appendix.

Final Master Plan

The Final Master Plan *(Illustration 1)*, which incorporated all of the conclusive refinements, was presented to the Gwinnett County Recreation Authority on March 21, 2002 and to the Gwinnett County Board of Commissioners on April 16, 2002. There have been no further revisions to the plan.
Appendix A

Tabulation of Concerns from Yellow River Park Master Plan Public Meeting
<table>
<thead>
<tr>
<th>Concern/Issue/Suggestion</th>
<th>Times Mentioned</th>
<th>Priority First</th>
<th>Second</th>
<th>Third</th>
<th>Fourth</th>
<th>Fifth</th>
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<td>Mountain Bikes Ruin Natural Environment</td>
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Appendix B

Feasibility Study for a Pedestrian Bridge at Yellow River Park
Pond & Company
FEASIBILITY STUDY FOR A PEDESTRIAN BRIDGE AT YELLOW RIVER PARK

YELLOW RIVER MASTERPLAN GWINNETT COUNTY PARKS AND RECREATION DEPARTMENT

Prepared by

POND & COMPANY
2635 Century Parkway
Suite 800
Atlanta, GA 30345

February, 2002
PROJECT DESCRIPTION

Purpose
Yellow River Park, owned and operated by Gwinnett County’s Parks and Recreation Department, is composed of approximately 565 acres. The property is bisected by the Yellow River. It is currently used as a passive park with a network of trails for hiking, mountain biking, and equestrian use. The existing main trail parallels the river bank to the west of the Yellow River. Approximately 200 acres of the park lies to the east of the Yellow River and is inaccessible from the west as currently configured. Gwinnett County, as part of future planning for the park, proposes to construct a pedestrian bridge to span the river, thus opening the remainder of the park to public use. As directed by Gwinnett County, three (3) locations for the pedestrian bridge will be analyzed.

Site Location and Considerations
The Yellow River Park is located in the southern part of Gwinnett County near the Dekalb County line just west of Centerville, between Annistown Road and State Route 124. Juhan Road currently provides the only access to the park. Roughly one-third of the park area is to the east of the Yellow River. The existing topography is relatively steep, and much of the park is wooded.

Several important factors were evaluated in determining a suitable location for the proposed pedestrian bridge. These included accessibility to the site, existing terrain, and width of the river. The bridge needed to be centrally located to increase functionality for all users. The bridge also needed to be located in areas of moderate terrain to allow smooth transitions from the bridge to the proposed trails with minimal land disturbance. Finally, the width of the river proved to be the most important factor in regards to site placement of the bridge. Gwinnett County provided direction to setting the proposed bridge above the 100-year floodplain. As the Yellow River drains roughly one-third of Gwinnett County, the floodplain elevation proved to be the overriding factor for setting the locations for the pedestrian bridge.
PEDESTRIAN BRIDGE LOCATIONS/CONSIDERATIONS

Three (3) potential bridge locations have been identified (see Appendix A for actual locations and cross sections) as requested by Gwinnett County. Elevations for all bridges are at approximately 760’. The three options are summarized below:

1. **Option 1**  
   Location: Middle of the park approx. 14,000’ upstream of SR 124  
   Span Length: 360’ +/-

2. **Option 2**  
   Location: Southern end of park approx. 10,600’ upstream of SR 124  
   Span Length: 390’ +/-

3. **Option 3**  
   Location: Most southern end of the park approx. 9,300’ upstream of SR 124.  
   Span Length: 400’ +/-

**Floodplain Consideration**

Pond & Company evaluated the 100-year flood elevations at each of the three potential locations. Using the Federal Emergency Management Agency (FEMA) Flood Insurance Study of Gwinnett County (see Appendix B), dated July 20, 1998, approximate elevations for the 100-year flood were determined at each location. Using these elevations and developing cross-sections at each location, an approximate preliminary bridge deck elevation could be determined which would site the bridge structure above the 100-year flood plain. Once the preliminary bridge deck elevation was known, the approximate bridge length was calculated. For all three cases, it is assumed that the bridge deck elevation will be approximately 760 feet.

**Special Note**

It is important to point out that this elevation may increase or decrease depending on the actual structural type of bridge used, i.e., different bridge types have different truss depths, thus affecting the necessary bridge deck elevation. It would be most desirable to have the entire structure (decking and supports) above the flood plain. This could mean a difference of approximately 5’.

It is also important to point out that an actual Flood Study may be required during the design phase of the project in accordance with Gwinnett County’s regulations which includes updating the Flood Plain based on the 2020 land use map. This could have an impact on the elevation of the bridge. This could mean a difference of approximately 5’.

**Other Considerations**

Because of the passive type use of the park, land disturbance for construction of the bridge must be kept at a minimum to reduce any damaging affects on the nature of the park.
Initial information for the pedestrian bridge was discussed with Alan Miller (678-422-2729) with the Army Corp of Engineers (ACOE). He indicated that a permit from the ACOE will not be required as long as the supports for the bridge are not located within the river itself. Permits that would possibly need to be obtained if the supports are within the river may include Nationwide 14 (minor road crossings), Nationwide 18 (allows up to 25 cy of fill in water) and/or Nationwide 25. He mentioned that if the supports are within the floodplain, it would be advisable to have a biologist verify that there will be no impacts to wetlands for construction of the supports and abutments. He also indicated that FEMA permits will be required (no rise certification as a minimum). Alan also indicated that further information for the project during the design phase should be coordinated with Gary Craig (678-422-2728) who is Gwinnett County’s representative.
BRIDGE MATERIALS
The two most common types of materials used for construction of pedestrian bridges are timber and steel.

- Timber Construction – typical materials used for construction include pressure treated, no.1 or 2 grade, southern yellow pine timber. Several configurations are used for this material as seen below. Short spans of approximately 20’ are pile supported while longer spans use freespan glu-lam construction. Typical glu-lam freespans are approximately 80’ in length. Most long span construction (over 100’) uses a combination of pile supported and glu-lam methods. Because of the small span availability for this material, a timber bridge structure will require multiple supports for the bridge.

Pile Supported Timber
These bridges are supported at intervals by timber piles that have been mechanically driven into the ground. Pile supported bridges can be of any length, built to almost any height, and can be constructed from deck level to ensure minimal impact on the surrounding environment.

Freespan Glu-Lam
Freespan glu-lam bridges can be used in applications such as crossing sensitive ecological areas, heavy water flow situations, roadways or railways. York Bridge Concepts incorporates the use of glue laminated beams to create longer freespan bridges.

Combination Pile Supported / Freespan
Our professional design department can combine pile supported bridges with freespan sections (timber or glu-lam) to allow for greater spans and more custom applications. This cost-saving construction method allows for affordable road & large river crossings for vehicles and pedestrians.

Freespan Timber
A freespan timber design allows the use of timber crossings in areas where pile supported structures are prohibited or impractical. Timber freespan bridges are a more economical alternative to freespan glu-lam structures when the spanning distance is 26 feet or less.
Steel Construction – Typical materials used for construction include galvanized steel. Several configurations are used for this material as seen below. These steel premanufactured bridges can be custom fabricated with spans ranging from 50’ up to 200’. The steel bridges are shipped in 70’ sections due to transportation restrictions and are “spliced together” at the site for desired span conditions. It is important to point out that the longer the span the heavier the lifting crane required for installation. Because of the long free spans, construction access if an important factor in the construction process. Typical truss support configurations include:

- **LINK STYLE BRIDGE**
  - “X” FRAMING TRUSS SUPPORT

- **CAPSTONE BRIDGE**
  - MODIFIED “BOW” TRUSS SUPPORT

- **KEYSTONE BRIDGE**
  - “BOW” FRAMING TRUSS SUPPORT

- **CABLE STAYED**
  - CABLE SUPPORTS
**Decking**
There are several types of decking materials that are used for the surface of the bridge. These include asphalt, recycled material, concrete, and timber to name a few. However, the most widely used materials used for pedestrian bridges are either concrete or timber. Concrete is the most durable and maintenance free of the two materials while timber decking gives a rustic feel for the bridge and is a must for bridges where equestrian uses are anticipated.

**Supports**
Supports for the pedestrian bridges are typically concrete. If aesthetics are an issue, the concrete foundations can be covered with a granite stone facing. Driven piles can also be used if access to the site can be obtained by pile driving equipment.

**Handrails**
Because of the potential varying use for the bridge, handrail type and height should be considered during the design portion for the project. Typical handrail installation height for pedestrian use is 42”, bicycle use is 54”, and equestrian use is 66”. Safety rails for the bridge may include horizontal and vertical picket type railings. Chain-link fencing may be even considered for additional safety.
One of the most important aspects of the project is accessibility of equipment to the proposed construction site. As the park is heavily wooded, consists of steep grades, and has no existing roads leading to any potential site, access will be difficult. Despite the desire to keep land disturbance to a minimum, it will almost certainly be necessary to create some type of construction access to the site. This will entail clearing, grubbing, and moderate grading for a temporary access road to the proposed bridge site. This temporary road will need to provide access to construction workers, general construction equipment, concrete trucks, and cranes. Depending on the type of free span for the bridge and method chosen for installation of the spans, a temporary construction road would vary with widths of 10’-20’ (15’-30’ of clearance). It would be anticipated that this temporary road could be re-landscaped and restored to a trail after construction to limit its visual impact, while still serving the purpose of access to the bridge.

The critical task of construction will be lifting the bridge spans into place. The larger the freespan, the larger the equipment needed to place it. Construction methods can vary from cranes of different sizes to even helicopters or barges (although it appears that the depth of flow of the river would not support barge installation). Typical lifting capacities of a helicopter are approximately 35,000 lbs to 50,000 lbs.

The bridge sections can be shipped via truck at 70’ section lengths to the site from the manufacturer. These 70’ section lengths would then be spliced together in the field for the desired span. Typical delivery time ranges from 12 to 14 weeks.
YELLOW RIVER BRIDGE

Initially, it was assumed (through conversations with Gwinnett County staff) that the bridge width would be a minimum of 12 feet. Due to the height of the bridge above the water surface, its length, and the possibility of equestrian and light traffic use, 12 feet appeared to be the most desirable width. Such a bridge would have higher handrails for horses and cyclists, and could support an occasional light vehicle for maintenance and emergencies.

After initially discussing the preliminary costs for the 12’ bridge with Gwinnett County staff, Pond was directed to look into a bridge width of 5 feet. After further investigations and conversations with manufacturer’s representatives, we concluded the following: As a rule, the maximum length to width ratio for a bridge of the magnitude is 20:1. A 5-ft wide bridge would limit the maximum span length to 100 feet. As it is assumed that a span of 400 feet will have to be cleared, additional pilings, foundations, and supports would be necessary for a 5-ft wide bridge. Additionally, due to its narrowness, the bridge members would have to be enlarged and stiffened to prevent swaying, increasing the costs of the bridge. With this information along with discussions with representatives from premanufactured bridge companies, it was determined that a width of 8 feet would be most cost efficient and could include spans of 100’ as well as 200’. An 8-ft bridge would be strictly for pedestrian use only.
YELLOW RIVER BRIDGE COSTS

The costs for pedestrian bridges can vary widely depending on the type, size, length of the bridge, availability of construction access, and construction methods. The following is a breakdown of preliminary construction costs for pedestrian bridges by material, length, and width. See appendix C for budgetary quotes from the manufacturer.

Timber Pedestrian Bridge (12’ wide x 400’ long – 16-20’ spans with 1-80’ span)
Construction Access: $40,000 (incl. clearing, grading, erosion control, maintenance, restoration-both side of river)
Bridge/Decking Material: $402,250 (incl. 7% tax, 10% mark-up, 10% contingency)
Installation Cost: $150,000 (incl. erection, placement, abutments, 17 supp.)
TOTAL COST: $592,250 ($600,000)

Cable Stayed Steel Bridge (12’ wide x 400’ long – 2-200’ spans – 1-135’ high tower)
Construction Access: $75,000 (incl. clearing, grading, erosion control, maintenance, restoration-both sides of river)
Bridge/Decking Material: $542,314 (incl. 7% tax, 10% mark-up, 10% contingency)
Installation Cost: $255,000 (incl. erection, placement, abutments, 1 support)
TOTAL COST: $872,314 ($875,000)

Steel Bridge Framing (8’ wide x 400’ long – 1-200’ span with 2-100’ spans)
Construction Access: $60,000 (incl. clearing, grading, erosion control, maintenance, restoration – both sides of river)
Bridge/Decking Material: $403,110 (incl. 7% tax, 10% mark-up, 10% contingency)
Installation Cost: $210,000 (incl. erection, placement, abutments, 2 supports)
TOTAL COST: $673,110 ($675,000)
CONSTRUCTION COST FOR OTHER PEDESTRIAN BRIDGES

- **Pedestrian Bridge at Canoe/Kayak Venue, Ocoee, TN**
  - Bridge Manufacturer: Steadfast Bridge
  - Date of Construction: 1995/1996
  - Bridge Dimensions: 10’ wide x 336’ long
  - Total Costs: Approx. $1.1 million
  - Other Information: Cable stayed design

- **Pedestrian Bridge at Life College, Marietta, GA**
  - Bridge Manufacturer: Steadfast Bridge
  - Date of Construction: 1997
  - Bridge Dimensions: 10’ wide x 310’ long
  - Bridge Material Costs: $125,000-$150,000
  - Installation/Incidental Costs: $275,000-$350,000
  - Total Costs: $400,000-$500,000

- **Pedestrian Bridge at Hemphill Knob, Blue Ridge Parkway National Park, Ashville, NC**
  - Date of Construction: 1998 (approx.)
  - Bridge Dimensions: 8.5’ wide x 180’ long (built in 3 sections)
  - Total Costs: over $200,000

- **Pedestrian Bridge at Fisher Peak, Blue Ridge Parkway National Park, Galax, VA**
  - Date of Construction: 1997/1998
  - Bridge Dimensions: 8’ wide x 110’ long (built in 3 sections)
  - Total Costs: over $200,000
  - Other Information: Galvanized steel frame, wood deck, concrete supports, stone veneer

- **Pedestrian Bridge at the Riverwalk for the City of Chattanooga, TN**
  - Bridge Manufacturer: Steadfast Bridge
  - Date of Construction: 1998/1999
  - Bridge Dimensions: 8’ (approx.) wide x 210’ long (built in 3/4 sections)
  - Total Costs: over $300,000
  - Other Information: Built over a tributary to the Tennessee River
    Steel bridge with concrete decking
Appendix C

Cost Estimate
# YELLOW RIVER MASTER PLAN

**The Jaeger Company** 03.21.02

## FINAL COST ESTIMATE - PHASE 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Quantity</th>
<th>Total</th>
<th>Phase 1</th>
</tr>
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<tbody>
<tr>
<td><strong>Pavilion Area</strong></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Multi-use trail (12’ wide asphalt)</td>
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<td>Asphalt drive/parking</td>
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<td>2,778</td>
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<td>Reinforced Turf (staff vehicle access to river)</td>
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<td>$3</td>
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<td>Security Gates for pkg. lot &amp; staff access to river</td>
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<td>Striping (50 spaces)</td>
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<td>Curb &amp; gutter (east side of pkg lot)</td>
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<td>8' wide paved connectors to 12' trail</td>
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<td>Playground</td>
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<td>Rustic pavilion structure (48’ x 60”)</td>
<td>SF</td>
<td>$50</td>
<td>2,880</td>
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<td>Picnic tables</td>
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<td>$1,000</td>
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<td>$10,000</td>
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<td>Bench on concrete pad</td>
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<td>EA</td>
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<td>Restrooms (24’ x 24’);</td>
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<td>576</td>
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<td>Grading (includes multi-purpose trail)</td>
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<td>Turf area (hydro-seeded)</td>
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<td>Vegetate swale/stormwater mgt.</td>
<td>LF</td>
<td>$8</td>
<td>400</td>
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<td>$3,200</td>
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<tr>
<td>Electricity/Conduit</td>
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<td>350</td>
<td>$4,200</td>
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<td>Water Service</td>
<td>LF</td>
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<td>350</td>
<td>$7,700</td>
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<td>EA</td>
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<td>$1,750</td>
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<tr>
<td>Sewer Waste Service, Septic Field</td>
<td>LS</td>
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<tr>
<td>Signage (park entrance)</td>
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<td>$1,200</td>
<td>1</td>
<td>$1,200</td>
<td>$1,200</td>
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<td>Signage (trails)</td>
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<td>$300</td>
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<td>$1,500</td>
<td>$1,500</td>
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<tr>
<td>Demolition/removal of existing structures</td>
<td>LS</td>
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<td>1</td>
<td>$30,000</td>
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<tr>
<td><strong>TOTAL</strong></td>
<td></td>
<td></td>
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<td>$631,583</td>
<td>$244,963</td>
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</table>

| **Bicycle Parking Area**                                            |      |            |          |         |         |
| Asphalt drive/parking                                              | SY   | $18        | 3,558    | $64,044 | $64,044 |
| Striping (55 spaces)                                               | LF   | $2         | 990      | $1,980  | $1,980  |
| Curb & gutter (around islands)                                     | LF   | $14        | 184      | $2,576  | $2,576  |
| Gravel drive/parking                                               | SY   | $14        | 3,496    | $48,944 | $48,944 |
| Restroom (24’ x 24’)                                               | SF   | $90        | 576      | $51,840 | $51,840 |
| Changing station (10’ x 20’)                                       | SF   | $60        | 100      | $6,000  | $6,000  |
| Maintenance building (30’ x 60’)                                   | SF   | $55        | 1,800    | $99,000 | $99,000 |
| Chain link fencing around maint. area                              | LF   | $16        | 350      | $5,600  | $5,600  |
| Security Gates @ Juhan Road & overflow pkg.                        | EA   | $1,800     | 2        | $3,600  | $3,600  |
| Clearing and grubbing                                              | AC   | $3,000     | 1        | $3,000  | $3,000  |
| Kudzu control                                                      | LS   | $2,500     | 1        | $2,500  | $2,500  |
| Grading                                                            | LS   | $7,500     | 1        | $7,500  | $7,500  |
| Erosion Control                                                    | LS   | $5,300     | 1        | $5,300  | $5,300  |
| Vegetate swale/stormwater mgt.                                     | LF   | $8         | 200      | $1,600  | $1,600  |
| Orientation Kiosk                                                 | EA   | $5,000     | 1        | $5,000  | $5,000  |
| Electricity/Conduit                                                | LF   | $12        | 600      | $7,200  | $7,200  |
## FINAL COST ESTIMATE - PHASE 1

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Quantity</th>
<th>Total</th>
<th>Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Service</td>
<td>LF</td>
<td>$22</td>
<td>600</td>
<td>$13,200</td>
<td>$13,200</td>
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<td>Water Fountain</td>
<td>EA</td>
<td>$1,750</td>
<td>1</td>
<td>$1,750</td>
<td>$1,750</td>
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<tr>
<td>Bike Wash w/ winterized valve box</td>
<td>EA</td>
<td>$500</td>
<td>1</td>
<td>$500</td>
<td>$500</td>
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<tr>
<td>Sewer Waste Service, Septic Field</td>
<td>EA</td>
<td>$5,000</td>
<td>2</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Signage (park entrance)</td>
<td>EA</td>
<td>$1,200</td>
<td>1</td>
<td>$1,200</td>
<td>$1,200</td>
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<tr>
<td>Covered shelter at campsite area (20' x 20')</td>
<td>SF</td>
<td>$30</td>
<td>400</td>
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<td>Picnic tables</td>
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<td>$4,000</td>
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<td><strong>TOTAL</strong></td>
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### Equestrian Parking Area

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<th>Quantity</th>
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<th>Phase 1</th>
</tr>
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<tbody>
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<td>Asphalt drive</td>
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<td>1,965</td>
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<td>Gravel parking</td>
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<td>2,380</td>
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<td>Security Gate @ Juhan Road entrance</td>
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<td>$1,800</td>
<td>$1,800</td>
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<td>Water Service (hose bibb)</td>
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<td>1</td>
<td>$1,750</td>
<td>$1,750</td>
</tr>
<tr>
<td>Clearing and grubbing</td>
<td>AC</td>
<td>$3,000</td>
<td>1</td>
<td>$3,000</td>
<td>$3,000</td>
</tr>
<tr>
<td>Orientation Kiosk</td>
<td>EA</td>
<td>$5,000</td>
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<td>$5,000</td>
<td>$5,000</td>
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<tr>
<td>Grading</td>
<td>LS</td>
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<tr>
<td>Erosion Control</td>
<td>LS</td>
<td>$3,800</td>
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<td>$3,800</td>
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<tr>
<td>Signage (park entrance)</td>
<td>EA</td>
<td>$1,200</td>
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<td>$1,200</td>
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### Spain Road Amenity Area

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<th>Quantity</th>
<th>Total</th>
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<td>Asphalt drive</td>
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<td>$1,800</td>
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<td>Rustic pavilion structure (20' x 30')</td>
<td>SF</td>
<td>$50</td>
<td>600</td>
<td>$30,000</td>
<td>$30,000</td>
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<tr>
<td>Picnic tables</td>
<td>EA</td>
<td>$1,000</td>
<td>5</td>
<td>$5,000</td>
<td>$5,000</td>
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<tr>
<td>Trash receptacle on concrete pad</td>
<td>EA</td>
<td>$300</td>
<td>4</td>
<td>$1,200</td>
<td>$1,200</td>
</tr>
<tr>
<td>Restrooms (24' x 24')</td>
<td>SF</td>
<td>$90</td>
<td>576</td>
<td>$51,840</td>
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<tr>
<td>Playground</td>
<td>SF</td>
<td>$10</td>
<td>9,793</td>
<td>$97,930</td>
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<tr>
<td>Retaining/Seatwall</td>
<td>LF</td>
<td>$25</td>
<td>3,750</td>
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<tr>
<td>Clearing and grubbing</td>
<td>AC</td>
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<td>3</td>
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<tr>
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<td>LS</td>
<td>$12,800</td>
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<tr>
<td>Erosion Control</td>
<td>LS</td>
<td>$7,800</td>
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<td>Shade Trees/landscaping</td>
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<td>$4,000</td>
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<tr>
<td>Turf area</td>
<td>AC</td>
<td>$3,500</td>
<td>3</td>
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<tr>
<td>Vegetate swale/stormwater mgt.</td>
<td>LF</td>
<td>$8</td>
<td>300</td>
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<td>Electricity/Conduit</td>
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<td>$12</td>
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<td>$22</td>
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<td>Water Fountain</td>
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<td>Sewer Waste Service, Septic Field</td>
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<td>Signage (park entrance)</td>
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<tr>
<td><strong>TOTAL</strong></td>
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### Trails West of Juhan Road

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Quantity</th>
<th>Total</th>
<th>Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle trail (new 40%)</td>
<td>LF</td>
<td>$10</td>
<td>5,911</td>
<td>$59,110</td>
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<tr>
<td>existing trail restoration (22%)</td>
<td>LF</td>
<td>$5</td>
<td>3,050</td>
<td>$15,250</td>
<td>$15,250</td>
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<tr>
<td>Equestrian trail (new 33%)</td>
<td>LF</td>
<td>$10</td>
<td>4,100</td>
<td>$41,000</td>
<td>$41,000</td>
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<tr>
<td>existing trail restoration (33%)</td>
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<td>$5</td>
<td>4,213</td>
<td>$21,063</td>
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## FINAL COST ESTIMATE - PHASE 1

<table>
<thead>
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<th>Item</th>
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<th>Quantity</th>
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<th>Phase 1</th>
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<tbody>
<tr>
<td>Pedestrian trail (to Rockbridge Road)</td>
<td>LF</td>
<td>$15</td>
<td>1,900</td>
<td>$28,500</td>
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<tr>
<td>Miscellaneous Erosion Control, trail repair</td>
<td>LS</td>
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<td>Meadow restoration</td>
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<td>$4,800</td>
<td>6</td>
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<td>$11,000</td>
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<td>Picnic area/council ring</td>
<td>LS</td>
<td>$7,500</td>
<td>1</td>
<td>$7,500</td>
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<tr>
<td>Foot bridges</td>
<td>EA</td>
<td>$4,600</td>
<td>5</td>
<td>$23,000</td>
<td>$23,000</td>
</tr>
<tr>
<td>Signage (trails)</td>
<td>EA</td>
<td>$300</td>
<td>15</td>
<td>$4,500</td>
<td>$4,500</td>
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<tr>
<td>Demolition/removal of existing structures</td>
<td>LS</td>
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<td>1</td>
<td>$30,000</td>
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### Trails East of Juhan Road

<table>
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<th>Quantity</th>
<th>Total</th>
<th>Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bicycle trail (new 57%)</td>
<td>LF</td>
<td>$10</td>
<td>8,879</td>
<td>$88,790</td>
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<td>existing trail restoration (6%)</td>
<td>LF</td>
<td>$5</td>
<td>820</td>
<td>$4,100</td>
<td>$4,100</td>
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<tr>
<td>Equestrian trail (new 33%)</td>
<td>LF</td>
<td>$10</td>
<td>4,133</td>
<td>$41,330</td>
<td>$41,330</td>
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<td>existing trail restoration (11%)</td>
<td>LF</td>
<td>$5</td>
<td>1,378</td>
<td>$6,890</td>
<td>$6,890</td>
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<tr>
<td>Pedestrian trail</td>
<td>LF</td>
<td>$8</td>
<td>750</td>
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<tr>
<td>Overlook - deck structure</td>
<td>EA</td>
<td>$10,000</td>
<td>1</td>
<td>$10,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Foot bridges</td>
<td>EA</td>
<td>$4,600</td>
<td>5</td>
<td>$23,000</td>
<td>$23,000</td>
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<tr>
<td>Signage (trails)</td>
<td>EA</td>
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<td>16</td>
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### Trails East of Yellow River

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<th>Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian trail - primary trails</td>
<td>LF</td>
<td>$8</td>
<td>19,878</td>
<td>$159,024</td>
<td>$159,024</td>
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<tr>
<td>secondary trails/loops, connections</td>
<td>LF</td>
<td>$8</td>
<td>7,575</td>
<td>$60,600</td>
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<tr>
<td>Overlook - deck structure</td>
<td>EA</td>
<td>$10,000</td>
<td>2</td>
<td>$20,000</td>
<td>$10,000</td>
</tr>
<tr>
<td>Foot bridge</td>
<td>EA</td>
<td>$4,600</td>
<td>1</td>
<td>$4,600</td>
<td>$4,600</td>
</tr>
<tr>
<td>Signage (trails)</td>
<td>EA</td>
<td>$300</td>
<td>10</td>
<td>$3,000</td>
<td>$3,000</td>
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<td><strong>TOTAL</strong></td>
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<td>$247,224</td>
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### Trails on Juhan Road

<table>
<thead>
<tr>
<th>Item</th>
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<th>Unit Price</th>
<th>Quantity</th>
<th>Total</th>
<th>Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of asphalt</td>
<td>SY</td>
<td>$15</td>
<td>2,000</td>
<td>$30,000</td>
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</tr>
<tr>
<td>Grading</td>
<td>LS</td>
<td>$23,000</td>
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<td>$23,000</td>
<td></td>
</tr>
<tr>
<td>Realignment of Juhan Road</td>
<td>LF</td>
<td>$95</td>
<td>1,700</td>
<td>$161,500</td>
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</tr>
<tr>
<td>Bike lanes - (within park)</td>
<td>LF</td>
<td>$35</td>
<td>9,800</td>
<td>$343,000</td>
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</tr>
<tr>
<td>Crosswalk treatment/traffic calming devices</td>
<td>LS</td>
<td>$10,100</td>
<td>1</td>
<td>$10,100</td>
<td>$10,100</td>
</tr>
<tr>
<td>Pedestrian crossing Juhan Road (pavilion area)</td>
<td>LS</td>
<td>$4,800</td>
<td>1</td>
<td>$4,800</td>
<td>$4,800</td>
</tr>
<tr>
<td>Bike crossing Juhan Road (north end of park)</td>
<td>LS</td>
<td>$4,800</td>
<td>1</td>
<td>$4,800</td>
<td>$4,800</td>
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<td><strong>TOTAL</strong></td>
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<td></td>
<td></td>
<td>$577,200</td>
<td>$19,700</td>
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</table>

### SUBTOTAL

- **$2,792,684** $1,694,164
- **CONTINGENCY (15%)** $418,903 $254,125
- **INSURANCE, BONDS, OTHER FEES (10%)** $279,268 $169,416
- **L.Arch./Eng./Arch./Survey Fees (12%)** $335,122 $203,300
- **MASTER PLANNING FEE** $26,500 $26,500
- **MAINTENANCE EQUIPMENT** $20,000 $20,000
- **TOTAL** $3,872,476 $2,367,504

### POTENTIAL ADDITIONAL CONSTRUCTION ITEMS

<table>
<thead>
<tr>
<th>Item</th>
<th>Unit</th>
<th>Unit Price</th>
<th>Quantity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pedestrian bridge over river</td>
<td>LS</td>
<td>$675,000</td>
<td>1</td>
<td>$675,000</td>
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<tr>
<td>Bike lanes - Juhan Road (N. to Anniston Rd.)</td>
<td>LF</td>
<td>$35</td>
<td>4750</td>
<td>$166,250</td>
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<tr>
<td>Caretaker Residence</td>
<td>LS</td>
<td>$125,000</td>
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<td>$125,000</td>
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<tr>
<td>Gravel driveway (to caretaker residence)</td>
<td>SY</td>
<td>$14</td>
<td>180</td>
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<td><strong>SUBTOTAL</strong></td>
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<td>$968,770</td>
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### FINAL COST ESTIMATE - PHASE 1

<table>
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<th>Item</th>
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<th>Unit Price</th>
<th>Quantity</th>
<th>Total</th>
<th>Phase 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CONTINGENCY (15%)</td>
<td></td>
<td></td>
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<td>$145,316</td>
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<tr>
<td>INSURANCE, BONDS, OTHER FEES (10%)</td>
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<tr>
<td>L.ARCH./ENG./ARCH./ FEES (8%)</td>
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<td>$77,502</td>
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**REVISED TOTAL**

$5,160,940  $2,367,504
PLANT COMMUNITIES

- OAK HICKORY FOREST
- BLUFF SLOPE RAVINE FOREST
- BOTTOMLAND/FLOODPLAIN FOREST
- SUCCESSIONAL FOREST
- PINE DIEBACK
Trail/Soil Suitability

- PfC2: High to Moderate
- PfC2: Low

Building Site Suitability

- PfC2: High to Moderate
- PfC2: Low
<table>
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<tr>
<th>Soil Name</th>
<th>Depth to hard rock</th>
<th>Depth to seasonally high water table</th>
<th>Depth from surface</th>
<th>Classification</th>
<th>USDA Texture</th>
<th>Percentage No. 4</th>
<th>Passing Sieve No. 10 No. 200</th>
<th>Permeability</th>
<th>Reaction</th>
<th>Shrink-swell potential</th>
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<tbody>
<tr>
<td>Appling (AmB2, AmC2, AnC2)</td>
<td>&gt;8</td>
<td>&gt;50</td>
<td>0-10</td>
<td>Sandy loam</td>
<td>95-100</td>
<td>95-100</td>
<td>20-35</td>
<td>2.0-6.3</td>
<td>4.5-5.0</td>
<td>Low</td>
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<tr>
<td></td>
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<td>10-24</td>
<td>Sandy clay loam</td>
<td>90-100</td>
<td>98-100</td>
<td>50-60</td>
<td>0.8-2.5</td>
<td>4.5-5.0</td>
<td>Moderate</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>24-42</td>
<td>Sandy loam</td>
<td>95-100</td>
<td>95-100</td>
<td>60-75</td>
<td>0.2-0.8</td>
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<tr>
<td>Buncombe (Bfs)</td>
<td>&gt;6</td>
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<td>Loamy fine sand</td>
<td>100</td>
<td>98-100</td>
<td>20-30</td>
<td>5.0-10.0</td>
<td>4.5-5.0</td>
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<td>12-74</td>
<td>Loamy fine sand</td>
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<td>5.0-10.0</td>
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<td>Low</td>
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<tr>
<td>Chewacla (Cfs)</td>
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<td>0-6</td>
<td>Silt loam</td>
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<td>95-100</td>
<td>45-55</td>
<td>0.6-2.0</td>
<td>4.5-5.0</td>
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<td>6-28</td>
<td>Silty clay loam</td>
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<td>50-65</td>
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<td>95-100</td>
<td>50-70</td>
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<tr>
<td>Congaree (Cng, Cos, Cus)</td>
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<td>95-100</td>
<td>50-60</td>
<td>0.63-2.0</td>
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<td></td>
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<td>40-52</td>
<td>Sandy clay loam</td>
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<td>95-100</td>
<td>50-60</td>
<td>0.63-2.0</td>
<td>5.1-5.5</td>
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<tr>
<td>Davidson (Dgb2, Dgc2, DhB2, DhC2, DhD2)</td>
<td>&gt;10</td>
<td>&gt;60</td>
<td>0-6</td>
<td>Loam</td>
<td>95-100</td>
<td>95-100</td>
<td>50-65</td>
<td>2.5-5.0</td>
<td>4.5-5.0</td>
<td>Low</td>
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<td></td>
<td>6-52</td>
<td>Clay loam or clay</td>
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<td>95-100</td>
<td>65-85</td>
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<tr>
<td>Durham (DiB)</td>
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<td>&gt;36</td>
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<td>Sandy loam</td>
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<td>95-100</td>
<td>20-40</td>
<td>2.0-6.0</td>
<td>5.6-6.0</td>
<td>Low</td>
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<td>12-44</td>
<td>Sandy clay loam or clay</td>
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<td>100</td>
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<td>44-59</td>
<td>Sandy clay loam</td>
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<td>100</td>
<td>40-55</td>
<td>2.5-5.0</td>
<td>4.5-5.0</td>
<td>Moderate to low</td>
</tr>
<tr>
<td>Gwinnett (GeB2, GeC2, GeE2, GgB2, GgC2, GgE2)</td>
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<td>&gt;60</td>
<td>0-7</td>
<td>Loam</td>
<td>95-100</td>
<td>85-100</td>
<td>20-40</td>
<td>2.5-5.0</td>
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<td>7-35</td>
<td>Clay</td>
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<td>95-100</td>
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<td>Clay loam</td>
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<td>95-100</td>
<td>55-75</td>
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<td>Fractured rock</td>
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</tr>
<tr>
<td>Louisville (Ldd, Ldf, LnC, LnE)</td>
<td>1 1/2 -4</td>
<td>&gt;60</td>
<td>0-6</td>
<td>Loamy sand</td>
<td>50-100</td>
<td>35-95</td>
<td>10-30</td>
<td>5.0-10.0</td>
<td>5.1-5.5</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>13-29</td>
<td>Sandy loam</td>
<td>95-100</td>
<td>95-100</td>
<td>40-50</td>
<td>2.0-6.3</td>
<td>5.1-5.5</td>
<td>Low</td>
</tr>
<tr>
<td>Madison (Mnb2, Mnc2, MinB2, MiC2, MID2, MIF2)</td>
<td>&gt;10</td>
<td>&gt;60</td>
<td>0-6</td>
<td>Gravelly sandy loam</td>
<td>90-100</td>
<td>85-100</td>
<td>25-50</td>
<td>2.5-5.0</td>
<td>5.1-5.5</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6-10</td>
<td>Clay loam</td>
<td>95-100</td>
<td>95-100</td>
<td>40-60</td>
<td>0.6-2.0</td>
<td>5.1-5.5</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>10-23</td>
<td>Sandy clay</td>
<td>95-100</td>
<td>85-100</td>
<td>70-80</td>
<td>0.6-2.0</td>
<td>5.1-5.5</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>23-29</td>
<td>Sandy clay loam</td>
<td>95-100</td>
<td>95-100</td>
<td>40-60</td>
<td>2.0-6.0</td>
<td>5.1-5.5</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>29-90</td>
<td>Weathered mica schist</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Musella (Mcd, Mcf)</td>
<td>&gt;8</td>
<td>&gt;60</td>
<td>0-6</td>
<td>Cobbly loam</td>
<td>80-85</td>
<td>60-70</td>
<td>30-40</td>
<td>0.8-2.5</td>
<td>5.1-5.5</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6-15</td>
<td>Clay</td>
<td>70-85</td>
<td>70-85</td>
<td>60-70</td>
<td>0.8-2.5</td>
<td>5.1-5.5</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>15-60</td>
<td>Broken rock</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Pacolet (Pfb2, Pfc2, PgB2, PgC2, PgD2, PgE2, PfF)</td>
<td>&gt;6</td>
<td>&gt;60</td>
<td>0-8</td>
<td>Sandy loam</td>
<td>90-100</td>
<td>80-95</td>
<td>35-50</td>
<td>2.5-5.0</td>
<td>5.1-5.5</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>8-26</td>
<td>Clay</td>
<td>95-100</td>
<td>90-100</td>
<td>55-75</td>
<td>0.8-2.5</td>
<td>5.1-5.5</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>26-34</td>
<td>Sandy clay loam</td>
<td>95-100</td>
<td>90-100</td>
<td>50-70</td>
<td>0.8-2.5</td>
<td>5.1-5.5</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>34-48</td>
<td>Sandy loam</td>
<td>95-100</td>
<td>90-100</td>
<td>40-50</td>
<td>2.0-6.0</td>
<td>5.1-5.5</td>
<td>Low</td>
</tr>
<tr>
<td>Wehadkee (Wed)</td>
<td>&gt;10</td>
<td>0-15</td>
<td>0-6</td>
<td>Silt loam</td>
<td>100</td>
<td>100</td>
<td>60-75</td>
<td>0.6-2.0</td>
<td>4.5-6.0</td>
<td>Moderate to low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>6-40</td>
<td>Silty clay loam</td>
<td>100</td>
<td>100</td>
<td>80-90</td>
<td>0.6-2.0</td>
<td>4.5-6.0</td>
<td>Moderate</td>
</tr>
<tr>
<td>Wickham (Wgb2, Wgc2)</td>
<td>&gt;10</td>
<td>35</td>
<td>0-7</td>
<td>Sandy loam</td>
<td>95-100</td>
<td>95-100</td>
<td>25-30</td>
<td>2.5-6.0</td>
<td>4.5-5.0</td>
<td>Low</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>7-21</td>
<td>Clay loam</td>
<td>95-100</td>
<td>95-100</td>
<td>50-60</td>
<td>0.8-2.5</td>
<td>4.5-5.0</td>
<td>Moderate</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>21-62</td>
<td>Clay loam to clay</td>
<td>95-100</td>
<td>95-100</td>
<td>50-70</td>
<td>0.6-2.5</td>
<td>4.5-5.0</td>
<td>Moderate</td>
</tr>
</tbody>
</table>
SHOALS EQUESTRIAN PARKING CLEARING/CAMPING AREA

RECENT COUNTY LAND ACQUISITION, POTENTIAL ACCESS POINT

POTENTIAL ACCESS TO SITE TRAIL CONVERGENCE HIGH IMPACT AREA UNDOCUMENTED PEDESTRIAN TRAILS POTENTIAL NEIGHBORHOOD CONNECTIONS DESIRABLE LAND FOR ACQUISITION - FUTURE PARK EXPANSION

LIMITED ACCESS TO THIS AREA

SCENIC STREAM AREA

EAST OF RIVER MODERATE TOPOGRAPHY MODERATE/HEAVY USE RESIDENTIAL BORDER EXISTING PARK SERVICES HISTORIC HOME SITE HISTORIC HOME

EAST OF JUHAN RD. MODERATE TOPOGRAPHY MODERATE/HEAVY USE RESIDENTIAL BORDER EXISTING EQUESTRIAN TRAIL PSCREENED EQUESTRIAN PARKING EXISTING BIKER AREA CLEARING/OPEN SPACE POTENTIAL AMENITY AREA EXISTING BIKE TRAIL POTENTIAL EQUESTRIAN TRAIL POTENTIAL BRIDGE CROSSING POINT

PARKING AREA ON-SITE RESIDENCE MAINTENANCE TRAILER

POTENTIAL ACCESS TO SITE

YELLOW RIVER MASTER PLAN GWINNETT COUNTY, GEORGIA

ISSUES & OPPORTUNITIES Illustration D

GWINNETT COUNTY, GEORGIA

YELLOW RIVER MASTER PLAN

ISSUES & OPPORTUNITIES Illustration D
PARKING AREA - BICYCLE
- 75,000 LF (2.4 KM)
- NATURAL SURFACE

EQUESTRIAN TRAIL
- 75,000 LF (2.4 KM)
- NATURAL SURFACE

MAINTENANCE AREA/CARETAKER RESIDENCE

MULTI-USE TRAIL
- PAVED, 12' WIDTH
- 5,000 LF (1.5 KM)

PARKING AREA - EQUESTRIAN
- GRAVEL, APPROX. 25 SPACES
- ONE-WAY LOOP
- HOSE BB; NO OTHER FACILITIES

GROUP CAMPING AREA
- EXISTING OPEN SPACE
- APPROX. 50 TENTS MAXIMUM

MOUNTAIN BIKE TRAILS
- 18,800 LF (3.6 KM)
- NATURAL SURFACE

PARKING AREA - PEDESTRIANS
- APPROX. 45'x55' STRUCTURE, 10 TABLES, 60-80 PEOPLE
- PLAYGROUND
- REST ROOMS
- GATED ACCESS DRIVE WITH APPROX. 50 PARKING SPACES
- INFORMAL PICNICKING AT EDGE OF WOODS

PEDESTRIAN TRAIL - NORTH LOOP
- 10,700 LF (2.1 KM)
- NATURAL SURFACE
- OVERLOOK - RIVERBEND

PEDESTRIAN TRAIL - SOUTH LOOP
- 6,900 LF (1.3 KM)
- NATURAL SURFACE
- OVERLOOK - RIVERBEND

HISTORIC HOUSE SITE - OPPORTUNITY FOR INTERPRETATION

OVERLOOK - SHOALS
- DECK - TYPE STRUCTURE
- STEPS TO RIVER FOR CANOE/BOAT ACCESS

PAVILION AREA
- APPROX. 45’x55’ STRUCTURE, 10 TABLES, 60-80 PEOPLE
- PLAYGROUND
- REST ROOMS
- GATED ACCESS DRIVE WITH APPROX. 50 PARKING SPACES
- INFORMAL PICNICKING AT EDGE OF WOODS

OVERVIEW/CAMPER PARKING
- GRAVEL OR TURFBLOCK-TYPE SURFACE
- APPROX. 25 SPACES

LEGEND

- PEDESTRIAN TRAIL
- EQUESTRIAN TRAIL
- BICYCLE TRAIL
- MULTI-USE TRAIL
- BRIDGE
- STRUCTURE
- PLAY AREA
- OVERLOOK
- PARKING LOT - PAVED
- PARKING LOT - GRAVEL
- OPEN AREAS/LAWNS

YELLOW RIVER MASTER PLAN
GWINNETT COUNTY, GEORGIA
PRELIMINARY CONCEPT A
Illustration E
GRAVEL - APPROX. 25 SPACES
NO FACILITIES
PARKING AREA - EQUESTRIAN

PEDESTRIAN/TRAIL BRIDGE
OVER JUHAN ROAD

REALIGNMENT OF JUHAN ROAD

EQUESTRIAN TRAIL
15,000 LF (2.9 MI.)
NATURAL SURFACE

MOUNTAIN BIKE TRAIL
15,300 LF (2.3 MI.)
NATURAL SURFACE

ROAD CROSSING WITH SPECIAL PAVEMENT TREATMENT

OVERLOOK - RIVERBEND

PARKING - GROUP CAMPING
- GRAVEL OR TURF/BLOCK-TYPE SURFACE
- APPROX. 25 SPACES

GROUP CAMPING
- EXISTING OPEN SPACE
- APPROX. 50 TENTS (MAXIMUM)

MOUNTAIN BIKE TRAILS
10,700 LF (2.0 MI.)
NATURAL SURFACE

PEDESTRIAN TRAIL
9,600 LF (1.8 MI.)
NATURAL SURFACE

EQUESTRIAN TRAIL
11,300 LF (2.2 MI.)
NATURAL SURFACE

BRIDGE
- APPROX. 400' LENGTH

PARKING - GROUP CAMPING

PARKING AREA - BICYCLE
- GRAVEL - APPROX. 25 SPACES
- NO FACILITIES

PARKING AREA - EQUESTRIAN
- GRAVEL - APPROX. 25 SPACES
- NO FACILITIES

MOUNTAIN BIKE TRAIL
8,500 LF (1.6 MI.)
NATURAL SURFACE

MULTI-USE TRAIL
5,000 LF (0.9 MI.)
PAVED, 12' WIDTH

PARKING AREA - EQUESTRIAN

PLAYGROUND
REST ROOMS
PAVED ACCESS DRIVE
APPROX. 50 PARKING SPACES
INFORMAL PICNICKING

PEDESTRIAN TRAIL
12,600 LF (2.4 MI.)
NATURAL SURFACE

EQUESTRIAN TRAIL

MOUNTAIN BIKE TRAIL
12,300 LF (2.3 MI.)
NATURAL SURFACE

MULTI-USE TRAIL
9,600 LF (1.8 MI.)
NATURAL SURFACE

PEDESTRIAN TRAIL
9,800 LF (1.9 MI.)
NATURAL SURFACE

EQUESTRIAN TRAIL

MOUNTAIN BIKE TRAIL
8,500 LF (1.6 MI.)
NATURAL SURFACE

MULTI-USE TRAIL
11,864 LF (2.2 MI.)
APPROX. 400' LENGTH

BRIDGE

OVERLOOK - RIVERBEND

PEDESTRIAN TRAIL

EQUESTRIAN TRAIL

BICYCLE TRAIL

MULTI-USE TRAIL

LEGEND

PEDESTRIAN TRAIL
EQUESTRIAN TRAIL
BICYCLE TRAIL
MULTI-USE TRAIL
BRIDGE
STRUCTURE
PLAY AREA
OVERLOOK
PARKING AREA
OPEN AREAS/ LAWN

YELLOW RIVER MASTER PLAN
GWINNETT COUNTY, GEORGIA

PRELIMINARY CONCEPT
Illustration G
MOUNTAIN BIKE TRAIL
- 13,745 LF (2.3 MI)
- NATURAL SURFACE

EQUESTRIAN TRAIL
- 14,175 LF (2.7 MI)
- NATURAL SURFACE

CARETAKER RESIDENCE

ECOLOGICAL PASTURE RESTORATION
- OLD FIELD/MEADOW HABITAT
- NATIVE GRASSES/WILDFLOWERS

GATED ACCESS

APPROX. 25 SPACES

MOUNTAIN BIKE TRAILS
- 14,312 LF (2.7 MI)
- NATURAL SURFACE

EQUESTRIAN TRAILS
- 12,525 LF (2.4 MI)
- NATURAL SURFACE

PEDESTRIAN TRAIL - NORTH LOOP
- 14,113 LF (2.5 MI)
- NATURAL SURFACE

PEDESTRIAN TRAIL - SOUTH LOOP
- 13,113 LF (2.5 MI)
- NATURAL SURFACE

OVERLOOK - RIVERBEND

HISTORIC HOUSE SITE
- OPPORTUNITY FOR INTERPRETATION

OVERLOOK - SOUTH RIVERBEND

LEGEND
- PEDESTRIAN TRAIL
- EQUESTRIAN TRAIL
- BICYCLE TRAIL
- MULTI-USE TRAIL
- BRIDGE
- STRUCTURE
- PLAY AREA
- OVERLOOK
- PARKING LOT - PAVED
- PARKING LOT - GRAVEL
- OPEN AREAS/ LAWN
- ECOLOGICAL RESTORATION AREA
- PLAYGROUND
PARKING AREA - BICYCLE
- 60 SPACES
- NATURAL SURFACE

EQUESTRIAN TRAIL
- 14,471 LF (2.7 MI.)
- NATURAL SURFACE
- OLD EBLANEADON HABITAT
- NATIVE GRASS/HERBS/PLANTS

EQUESTRIAN TRAIL LINK FROM PAVILION AREA WITH CROSSWALK

OVERFLOW/CAMPER PKG
- GRAVEL OR TURF-LIKE SURFACE
- 25 SPACES
- GATED ACCESS

GROUP CAMPING
- EXISTING OPEN SPACE
- APPROX. 25 AIRES MINIMUM
- PAVEMENT BUILDER WITH 4 PICNIC TABLES

EQUESTRIAN TRAILS
- 12,525 LF (2.4 MI.)
- NATURAL SURFACE

MOUNTAIN BIKE TRAILS
- 14,471 LF (2.7 MI.)
- NATURAL SURFACE

NOTE: Location of existing trail is based on information provided by user groups and field observation and may vary from actual conditions. Proposed trails shown indicate general intent of trail system; however, actual length and extent of trails may increase during final design.

Total Park Acreage: 565 acres
Total Parking: 180 spaces (+25 overflow)