U.S. Forest Service: Sustainable Recreation Infrastructure Pay-for-Success Feasibility Report

PREPARED BY QUANTIFIED VENTURES | APRIL 16TH, 2018

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Executive Summary

In September of 2017, the National Forest Foundation (NFF) contracted Quantified Ventures to assess the feasibility of Pay for Success (PFS) financing to fund recreational infrastructure needs on U.S. Forest Service (USFS) land. Through a competitive process, the Baileys Mountain Biking Trail System (Baileys Trail System) on the Wayne National Forest in Athens, Ohio was selected as the first use case. After seven months of analysis, in-depth conversations with community and national stakeholders, and multiple site-visits to Ohio, Quantified Ventures concludes that it is feasible to fund the Baileys Trail System through a PFS financing approach.

PFS is a financing mechanism in which investors provide up-front capital for an intervention, with repayment tied to the successful achievement of outcomes. It is a useful tool for aligning incentives, shifting the risk to the private sector, and building a financing technique around data and validated outcomes.

USFS is working with Quantified Ventures to pilot PFS financing to finance sustainable recreational infrastructure projects on national forest land. USFS is assessing the viability of using innovative finance techniques to address its $5 billion in deferred maintenance needs (Vincent 2017). The project with the Baileys Trail System will serve as a case study for the USFS to address deferred maintenance needs and to fund new infrastructure projects.

In collaboration with USFS, NFF, and Quantified Ventures, the Baileys Trail System, a mountain biking trail on the Wayne National Forest, was selected through a competitive process as the pilot project for assessing the viability of using PFS financing for national forest projects.

The Baileys Trail System is on a 9,000-acre parcel of land on the Wayne National Forest in Athens county, Ohio. This land is ringed by miles of abandoned coalmines. Twenty-four years ago, stakeholders for the Wayne National Forest assessed the land and re-envisioned the mining scars as unique terrain for trail riding. Currently, it does not have a trail system, allowing for a blank canvas for the top trail designers in the industry to create the ideal trail system for not only mountain bikers, but hikers and other bike riders. Within driving distance of ~15% of the US population, The Baileys Trail System will be an 88-mile, premier mountain biking destination east of the Mississippi.

The Baileys Trail System presents the opportunity to revitalize one of the poorest and most underserved counties in Ohio. Mountain biking trails have been proven to produce health, environmental, financial, and social benefits for the communities in which they are built. Through a thorough market analysis and qualitative and quantitative research, Quantified Ventures assessed that The Baileys Trail System will attract over 181,000 visitors per year. In 10 years, these visitors will result in $6.9MM in higher wages, $7.3MM in increased tax revenue, $20.1MM in increased spending, and 66 new jobs in Athens county. Because of the Baileys Trail System, Athens county and the surrounding

cities and villages will have the ability to substantially diversify their economy through enhanced outdoor recreation and tourism opportunities.

Funding the Baileys Trail System through an outcomes-based financing approach will represent the first PFS investment into a recreational infrastructure project. The Wayne National Forest will have the ability to be thought leaders in the field of recreational infrastructure and innovative financing techniques. Furthermore, PFS allows for an increase in availability and flexibility of funding, a decrease in the time to build the trail from five to two years, and a more robust data source around economic outcomes.

For this transaction, private investment will provide the upfront cost of building the Baileys Trail System, estimated to be $5.4MM. Investor repayment will be tied to the economic development outcomes produced from the influx of new visitors to the Baileys Trail System. Athens county, the City of Athens, the City of Nelsonville, the Village of Buchtel, and the Village of Chauncey will form a Council of Governments to serve as the payor, repaying the investors based on the successful achievement of the economic outcomes. The local university, Ohio University (OU), will serve as the evaluator in order to validate these outcomes, allowing for greater transparency around outcomes data, government spending, and national forest and recreational infrastructure usage.

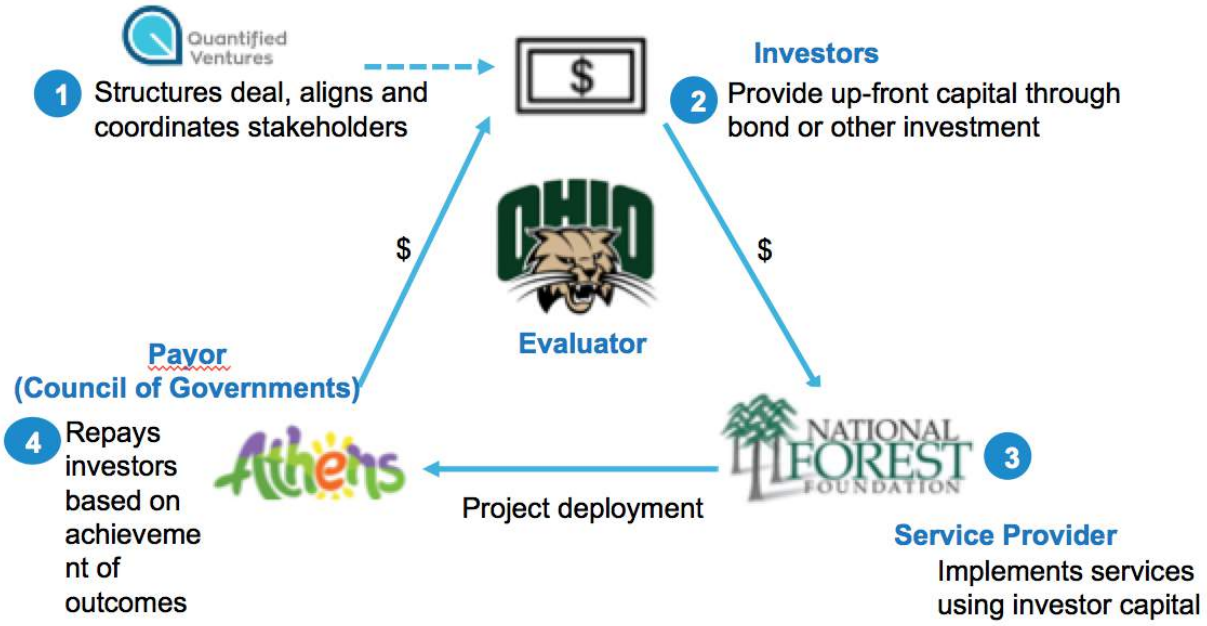

Image 1, Proposed Transaction Model, Quantified Ventures 2018

This Feasibility Analysis outlines the collaborative efforts of Quantified Ventures, the National Forest Foundation, U.S. Forest Service, the Wayne National Forest, Athens county community, and the national mountain biking community. The proposed transaction, as outlined in **Image 2** below, will result in the economic revitalization of Athens, Ohio and will serve as a case study for future PFS transactions on national forest land.

Transaction overview

Project:	88-mile mountain biking trail on the Wayne National Forest
Geography:	Athens and Hocking County in SE Ohio
Target population:	Mountain Bikers coming to ride on the Baileys Mountain Biking Trail
Service providers:	Wayne National Forest, Athens Bicycle Club, Applied Trails Research
Payors:	Council of Governments, including: Athens County, City of Athens, City of Nelsonville, Village of Buchtel, Village of Chauncey
Transaction Term:	5 years
Transaction Size:	$5.4MM (est.)
Performance metric(s):	▪ Number of mountain bikers ▪ Number of non local visitors ▪ Tax revenue increase ▪ Increase in number of registered businesses

Image 2, Proposed Project Model, Quantified Ventures

1. Feasibility Analysis Overview

Since September 2017, Quantified Ventures has been contracted by the National Forest Foundation (NFF), the non-profit partner for the U.S. Forest Service (USFS), to develop this Feasibility Analysis for a selected recreation site to determine if Pay For Success (PFS) could be a viable mechanism to finance recreational infrastructure on USFS land. Through a competitive process, USFS, NFF, and Quantified Ventures chose the Baileys Mountain Biking Trail System, an 88-mile single track mountain biking trail designed for all level riders on the Wayne National Forest in SE Ohio (see selection process and criteria in section 3.1) Through this Sustainable Recreation Infrastructure Feasibility Analysis, Quantified Ventures has deemed that PFS is a viable tool to finance the Baileys Trail System. This transaction will serve as a case study for future PFS transactions to finance recreational infrastructure and deferred maintenance needs on national forest land.

This report assesses the feasibility of employing PFS financing to raise private capital to build the Baileys Trail System. The objectives of using PFS are to provide increased availability and flexibility of funding, the ability to build the trail faster, and the ability to measure economic outcomes directly tied to the trails performance.

This Feasibility Analysis addressed the following questions:

- What is the Baileys Trail System and how might the proposed project impact Athens county?
- Who are the key stakeholders involved and which entities might benefit from the project?
- How much capital would be required for the trail, and what is the economic value of the outcomes it could produce?
- What are the benefits of using a PFS approach to bring capital to and finance the project?
- What might the PFS transaction look like?
- How might the project team think about maximizing the impact and scaling to other national forest lands?

1.1 Team

Quantified Ventures advises governments, non-profit organizations, for-profit social enterprises, and impact investors who demonstrate capacity for transformative social good. Quantified Ventures provides feasibility analysis, due diligence, transaction structuring, and fundraising services for social enterprises and social impact projects in the environmental, health, education and workforce development sectors across the United States.

The project team consisted of members from Wayne National Forest, U.S. Forest Service, as well as Quantified Ventures.

- **National Forest Foundation:**
  - *Vice President, Field Programs:* Marcus Selig
- **U.S. Forest Service**:
  - *Director, National Partnership Office:* Jacqueline Emanuel
  - *National Conservation Finance Lead*: Catherine "Tommie" Herbert
- **Wayne National Forest**:
  - *Forest Supervisor:* Anthony Scardina
  - *Athens District Ranger:* Jason Reed
  - *Assistant District Ranger for Operations:* Dawn McCarthy
- **Quantified Ventures**:
  - *Project Executives:* Carolyn duPont and Todd Appel
  - *Project Manager:* Seth Brown
  - *Project Associate:* Emma Kloppenburg

1.2 USFS's Need for Innovative Financing

USFS's mission is "to sustain the health, diversity, and productivity of the Nation's forests and grasslands to meet the needs of present and future generations" (USFS 2017). USFS not only manages forests, sustainably harvests timber, and prevents and suppresses forest fires, but also, "delivers clean air and water, protects wildlife habitat, and offers opportunities for outdoor recreation" (USFS 2015). Providing opportunities for outdoor recreation have proved challenging in recent years. USFS has difficulty funding new outdoor recreation infrastructure projects and maintaining existing infrastructure for three major reasons: budget constraints, the federal Anti-Deficiency Act, and fire borrowing.

1.2.1 Budget Constraints

USFS has a growing deferred maintenance problem, but not enough funds to address the issue. According to the 2019 Budget Proposal, there is $5.5 billion in deferred maintenance across USFS consisting of $3 billion in roads, $1.15 billion in buildings, and $300 million in trails. The President's 2018 and 2019 Budget Proposal recommended a significant reduction in funding to USFS (USDA 2018, USDA 2017, Forest Policy Pub 2017). The budget recommended a 74% reduction in capital towards improvement and maintenance, including reducing funding for Legacy Roads and Trails from the 2018 Continuing Resolution (CR) value of nearly $40MM to $0. Trail improvement and maintenance was recommended to reduce 84% from $77 million to $12 million (USDA and USFS 2018).

In April of 2018, Congress passed an FY 2018 Omnibus Spending Package to include a large increase in funding for trails and maintenance. The Omnibus boosts spending allocation from $361 to $449 million, nearly five times the President's recommendation of $94.7 million (House 2018). However, the $450 million is still a small fraction of the $5 billion in deferred maintenance needs.

1.2.2 Anti-Deficiency Act

It is illegal for USFS to finance off of future appropriations assumptions, making it extremely difficult to finance large, capital intensive projects. In order for USFS to

finance a project, they must have the entirety of funding in year zero. The Federal Anti Deficiency Act (ADA) (FSH 6509.11g) prohibits agencies from incurring debt that exceeds the dollar amount available in an appropriation year.[1] Therefore, when USFS enters into contracts or agreements that involve monetary payments, the agency must first establish that it has the total funding in place in the current year budget (Forest Resilience Bond 2017). This restriction makes it difficult to engage in expensive, long-term capital projects.

1.2.3 Fire Borrowing

The rising cost of fighting fires continues to divert money away from other priorities on forest land. In 2015, for the first time ever, USFS spent more than 50% of its budget on suppressing wildfires[2]. For perspective, fighting fires was only 16% of the budget in 1995. Climate change has led to a longer fire season, with seasons lasting 78 days longer than in 1970 (USDA 2015). According to USFS, over the last 55 years, the six worst fire seasons have occurred since 2000. While most federal agencies draw from an emergency fund to pay for disaster response, USFS cannot (Gulch 2018). When the cost of fighting fires exceeds the budget of fighting fires, funds are "borrowed" from non-fire programs. The shift in resources also correlates with a shift in staff, for there has been a 39% reduction in non-fire staff in USFS since 1995. According to the USDA, "while Congress typically provides supplemental resources to replenish USFS budget after fire transfers, transfers remain extremely problematic as they disrupt seasonal work, frustrate partners, and delay vital work" (USDA 2015). This leads to a cycle of fighting fires at the expense of prevention and mitigation of other USFS problems.

All of these issues have contributed to a substantial deferred maintenance problem on USFS land. USFS is now looking for innovative funding sources to mitigate this problem. If this PFS model can be piloted and proven to be successful, PFS could be scaled and replicated across the country to help address the $5.5 billion in deferred maintenance nationally.

1.3 Pay for Success as a Solution

PFS is a contracting and financing mechanism in which investors provide up-front capital for a program or intervention, with payments tied to the achievement of specific measurable outcomes. It is a useful tool for aligning the incentives of project developers or service providers with those of payors, shifting risk to the private sector, and integrating multiple parties in a complex transaction. It is consistent with existing USFS programs and approaches of constructing public-private partnerships to maximize efforts in pursuing strategic goals.

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[1] There are three major types of appropriations: one year, multiple year, and no-year appropriation. One year or fiscal or annual appropriations are available only during that year. Multiyear can exceed the fiscal year. USFS operates off 4 year appropriation for multi-year appropriations. No-year appropriation is available for indefinite periods and is available until it is expended. All funding, regardless of appropriation type, is approved by OMB on a fiscal year basis. That is, if funds have not been apportioned in the current fiscal year, it is not available.

[2] The FY 2018 Omnibus Spending Package contains a Fire Funding Fix that should help address these issues (Gulch 2018, USDA 2018).

PFS deals are multi-party transactions that align incentives amongst stakeholders from multiple sectors with seemingly different or conflicting priorities and goals. While each transaction is different, most projects involve the following parties:

- **Investors** provide up-front, at-risk capital to enable the program to scale. If the project outcomes are achieved, the investor receives a higher return on their investment. Conversely, if outcomes are not achieved, investors receive a lower return or may even make a payment to the payor to help them recoup costs. It is important to note that this an investment, not philanthropy or charity.
- **Payors** are the entities that realize cost savings, revenue increases, and/or other positive outcomes resulting from the scaled program. Payors can be either private or public entities, such as municipal or state governments. They use PFS to shift the risk of project or program failure to investors.
- **Service Providers** deliver the selected service or solution to the target population and geography, with the goal of achieving both improved social, health, or environmental outcomes to the target population and the projected financial benefits to the payor.
- **Evaluators** are independent entities that measure the impact of the program against the agreed-upon outcomes as well as the financial impact to the payor.

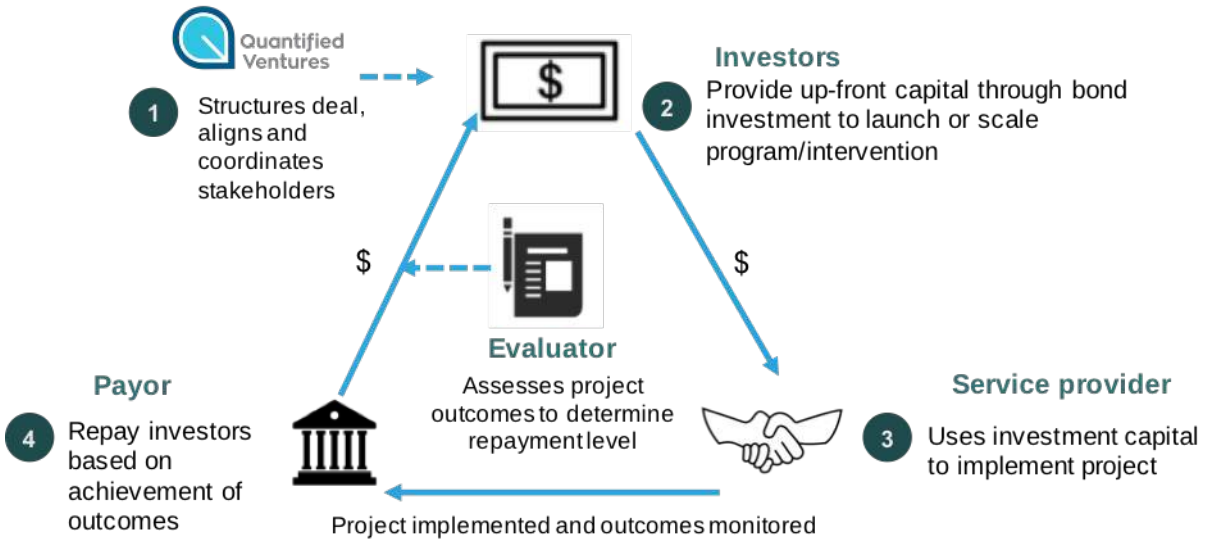


Image 3, Social Impact Bond Model, Quantified Ventures 2018

PFS transactions provide several benefits when compared to traditional financing methods:

1. **Access to Impact Capital:** Private investors who are interested in the outcomes of the project provide the upfront capital and are willing to take on some of the risk. The upfront payment provides cash flow timing relief for servicers, allowing for more immediate impact.

2. **Reduced Risk:** Private investors take on the downside risk if the intervention is less effective than expected, protecting the capital budget of the municipal or State agency.
3. **Link to Outcomes:** The PFS model links payments to environmental and social outcomes in order to align incentives of involved stakeholders.
4. **Improved Data Collection:** Through the evaluation process, valuable data is gained on tourism, outdoor recreation, and national forest land use as well as government spending and the outcomes achieved.
5. **Stakeholder Engagement Support:** This model requires stakeholder engagement across multiple entities and presents opportunities to engage new partners.
6. **Innovation:** This use case will be the first of its kind for PFS financing, opening up innovative learnings for the outdoor recreational space.

Quantified Ventures believes that a PFS transaction would be an efficient and impactful method to finance the construction of the Baileys when compared to traditional financing.

2. Feasibility Analysis Approach

This Feasibility Analysis approach was designed to deliver an assessment of the viability of pursuing a PFS project, with the findings and recommendations driving toward fulfilling USFS's long-term vision and generating lasting benefits to the Wayne National Forest, Athens county, and the City of Athens. The team, comprised of Quantified Ventures, the National Partnership Office of USFS, and the National Forest Foundation, worked towards and achieved the following project milestones:

- Assessed and selected recreation sites from across USFS
  - Developed rubric for comparison
  - Assessed at least 11 sites
  - Conducted a "deep dive" on 4 sites
  - Selected a final site
- Defined the scope of the project that would be financed including specific processes and operations, target geography, and roles of partner organizations
- Analyzed evidence base of outcomes
- Prepared an economic model that evaluates:
  - Costs
  - Cost savings and new revenues
  - Other qualitative benefits
  - Mapping of benefits to specific organizations who could act as payors
- Developed initial concepts of transaction structure, including:
  - Definition of roles and responsibilities between service provider, payor(s) and investor(s)
  - Selection of payors
  - Specification of outcome measures and outcome payment triggers
  - Financing structure and strategy
- Confirmed interest and feasibility from investors and other key stakeholders
  - Pitched opportunity to potential investors to gauge interest and refine PFS design
  - Presented economic model, PFS design and investor feedback to all stakeholders
  - Developed transaction structuring plan
  - Specified timeline and roles to finalize PFS contracts

In addition to these milestones, Quantified Ventures read nearly 300 mountain biking case studies, held over 150 calls and meetings with relevant stakeholders, and made multiple trips to Ohio. This work resulted in a mountain biking industry market analysis and stakeholder map, a robust cost-benefit analysis that weighs variances in multiple inputs, and a PFS transaction structure that aligns the incentives of multiple players within the community.

Lastly, this Feasibility Analysis laid the groundwork for the transaction structuring phase and a pilot case for future PFS transactions across national forest lands.

3. Project Site Selection

Quantified Ventures, NFF, and USFS agreed to develop a sustainable recreation infrastructure PFS Feasibility Analysis by completing the following steps:

- Developed a rubric for quantitatively comparing national forest sites
- Assessed proposed sites and prepare quantitative and qualitative comparison of the sites
- Identified one site for a full Feasibility Analysis

3.1 RFP Assessment

In September of 2017, Quantified Ventures, NFF, and USFS developed criteria to identify a project that would have the highest potential as a PFS pilot site. Once developed, the team released an RFP to all national forest sites in need of sustainable recreation improvements. Applications were assessed on the criteria listed below:

- NEPA status is granted
- Financial need is a minimum of $3MM
- Forest is within 100 miles of metropolitan area (indicating a high-use area)
- Measurable environmental outcomes of the proposed project are identified
- Measurable social and community outcomes of the proposed project are identified
- Stakeholders are identified, willing, and able to pay for outcomes
- Strong support on behalf of local leaders for recreation economy
- Demonstrated ability to address significant deferred maintenance or avoid compounding costs
- Traditional funding resources are unavailable or inaccessible
- Multiple or large revenue sources are identified for repayment of the investment
- USFS and partners have a strong capacity to implement large scale projects
- Aligns with NFF strategic focus/priority areas

3.2 Potential Projects

Eleven national forests (~8% of all national forest sites) applied to the RFP released by the team. **Table 1** shows the national forest applicants that responded to the RFP.

National Forest	Project
Sierra National Forest	Sierra National Forest campground repairs
Wayne National Forest	Building the Baileys Mountain Biking Trail
Gifford Pinchot National Forest	Improvements to the Science and Learning Center at the Mt St Helens National Volcanic Monument
Coconino and Tonto National Forests	Fossil Creek Wild & Scenic River infrastructure improvements
Mount Baker-Snoqualmie National Forest	Mt. Baker infrastructure improvements
Idaho Panhandle National Forest	Route of the Hiawatha Rail Trail infrastructure improvements
White River National Forest	Dillon Ranger District and Cataract Lake cabins deferred maintenance needs
Columbia River Gorge National Scenic Area	Columbia River Gorge Recreation Area improvements
Willamette, Deschutes and Ochoco National Forests	Central Oregon Landscape recreation facilities and improvements at Blue Pool
Tahoe National Forest	Lake Tahoe Basin Management Unit improvements
Coronado National Forest	Sabino Canyon Recreation Area deferred maintenance

Table 1, National Forest Applicants, Quantified Ventures 2018

3.3 Project Selection

After considering project size and cost, project planning progress, proximity to population centers, and overall need, the Wayne National Forest in Athens, OH was selected as the top site for a pilot PFS feasibility analysis. Their recreational infrastructure project is the Baileys Mountain Biking Trail System, an 88-mile mountain biking trail.

4. The Baileys Mountain Biking Trail System in the Wayne National Forest

4.1 The Wayne National Forest

The Wayne National Forest is Ohio's only national forest. It is situated in Southeastern Ohio in the Appalachian foothills. The area was purchased by USFS in the 1950s due to land abandonment by coal mining companies. Today, it is a healthy forest system that has rebounded from its past coal mining use. However, the land still shows the semi-permanent scars of strip mining. These features of the land provide a unique trail experience for mountain biking.

The Wayne National Forest is a staple to the regional and local economy. It provides recreation and forest products, resource management investments, and revenues to local governments. Recreation users on the Wayne National Forest contribute directly to local economies through purchasing equipment and supplies, and also indirectly through services such as hotels and restaurants. In 2014, the Wayne National Forest contributed an estimated $9.3 million in labor income to the local area, of which $1.16 million was contributed from visitors using outdoor recreation (McCarthy 2017, USFS 2018).

4.2 The Context: Athens County, Ohio

The Baileys Trail System will be located in Southeastern Ohio in the Wayne National Forest in Athens county, Ohio. The county is part of the "unglaciated Allegheny Plateau" portion of Ohio, which yields a terrain of steep, rugged hills dissected by stream valleys. The city of Athens is the county seat. Athens has a population 24,000 and is the home of Ohio University, a large public research university with nearly 37,000 students enrolled. Other notable towns and villages in the county include Nelsonville, Chauncey, Buchtel, and the Plains.

The Baileys Trail System will be located in an economically distressed area of the county facing health, environmental, financial, and social problems.

4.2.1 Health Challenges

Athens county has high rates of poor physical and mental health among its inhabitants as compared to Ohio and the US average (see **Image 4** below). Obesity, diet, and lack of exercise are the most pressing health challenges in the county. Furthermore, 50% of respondents in four zip codes said there were not enough safe places for children to play.

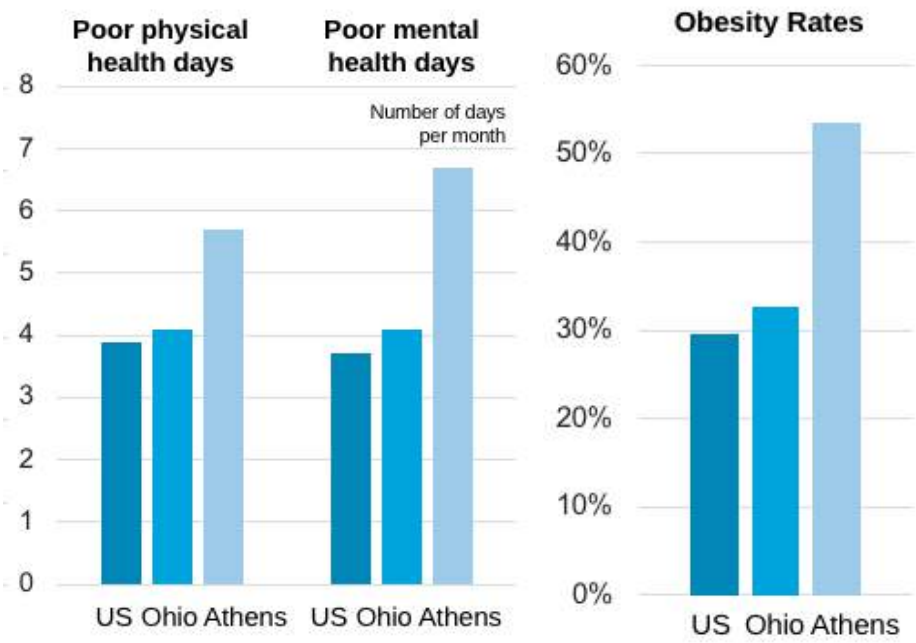


Image 4, Athens County's State of Health, Quantified Ventures 2018

4.2.2 Environmental Challenges

Athens county and the Wayne National Forest face environmental difficulties including acid mine drainage and illegal dumping.

- **Acid Mine Drainage** is the overflow of acidic water from abandoned coal mines. It leaves rivers with high amounts of iron and sulfuric acid. Acid mine drainage can make a water's pH as low as 2.5, a level that cannot support healthy biodiversity. Visually, the waters are an unhealthy orange color. This is a 100 year old pervasive problem that will continue to present significant environmental and health challenges in the absence of financial support (Akcil 2006).
- **Illegal Dumping** of waste is a costly issue for the Wayne National Forest. Locals dump trash, appliances, cars, and furniture on USFS land. The cleanup is costly. Since 2014, 21 dumpsites have been cleaned using more than 200 volunteers and over 600 work hours. Over the last four years, Ohio EPA has paid over $12,000 in order to aid in the cleanup of illegal dumping (Marshall 2017).

4.2.3 Economic Challenges

Athens county is the poorest county in Ohio. It is one of four counties in Ohio and 84 counties nationally listed as economically distressed by the Appalachian Regional Commission (see **Image 6** below). Athens county has consistently had a lower per capita income than Ohio and US averages over the last 50 years (see **Image 5** below). Macroeconomic trends have been affecting Athens county for decades, including the decline of the coal industry and manufacturing, the closure of the state prison, and the increase of online education, which has affected the local university.

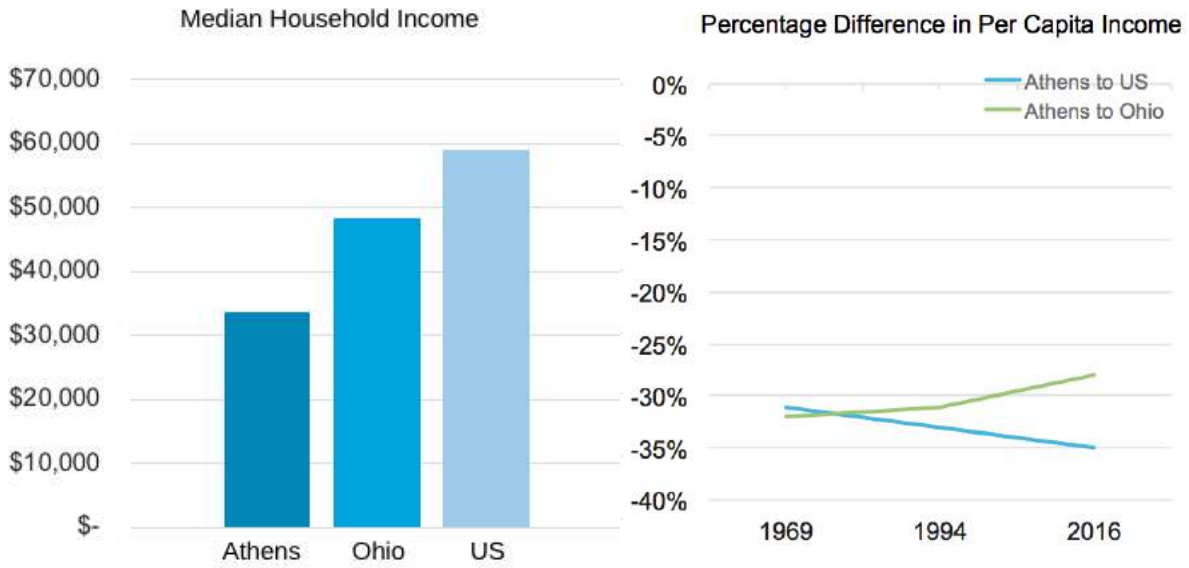


Image 5, Athens County's State of Economy, Quantified Ventures 2018

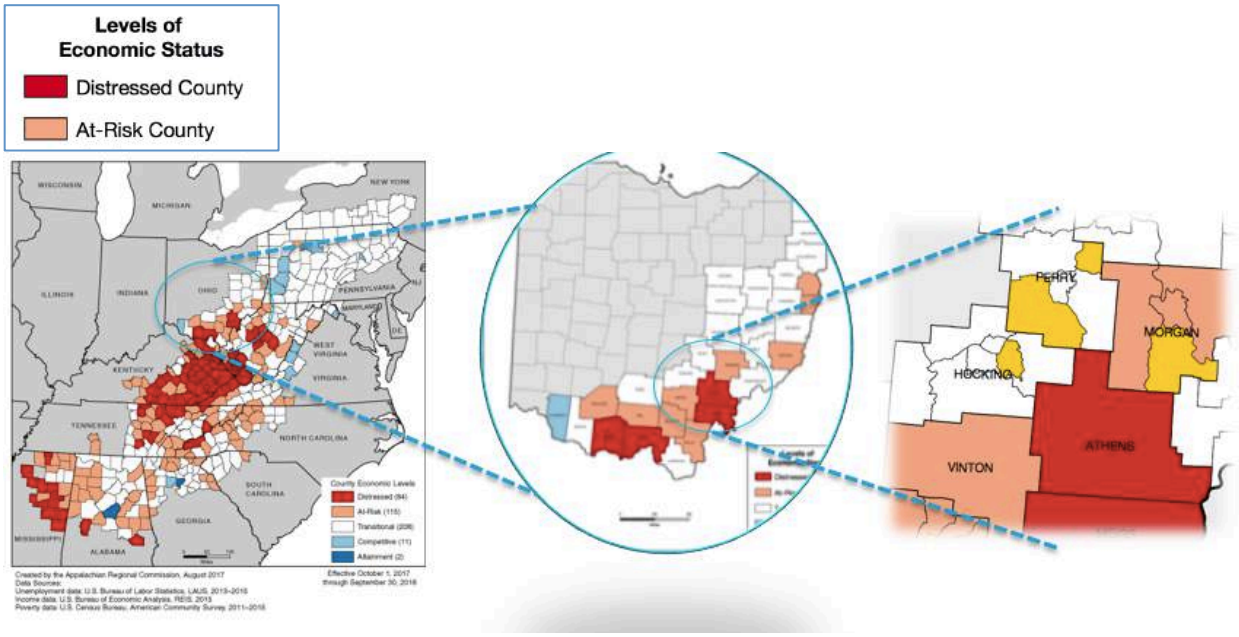


Image 6, Athens County is a Distressed County, Appalachian Regional Commission

4.2.4 Social Challenges

Due to OU, Athens county is a transient community that strives to keep students after they graduate. OU has an enrollment of over 37,000 while the city of Athens only has a permanent population of 21,000. With a constant outflow of industry and talent, and a lack of opportunities for those who stay, negative perception from outsiders onto Athens

county has impacted how citizens see themselves and their community (Balusky 2017, Vance 2016, Semuels 2017, Quinones 2015). All these factors listed above contribute to a degradation of community pride and culture.

4.2.5 Solutions in Progress by Athens County

Athens county has recognized and has been working to solve these problems for years. Today, the Athens county views the Baileys Trail System as an innovative solution to some of these county-wide issues. Per the 2017 Athens County Comprehensive Plan, Athens county's vision is to "build upon its unique heritage to practice wise land use that creates a healthy, prosperous and cohesive community for a diverse population and are committed to:

- Meaningful employment
- Entrepreneurial opportunities
- Sustainable agriculture
- Environmental stewardship
- Education achievement & cultural opportunities
- Appropriate transportation and other public services
- Vibrant rural areas and small towns" (Athens 2017)

Furthermore, Athens county set forth three goals relevant to the Baileys Trail System:

- Goal one: Park District and Recreation Plan
  - Involve the community in development and maintenance of recreational opportunities, particularly with established community organizations.
- Goal two: Accessibility
  - Increase accessibility to diverse recreation opportunities for all residents.
  - Connect recreation areas with community trails using existing public lands, scenic roadways, new and expanded horse and bike trails, and new acquisitions.
- Goal three: Provide, Protect, and Enhance Recreation Opportunities
  - Provide diverse recreation options, protect them and improve them.
  - Expand on the existing bike path by developing a system of trails throughout the county and strive to improve the range of recreation options to satisfy interests of all ages.

The Baileys Trail System aligns these stated County goals and commitments, as will be discussed in greater detail throughout the report.

4.3 History and Timeline of the Baileys Trail System

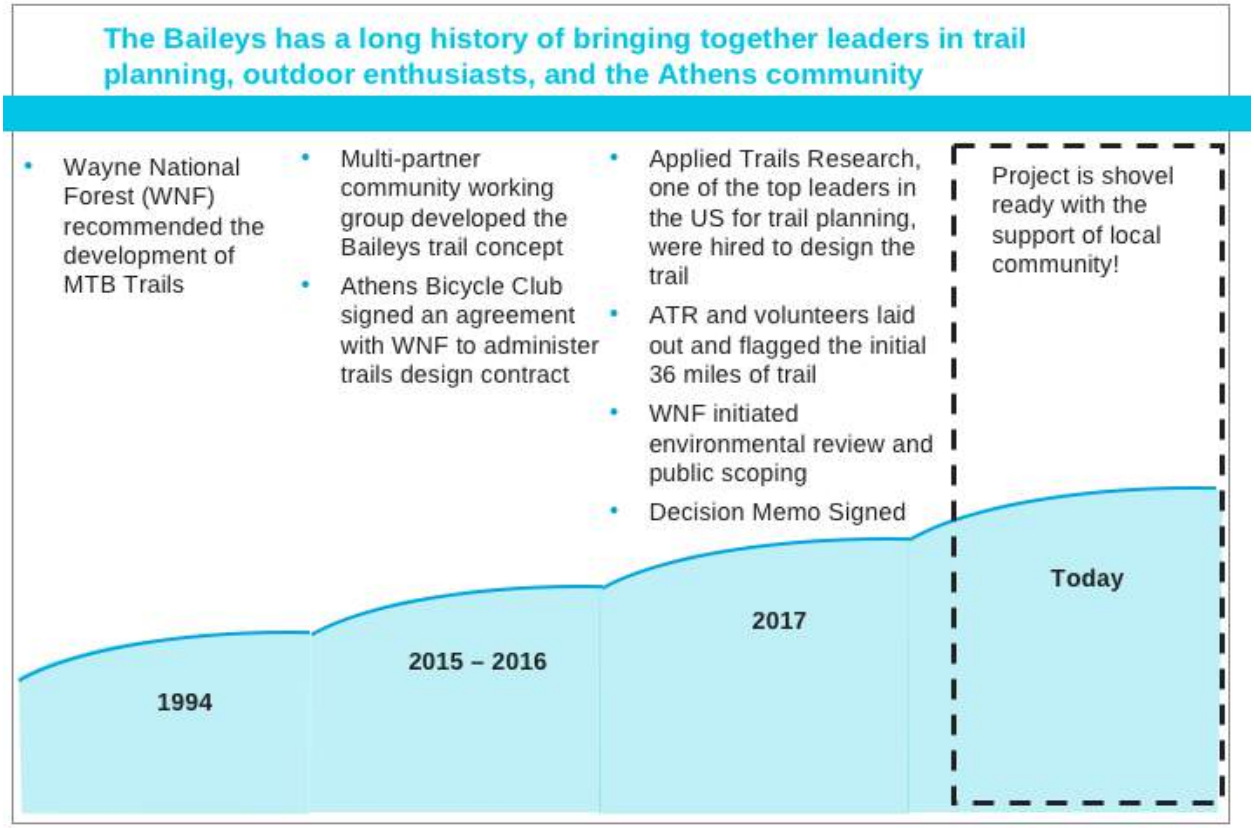


Image 7, History of Baileys Trail System, Quantified Ventures 2018

In 1994, stakeholders for the Wayne National Forest assessed the land and re-envisioned the mining scars as unique terrain for trail riding. Of particular interest is the Baileys Tract in the Wayne. The Baileys Tract is a 9000-acre (14 square miles) parcel that is ringed by old company coal towns. Currently, it does not have trails, allowing for a blank canvas for trail designers to create their ideal trail system. The development of a destination mountain biking trail system in the Baileys Tract became a priority.

In 2015, the Wayne National Forest built a partnership with the Athens Bicycle Club (ABC) to establish a community collaborative group that includes Athens County Visitors' Bureau, Athens local government, the health department, local non profits, USDA Rural Development, Ohio University Patton College of Education Recreation Studies Program, International Mountain Bicycling Association, Central Ohio Mountain Biking Organization, Athens City Planner, and Athens County Planner.

This trail-planning group had three priorities:

1. Sustainable Economic Development
2. Health and Wellness
3. Community Connectivity and Pride

Through this collaboration, the group fundraised $40,000 in 45 days to fund a Master Trail Plan to design the trail. Applied Trails Research from State College, PA won that contract though its work of developing similar trail systems throughout North America. Applied Trails Research worked with Kay Linn Enterprises and Trail Wisdom LLC, completing a team of 3 of the top of 5 trail designers in the county.

As the Master Trail Plan was being developed, the Wayne National Forest started the Environmental Assessment (EA) in order to test how the land would handle such development and comply with National Environmental Policy Act (NEPA). OU supported the assessment by providing interns and graduate students. In December 2017, both the Master Trail Plan and the forest EA were completed. In April of 2018, all 88 miles of the trail had been walked, flagged, and adjusted by the trail designers, taking a theoretically, Geographic Information System trail plan to a shovel ready trail.

4.4 Trail Design and Master Plan

The Baileys Trail System is an 88-mile single-track multi-use trail system on the Wayne National Forest in Athens county, Ohio. The Baileys Trail System is:

- Designed on a “blank canvas” land by the top consulting firms in the county (Applied Trails Research)
- Optimized for mountain bikers, but can accommodate hikers, backpackers, trail runners, and nature watchers
- A trail of varying levels of difficulty for all skill levels
- A trail that connects to local communities via trail heads in Chauncey, Doanville, and Buchtel
- A trail route with rolling contour design principles
- Sustainably built with consideration to drainage, cohesion, and durability of soils to ensure the long-term viability
- Within driving distance of ~15% of the US population
- Will be a premier mountain biking destination east of the Mississippi

Per USFS’s Decision Memo[3], the Baileys Trail System will also (USDA 2017):

- Provide an opportunity for sustainable backcountry single track mountain biking experience on the Wayne National Forest for all riders
- Reduce conflicts between mountain bikers and other recreational trail users by providing a trail system that is designed specifically for mountain biking use
- Advance a collaborative approach to construct and maintain a sustainable mountain bike trail
- Connect mountain bike trail to communities in Athens and Hocking counties in a manner that contributes to the ecological, social, and economic growth and sustainability to these communities over the long term (Wayne 2017)

[3] A Decision Memo documents and concludes USFS analysis of a proposed action which is consistent with the NEPA requirements. It describes in detail USFS purpose and need for action and the decision including the proposed project to be implemented and how it meets the necessary requirements.

Image 8 is a map of the Baileys Trail System, conveying the following benefits:

- Trailheads off the forest land, providing direct access to the community
- Multiple levels of difficulty for all skill levels of riders
- Stacked loop system for easy access on and off access
- All routes are on the Wayne National Forest

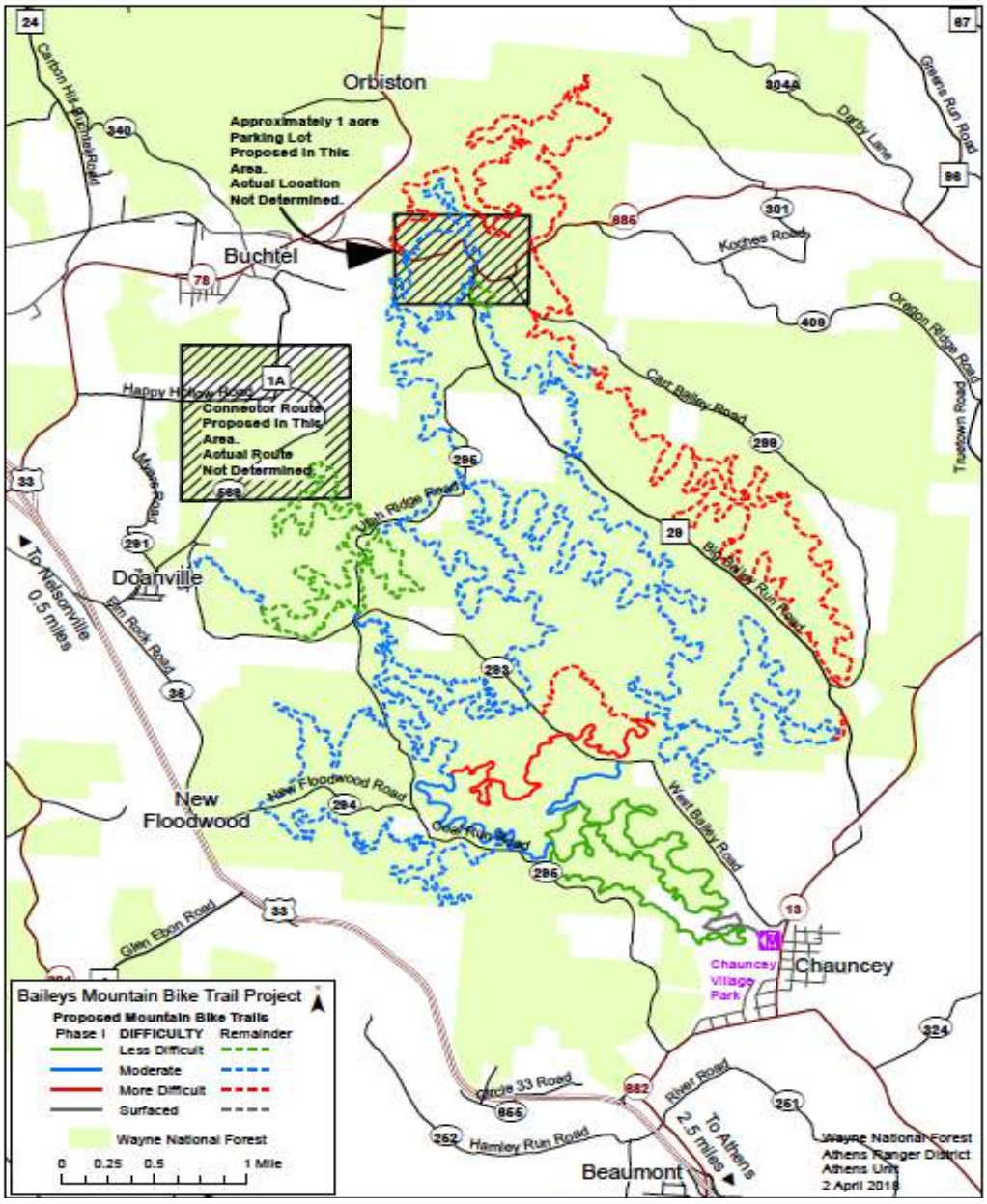


Image 8, Map of the Baileys Trail System, Applied Trails Research 2017

4.5 Use of Funds

The Baileys Trail System will cost about $5.4MM to build over two years. Overall, the estimated cost to construct 88 miles of trail is $2.4 to $3.9 million. An additional $500,000 to $2 million would be needed to construct three trailheads in Chauncey,

Doanville, and Buchtel, including parking areas, restrooms, kiosks, and amenities. Quantified Ventures built out a model that evaluated low, average, and high cost variance. The cost of construction will vary depending on:

- Time of year
- Soil conditions
- Subsurface rock
- Landscape grades
- Vegetation thickness
- Type of trail
- Construction methods

Image 9 shows the variance of costs ranging from $3.6MM to $7.2MM, with an average of $5.4MM. See Appendix 11.1 for a detailed budget.

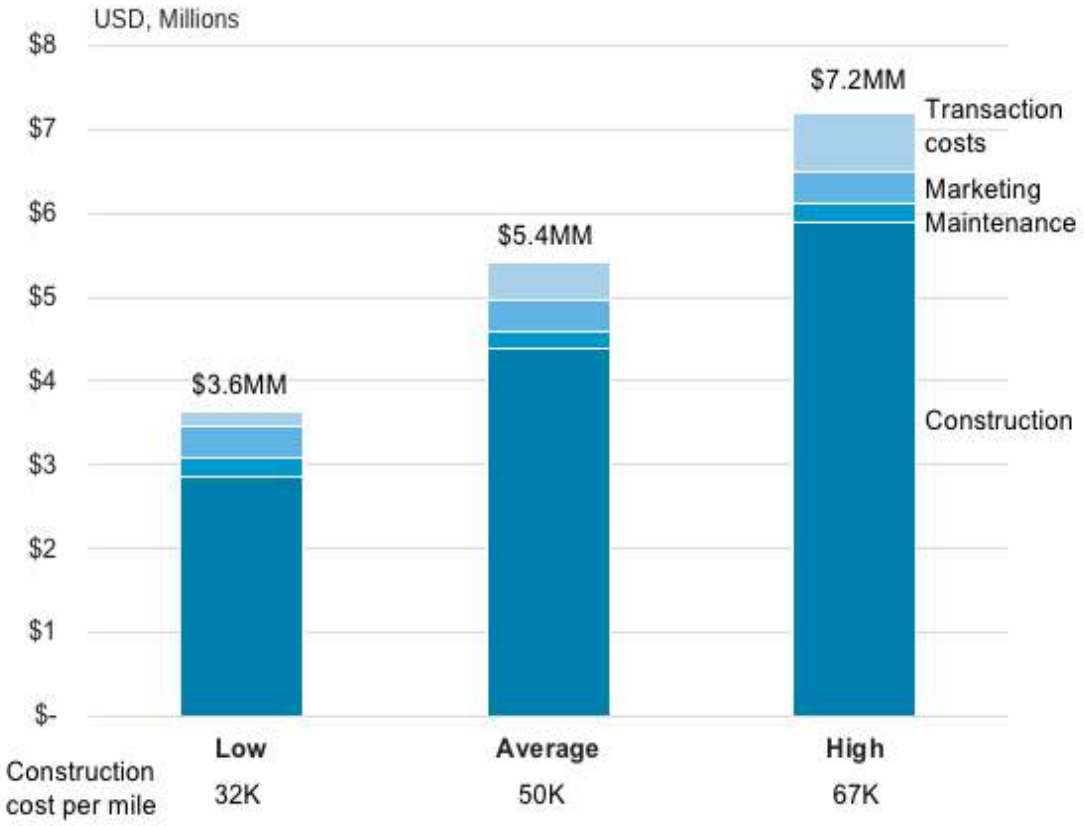


Image 9, **Low, Medium, High Trail Cost Estimates, Quantified Ventures 2018**

4.6 Current Financing Plan

The current plan is to find ways to finance the trail through grants and philanthropic means by breaking the project into five sequential phases, displayed by **Image 10** below:

- Phase 1 ranges from $365,864 to $588,656 for 13.6 miles of trail
- Phase 2 ranges from $456,757 to $755,500 for 17 miles of trail
- Phase 3 ranges from $340,506 to $571,099 for 12.5 miles
- Phase 4 ranges from $483,115 to $804,018 for 18.3 miles of trail
- Phase 5 ranges from $711,548 to $1,181,771 for 26.1 miles of trail

This phased approach will take 10-15 years to complete. Fundraising will restart every year and the likelihood of success will depend on many factors outside of the control of the Wayne National Forest and the organization team.

Bailey Trail Plan Phases and Cost Estimates

Phase	Miles	Footage	Green %	Blue %	Red %	Cost Estimate (Low)	Cost Estimate (High)
1	13.6	71,916	57%	21%	22%	$365,864	$588,657
2	17.0	89,879	15%	79%	6%	$456,757	$755,500
3	12.5	66,186	28%	59%	13%	$340,506	$571,099
4	18.3	96,780	20%	30%	50%	$483,115	$804,018
5	26.1	137,666	0%	87%	13%	$711,548	$1,181,771
Total	87.6	462,427	20%	59%	21%	**$2,357,789**	**$3,901,044**

Image 10, Trail Budget Overview, McCarthy 2017

4.7 Benefits of PFS Financing

PFS presents three major benefits to the Baileys Trail System:

- **Single Source of Funds Connecting Partners:** The initiative is building on a culture of cross-boundary and cross-sector collaboration in Southeastern Ohio. Key partners include the city of Athens, Athens county, the state of Ohio, OU, Athens Bicycle Club, Central Ohio Mountain Biking Organization, Applied Trails Research, International Mountain Biking Association, and the National Forest Foundation. The 88 miles of new trails extend beyond national forest lands, connecting towns and villages with trailheads and parking. Current funding restricts usage of dollars to a certain geography. Using this proposed transaction opens up a new pool of flexible capital to use for spending across geographic borders.
- **Accelerated Timeline:** Through this innovative model, it is possible to accelerate the Baileys from a 10-15 year construction project, funded through traditional public and philanthropic sources, to a one to two year project using impact investing.
- **Measurement of Impact:** The impact of the trail system must be measured to enable investor repayment. This provides a unique opportunity to governments, industry leaders, and non-profits to measure and observe the true economic

value of outdoor recreation. This transaction will be a case study for the outdoor industry on an innovative way to quantify the social and environmental benefits from new trail infrastructure. The project will generate economic benefits in the form of increased tourism, employment opportunities, quality of life, and public health.

4.8 Stakeholder Engagement

The Baileys Trail System project team has a long history of bringing together leaders in trail planning, outdoor enthusiasts, and Athens county and City government. In order to tap into this large support system, the Wayne National Forest team and Quantified Ventures developed a stakeholder map. The stakeholder map, shown in **Image 11**, was developed jointly between Quantified Ventures and the Wayne National Forest team. It enabled productive conversations with the Athens community and the mountain biking industry and highlighted the potential impact the Baileys Trail System could have on the county. Quantified Ventures conducted over 150 calls, meetings, and presentations at the state, federal, and local levels in all sectors of society: nonprofits, for profits, academics, and governments. During this Feasibility Analysis, Quantified Ventures built strong relationships with leaders in the community, which is necessary for a complex, multi-party stakeholder transaction like this one. These conversations with relevant stakeholders within the community created the foundation on which the cost-benefit analysis was built and solidified community engagement with the project.

During these calls and meetings, Quantified Ventures also heard resounding verbal support for the Baileys Trail System from governmental leaders at all levels including municipal, county, and state legislatures and as well the staff from Federal Congressman and Senators. Many of these individuals have provided letters of support and a willingness to help the project.

Image 11, Stakeholder Map, Quantified Ventures 2018

5. Business Case for Mountain Biking Trails

5.1 Business Case for Outdoor Recreation

Outdoor recreation is a robust and growing industry within the U.S. In February 2018, for the first time ever, the Bureau of Economic Analysis (BEA) created an Outdoor Recreation Satellite Account. BEA is measuring outdoor recreation's impact on US GDP, symbolizing the recognition that outdoor recreation has a positive impact on the economy (BEA 2018).

The Outdoor Industry Association (OIA) highlights the economic importance of outdoor recreation in the 2017 Outdoor Recreation Economy Report. According to the OIA, 145 million Americans participate in outdoor recreation, translating to $887 billion in consumer spending, 7.6 million direct jobs, $65.3 billion in federal tax revenue, and $59.2 billion in state and local tax revenue annually.

In Ohio, outdoor recreation generates $24.3 billion annually through consumer spending, $7.0 billion in wages and salaries, and $1.5 billion in state and local tax revenues, resulting in 215,000 jobs directly related to outdoor recreation (Outdoor Industry Association Ohio, 2017). The Ohio Tourism Industry Group reported that recreation accounted for 17% of visitor spending in the state in 2015 (Tourism Economics, 2016).

In the Southeast Ohio region, outdoor recreation contributes to 3.5% of tourism sales in Ohio, representing the smallest portion of tourism sales of any region in the state. Within the Southeast Ohio region, Athens county ranks sixth in tourism sales, generating $154.3 million in 2015, $9.84 million of which was attributed directly to the recreation and entertainment industry. Recreation accounts for 6.5% of visitor spending in Athens county (Athens County Visitors Bureau, 2016). Appalachian Ohio has some of the most beautiful landscapes and varied terrain in all of Ohio. All of these characteristics give SE Ohio the potential to tap into the benefits of outdoor recreation.

5.2 Mountain Biking Industry Overview and Benefits

There is a strong business case for building a mountain bike trail in Athens. According to the International Mountain Bicycling Association, mountain biking is one of the fastest-growing recreational activities in the US. Bicycling contributes about $133 Billion to the economy each year, and supports 1.1 Million jobs, produces $53.2 billion in revenue each year in related retail and services, and generates $17.7 Billion annually in federal and state tax revenue. In the "East North Central Region", consisting of Indiana, Illinois, Michigan, Ohio, and Wisconsin, bicycling contributes $17 Billion to the regional economy and 191,000 jobs and over $2 Billion in taxes (Outdoor Industry Foundation 2006).

Furthermore, studies have shown that many mountain bikers are affluent people who are willing to travel to ride their bikes. The statistics below summarize the market research on the mountain biking industry (NBDA, PR NewsWire, Statista, SingleTracks, IMBA, Wayne National Forest):

- Mountain biking is a growing industry:
- 40 million people mountain bike per year in the US, growing at 3% per year
- 750K mountain bikers reside within driving distance of the Baileys Trail System
- Average mountain biking group size is 2.5 people
- Mountain bikers travel to ride:
- 62% of mountain bikers travel to ride because they want to ride new trails
- 27% of mountain bike trips are overnight
- Overnight trips last an average of 2.5 days
- Mountain bikers spend money on their trips:
- 55% of mountain bikers have a household income level greater than $80,000
- Mountain bikers spend $52 per day trip and $234 for overnight trips
- Some estimates have averaged $380 per trip

Lastly, outdoor recreational infrastructure is a catalyst for economic development. When trails are developed, visitation to the area increases. New visitors spend money and local communities capture a portion of that spending resulting in increased earnings, job opportunities, and tax revenue. Economists and economic development agencies are increasingly aware of the role of outdoor infrastructure to support and promote sustainable and diversified economies. In the last year alone:

- The Appalachian Regional Community awarded a grant nearly $1 million to West Virginia to build out a mountain bike trail in order to spur $3 million in new revenue (ARC 2017).
- The Iron Range Resources and Rehabilitation Board, a state development agency, recently approved about $5 million for new trails in NE Minnesota building off the success of Cuyuna Lakes. This abandoned mining town has been revitalized due to this popular trail (Kraker 2018).
- A 2018 study of mountain biking trails in NW Arkansas found that the 90,000 visitors rode the trails spending $21 million on local businesses (Gill 2018).

5.3 Mountain Biking as a Community Development Project

Athens county has the ability to capitalize on this large and growing mountain biking movement. Research has shown that mountain biking trails have provided numerous benefits to the communities in which they are built. Some of these benefits address the aforementioned four major problems that Athens county is currently facing: health, environmental, economic, and intangible.

5.3.1 Health Benefits

Trails lead to better quality of life and improved wellbeing. Building a mountain biking trail has been shown to lead to decreased rates of obesity and heart disease as well as increased rates of exercise. Proximity to trails has also shown to be tied to decreased rates of tension, confusion, anger, stress, and depression (National Trails Training Partnership 2017). The following studies have shown the correlation between trials and health benefits:

- A 2018 study in NW Arkansas found that the increased bike activity due to trails resulted in an impact of $86 million in health care costs avoided (Walton Foundation 2018).
- A study in Lincoln, Nebraska found that the per capita annual direct medical benefit far outweigh the cost of investment. With a per capita trail use cost of $209 and a direct medical benefit of $564, the cost benefit ratio was 2.94. That is, for every dollar spent on trails a $2.94 medical benefits were seen (Single Tracks).
- The Ludlam Trail in Miami was projected to save the community between $1.7 and $2.25 million annually in direct medical costs. This is based off the believe that 5-7 thousand local residents will become new exercisers, losing and keeping off weight (American Trails).
- In Morgantown, WV, 60% of trail users exercise more regularly since they began using trails – 23% did not exercise regularly at all before they had trail access. (Twilley 2017, Gordon 2004).

5.3.2 Environmental Benefits

Increased connectedness to nature results in increased environmental awareness, conservation, and education opportunities. That is, proximity to trails incentivizes better maintenance of the land. Increased visitation may also decrease illegal dumping (Alexander 2010) for two reasons. First, increasing visitation to an unvisited portion of the national forest will displace illegal activity. Second, increased community pride increases community stewardship of its resources (see societal benefits below).

5.3.3 Economic Benefits

Mountain biking trails bring outside visitors into the community where the trail is built. Outside visitors leads to greater spending in the economy, leading to increased sales taxes, property values, number of jobs, and earning. Quantified Ventures' assessment of over 50 case studies revealed that a mountain biking trail has the ability to help the region pivot to a sustainable, diversified economy (see Appendix 11.2). New businesses open as a result of mountain biking trail development. For example, due to the Pinellas Trail, Dunedin, Florida went from a 35% storefront vacancy rate to a 100% storefront occupancy with a waiting list for available space (Conservation Tools). Cuyuna lakes, a small abandoned mine town of 2,300 people in northern Minnesota, has 15 new business in 6 years since investing mountain biking trails (Duluth News Tribune 2018).

5.3.4 Social Benefits

For mountain bikers, much of the value derived from the activity goes beyond the market cost of participating in biking. A 2017 study by USFS determined the average consumer surplus per person and per primary activity day for mountain biking was $97.60 nationally and $74.70 for USFS Region 9 (Wayne National Forest's region). Consumer surplus is a measure of the welfare an individual gains by engaging in an activity. It is determined by identifying the total willingness to pay minus the cost of engaging in an activity for purchasing a good. This value helps encompass many of the non-market and intangible factors that people value in outdoor recreation (Rosenberger 2017).

For a region or community, building a popular mountain biking trail brings pride into a community (American Trails 2017, Cuyuna Lakes 2017). Trails can become a focus point of pride and a “means of preserving and celebrating what is special about a community” (Conservation Tools).

- In a study of three rural trails in Nebraska, 68% of residents near four rural trail systems in Nebraska say that trails have had a positive influence on their community. 59% report an increased sense of community pride (Twilley 2017, Greer 2014).
- In Marthasville, MO, the Katy Hiking and Biking Trail is credited with an increase in community pride, leading to further investment into neighborhood resources (Hugh 2015).

6. Cost-Benefit Analysis

Quantified Ventures selected the economic benefits to model the cost-benefit analysis of the trail. A summary of these benefits is shown in **Image 12** below.

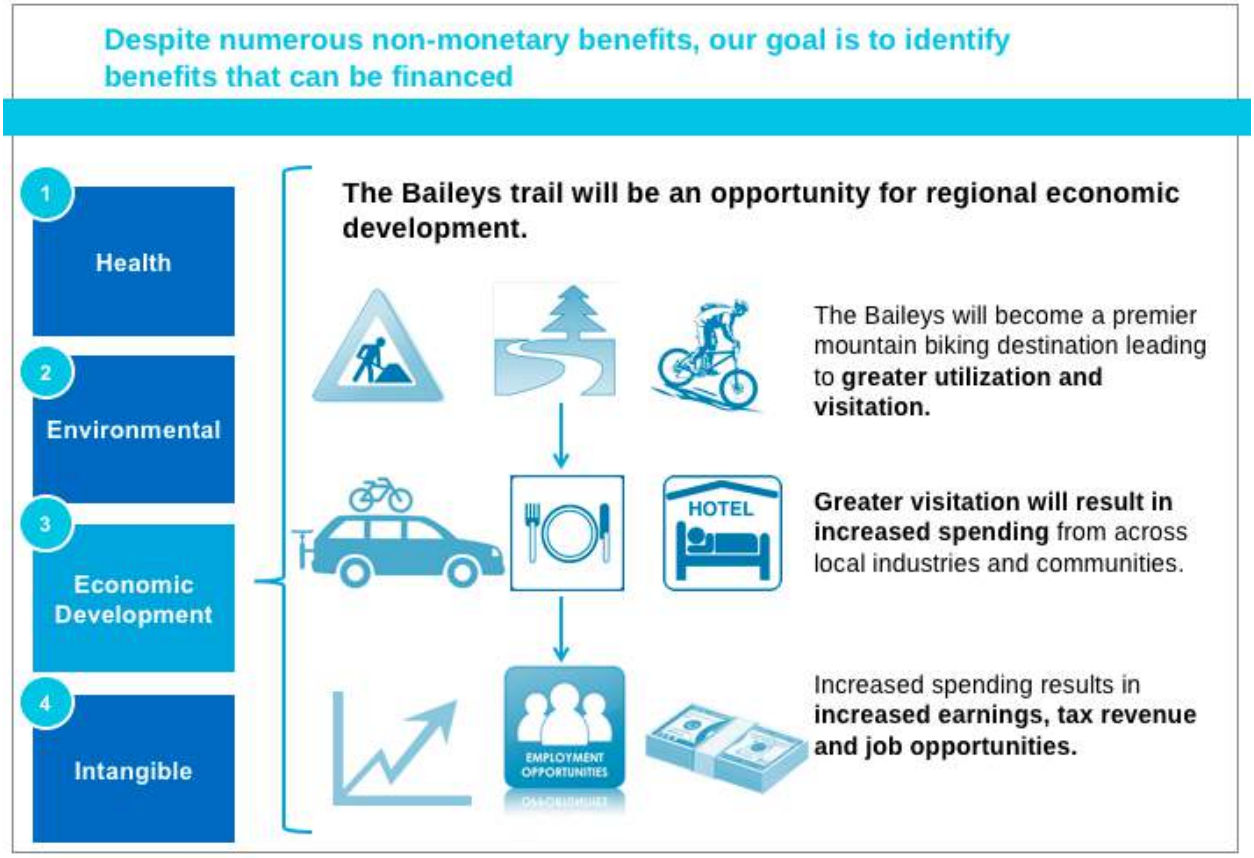


Image 12, Baileys Trail as an Economic Development Project, Quantified Ventures 2018

The logic of the cost-benefit analysis was the following:

1. Building the mountain biking trail will lead to an increase in visitors to Athens county.
2. Visitors will be either local or non-local to Athens county.
3. Non-local visitors will either travel on an overnight trip or on a day trip.
4. Overnight and day-trippers have different spending patterns per trip.
5. Based on the diversification of the economy, a certain percentage of the spending will remain in the economy.
6. The spending that is captured by the economy will multiply throughout the economy resulting in direct, indirect, and induced spending.
7. The spending will result in an increase in jobs, earnings, tax revenue, and spending in the community.[4]

Image 13, Cost-Benefit Logic Chain, Quantified Ventures 2018

6.1 Cost-Benefit Model Assumptions

Key inputs and assumptions to the model include: visitor analysis, growth rate to visitation, percentage of day and overnight visitors, spending per visitor, spending distribution across sectors, economic capture rate, multipliers, taxes, and discount rates. According to the model, these inputs lead to a cumulative 10 year impact of $6.9MM in higher wages, $7.3MM in increased tax revenue, $20.1MM in increased spending, and 66 new jobs for Athens county due to 181,000 visitors a year.

[4] Economic Impact of Visitor Spending = Number of Visitors *Average Spending * Multipliers

Key Assumption	Value Used in Model	Method
Visitation	181,000	Case studies, interviews, market sizing
Growth Rate to Peak Visitation	58%	Twice as fast as the average growth rate from case studies
Percentage Day/Overnight	77% for day, 23% for overnight	Case studies (see Appendix 11.2)
Spending Per Party per Trip (Day/Overnight)	$52.18 for day, $234.23 for overnight	Case studies (see Appendix 11.2)
Spending Distribution Across Sectors	See **Table 9**	See **Table 9**
Economic Capture	55%	Calculation
Economic Multipliers	See **Table 11**	See **Table 11**
Taxes	See **Table 12**	See **Table 12**
Discount Rate	Private Sector 7% State of Ohio 4.52% Athens county 5.18% Athens city 3.59%	See Appendix 11.7 for bond analysis details

Table 2, Assumptions for Cost-Benefit Analysis, Quantified Ventures 2018

6.1.1 Visitation

Quantified Ventures estimated that the trail would attract 181,000 visitors a year. This number was derived and validated in 3 different ways: comparable trails, market sizing, and qualitative research.

Comparable Trails:

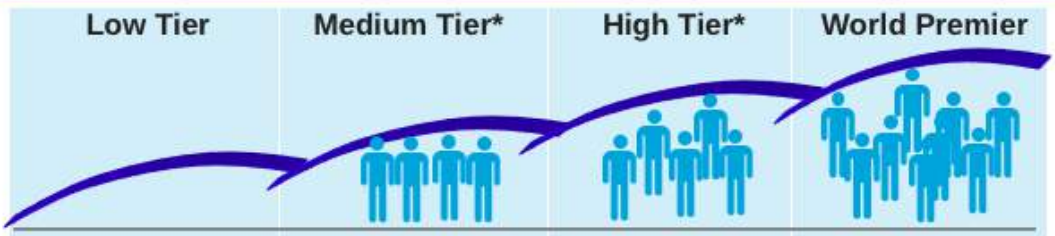
Quantified Ventures looked at the visitation of 60 mountain biking trails through various economic studies. Quantified Ventures eliminated any study that was state or regional wide, resulting in ~50 community-based trails. See Appendix 11.2 for details on the Case Studies analyzed. Quantified Ventures found 4 clear delineations between trails:

- "World Premier Trails" with 600,000+ visitors per year
- "High Tier Trails" with 235,000+ visitors per year
- "Medium Tier Trails" with 125,000+ visitors per year
- "Low Tier Trails" with 33,000+ visitors per year

Given length of trail, proximity to population centers, and varying level of difficulty, the Baileys Trail System fell in-between “Medium Tier Trails” and “High Tier Trails” at 181,000 visitors.

Image 14 portrays each tier of trails with their resulting 10-year cumulative impact in spending, earning, jobs, and taxes.

The quantity of visitors to the trail impacts the number of benefits and the number of years to break-even on the investment cost



	Low Tier	Medium Tier*	High Tier*	World Premier
# of visitors a year	33,000	125,000	235,000	600,000+
Years to break even (Tax rev. only)	N/A	14 years	8 years	4 years
10 year cumulative impact (total benefits)	• **Spending**: $1.7MM • **Earnings**: $600K • **Jobs**: 5 • **Taxes**: $920K	• **Spending**: $13.4 MM • **Earnings**: $3.4 MM • **Jobs**: 43 • **Taxes**: $4.9MM	• **Spending**: $26.6MM • **Earnings**: $9.2 MM • **Jobs**: 89 • **Taxes**: $9.6 MM	• **Spending**: $68.8 MM • **Earnings**: $23 MM • **Jobs**: 239 • **Taxes**: $23.8MM
Comparable Trails	Hatfield & McCoy's Copper Harbor Oakridge Jakes Rocks	Virginia Creeper Cuyuna Lakes Oak Mountain State Park	Duluth Traverse Columbia River Gorge Moab Jackson Hole	Nantahala and Pisgah Great Allegheny Mohawk-Hudson

*Average of the Medium and High Tier (181,000) was used as the baseline performance assumption for the model

Image 14, Impact of Mountain Biking Trails by Number of Visitors, Quantified Ventures 2018

Market Sizing:

The estimated visitation number was further validated by estimating the market size of mountain bikers near the Wayne National Forest. This market sizing was a three step process.

- Quantified Ventures calculated the number of people within a radius of 75 miles of the Wayne National Forest (day-trippers), 250 miles (overnight trippers), and >250 miles (flying and spending multiple days).[5] The Circular Area Profiling System (CAPS) from the university of Missouri pulled data from the 2010 census to estimate populations in a circular radius around the Wayne National Forest Headquarter and Athens Ranger Unit. **Table 3** shows the number of people within each of these categories:

[5] # Potential Visitors = (1) Population*(2) % Mountain Bikers* (3) Capture Rate

Distance	Population
<75 miles	3,059,431
76-250 miles	34,654,661
>251 miles	325,340,000

Table 3, Market Sizing by Miles from Trail, Quantified Ventures 2018

- Quantified Ventures then assessed the number of mountain bikers in each category, using low, medium and high estimations. **Table 4** shows these estimations as well as the average. The average value was the value used in the cost-benefit analysis, at 3.47%.

Level	Value	Source/Justification
Low	2.42%	The average percentage of mountain bikers nationally from 2006-2016 from the Outdoor Industry 2017 Topline report
Medium	2.58%	The average percentage of mountain bikers nationally from 2014-2016 from the Outdoor Industry 2017 Topline report
High	5.6%	Survey data on Ohioans who mountain bike from the Ohio DNR 2017 Resident Survey Report
Average	3.47%	Calculated the average of high, medium, and low numbers.

Table 4, Percentage of Mountain Bikers, Quantified Ventures 2018

- Quantified Ventures used data from Table 3 and 4 to quantify the mountain biking market. Quantified Ventures assigned a market capture rate to assess how much of the mountain biking market the Wayne National Forest can expect to capture. **Table 5 shows these market capture rates.**

Distance	Market Capture
<75 miles	33%
76-250 miles	5%
>251 miles	0.5%

Table 5, Market Sizing by Market Capture Rate, Quantified Ventures 2018

Using these market capture rates of the number of mountain bikers in each population cohort, Quantified Ventures was then able to calculate how many visits can be attributed to each group. **Table 6** shows this calculation.

Distance	Visits per year
<75 miles	105,000 (3 visits per person)
76-250 miles	55,000 (1 visit per person)
>251 miles	30,000 (1 visit per person)
Total	190,000

Table 6, Market Sizing by Number of Visits per Year, Quantified Ventures 2018

Qualitative Research:

Finally, the visitation was validated through independent research on similar recreation development efforts, including those outlined below:

- Two of the three most visited National Parks are in Appalachia: The Blue Ridge Parkway (15MM visitors) and Great Smoky Mountain National Park (~11MM visitors) (Erick 2016). These sites draw more people than the Grand Canyon (~5MM visitors) due to proximity to population centers.
- The Hocking Hills State Park, Ohio's most popular state park is a 30-minute drive from the Wayne National Forest and has visitation rates that vary from 2MM-5MM a year (ODNR 2017, Columbus Navigator 2017). This State Park, less than 30 miles away, has similar visitation to Yellowstone NP and Glacier NP (NPS 2017).
- Driving time from the Baileys Trail System to major cities range from 1 to 5 hours for the following major cities: Columbus, Dayton, Cincinnati, Cleveland, and Toledo, Ohio; Pittsburgh and Erie, Pennsylvania; Lexington and Louisville, Kentucky; Charleston, Huntington, Parkersburg, and Morgantown, West Virginia; Detroit, MI. This allows ample access to millions of visitors.
- Quantified Ventures also conducted interviews with leaders in the mountain biking industry including Trek Bicycles, Quality Bicycle Parts, Applied Trails Research, Central Ohio Mountain Biking Organization (COMBO), and International Mountain Biking Association (IMBA). Through these conversations, Quantified Ventures learned that trail would be a unique opportunity amongst all trails east of the Mississippi. It will be the longest connected trail system east of the Mississippi, designed by top trail consulting firms, and will provide multiple stacked-loop trails for various skill levels. All of these conversations have substantiated the number of visitors estimated for the trail.

Using these three approaches to confirming estimated visitation, Quantified Ventures was feels confident in the 181,000-visitor estimation number to the Baileys Trail System per year.

6.1.2 Growth Rate to Full Visitation

The growth rate to full visitation (181,000 people) is an important driver of the model; Research shows a growth rate in trails from 10%-35% a year (See Appendix 11.2). Given our assumptions around visitation, Quantified Ventures that under traditionally financing techniques, which take 10-15 years, a 25% growth rate would allow the Baileys to reach full visitation in 10 years. With PFS, Quantified Ventures assumes the Baileys Trail System will have full visitation in five years. To achieve full visitation in five years, Quantified Ventures assumed an annual growth rate of 58%, which is the Compound Annual Growth Rate for 5 years to full visitation.

6.1.3 Percentage of Day and Overnight Visitors

The percentage of day and overnight visitors drives the total amount of spending for outside visitors. **Table 7** shows the accumulation of research on day versus overnight visitation. Quantified Ventures used an average derived from six studies, which was 77% day visitors and 23% overnight visitors.

Study	Day	Overnight
Ohio Resident Outdoor Recreation Survey 2017 Report	75%	25%
2017 Spending Patterns (USFS) (White 2017)	67%	29%
Wayne National Forest Use and Visitation Survey (2014) overnight within 50 miles	80.6%	19.4%
Wayne National Forest Use and Visitation Survey (2014) visitors within 75 miles	81%	19%
Wayne National Forest Use and Visitation Survey (2009) overnight within 50 miles	78.5%	21.5%
Wayne National Forest Use and Visitation Survey (2009) visitors within 75 miles	80.9%	19.1%
Average	**77%**	**23%**

Table 7, Day Versus Overnight Visitation, Quantified Ventures 2018

6.1.4 Spending per Trip

Overnight visitors and day visitors have different spending patterns. There is a large variation between studies of spending. Quantified Ventures used 26 studies to determine an estimated spending value of $52.18 per day per party for day visitors and $234.23 per trip per party for overnight visitors. **Table 8** shows these studies.

Calculation	Day	Overnight	Source
Midpoint of the range from the Ohio Resident Study	$34.50	$174.50	Ohio Resident Outdoor Recreation Survey 2017 Report
Average of the range from the Ohio Resident Study	$81.97	$220	Ohio Resident Outdoor Recreation Survey 2017 Report
2017 Spending Patterns (USFS) (White 2017)	$28	$247	2017 USFS Spending Patterns (White 2017)
Average spent on Day outings (Adjusted for Inflation)	$72.8	N/A	1996 Department of Development study
Wayne 2003 (Adjusted for Inflation)	$55.76	$182.24	Wayne 2003 internal data
Reported Value	N/A	$380	SingleTrack.com
Average of 20 case studies	$40	$201	Multiple
Average	**$52.18**	**$234.23**	

Table 8, Spending Per Trip, Quantified Ventures 2018

6.1.5 Spending Distribution Across Sectors

The fifth assumption was the spending distribution throughout each sector in the economy. To determine the distribution of spending across sectors, Quantified Ventures created nine categories that were most commonly used across recreational infrastructure studies. Quantified Ventures then used the data from the National Forest Visitor Spending Profiles in order to segment the spending by trip-type and spending category per party and per trip (USFS 2017). **Table 9** shows the distribution of all spending across the nine categories.

Economic sector	% Of total spending
Accommodation	31%
Restaurants	19%
Other Food & Bev (Groceries)	15%
Recreation & Entertainment	5%
Gas And Oil	19%
Entry Fees	3%
Sporting Goods (Bike Shops/Parts /Repairs/Bikes)	3%
Other Shopping (Souvenirs and Other)	4%
Local Transportation	1%
Total	100%

Table 9, Spending Across Economic Sectors, Quantified Ventures 2018

6.1.6 Economic Capture

The economic capture is the rate of the spending brought into the economy. Not all spending will be able to be captured by the local economy. The capture rate depends on how much of the goods are purchased from local suppliers.[6]

A common error in assessing the value of tourism is to use the total value of spending as the final direct effect. The total spending needs to be adjusted for "leakage" out of the economy. That is, most purchases that a visitor makes are of goods that were produced outside of the local economy in which they bought that good, in this case, outside of Athens county. When this occurs, the local economy is not able to fully benefit from the good purchased. According to Daniel Stynes of Michigan State, "only 60 to 70% of tourist spending appears as final demand in a local region" (Stynes 2000).

Table 10 shows the economic capture rates per economic sector. The total value captured by the local economy is the percentage attributable to retail margin and regional production. When the capture rates are applied to all spending, the model

[6] Capture rate = local final demand / tourism spending in local area

produced an economic capture rate of 55%. This indicates that 55% of all visitor spending will be directly captured by the local economy.[7]

Economic sector	Retail Margin	Regional Production	Imports	Total
Accommodation	0%	100%	0%	100%
Restaurants	0%	100%	0%	100%
Other Food & Bev (Groceries)	10%	10%	80%	100%
Recreation & Entertainment	0%	100%	0%	100%
Gas And Oil	10%	0%	90%	100%
Entry Fees	40%	20%	40%	100%
Sporting Goods (Bike Shops/Parts /Repairs/Bikes)	40%	20%	40%	100%
Other Shopping (Souvenirs and Other)	40%	20%	40%	100%
Local Transportation	40%	20%	40%	100%

Table 10, Economic Capture Rates Per Economic Sector, Quantified Ventures 2018

6.1.7 Economic multipliers

The seventh assumption was the multipliers of economic impact. Multipliers are used determine how captured spending permeates throughout the economy. Quantified Ventures used Type II multipliers for the Bureau of Economic Analysis for the Athens, Perry, Hocking, and Morgan Counties. Type II multipliers account for direct, indirect, and induced effects in spending.

Image 15 shows how these multipliers interact with each other.

[7] We find the capture rate of 55% to be highly conservative. For reference, a study of Barre Town Forest had a capture of 73%, and a study of Mammoth Cave, KY study had a capture rate of 72% (Stynes 1994).

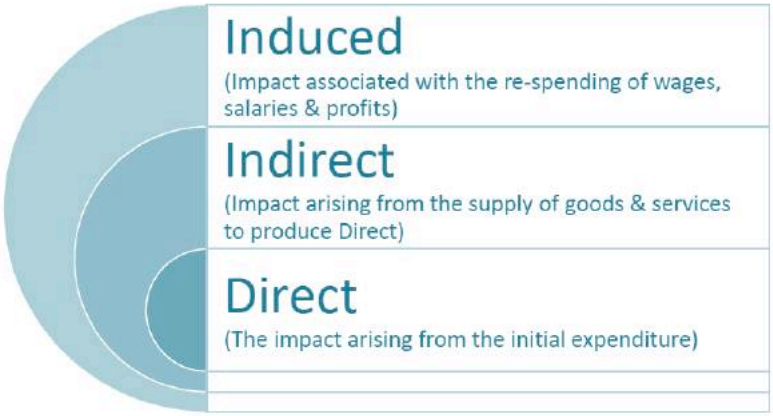


Image 15, Economic Multipliers, Squamish 2017

- **Direct Impact**: Direct impacts are the changes in sales, income, and jobs in the sectors that are directly involved in the sales to tourists (captured by Type II sales multipliers).
- **Indirect Impacts**: Indirect impacts are the changes in sales, income, and jobs that supply goods and services to the businesses that directly sell things to tourists (captured by Type I multipliers).[8]
- **Induced Effects**: Induced effects are the changes in household spending based on increases in income of those that work in the tourism sector.

For example, when a visitor visits Athens, Ohio, they may visit Ohio University Inn and purchase food or drink (direct impact). The Ohio University Inn will then have to buy from their local supplier to refill their food and drink supply (indirect impact). When the visitor leaves a tip for the server, the server may spend a portion of that money on something that is not related to the sector in which (s)he works (induced effect).

In order to calculate the total impact, we used three types of Type II Sales Multipliers[9]:

- **Sales multiplier:** the total change in sales for every dollar change in direct sales through the economy.
- **Employment multiplier**: The change in jobs per every million dollar change in total sales
- **Personal income multiplier**: The change in household income for every dollar change in total sales

The multiplier values are shown in the **Table 11** on the following page.

[8] Type I sales multiplier = (direct sales + indirect sales)/ direct sales
[9] Type II sales multiplier = (direct sales + indirect sales + induced sales)/direct sales

Economic sector	Sales multiplier	Income Multiplier %	Jobs per million
Accommodation	1.31	0.32	11.18
Restaurants	1.33	0.33	15.97
Other Food & Bev (Groceries)	1.34	0.40	16.36
Recreation & Entertainment	1.38	0.40	16.19
Gas And Oil	1.34	0.45	9.97
Entry Fees	1.38	0.40	16.19
Sporting Goods (Bike Shops/Parts /Repairs/Bikes)	1.31	0.35	14.99
Other Shopping (Souvenirs and Other)	1.31	0.35	14.99
Local Transportation	1.35	0.41	19.61
Average Sales Multiplier	1.33	N/A	N/A

Table 11, Sales Multipliers by Economic Sectors, Quantified Ventures 2018

6.1.8 Taxes

The eighth assumption is that the taxes to the City of Athens, Athens county and the State of Ohio for lodging, sales, income, property, payroll, and parking would remain at current levels. **Table 12** shows the tax rate per each category.

Tax	Athens City	Athens county	State of Ohio	Applied to:
Lodging Tax	3%	3%	0%	Direct sales on accommodation
Sales Tax	0%	1.25%	5.75%	Total spending
Income Tax	1.85%	0%	2.97%	Total Increased income
Property Tax[10] revenue	0.16%	0.16%	0%	Property tax with a 2% growth rate a year
Parking	0%	100%	0%	Entry fees spending
Payroll Tax (per new job)	0%	0%	+$915	2.7% for new employees with a median salary of $33,872

Table 12, Taxes, Quantified Ventures 2018

6.1.9 Discount Rates

The ninth assumption was the discount rates used for the private sector, State of Ohio, Athens county, and the City of Athens. **Table 13** shows the discount rates used.

Sector	Discount Rate	Justification
Private Sector	7%	Adjusting for inflation and dividends, the average return on the S&P 500 from 1950-2009
State of Ohio	4.52%	Avg. of General Obligation, Revenue Bonds, and Certificates of Participation from 2016 Annual Report
Athens county	5.18%	Avg. for bond Issuances since 1994
City of Athens	3.59%	Avg. rate for bond issuances of since 1999

Table 13, Discount Rates, Quantified Ventures 2018

[10] The literature states that proximity to trails increases property values from 5-10% (Headwaters economics). Quantified Ventures said that if property values were increased by 5% over the course of 30 years, that would be an average growth rate of 0.16% of property taxes that are attributable to the trail. Quantified Ventures assumed a conservative baseline growth rate of 2% a year. Current housing values are growing at 3.34% (DataUSA 2017) and the property tax revenues for the county have been averaging nearly 5% growth a year (Athens County Auditor).

6.2 Cumulative Benefits Over 10 Years

All of the aforementioned inputs and assumptions lead to a calculation of 10 year cumulative impact of $6.9MM in higher wages, $7.3MM in increased tax revenue, $20.1MM in increased spending, and 66 new jobs for Athens county. **Image 16** shows how these benefits are broken down across sector.

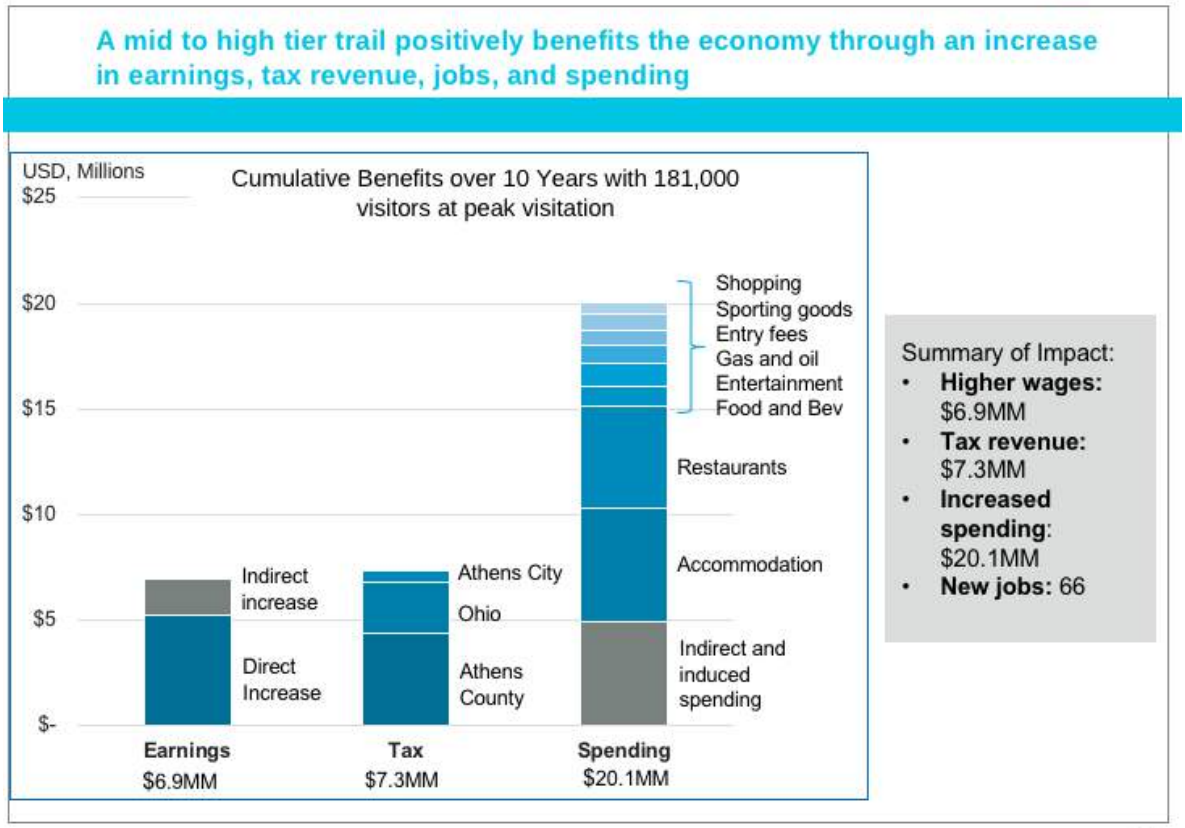


Image 16, Cumulative Benefits over 10 Years, Quantified Ventures 2018

When assessing only tax revenue due to increased spending, only a “Low Tier Trail” does not break-even on the $5.4MM cost of the trail. **Image 17** shows the tax revenue compared to the cost of the trail for a “World Class Trail”, “High Tier Trail, “Medium Tier Trail” and “Low Tier Trail” over 30 years.

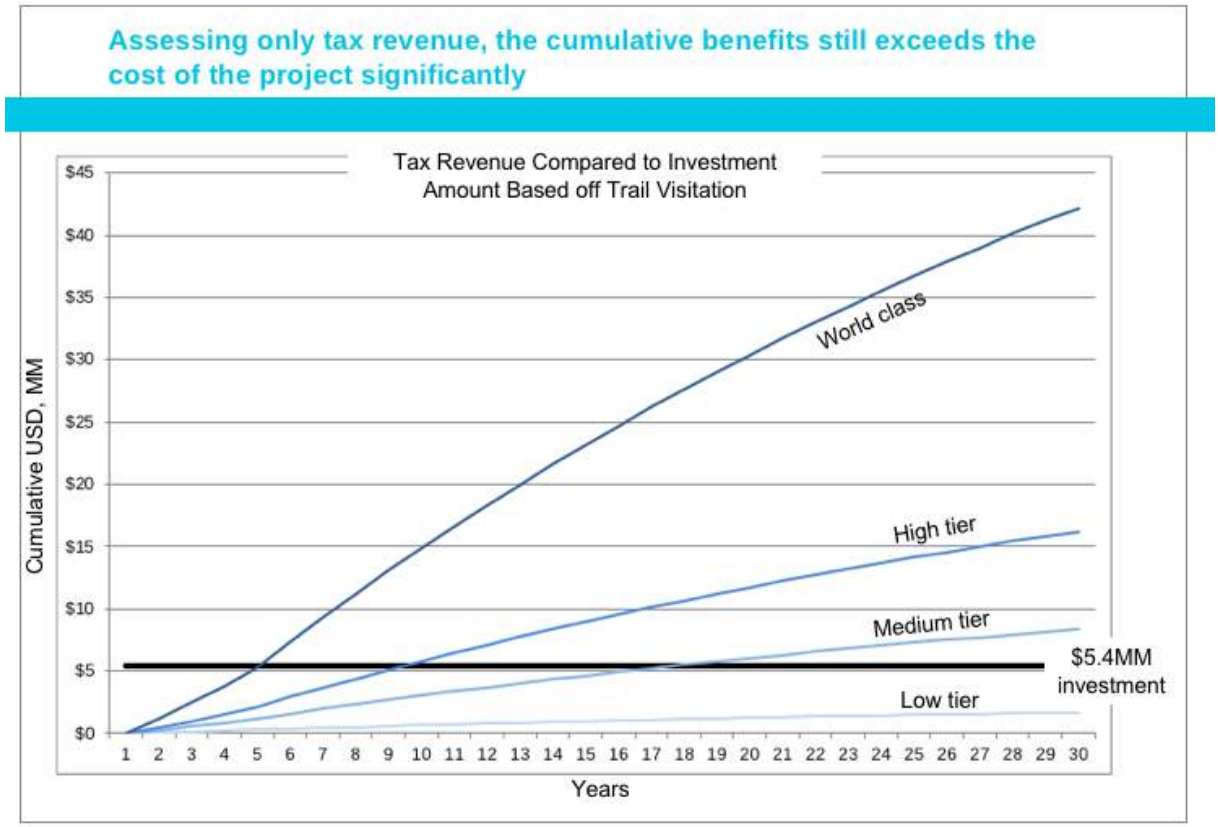


Image 17, Tax Revenue Break-Even, Quantified Ventures 2018

Given the results of this sensitivity testing, the inputs and assumptions in the model can vary significantly and still a produce a strong benefit to cost ratio.

7. Possible Transaction Structures

In order to prove the feasibility of a transaction, Quantified Ventures presented potential financial structures. The goal was to structure transactions that are as similar to current financial structures in the marketplace as possible. Given that evaluating outcomes and tying repayment to success is innovative, Quantified Ventures strives to simplify the financial structure(s) so that it is welcomed by investors and the broader financial markets. After talking with investors, financial experts, and exploring similar transactions, Quantified Ventures presents three potential financial structures for this project. Each transaction would finance the trail, provide principal protection to investors, generate similar returns, and transfer risk from the payor to the investor, but they vary in length and form. The actual transaction structure will be finalized during the next phase of the project.

Option one is an interest only bullet loan, where the entirety of the principal is repaid at the end of the term. In this option, there is a performance payment based on visitation that will adjust the effective interest rate. Option two is a long-term bond with an interest rate adjustment after the evaluation period. Option three is an interest and principal loan or bond, similar to a mortgage, with performance payments following the evaluation period.

7.1 Five Year Interest-Only Bullet Loan

The first option is a bullet loan where the principal is repaid in full at the end of the term. In this option, the transaction is a five-year interest only loan with coupon payments paid yearly and full principal and interest due at the end of the loan. A separate performance payment will also be due at the end of the loan based on actual levels of visitation (**Table 15**). In order to pay the outstanding balance back to the investor, the payor will issue a new debt to close out the loan and success payment at the cost of capital in 2023. **Image 18** is a graph to depict yearly payments made by the payor(s).

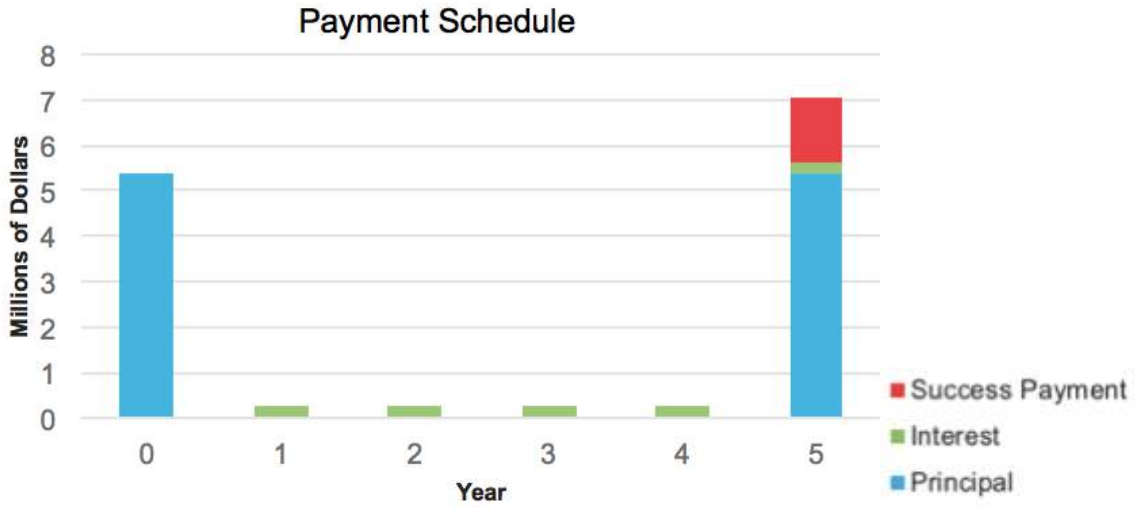


Image 18, Five Year Interest Only Bullet Loan Payment Schedule, Quantified Ventures 2018

Benefits of Option One:

- The majority of the risk of this transaction is based on visitation assumptions. This option passes off performance risk to a private investor.
- Once the evaluation is complete, the payor can refinance the debt to the investor to where the debt service is below the benefits received, regardless of visitation meeting, exceeding, or failing to meet expectations.

Concerns of Option One:

- There is interest rate risk when financing at the cost of capital in five years. That is, in order to close out the impact investor's transaction, the payor will go to the markets and reissue their debt. Macroeconomic factors will have changed which could result in changing interest rates.
- The payor will commit to refinancing, but there could be risk of default.

Example Terms of Option One:

Term	Value
Value	5,400,000
Interest Rate	4.39%
Payment Schedule	Annual IO payments of $237,500
Term	Five years
Performance Payment	Due at year five

Table 14, Option One: Example Terms, Quantified Ventures 2018

Example Performance Outcomes of Option One:

Term	Under	Expected	Over
Visitation	125K	Between 125-235K	235K
Performance Payment	-$1,180,000	$0	$1,400,000
Refinance Amount	$4,460,000	$5,650,000	$7,000,000
Investor Return	0%	4.39%	8.77%

Table 15, Option One: Performance Outcomes, Quantified Ventures 2018

7.2 Long Term Debt Service with a Variable Interest Rate

The second option is a long-term debt with the interest rate adjusted based on the performance at the end of the five-year evaluation period. The new interest rate would be paid down until year 30, with interest and principal paid in year 30. **Image 19** is a graph to depict yearly payments made by the payor(s).

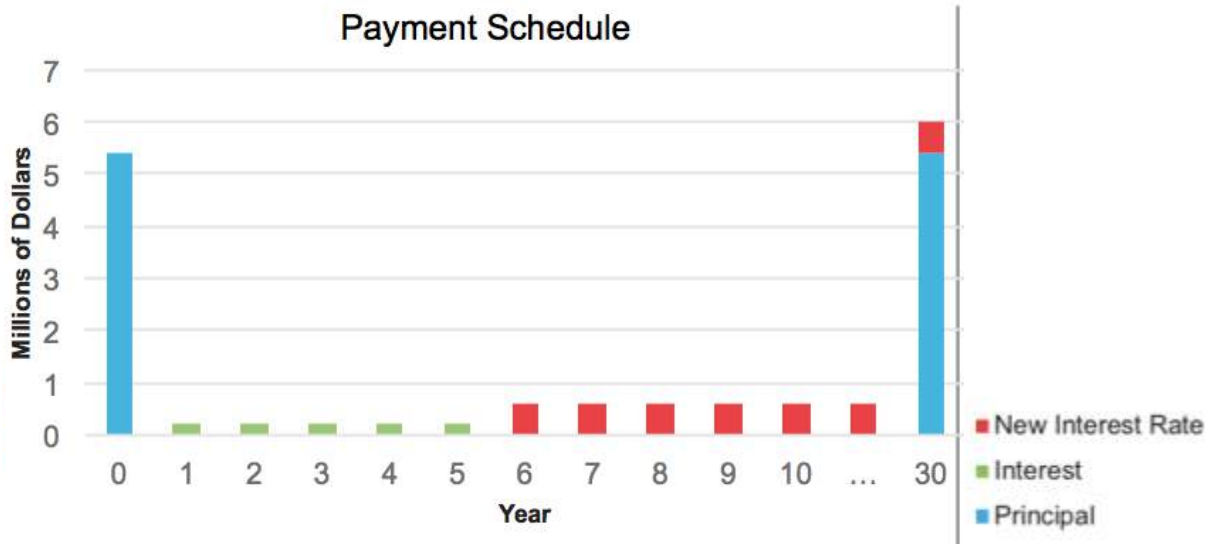


Image 19, Long Term Debt Service Payment Schedule, Quantified Ventures 2018

Benefits of Option Two:

- This option could cater to a different type of investor, as it is an uncorrelated bond based on visitation, not the capital markets. Interest rates on bonds are affected by credit ratings, inflation risks, and interest rate risk. Creating a bond with an interest rate that is dependent on mountain biking rather than macroeconomic trends is attractive to some fixed income investors
- This option allows the payor to reward the investor for assuming risk without re-issuing new debt or paying principal.
- This long-term debt service can be issued as a 30-year loan or a 30-year bond, where entirety of the 30 years could be interest only payments.
- Investor risk is minimized because the full repayment of the interest and principal are paid off in this 30-year commitment, rather than by refinancing (like in option one).

Concerns of Option Two:

- The refinancing will be based upon performance of the trail, not macroeconomic trends of the cost of capital.
- Conversations with investors have demonstrated that most are interested in repayment within a 5-7 year timeframe.

Example Terms of Option Two:

Term	Value
Value	5,400,000
Interest Rate	4.39%
Payment Schedule	Annual interest only payments of $237,500
Term	30 years
Performance Payment	Interest Rate Adjustment

Table 16, Option Two: Example Terms, Quantified Ventures 2018

Example Performance Outcomes of Option Two:

Term	Under	Expected	Over
Visitation	125K	Between 125-235K	235K
New Interest Rate for years 6-30	0%	4.39%	11.4%
New Coupon Payment for years 6-30	$0	$237,500	$617,000
Investor Rate of Return on 30 year note	0.81%	4.39%	8.77%

Table 17, Option Two: Performance Outcomes, Quantified Ventures 2018

7.3 Interest and Principal Loan

The third option is an eight-year loan with principal and interest payments due annually. A separate performance payment will be paid from years six to eight. **Image 20** depicts annual payments made by the payor(s).

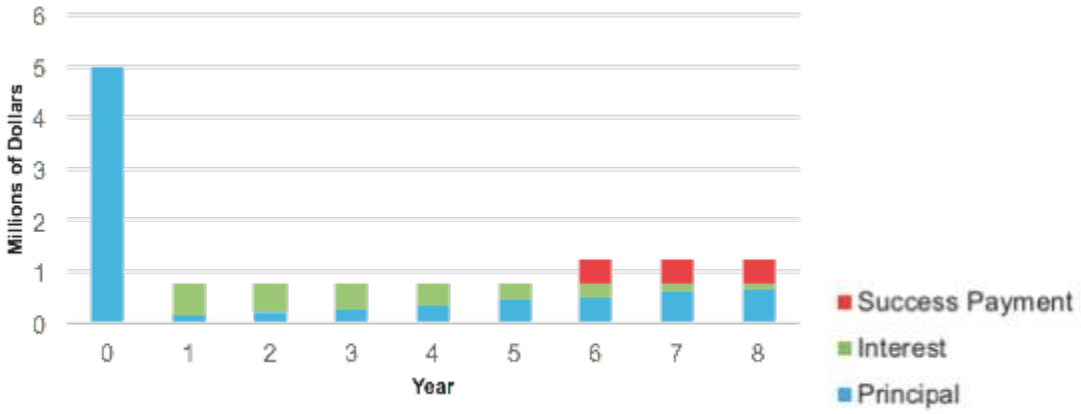


Image 20, Interest and Principal Loan Payment Schedule, Quantified Ventures 2018

Benefits of Option Three:

- The shortest tenure of the three options, which may be favorable to investors.
- Lower risk for investors may give a more favorable interest rate.

Concerns of Option Three:

- This option has a higher debt service than the first two options. This could require the payor to raise revenues in order to cover the debt service.
- Principal is being paid down before the success of the project is measured.

Example Terms of Option Three:

Term	Value
Value	$5,400,000
Interest Rate	4.39%
Payment Schedule	P+I of $817,000
Term	8 years
Performance Payment	Premium or Return in years 5-8

Table 18, Option Three: Example Terms, Quantified Ventures 2018

Example Performance Outcomes of Option Three:

Term	Under	Expected	Over
Visitation	125K	Between 125-235K	235K
Coupon Payment	$817,000	$817,000	$817,000
Performance Payments in year 8	-$1,120,000 ($375,000 in years 6-8)	0	$1,525,000 ($508,000 in years 6-8)
Investor Return	0%	4.39%	8.77%

Table 19, Option Three: Performance Outcomes, Quantified Ventures 2018

8. The Transaction Stakeholders

The parties involved in this transaction, outside of the Wayne National Forest and Quantified Ventures, are: the payor(s), investors, and evaluators. **Image 21** shows how these players interact with each other.

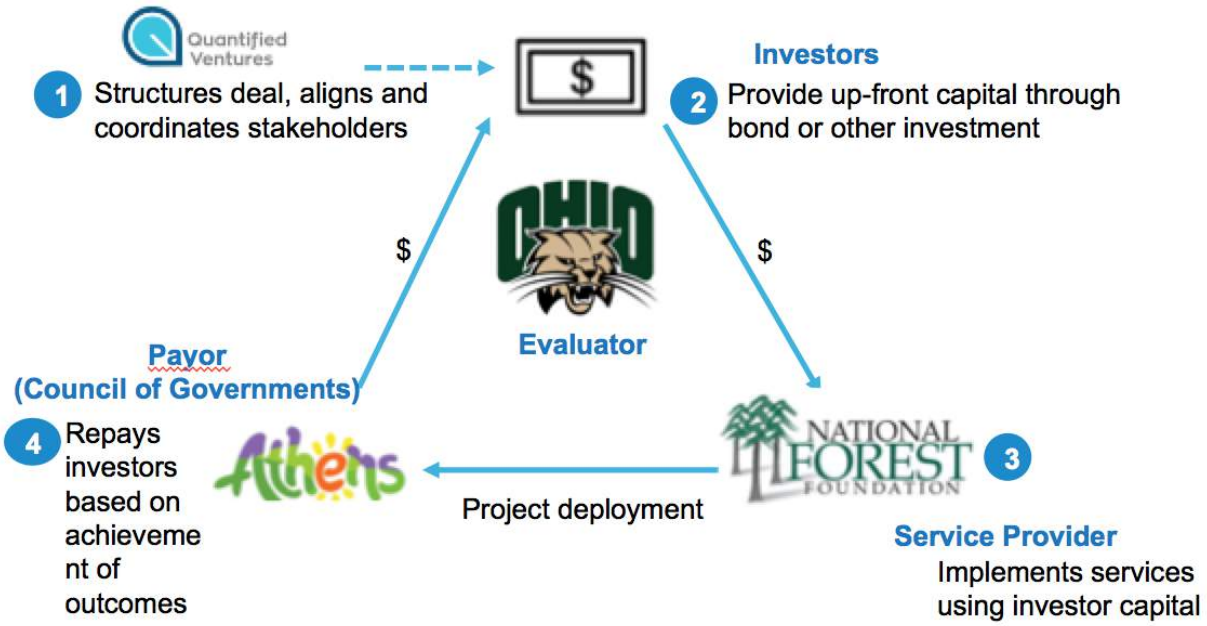


Image 21, Social Impact Bond with Relevant Parties, Quantified Ventures 2018

8.1 Payors

Through our stakeholder engagement and landscape analysis, Quantified Ventures mapped the economic benefits from the Baileys Trail System to Athens county and the surrounding cities and villages. Through in-depth conversations with Athens government leaders, Quantified Ventures gained verbal buy-in from the local representatives. In order to bring together all regions that will benefit from the Baileys Trail System, local leaders suggested forming a Council of Governments. This Council of Governments (COG), made up of Athens county, the City of Athens, the City of Nelsonville, the Village of Buchtel, and the Village of Chauncey, will serve as the payor for this transaction. The payors' responsibility for repayment would be determined based on which of the above three transaction structures is pursued.

The aforementioned government bodies are intending to form a COG to support outdoor recreational infrastructure. The COG will be a political subdivision of the State of Ohio, but will have no regulatory power or other authority possessed by cities, counties or other local governments.[11]

[11] Signed LOI to form COG is currently pending

Image 22 shows how the payors play into the transaction.

8.1.1 Option one: Council of Governments

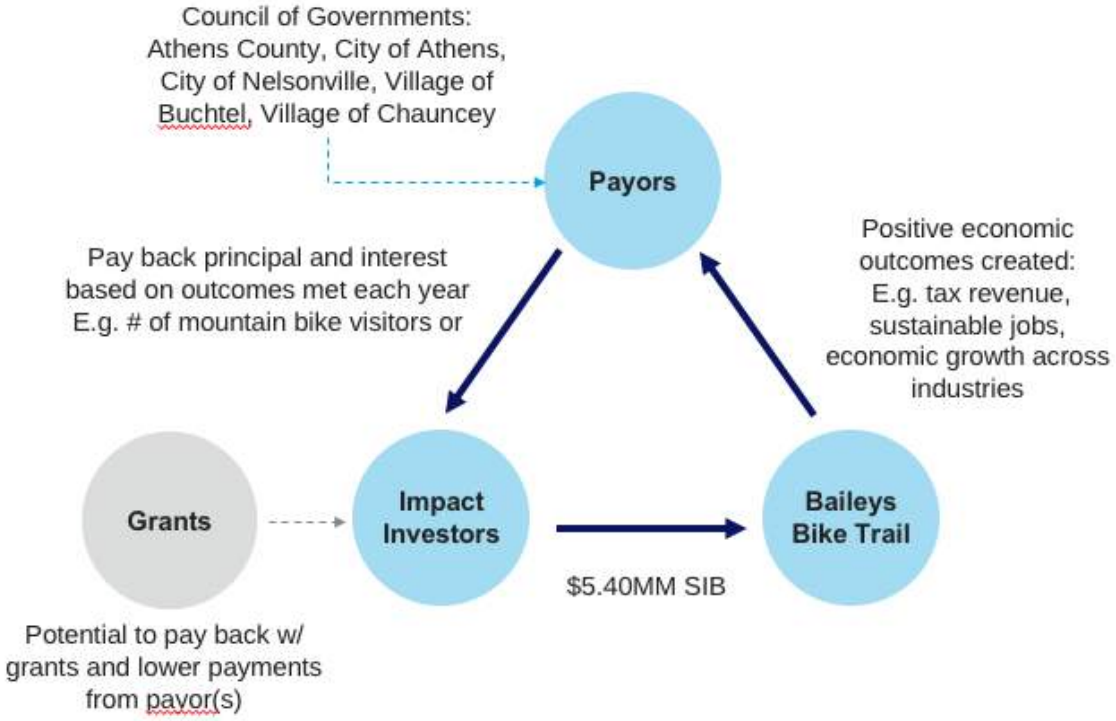


Image 22, Transaction Structure with COG, Quantified Ventures 2018

Given conversations with the Mayor of the City of Athens, Commissioners of Athens county, and Nelsonville City Manager, forming the Council of Governments is the most viable option for a payor. Options two, three, and four, outlined below, are other transactions that were considered.

The council of governments was favored over the other transaction options because it forms the necessary structure by which multiple government bodies can come together under one pre-existing entity to make decisions and hold and disperse moneys. This structure allows for other parties to also be involved, when necessary, even if they are not putting forth any money for the project. A council of governments is already a structure that government bodies are comfortable with, allowing for an easier transition into transaction structuring. This structure can also be reused for future cross-boundary recreational infrastructure projects.

Images 23, 24, and 25 portray other possible transaction structures.

8.1.2 Option Two: Two Payors - Athens County and City

Image 23 portrays a transaction structure in which there are two payors: Athens county and the City of Athens. Each body could pay equal or differing amounts, depending on how the transaction was structured.

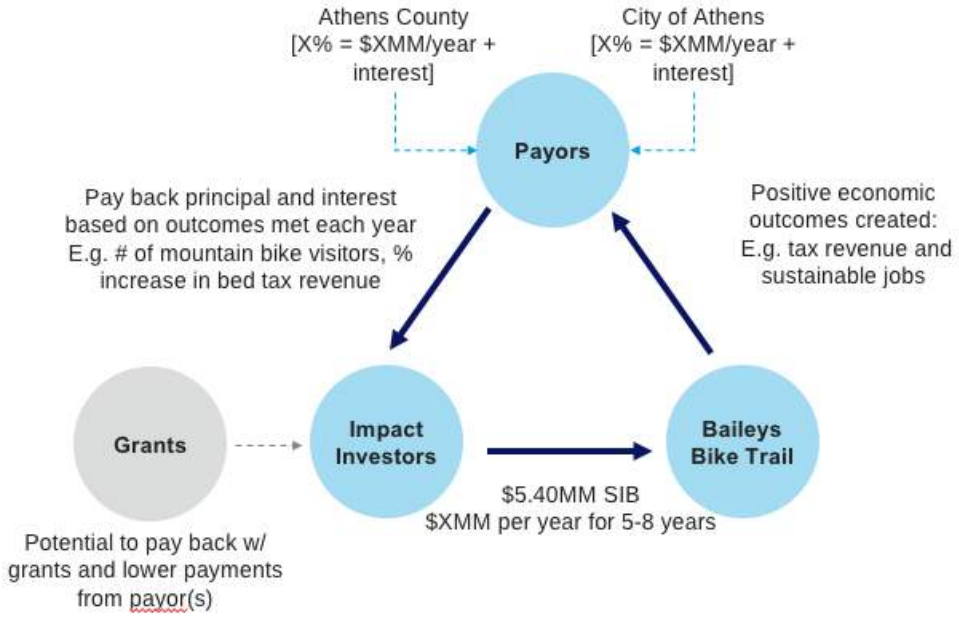


Image 23, Two Payor Transaction Structure, Quantified Ventures 2018

8.1.3 Option Three: Three Payors - Athens County, the City of Athens, and Ohio

Image 24 portrays a transaction structure in which there are three payors: Athens county, the City of Athens and the State of Ohio. Each body could pay equal or differing amounts, depending on how the transaction was structured.

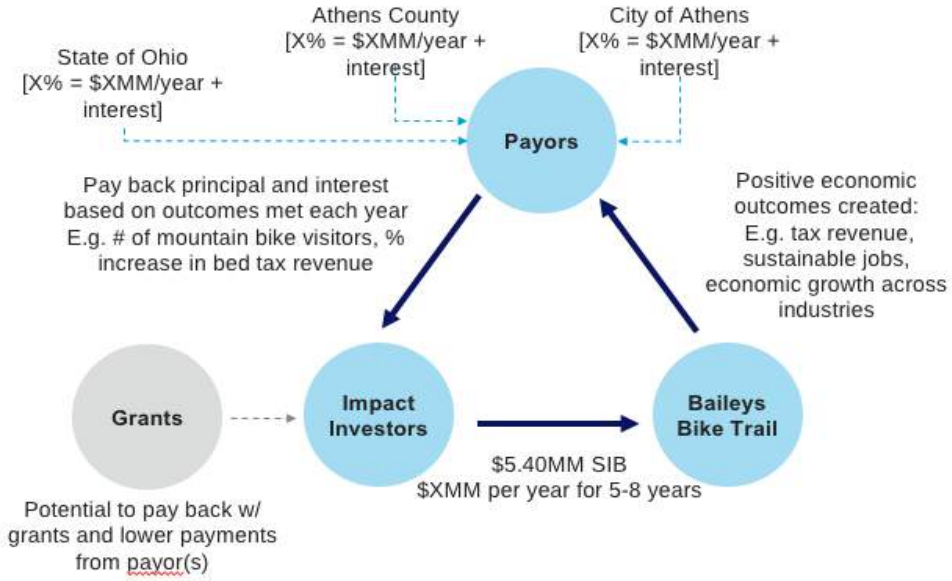


Image 24, Three Payor Transaction Structure, Quantified Ventures 2018

8.1.4 Option Four: Four Payors - Athens County, City of Athens, Ohio, and Associations

Image 25 portrays a transaction structure in which there are four payors: Athens county, the City of Athens, the State of Ohio, and an outdoor recreation industry association (e.g. REI, Patagonia, etc). Each body could pay equal or differing amounts, depending on how the transaction was structured.

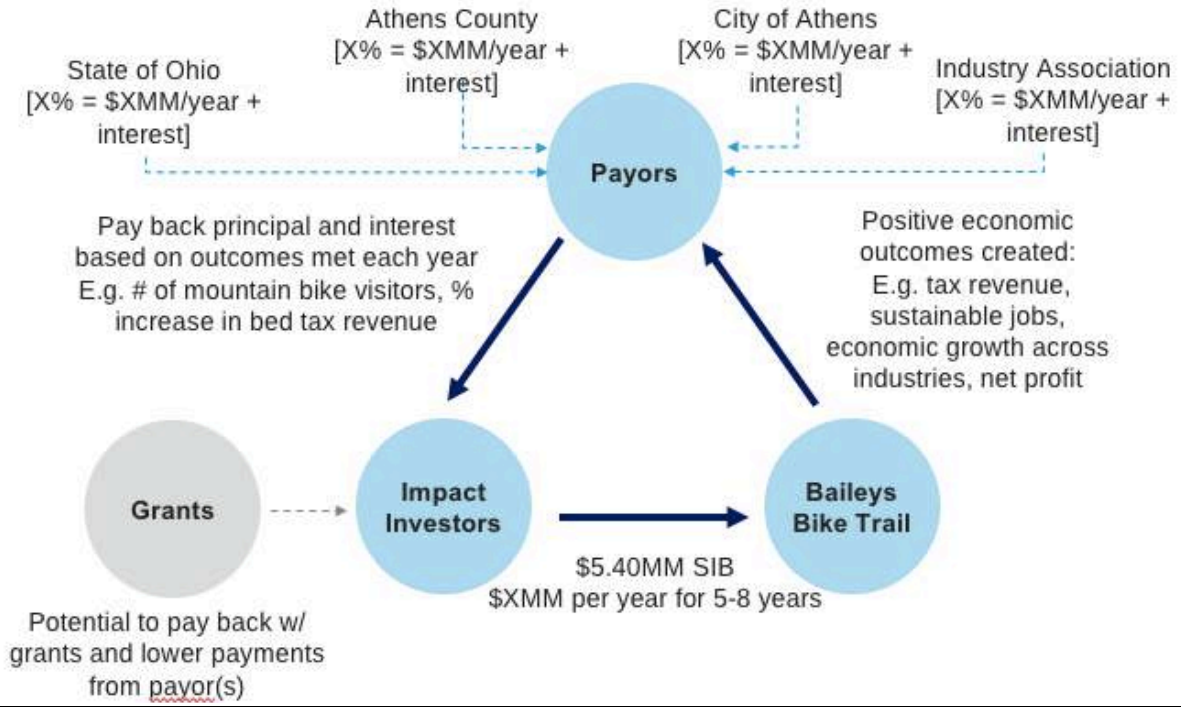


Image 25, Four Payor Transaction Structure, Quantified Ventures 2018

8.2 Investors

Quantified Ventures constantly monitors the investor landscape and engages impact investors to develop strategic relationships for the benefit of its clients. With only a handful of PFS projects in the United States to date, investors are approaching the space from varied levels of interest and experience. In deals that have launched to-date, there have been a number of different investor types, including large commercial financial institutions, Community Development Finance Institutions, high net worth individuals, philanthropic foundations, corporations, and insurance companies, among others. Over $160M has been invested in US PFS deals to date, and this new asset class has the potential to unlock billions in uncommitted capital over the coming years.

8.2.1 Investor risks

Impact Investing is not philanthropy or charity, and investors want to mitigate their risk

Risk	Definition	Mitigation
Programmatic	Trails do not lead to economic growth	Sufficient evidence and studies to support it
Implementation	Trails work in general, but the Baileys does not increase visitation	Designed by premier trail design firms. Allocate money for marketing
Evaluation	Trail is visited, but the evaluation fails to capture it	Work with industry expects and ensure investors are comfortable
Political/ Appropriation	Outcome payer cannot repay investor if targets are hit	Sinking funds, 30 year bonds, letters of commitment
Partnership	One of more actors do not fulfill obligations	Stability of USFS and Ohio University is not a risk

Source: Urban Institute: Managing Investor's Risk in Pay for Success (2016)

Image 26, Investor Risks, Quantified Ventures 2018

8.2.2 Investor categories

One way to mitigate investor risk in PFS investment is to include multiple supports: grants, senior and junior investors, and guarantees

1 Non-Recoverable Grantors	▪ Non- Recoverable Grantors give grants that will not be repaid. ▪ These are grants or commitments provided by non-Outcome Funder actors to fund the intervention, which the grantor has no opportunity to recover or recycle
2 Senior Investors	▪ Senior Investors are investors with the highest priority for repayment ▪ Traditionally, more similar to equity
3 Subordinate/ Junior Investors	▪ Mitigates performance risk by acting as first-loss capital, enabling lower "break-even" threshold for senior lenders ▪ Investors with a lower repayment priority than senior investors ▪ More risky since repaid after senior, more likely to be structured like equity
4 Recoverable Grantors	▪ Recoverable Grantors give grants that stay with the intermediary and are recycled into future programming ▪ They can also provide Investment Guarantees, which are first loss guarantees that are paid to investors in outcomes are not achieved and are recycled into future programs if not used. (only triggered if investment fails)

Image 27, Types of Investors and Investments, Quantified Ventures 2018

8.2.3 Proposed investors

In discussions with potential investors, the Baileys Trail System resonated with several notable impact and philanthropic investors. **Table 20** summarizes these conversations.

Investor	Rationale	Highlights and feedback
Athens Foundation	Foundation located in Athens county that works to expand economic opportunities in Athens.	Indicated interest in giving a PRI to the Baileys Trail System.
Athens county Government	Local county government and potential back end payor.	Indicated interest in investing in the Baileys Trail System.
Rocky Boots	Local for profit company and large employer in Athens county.	Indicated interest in investing in the Baileys Trail System.
Jackie O's Brewery	Local brewery and pub that sustainable and locally brews beer.	Indicated interest in investing in the Baileys Trail System.
ACENet	Local CDFI in Athens county.	Clear interest in supporting Athens county economic development.
Ohio University	Local university that is incentivized to uplift the region for a more positive experience for current and future students.	Clear interest in supporting the project and Athens county development as well as substantial endowment.
Calvert Impact Capital	Nonprofit impact investment firm	Prior relationship with Quantified Ventures via the DC Water transaction.
Industry Association Group	A national outdoor recreation for profit firm	Fits their market strategy
Goldman Sachs	Impact investment arm of the investment bank has shown interest in this type of innovative projects.	Prior relationship with Quantified Ventures via the DC Water transaction.
Barclays	Impact investment arm of the investment bank has shown interest in this type of innovative projects.	Indicated interest in investing in Appalachia.
Maycomb Capital	Provide financing across asset classes to fund strategies and enterprises that transform communities.	Fits their investment focus and strategy.

Table 20, Investor Options, Quantified Ventures 2018

8.2.4 Example capital stack

These investors fall into various places within the investment capital stack. The ultimate capital stack and associated investors would be determined in the transaction-structuring phase, following this feasibility analysis. **Image 28** portrays how the capital stack could be arranged.

The project can be structured to match the risk/return portfolio of investors depending on outcomes and levels of grant capital raised

	Senior Investor	Subordinate Investor	Recoverable Grants Investment Guarantees	Non-Recoverable Grants
Example	Goldman Sachs, OU, REI	Calvert Impact Capital, Athens Foundation	Athens Foundation	ARC Power Initiative
Investment	3.5 MM (87.5%)	500K (12.5%)	1MM (0% of investment)	1,400,000 (16%)
Expected Return	7% (3.75MM)	4% (520K)	0%	-100%
Max potential loss of Principal	60% (2 MM)	100% (Principal at Risk)	100%	100%
Blended Return	6.6% ($4.265MM)			

Illustrative

Image 28, Illustrative Capital Stack, Quantified Ventures 2018

8.3 Evaluator

Evaluators play an important role during each stage of PFS financing development by grounding decisions in evidence and navigating stakeholders through evaluation design questions.

To be a strong evaluator, they must be able to (Urban Institute 2016):

- Identify a program model and interpret the evidence base
- Develop a program monitoring tool or a way to measure and track the outcomes overtime
- Develop an informed evaluation design
- Define a target population as well as the take-up rates needed to achieve sufficient analytic power
- Develop a baseline of data in order to compare against a historical or current population

- Identify outcomes of interest
- Implement multiple stages of evaluation during project development and recommend any necessary course changes
- Inform development of success payments based on evidence
- Build understanding, consensus, and buy-in on a rigorous evaluation design
- Finalize data-sharing agreements and address any ethical considerations
- Work with investors to understand financial risks related to the program model and research design
- Document outcomes for success payments
- Support interpretation of results

Furthermore, the evaluator must understand the community of players in the transaction as well as the content that they are evaluating. Quantified Ventures recommends Ohio University College of Business, Department of Sports Administration because they are rooted in the community, understand the players, and have a history of developing and implementing evaluations for recreational infrastructure projects.

8.3.1 Recommended Evaluator: Ohio University

The proposed evaluator is Ohio University College of Business, Department of Sports Administration. The OU Sports Management Program is one of the premier programs in the country, ranked the best sport business program in the world by Sport Business International (OU 2018). This program includes a special focus on evaluating the economic impact of sport, tourism, and sporting events, therefore providing opportunity for alignment with this PFS transaction.

8.3.2 Faculty Evaluator: Norm O'Reilly

Through this feasibility analysis, Quantified Ventures has had extensive engagement with Professor Norm O'Reilly, Richard P. and Joan S. Fox Professor of Management & Chair in the Sports Administration department. Quantified Ventures recommends using Dr. Norm O'Reilly as the evaluator for this transaction and has received verbal commitment from him to that he is able and willing to do so. See Appendix 11.6 for Dr. Norm O'Reilly's bio.

8.3.3 Potential Evaluation Design

The proposed evaluation methodology (subject to change), is driven from our economic model:

- Estimate the change in the number and types of tourists to the region
- Estimate average levels of spending (often within specific market segments) of tourists in the local area.
- Apply the change in spending to a regional economic model or set of multipliers to determine the secondary effects (Stynes 1999).

Image 29 shows the possible metrics the evaluator can evaluate on, the method of evaluation, as well as the frequency of measurement. Quantified Ventures anticipates that the number of mountain bikers on the Baileys Trail System will be the metric that the transaction is structured around, however the other metrics listed below will also be

rigorously measured in order to triangulate the visitation number.

Possible outcome metrics for success payments

Metric	Method	Frequency of measurement
**Number of mountain biking on the Baileys	Trail Counters	Constant
Number of non local visitors	Cameras at parking lots with license plate readers	Constant
% of Overnight versus Day	Surveys	Monthly
Spending per party	Surveys	Monthly
Rise in Bed Tax Collections	Public Record	Yearly
Rise in Sales Tax Collections	Public Record	Yearly
Rise in Property Tax Collections	Public Record	Yearly
Rise in Number of Registered Businesses	Public Record	Yearly
Increased Pride and Regional Attitude	Surveys	Yearly
Number of Volunteer Hours	Surveys	Yearly

Image 29, Outcome Metrics, Quantified Ventures 2018

8.3.4 Evaluation Design Support and Risk Mitigation

In addition to the evaluator, contracting with an industry expert in the evaluation design phase may mitigate evaluation risk and improve accuracy. Therefore, Quantified Ventures has also engaged with Nathan Reigner from Recreation and Tourism Science, LLC. Nathan has a PhD in Natural Resources and is a public lands, conservation, outdoor recreation, and nature-based tourism social scientist. He has over a decade of experience directly informing visitor use, tourism, and resource planning and management. His experience includes survey research, statistical analysis, and policy evaluation.

Dr. Reigner provided three key insights related to evaluation design that are worth noting in this analysis:

- Trail counters are relatively inexpensive; the real expense is in the design of where to put them on the trail. Since the trails are inter-connected, with multiple entrances and exists, some people go “out and back”, some people do loops, and others do “figure eights”. It is important to conduct a trial evaluation that can adjust for these differences in behavior so that 1 visit gets 1 count.
- Counters need to be maintained and checked monthly in order to ensure that data is not lost.
- Surveys on public lands may require approval from Office of Management and Budget to comply with the “Paperwork Reduction Act” (OPM).

9. Path to Transaction Structuring

This section outlines next steps to move forward in structuring and executing this transaction.

9.1 Next Steps

The following items are immediate next steps as the transaction moves into the structuring phase:

- **Set up a Council of Governments:** After conversations with Athens government leaders, it was determined by the project team that the mechanism that would serve to be the payor in this transaction would be a Council of Governments (COG). Athens county, The City of Athens, The City of Nelsonville, the Village of Buchtel, and the Village of Chauncey are intending to form a COG to support outdoor recreational infrastructure. The COG will be a political subdivision of the State of Ohio, but will have no regulatory power or other authority possessed by cities, counties or other local governments. Once the COG has been formed, Quantified Ventures agrees to provide expertise and technical assistance to the COG, as part of a program to structure and issue alternate private sector financing, via a Pay-For-Success (PFS) model, pursuant to which the amount of the return to private investors will take into account specified economic outcome(s), in order to assist the COG in meeting the costs of financing the Baileys Trail System. Quantified Ventures will aid the COG, its bond counsel, disclosure counsel and municipal advisor in developing the PFS structure, identifying potential investors, pricing, and issuing the financing for relevant recreational infrastructure projects.
- **Submit ARC grant:** Athens county, the Athens Bicycle Club, and the Wayne National Forest are submitting a grant to the Appalachian Regional Commission POWER grant for partial funding to help subsidize the investment need for the Baileys Trail System. The outcome of this grant application will provide a final estimate of capital investment needed to be financed via PFS.
- **Finalize costs:** The Wayne National Forest is currently working with Applied Trails Research to finalize the cost estimates of building the Baileys Trail System. Once confirmed, Quantified Ventures will adjust the investment amount.
- **Outstanding contracts:** Quantified Ventures, the Wayne National Forest, and the COG will have to ensure legal compliance, which may include:
    - Forming a Special Purpose Vehicle to hold and distribute money to and from investor and payor(s)
    - Outsourcing a Service Provider to build out the trail
    - MOU for the COG to serve as a Payor
    - MOU for the investor(s) to invest in this transaction

9.2 Path to Transaction Close

The following will encompass next steps for Transaction Structuring:

- Confirm work plan and mobilize Council of Governments
- Confirm outcome metrics, outcome payment triggers and outcome valuations with all stakeholders
- Develop and agree upon financing strategy and transaction structure
- Determine legal structure, including need for Special Purpose Vehicle or other intermediary
- Secure legal team
- Design evaluation methodology and select evaluator
- Develop investor pitch deck and secure investors
- Negotiate terms with investors
- Finalize all contracts
- Issue financing

9.3 Scaling Opportunities

If this transaction closes successfully, it has the ability to help fulfill USFS's long-term vision and generate lasting benefits to the Wayne National Forest, Athens county, and the City of Athens. This transaction can serve as a pilot case in using PFS to successfully address recreational infrastructure needs across national forest land. Furthermore, given the multiple aforementioned financing issues that USFS currently faces, PFS can be modified and scaled to meet other use cases on national forest land. During Quantified Ventures' research, we unveiled the applicability of PFS as a means to innovatively and sustainably finance not only other trails, but also other recreational infrastructure projects, deferred maintenance projects and acid mine drainage problems. Given the large amount of responses to the initial RFP for projects, it is clear that there is a need and desire to utilize this financing technique to solve these problems in a new way.

10. Conclusion

Based on the analysis detailed in this Feasibility Analysis, Quantified Ventures has deemed that pay-for-success is a viable tool to finance the Baileys Trail System on the Wayne National Forest.

The transaction with the Wayne National Forest will result in a fully financed mountain biking trail. Once built, the Baileys is predicted to bring in over 181,000 visitors per year resulting in $6.9MM in higher wages, $7.3MM in increased tax revenue, $20.1MM in increased spending, and 66 new jobs over 10 years. The $5.4MM invested is expected to produce a strong rate of return for impact investors and will represent the first PFS investment into a recreational infrastructure project. Athens county, The City of Athens, The City of Nelsonville, the Village of Buchtel, and the Village of Chauncey will form a Council of Governments to align their payments with the completion of successful outcomes, all the while putting the upfront financial risk onto impact investors. The Council of Governments can also serve as a political structure to facilitate future cross-boundary recreational projects. OU will serve as the evaluator to build out a robust evaluation design and will be able to produce reports, allowing for greater transparency around outcomes data, government spending, and national forest and recreational infrastructure usage. The Wayne National Forest will have the ability to be thought leaders in the field of recreational infrastructure and innovative financing techniques, while also gaining access to a new cohort of visitors, providing ample opportunities for environmental education and stronger ties to the outdoor community in Athens and nationally. Most importantly, the people of Athens will have a high-class 88-mile mountain biking trail that will bring positive environmental, economic, health, and intangible benefits directly into the community.

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12. Appendix

12.1 Detailed Budget of the Baileys Trail System

Pay Items	Title	Wage Rate	Units	Cost/Task	Cost/ Unit	Est Annual Quantity	Total Price
900	**Trail Construction & Maintenance**						
907	Mobilization						
90701	Mobilization	DBA	MI	$175.66	$5.02	400	$2,007.54
910	Trailway						
91101	Excavation	DBA	LF	$126.90	$1.27	100	$126.90
91102	New Trail Construction	DBA	MI	$26,964.60	$26,964.60	0	$0.00
91106.1	Normal Tread Maintenance	SCA	MI	$2,160.48	$2,160.48	10	$21,604.80
91106.2	Heavy Tread Maintenance	SCA	MI	$3,827.52	$3,827.52	2	$7,655.04
91116	Obliteration of Abandoned Trail	SCA	LF	$160.14	$1.60	0	$0.00
91210	Brush Cutting	SCA	mi	$983.28	$983.28	5	$4,916.40
91217	Hazard Tree removal	SCA	EA	$39.23	$19.62	5	$98.08
913.00	Surfacing						
91303.1	Aggregate Surfacing, Grading & Compaction Method, trail maintenance	SCA	ton	$621.68	$31.08	40	$1,243.36
91303.2	Aggregate Surfacing, Grading & Compaction Method, trail construction	DBA	ton	$667.96	$33.40	0	$0.00
91303.3	Aggregate Surfacing (Government furnished), Grading & Compaction Method, trail maintenance	SCA	ton	$160.88	$8.04	40	$321.76
91303.4	Aggregate Surfacing (Government furnished), Grading & Compaction Method, trail construction	DBA	ton	$207.16	$10.36	0	$0.00
91303.5	Aggregate Surfacing, Additional ¼ Mile Haul Pay Rate	SCA	ton/ 1/4 MI	$25.05	$5.01	100	$501.10
91307.1	Base Course, Grading & Compaction Method, trail maintenance	SCA	ton	$651.68	$32.58	40	$1,303.36
91307.2	Base Course, Grading & Compaction Method, trail construction	DBA	ton	$697.96	$34.90	0	$0.00
91309	Watering	SCA	K gal	$560.34	$560.34	0	$0.00
91316.1	Grid Pavement Units, Concrete Mat (4x16 ft)	DBA	SF	$764.50	$11.95	0	$0.00
91316.2	Grid Pavement Units, Pavers	DBA	SF	$1,104.10	$11.04	0	$0.00
91318.1	Riprap Surfacing (ODOT Type A or B)- ARD	SCA	ton	$824.78	$41.24	40	$1,649.56
91318.2	Riprap Surfacing (ODOT Type D)	SCA	ton	$753.58	$37.68	0	$0.00
91701	Ford, Shallow Stream	DBA	EA	$1,027.96	$1,027.96	0	$0.00
91805	Separation Geotextile	SCA	SY	$244.58	$1.22	0	$0.00

Pay Items	Title	Wage Rate	Units	Cost/Task	Cost/ Unit	Est Annual Quantity	Total Price
900	**Trail Construction & Maintenance**						
907	Mobilization						
90701	Mobilization	DBA	MI	$175.66	$5.02	400	$2,007.54
910	Trailway						
91101	Excavation	DBA	LF	$126.90	$1.27	100	$126.90
91102	New Trail Construction	DBA	MI	$26,964.60	$26,964.60	0	$0.00
91106.1	Normal Tread Maintenance	SCA	MI	$2,160.48	$2,160.48	10	$21,604.80
91106.2	Heavy Tread Maintenance	SCA	MI	$3,827.52	$3,827.52	2	$7,655.04
91116	Obliteration of Abandoned Trail	SCA	LF	$160.14	$1.60	0	$0.00
91210	Brush Cutting	SCA	mi	$983.28	$983.28	5	$4,916.40
91217	Hazard Tree removal	SCA	EA	$39.23	$19.62	5	$98.08
913.00	Surfacing						
91303.1	Aggregate Surfacing, Grading & Compaction Method, trail maintenance	SCA	ton	$621.68	$31.08	40	$1,243.36
91303.2	Aggregate Surfacing, Grading & Compaction Method, trail construction	DBA	ton	$667.96	$33.40	0	$0.00
91303.3	Aggregate Surfacing (Government furnished), Grading & Compaction Method, trail maintenance	SCA	ton	$160.88	$8.04	40	$321.76
91303.4	Aggregate Surfacing (Government furnished), Grading & Compaction Method, trail construction	DBA	ton	$207.16	$10.36	0	$0.00
91303.5	Aggregate Surfacing, Additional ¼ Mile Haul Pay Rate	SCA	ton/ 1/4 MI	$25.05	$5.01	100	$501.10
91307.1	Base Course, Grading & Compaction Method, trail maintenance	SCA	ton	$651.68	$32.58	40	$1,303.36
91307.2	Base Course, Grading & Compaction Method, trail construction	DBA	ton	$697.96	$34.90	0	$0.00
91309	Watering	SCA	K gal	$560.34	$560.34	0	$0.00
91316.1	Grid Pavement Units, Concrete Mat (4x16 ft)	DBA	SF	$764.50	$11.95	0	$0.00
91316.2	Grid Pavement Units, Pavers	DBA	SF	$1,104.10	$11.04	0	$0.00
91318.1	Riprap Surfacing (ODOT Type A or B)- ARD	SCA	ton	$824.78	$41.24	40	$1,649.56
91318.2	Riprap Surfacing (ODOT Type D)	SCA	ton	$753.58	$37.68	0	$0.00
91701	Ford, Shallow Stream	DBA	EA	$1,027.96	$1,027.96	0	$0.00
91805	Separation Geotextile	SCA	SY	$244.58	$1.22	0	$0.00

12.2 Case Studies

Trail Ranking by Annual Visitation

*Not used during calculation of World Class, High, Medium, Low Tier trail because it assessed state-wide usage

	Name of Trail	Annual Use	Ranking
1	Statewide Economic Impact of Recreational Trail Use (MN)*	30,092,800	N/A
2	South Economic Impact of Recreational Trail Use (MN)*	6,475,500	N/A
3	Central Economic Impact of Recreational Trail Use (MN)*	4,045,400	N/A
4	North East Economic Impact of Recreational Trail Use (MN)*	3,614,800	N/A
5	Northwest Economic Impact of Recreational Trail Use (MN)*	2,163,800	N/A
6	Washington/Old Dominion*	1,707,353	N/A
7	Central Florida*	1,700,000	N/A
8	Metro Economic Impact of Recreational Trail Use (MN)*	1,397,300	N/A
9	Great Allegeny	800,000	World Class
10	Andrew Pickens National Forest	750,500	World Class
11	Nothern Outer Banks Trail	680,000	World Class
12	Whistler	533,348	World Class
13	Mohwak-Hudson	458,000	World Class
14	All Nantahala and Pisgah trails	435,000	World Class
15	Laurel Highlands Hiking Trail	281,145	World Class
16	Colorado High County	276,400	World Class

	Name of Trail	Annual Use	Ranking
17	Deluth Traverse	268,000	High Tier
18	Columbia River Gorge	230,000	High Tier
19	Jackson Hole	222,535	High Tier
20	St. Marks Trail	220,000	High Tier
21	Moab	200,000	High Tier
22	Long Trail (Vermont)	200,000	High Tier

	Name of Trail	Annual Use	Ranking
23	Cuyuna Lakes Mountain Biking	185,000	Medium Tier
24	Whistler (Bike Park)	136,879	Medium Tier
25	Curt Gowdy State Park	135,000	Medium Tier
26	Virginia Creeper	130,172	Medium Tier
27	Lower Trail of Blair County	130,000	Medium Tier
28	Sandy Ridge	125,000	Medium Tier
29	Vermont Area Trails	105,750	Medium Tier
30	Paint Creek	100,000	Medium Tier
31	Slick Rock	100,000	Medium Tier
32	Oak Mountain State Park Bump Trail	100,000	Medium Tier
33	Sea To Sky Corridor	99,000	Medium Tier
34	Kingdom Trails	94,000	Medium Tier
35	Slaughter Pen Trail	92,000	Medium Tier
36	Whistler (Lost Lake)	63,527	Medium Tier
37	Pisgah (Nantahala and Pisgah)	60,900	Medium Tier
38	Coldwater Mountain Trail	50,000	Medium Tier

	Name of Trail	Annual Use	Ranking
39	Raystown Lake	35,000	Low Tier
40	Grandfather Trail	34,800	Low Tier
41	Nantahala (Nantahala and Pisgah)	26,100	Low Tier
42	Glacial Hills	26,000	Low Tier
43	Chequamegon Area Trails	25,000	Low Tier
44	Hatfield- McCoys	24,285	Low Tier
45	CAMBA Wisconsin	22,630	Low Tier
46	Burlington, VT trails	22,500	Low Tier
47	Copper Harbor	20,000	Low Tier
48	Cheoah Trail	17,400	Low Tier
49	Appalachain Trail on Nantahala and Pisgah	17,400	Low Tier
50	Tusquitee Trail	17,400	Low Tier
51	Oakridge, Oregon	15,900	Low Tier
52	Maah Daah Hey (Medora) Trail	15,000	Low Tier
53	Cariboo Trail	10,160	Low Tier
54	Jakes Rocks	10,000	Low Tier
55	Catamount Trail	10,000	Low Tier
56	Wisconsin Off-Road Series	9,870	Low Tier
57	Barre Town Forest	8,053	Low Tier
58	Kamloops Trail	7,300	Low Tier
59	Vultures Knob	6,000	Low Tier

Trails Ranked by Economic Impact in Region

	Name of Trail	Economic Expenditure	Captured Economic Impact	Income	Jobs	Taxes	Day Spending	Night Spending
1	Wisconsin State Park		$924,000,000					
2	MN Statewide Trails		$498,928,000	$145,142,000	5263	$35,845,000	$10	$44
3	MN Metro Area Trails		$140,351,000	$43,895,000	1374	$10,342,000	$10	$44
4	WI Off-Road Series		$135,000,000					
5	South MN Trails		$84,913,000	$21,929,000	1228	$5,981,000	$10	$44
6	NE MN Trails		$75,333,000	$22,132,000	1146	$5,790,000	$10	$44
7	N. Outer Banks Trail		$60,000,000					
8	Central MN Trails		$52,278,000	$14,995,000	731	$3,864,000	$10	$44
9	Central Florida Trails		$42,000,000				$19	
10	Great Allegheny		$40,800,000				$98	
11	Whistler		$39,300,000					
12	Andrew Pickens National Forest		$32,100,000					
13	All Nantahala and Pisgah trails		$30,200,000	$9,000,000	366	$3,734,077		
14	NW MN Trails		$28,487,000	$7,797,000	450	$2,215,000	$10	$44
15	Columbia River Gorge		$21,054,000					
16	Cuyuna Lakes Mountain Biking		$21,000,000					
17	Jackson Hole		$17,000,000	$3,600,000	213	$1,100,000	$7	$126
18	Wisconsin Trails	$26,434,000	$16,684,000	$6,405,000	222			$468
19	Sea To Sky Corridor	$10,044,962	$15,600,000	$4,600,000	71	$2,800,000		
20	Phoenix & Central Arizona		$13,774,000	$5,723,000	134			$189
21	Tuscon & Southern Arizona		$13,550,000	$6,532,000	214			$353
22	Pisgah (Nantahala and Pisgah)	$14,000,000	$12,413,462	$5,149,847	198	$2,047,264		
23	Fruita, Colorado		$8,700,000					

	Name of Trail	Economic Expenditure	Captured Economic Impact	Income	Jobs	Taxes	Day Spending	Night Spending
24	Hatfield- McCoys		$7,700,000	$2,700,000	146	$622,752		
25	Washington/Old Dominion		$7,000,000				$74	
26	Anniston, Alabama		$6,000,000					
27	Oakridge, Oregon		$4,900,000		24		$63	$491
28	Nantahala (Nantahala and Pisgah)	$4,600,000	$3,690,271	$1,236,466	55	$576,282		
29	Kamloops, BC		$3,500,000					
30	Grandfather Trail	$4,000,000	$3,092,626	$874,212	39	$360,156		
31	Cheoah Trail	$3,200,000	$2,284,803	$804,636	34	$344,450		
32	Appalachain Trail on Nantahala and Pisgah	$2,200,000	$1,905,824	$576,066	20	$231,638		
33	Virginia Creeper	$2,500,000	$1,600,000		30		$119	
34	Jakes Rocks, PA		$1,500,000					
35	Tusquitee Trail	$2,200,000	$1,485,984	$434,737	19	$174,287		
36	Glacial Hills		$1,450,000				$71	$522
37	North Central Arizona		$1,428,000	$812,000	26			
38	Chequamegon		$1,300,000					
39	CAMBA Wisconsin		$1,300,000	$670,800	31			
40	West Coast of Arizona		$909,000	$378,000	16			
41	Northern Arizona		$889,000	$404,000	14			$203
42	Cariboo Trail		$427,081		22		$57	
43	Mohwak-Hudson							
44	Laurel Highlands							
45	Colorado High County	$76,000,000						
46	Deluth Traverse							
47	St. Marks Trail							
48	Moab			$8,400,000	312			
49	Long Trail (Vermont)							
50	Whistler (Bike Park)							
51	Curt Gowdy State Park							$382

12.3 Baileys Master Trail Plan

BAILEY TRACT MOUNTAIN BIKE TRAILS

WAYNE NATIONAL FOREST, ATHENS RD

MASTER PLAN

NOVEMBER, 2017

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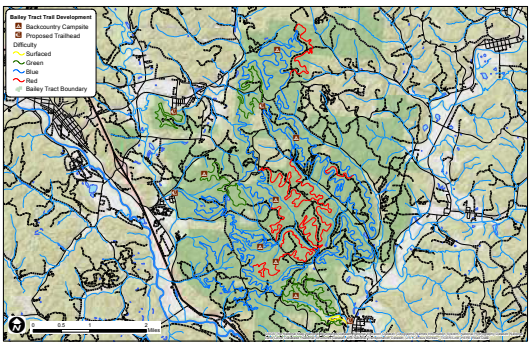
EXECUTIVE SUMMARY

The Wayne National Forest and Athens Bicycle Club have begun the collaborative development of a destination-level, mountain bike-optimized trail system in a portion of the Forest commonly called the Bailey Tract. Engaging a diverse array of regional supporting partners, this collaborative endeavor envisions the trail system providing significant quality of life, economic, and health benefits to southeast Ohio communities and residents.

The trail system will highlight the ridges and slopes of the roughly 9,000 acre tract, have direct community connections to Nelsonville, Buchtel, and Chauncey, as well as bikeway connectivity to Athens and The Plains via the Hockhocking Adena Bikeway. The 87 miles of singletrack trails are being professionally designed to maximize sustainability, protect natural resources, and provide a world-class mountain biking experience. With trails tailored to beginner through expert mountain bikers and loops that provide incredible hikes and trail runs through an actively restored forest to classic Appalachian foothill vistas, the system will become an ecotourism magnet for visitation from a 150-mile radius with a population over 15 million people, a reasonable destination distance for weekend travelers.



This document provides details regarding the partners' goal alignment, the development process to-date, trail specifications, community connectivity, avoidance of natural and cultural resource impacts, development process moving forward, and an opinion on the necessary fundraising needs. While the capital development of a project such as this seems quite small for an economic development endeavor, other similar, recently developed trail systems (eg. Duluth Traverse, Floyd's Fork, Jakes Rocks, Ozark Greenway singletrack, Kingdom Trails) have become destinations for not only outdoor adventurers, but as quality of life drivers for high wage businesses seeking to attract and retain employees.

TRAIL SYSTEM GOALS

TRAIL SYSTEM GOALS

CREATE TRAIL EXPERIENCES THAT:

- Provide destination-quality recreational trail amenities,
- Drive and sustain significant visitation that creates direct quality of life and economic benefits to the region,
- Provide physical trail connections to the surrounding communities of Nelsonville, Buchtel, and Chauncey, and
- Enhances marketing opportunities for outdoor recreation in the region.

PROVIDE A DIVERSITY AND PROGRESSION OF RIDING EXPERIENCES TO:

- Offer a broad range of high quality trails that appeal to the wide demographic of skills present in the region and to destination visitors,
- Create a progressive environment where mountain bike instruction or self-paced skills development is widely available and actively encouraged, and
- Help market and drive current and future utilization of regional lodging and amenities through a modern mountain bike-focused trail system of the highest riding quality.

CONSTRUCT DURABLE TRAILS THAT:

- Ensure the quality of the developed mountain bike trail product is consistent over the long term,
- Operate efficiently and reduce the annual capital/labor needed to effectively address degradation issues brought on by high levels of trail use, climatic events, and other Forest activities, and
- Extend the number of available riding days during the open trail season by creating trails that dry quickly and span or harden seasonally wet locations.

EMPLOY A COMPREHENSIVE SIGNAGE AND NAVIGATION SYSTEM THAT:

- Provides easy-to-understand information on the range trail experiences offered,
- Efficiently brings trail users to a trail they consider appropriate for their desired experience, and
- Directs users to high quality trailside amenities and the area service providers.

INTRODUCTION

USFS WAYNE NATIONAL FOREST PROJECT PURPOSE AND NEED

The Forest Service's stated purpose of this project is to:

- Create recreational opportunities for a quality backcountry, single-track mountain biking experience on the Wayne National Forest for riders of various skill levels (technical and physical capabilities) that is near existing trails and interested communities;
- Reduce conflicts between mountain bikers and other recreational trail users by providing a trail system that is designed specifically for mountain bike use;
- Continue a collaborative approach to construct and maintain a sustainable mountain bike trail system;
- Connect mountain bike trails to communities in Athens and Hocking counties in a manner that contributes to the ecological, social, and economic prosperity of these communities over the long term.

ATHENS COUNTY COMPREHENSIVE PLAN CONFORMANCE

Vision: "Athens County will build upon its unique heritage to practice wise land use that creates a healthy, prosperous and cohesive community for a diverse population. We, the citizens of Athens County, are committed to:

- Meaningful employment
- Entrepreneurial opportunities
- Sustainable agriculture
- Environmental stewardship
- Education achievement & cultural opportunities
- Appropriate transportation and other public services
- Vibrant rural areas and small towns"

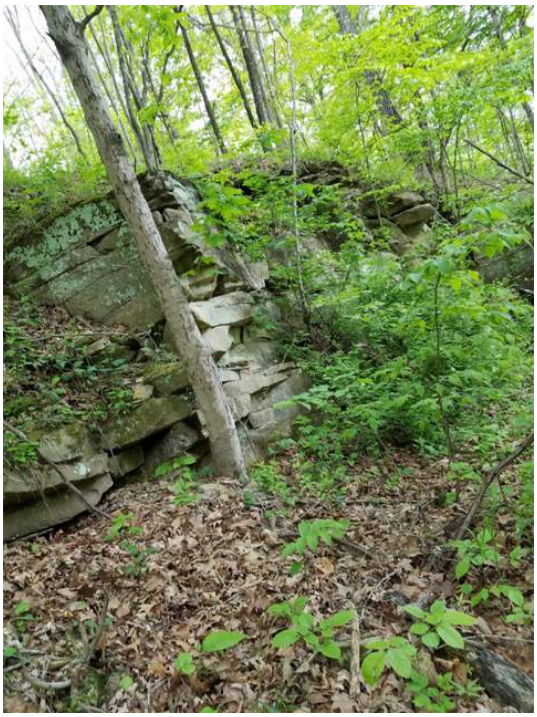
BACKGROUND (Athens Comprehensive Plan)

Athens County offers a combination of scenic natural beauty and cultural resources. Tourism is an important source of revenue for the county, but more can be done to develop its recreational potential. The completion of the Nelsonville Bypass, which widened the last two-land link of US HWY 33 between Columbus and Athens, will increase the county's accessibility for the Franklin County metropolitan area. Rising gas prices and other cost factors will compel Ohio residents to vacation within the state.

While recreational resources bring tourism revenues, their greatest value is in enhancing the quality of life of residents. The existence of parks, trails, nature preserves, and other recreational opportunities make Athens County a desirable place to live, and further development of these resources will help attract future residents. Athen County's hilly, forested terrain, abundant wildlife, a diverse native flora, and a multitude of public lands makes Athens County an ideal location for a variety of outdoor recreation pursuits and help to fuel the tourism

INTRODUCTION

industry. The Hock Hocking Adena Bikeway and a growing network of bicycle routes on rural highways and mountain bike trails in the woods provide new opportunities.



GOAL 1: Park District and Recreation Plan

- Involve the community in development and maintenance of recreational opportunities, particularly with established community organizations.

GOAL 2: Accessibility- Increase accessibility to diverse recreation opportunities for all residents.

- Connect recreation areas with community trails using existing public lands, scenic roadways, new and expanded horse and bike trails, and new acquisitions.

GOAL 3: Provide, Protect, and Enhance Recreation Opportunities- Provide diverse recreation options, protect them and improve them.

- Expand on the existing bike path by developing a system of trails throughout the county.
- Strive to improve the range of recreation options to satisfy interests of all ages.
- Use a framework of ecologically sound guidelines for a broad range of recreation activities.

COLLABORATIVE PROJECT WITH REGIONAL BENEFITS

Mountain bike-focused trail development on the Wayne National Forest has been a topic discussed by the Forest Staff and regional mountain bike advocates for a number of years. A partnership made up of community non-profit, and governmental organizations proposes to construct an 88-mile single track, sustainable trail system for mountain biking in the Baileys area (West Bailey, Big Bailey, and Carr-Bailey Roads) with trailheads located in or near the communities of Chauncey, Buchtel, and/or Nelsonville. The trail system would be easily accessible to the Athens and Columbus areas and potentially become a destination area for trail-based recreation enthusiasts throughout the Midwest, as the Bailey Tract is within 150 miles of over 15 million people.

Studies show that building a mountain bike trail destination boosts local economies through tourism and provides health benefits to citizens by providing safe, accessible places to walk, run, bike, and enjoy nature. With the physical connectivity of the Baileys trail system to area communities, the trail system will provide a source of community pride, and foster an appreciation for the management and conservation of public lands. These benefits have been realized by numerous communities that have used the relatively small capital investment in trails to propel local economies through tourism visitation, business and high-wage worker recruitment and retention, quality of life, and health benefits. The Duluth Traverse, MN, Jakes Rocks, PA,

INTRODUCTION

Floyd's Fork, KY, Ozark Greenways, AR, and Kingdom, VT Trail Systems have all made investments of a few million dollars that see a return on that investment within a year and continue to provide economic improvements for years to come.

PROJECT PARTNERS

In 2016 members of the Athens Bicycle Club (ABC) and the Wayne National Forest (WNF) came to agreement in pursuing the development of a large trail system on the Bailey Tract near the Forest Headquarters. Athens Bicycle Club has developed and maintained 45 miles of singletrack at Lake Hope and Stroud's Run State Parks and committed to spearheading this new project. The Forest and ABC outlined the desire for an extensive system of 80 to 100 interconnected trail miles with direct connectivity to Nelsonville, Buchtel, Doanville and Chauncey located on the periphery of the Bailey Tract. The project leaders formed a working group of project supporters, including the Athens County Commissioners, Athens County Visitor's Bureau, Athens City and County Planners, Village of Chauncey, Central Ohio Mountain Bike Organization (COMBO), Ohio University, and the International Mountain Bicycling Association, all of whom are willing to provide letters of support for the project.

COMMUNITY OUTREACH PROCESS/ SCHEDULE

In January of 2016, ABC organized a meeting between WNF, IMBA Great Lakes Region Director Andy Williamson, and members of the Central Ohio Mountain Bike Organization (COMBO) to discuss the concept and draw support. An initial stakeholder meeting was held on January 22, 2016, with a follow-up public stakeholder meeting held on March 14, 2016, to gauge interest. A formal Bailey's Tract working group was assembled in April 2016, consisting of representatives from ABC, WNF, Athens County Visitor's Bureau, Ohio University Outdoor Recreation Program (within the Patton College of Education), and COMBO, and including the Athens City Planner and the Athens County Planner. ABC accepted the position of the lead community partner for the project and signed an agreement with the Forest to solicit

Plans inching forward for mountain bike trails in Wayne National Forest

By STEVE ROBB Messenger staff journalist Nov 16, 2016

Mountain bike trail system proposed

approved, 92-mile trail could greatly impact Hocking County

BY BETH LANNING

INTRODUCTION

and administer a contract for professional trail design and master planning services, and selected Applied Trails Research (ATR) to assist with the conceptualization and field design.

ATR provided a conceptual overview of an approximately 90-mile trail system to Forest and ABC leaders in Spring, 2017, had a day-long meeting with more than 20 Wayne National Forest officials, including the Regional Forester and District Ranger, where issues and opportunities were discussed and sideboards developed for the subsequent Phase 1 trail corridor development. With the potential opportunity to link the the City of Athens, through the Village of Chauncey, to the trail system with an extension of the Hockhocking-Adena Bikeway, as well as existing Chauncey park lands adjacent to Forest holdings, this node became the focus of Phase 1 trail corridor development. Subsequently ATR provided two days of intensive trail design training to ABC volunteers who spent the next week working collaboratively with ATR to field flag the Phase 1 trail corridors in preparation for natural and cultural resource review by the Forest.

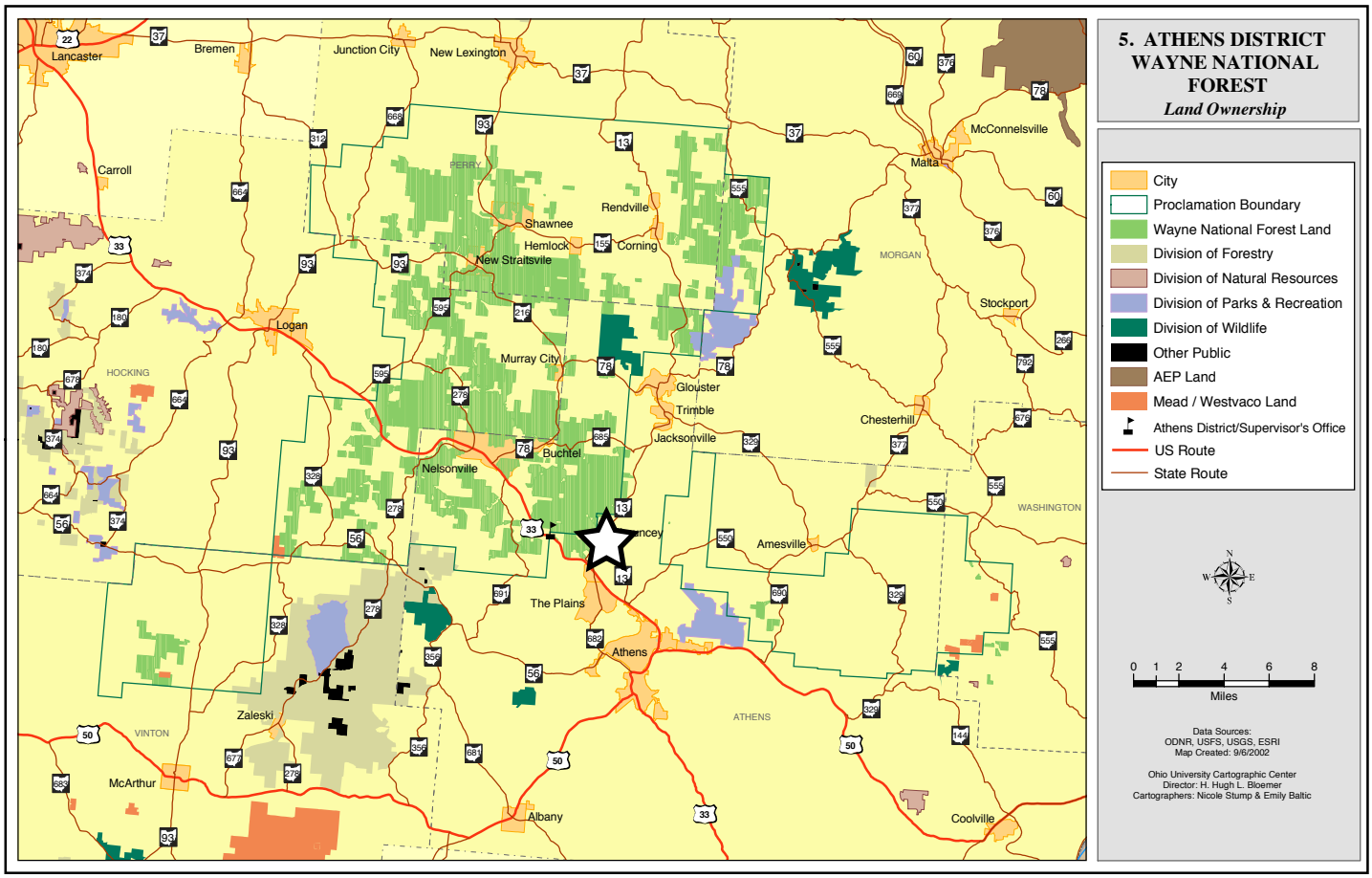
The ABC/Forest/ATR team conducted two public outreach and discussion sessions in late February at the Nelsonville Opera House and Athens Community Recreation Center. Approximately 35 individuals attended each session. Introduction of the project by Forest and ABC leaders was followed by a 30 minute presentation by the ATR team explaining the best practices of sustainable trail design and the activities that the design team, with the assistance of ABC volunteers, would be undertaking in April, 2017. Open question and answer periods of approximately 30 minutes followed the presentations.

Comments provided by the public were overwhelmingly positive, with many individuals expressing their desire to assist in moving the project forward, stating that the area could benefit tremendously in economic and community quality of life impacts from the trail system, and hoping to have a better idea how the project could move forward expeditiously. A few private property owners expressed wariness that the project would negatively impact their personal quality of life and potentially the hunting quality in the vicinity of their homes.

In June the Forest published a Scoping document that described the project and solicited additional public comment (by July 7, 2017) to assist the partners in refining the project's details. During this timeframe the Forest also conducted an assessment of natural and cultural resource review of the entire Baileys area to better refine avoidance areas for the trail system. The refinements proposed by the public and the Forest have been integrated into this final draft plan for additional review and in preparation for an official decision by the Forest regarding the project. Partners anticipate beginning the process of funding development in Winter, 2018 with hopes that trail construction can be initiated later in the year.

BAILEY TRACT OVERVIEW

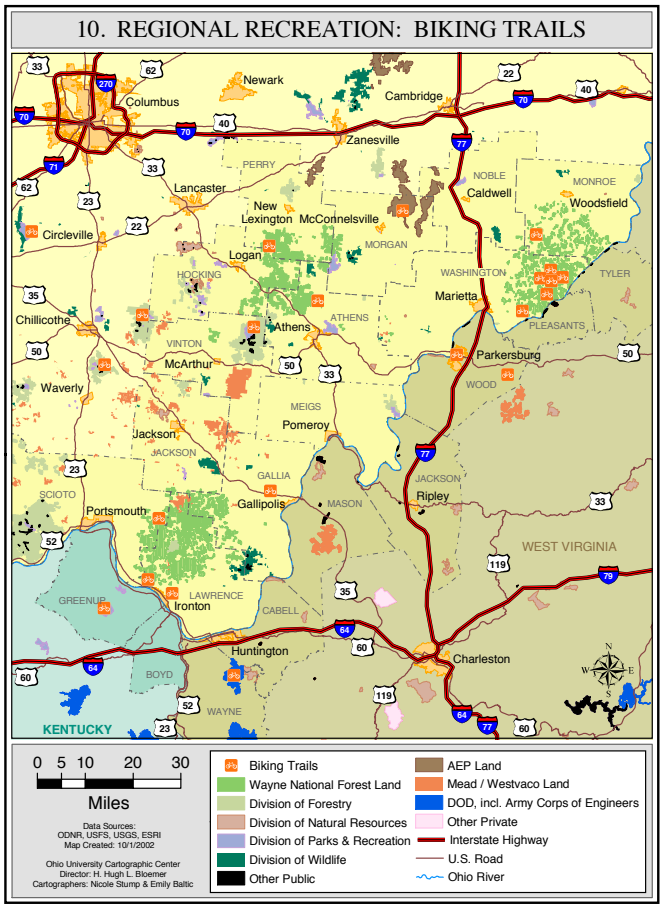
WAYNE NATIONAL FOREST ATHENS DISTRICT (GREEN) ACCESS

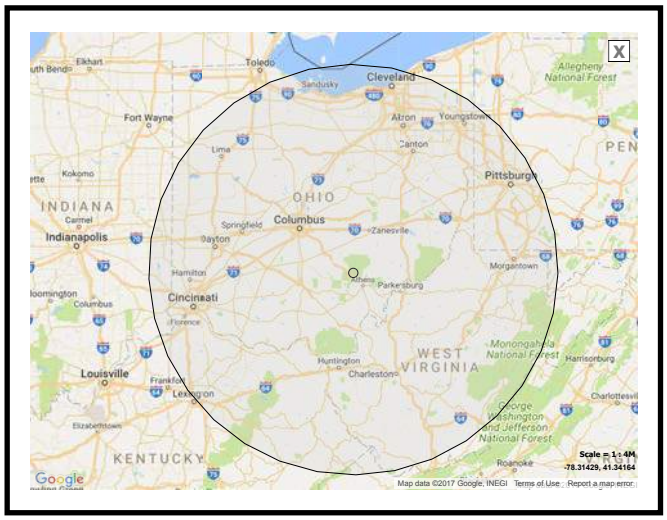


The Bailey Tract (indicated by the star on the map above) is located north of HWY 33, the major transportation corridor between Columbus and Athens, OH. With a metropolitan area population of 1.9 million people, the third largest in Ohio, and relatively few outdoor recreation areas, the HWY 33 corridor already sees significant recreation-centered traffic on Spring through Fall weekends, with travel times of 1 to 1.5 hours to the Bailey Tract area for most of the Columbus metro area. Interstate highway access to Columbus provides efficient access to HWY 33 and Chauncey, OH from Cincinnati (2.5 hours), Akron (2.75 hours), Cleveland (3.25 hours), Pittsburgh (3.25 hours), Indianapolis (3.75 hours), and Louisville, KY (4 hours).

BAILEY TRACT OVERVIEW

REGIONAL MOUNTAIN BIKING OPPORTUNITIES





The Wayne National Forest currently allows mountain biking on 209 miles of forest trails. These opportunities are depicted by the bike icons on the green land parcels on the upper left hand map. The majority of these trails have a designed and primary use of off-highway vehicles. Similarly, many OHV trails in OH State Forests are open to mountain biking, depicted in the grey parcels east and south of Chilicothe. In many cases these trails do not provide a recreational experience that matches with the desires of mountain bikers.

Approximately 30 miles of trails within the Wayne National Forest are designed for the primary use of hiking, but mountain biking is an allowed use. In both OHV and hiking trails, the trail grades and tread roughness do not match well with the skills and fitness of all but the best mountain bikers.

Smaller trail systems are present in the region that are more appropriate for mountain biking. Most notably, Lake Hope and Strouds Run State Parks outside Athens. Currently, these trail systems are broadly considered to be the best riding opportunities in the region. Additionally, the Bailey Tract is within a 30 minutes of Hocking Hills State Park, which receives 4.5 million visitors per year. The Hocking Hills Tourism Association is actively seeking additional outdoor recreation opportunities to recommend to visitors.

The map on the lower left represents a 150-mile radius around the Bailey Tract. Census data indicates the population within this radius to be over 15 million. This distance from the site represents a reasonable assumption of potential weekend visitation distances travelled. With ease of interstate highway access, visitation could easily extend to the Indianapolis and Louisville metropolitan areas.

BAILEY TRACT OVERVIEW

US FOREST SERVICE LAND- BAILEY TRACT IN GREEN

The Bailey Tract is a roughly 9,280-acre area located on the Athens Ranger District of the Wayne National Forest. The area is located north of US HWY 33, approximately 12 miles west of the City of Athens, Ohio. Adjacent to the National Forest are the communities Nelsonville, Buchtel, Doanville, and Chauncey. Like most Eastern National Forests, the Bailey Tract has many private property intrusions and inholdings. Much of the privately held land is located in the valley bottoms in lower elevations with a few notable exceptions of large higher elevation inholdings in the Utah Ridge and Coal Run Road areas. The forest is being actively managed, through fire and vegetation management, toward a mixed-age, diverse oak-hickory community. The area has numerous evidence of past and current land use practices, including many historic timber extraction routes and operating oil wells, and, as such, could be enhanced with the proposed recreational development. The Forest is currently managed for multiple uses, including improving conservation/forest resources, protecting water quality, and providing hunting opportunities.

The predominant ridge within the Bailey Tract are the Utah and Oregon Ridges with elevations around 1,000 feet. From this watershed divide in the northwest, valleys fall to the southeast. Small perennial streams with floodplains of 100 to 500 feet in width flow in the valley bottoms toward confluences with Sunday Creek and the Hocking River on the broad floodplain where the town of Chauncey is located at approximately 670 feet in elevation. Smaller portions of the property fall into other watersheds, with the western flank draining to Monday Creek and the Nelsonville area and the northwest corner of the property draining to the Snow Fork and Buchtel.

Roads are prevalent on the Bailey Tract and generally follow the stream valleys from northwest to southeast. From the south to north, these include Coal Run Road (unpaved), West Bailey Road (paved and unpaved), Big Bailey Run Road (paved), and Carr-Bailey Road (unpaved and paved). At the Oregon Ridge, Big Bailey and Carr-Bailey Roads drops to the west on Marietta Ave and the Town of Buchtel. At the Utah Ridge, Utah Ridge Road connects Big Bailey, West Bailey, and Coal Run Roads to New Floodwood Road, US HWY 33, and City of Nelsonville. West Bailey Road continues over the ridge and down to the west into the unincorporated community of Doanville.

TRAIL DESIGN FUNDAMENTALS

TRAIL SYSTEM OVERVIEW

The Bailey Tract trail system is intended to provide a diversity of experiences for mountain biking and pedestrian trail users. Planned trailhead locations near the adjacent towns are ideal for the development of stacked loop trail subsystems within the larger Bailey Tract trails. The trails will:

- Be located on hillsides rather than on ridges or within flat valleys/floodplains.
- Utilize relatively minor trail corridor grades, generally less than 10%.
- Consistently undulate up and down and left to right. The resulting sinuous trail is referred to as having a rolling contour alignment, which aids in draining water off of the trails, minimizing the potential for erosion, and reducing the need for water diversion structures such as culverts and water bars.
- Minimize potential impacts to nearby natural and cultural resources through this narrow, sidehill location that will not change over time and encourages users to remain in the intended recreational corridor

While all the trails will bear these fundamentals of sustainable trail location and design, a progression of difficulty and diversity of trail experiences will be developed by providing differing trail distances, grades, widths, and levels of roughness. There will be three primary trail types within the overall system and accessible from each trailhead access area- beginner/family friendly trails, intermediate level backcountry trails, and difficult backcountry trails. In total 87.6 miles of trail corridors have been conceptualized throughout the Bailey Tract.

Bailey Tract Trail Plan			
Difficulty	**Miles**	**Footage**	**%**
Surfaced	0.7	3,873	1%
Green	16.8	88,659	19%
Blue	51.6	272,457	59%
Red	18.5	97,438	21%
Total	87.6	462,427	100%

TRAIL TYPES

All-Weather Trails (0.7 miles, 1% of total mileage)
Short trail loops with a rock aggregate surface (yellow on maps), connected directly to trailhead parking will provide access to the forest for all visitors. The distance and smooth surface will provide for the use of strollers and push bikes without muddy conditions. Developed at a width that allows for strollers to pass comfortably, these introductory trails may also have adjacent interpretive information or beginner riding skill development features.

Frontcountry Trails (16.8 miles, 19% of total mileage)
Shorter distance/duration loops that cater to visitors with lower levels of trail experience, stamina, or time will be accessed directly from the trailheads. These beginner-friendly trails (green on maps) will be constructed to a width that allows trail users to safely pass without getting off the tread of the trail. The trail tread will be constructed to be primarily smooth to provide maximum accessibility to a variety of trail users, including adaptive or hand-propelled bicycles. Biking skills development features may be present, but will be placed adjacent to the trail and developed to be "rollable" and not require advanced balance or strength to negotiate.

Backcountry Trails (70.1 miles, 80% of total mileage)
Multiple options will extend from the frontcountry trails to provide longer distance/duration loops. These intermediate (51.6 miles, blue on maps) and advanced (18.5 miles, red on maps) level trails allow visitors with higher levels of fitness and/or time extend their exploration of the forest. The trail widths will be relatively narrow and passage will require a trail user to step to the side of the trail. Trail grades and distances of climbs/descents will increase on these backcountry trails. The most difficult trails will be optimized for mountain biking and generally have a downhill directional orientation. The trail surface will be less manicured with larger rocks and roots exposed in the tread. Challenging riding features may be present within or adjacent to the main trail tread, constructed of natural materials, may require advanced balance or strength to negotiate, and could provide the opportunity to jump.

TRAIL SYSTEM CONNECTIVITY

Trailhead Locations
Discussions between the Working Group have prioritized the creation of trailheads off of Forest Service lands, working in partnership with the communities to identify and develop access points on municipal lands that are more geographically tied to the services present.

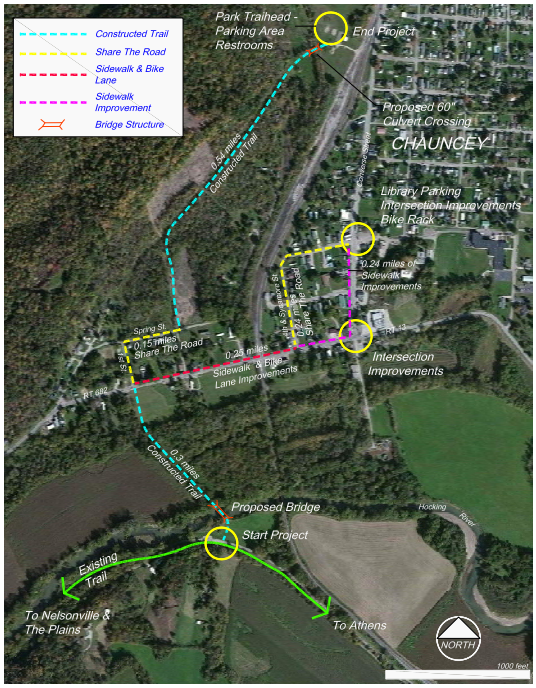
Identified with the Phase 1 trail system and with municipal support committed, Chauncey Village Park will become the first major trailhead to access the trail system. New access may be necessary to avoid traffic conflicts with the adjacent railroad, but the park has the capacity to develop parking for 50 or more vehicles. A planned bridge (see Connectivity below) will provide access across the creek and the planned all-weather and frontcountry trails, portions of which have been located on municipal lands.

Preliminary sites for secondary phase community trailheads have been identified, but not confirmed at this time. A small system of two frontcountry loops have been conceptualized on a Forest parcel adjacent and south of Buchtel where a minor trailhead with approximately 10-car capacity would benefit local access. Trails have been conceptualized with a node just inside the Forest boundary, east of Monday Creek on Marietta Avenue to the east of Buchtel. A second potential minor trailhead site will be developed in the Doanville area, which would also provide trail access to Nelsonville via low traffic volume roads. Improved parking and service amenities within or adjacent to the historic Nelsonville town center could create an off-site trailhead that invites trail access from the town and places visitors near amenities at the beginning and end of their recreational experience.

An additional site for a second major trailhead has been identified on Forest property near the Buchtel community, at the top of Big Bailey Run Road, approximately 0.2 miles south of the junction with SR 685. It is anticipated

TRAIL SYSTEM CONNECTIVITY

Bikeway Connectivity
Bike-friendly connectivity from the trail system to the Hockhocking-Adena Bikeway is currently in the planning and funding stages. A spur would extend from the Bikeway north through Chauncey, terminating at the Chauncey Village Park Trailhead. This connectivity would allow regional visitors the opportunity to utilize Bikeway parking areas and facilities in Athens, The Plains, and Nelsonville at mile markers 0 (East State Street Recreation Area, Athens), 4 (West State Street Ballfields, Athens), 10.2 (SR682, The Plains), and 16.4 (Robbin's Crossing/ Hocking College, Nelsonville) to access the trails.



Backcountry Campsites
Seven backcountry campsites locations have been identified throughout the trail system. These locations have been selected to facilitate more in-depth exploration of the Baileys area. Located at the edge of ridges, the proposed site locations should not impact water resources and provide great views of the forest. Campsite locations are distributed across the five phases of trail system development. Located away from road and trailhead access points to discourage undesirable use, these sites present opportunity for bike-packing and pedestrian overnight use within the Bailey Tract. The dispersed sites can be connected to configure multiple night travel patterns. Due to the interconnected nature of the proposed trails and existing forest and county roads there are numerous routing configurations possible to move from campsite to campsite.

In some cases, limited timber management may be required to enhance a viewshed, others will provide seasonally variable views of the surrounding mountains and the fire managed forest understory that highlights the areas long management history. Care should be taken in development of campsites on the Bailey Tract. Like trails, campsites should be constructed on the sidehill or in areas where adjacent terrain will restrict site expansion. Final location of these sites should include consideration of site amenities such as views, natural and cultural attractions, functional sleeping, cooking and eating areas. Given the rise of hammock based camping, selection of sites with trees of appropriate spacing for hammock use should also be considered.

IMPACT AVOIDANCE

Existing Forest Infrastructure/Resource Avoidance
The Bailey Tract, like all of the Wayne National Forest, was heavily impacted prior to its management control being ceded to the Soil Conservation Service and later, the United States Forest Service. These agencies inherited lands that had been clear cut and farmed until the subsequent soil erosion resulted in a landscape that did not support agriculture or silviculture. This use of the lands on the Bailey Tract is still evident in the numerous forest roads, logging decks, and eroded skid tracks throughout the property. The roads have been avoided in the trail system design due to prevalent grade and/or drainage challenges. Likewise, the logging decks and adjacent disturbance areas have persistent wetness issues and a prevalence of primary successional shrub and thorny vegetation that does not provide a quality setting for trails. The eroded skid tracks have been avoided, where possible. As these unnatural channels extend from the top of the ridges down to the floodplains in most cases, avoidance is not always practical when designing a sidehill-focused trail system. In cases where Phase 1 trail corridors have been located, crossings of these channels have been optimized to require structures of minimal length.

Later in the same pre-Federal controlled era of land use on the Bailey Tract, mineral exploration determined the presence of coal and oil in the area. While the extraction of these resources was rather limited, oil and gas operations are still active in the area with numerous pumps, tanks, and access routes to these facilities. The access routes have not been utilized for any portion of the trail system due to unsustainable grades, significant erosion, and wetness issues. Trail corridors avoid the pump and tank facilities to the greatest extent practicable. These structures do not provide a quality trail setting and the private management of these facilities introduces compliance and law enforcement issues.

Riparian and wetland areas have been avoided in the trail design to the greatest extent practicable. Persistent wetness issues harm the quality of a trail experience and trails in these landscape positions have a much higher probability of introducing sediment to these aquatic systems. Trail corridors, in most cases, have been located at much higher locations on the landscape, tracing routes around and above the uppermost seeps that form the primary, ephemeral

IMPACT AVOIDANCE

stream channels of their respective watersheds. When trails descend these watersheds, the lowermost alignments are typically more than 10 vertical feet above the uppermost portion of the floodplain. When floodplains must be crossed, the trail location is optimized to have the minimal length in the riparian area. Crossings of perennial streams, when possible, utilized existing culverted or bridged road crossings.

At the appropriate stage of trail development, final design and construction notes will specify that no shagbark or shellbark hickory trees greater than 6” dbh will be removed. This is not at all problematic for sustainable trail construction, as conservative trail corridors have been utilized that allow for these types of resource avoidance needs. To preserve hydrologic connectivity, crossings of intermittent streams will be constructed with low bridges for channels wider than 5 feet at bankfull and with open bottom arched culverts where channels are less than 5 feet in width at bankfull.

As the vast majority of trail corridor design is focused on sidehill locations, existing heritage and subsurface cultural resource impacts have avoided, as these resources are traditionally focused on flatter ridges, floodplains, and midslope benches.

CONCEPTUAL TRAIL SYSTEM

Insert project maps in the following PAGE order:
15. Difficulty_Final
16.Phase_Final
17.Phase 1_Crossing_Final
18.Directional_Final
19.Chauncey_TH_Concept (from K-L, on DB)

DEVELOPMENT PROCESS

FOREST SERVICE APPROVAL PROCESS

The Wayne National Forest (WNF) has followed procedures for compliance with the National Environmental Policy Act (NEPA) of 1969 (42 U.S.C. 4321 et seq.) and the Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of NEPA (40 CFR parts 1500 through 1508). WNF released the public scoping notice on June 21, 2017. Following the scoping period, WNF responded to relevant comments and considered alterations to the proposed action. Biological and cultural resource surveys were conducted from May to August 2017. Resource reports and consultation with the appropriate agencies regarding the reports were completed in September 2017. As the project fits into a category under Categorical Exclusion (CE) (36 CFR 220.6(e)(1)) and no extraordinary circumstances have been identified, WNF may move forward with a Decision Memo (DM), which serves as a combined analysis and decision document.

PERMITTING APPROVAL PROCESS

Implementation will be initiated through securing relevant local, state, or federal permits related to land disturbance, stream/wetland crossings, and water quality, if necessary. The specific permits, preparation needs, typical review periods, and preparation costs need to be investigated during the EA process to inform any potential corridor location alterations and the impacts on the permitting and review needs moving forward. When permits have been received, construction can commence.

CONSTRUCTION PROCESS

Projects of the magnitude of the Bailey Tract trails are typically undertaken by professional trail contractors, sometimes with the assistance of volunteers, youth corps, or other service organizations. Economies of scale are realized when a large mileage of trails/features are developed under a single contract, but funding requirements are consequently much higher. An implementation goal of a 5-year development, with at least 15 miles of new trail are developed each year, will maintain momentum and realize the potential benefits of this project.

Trail construction is defined by construction documents, project specifications, and permit requirements, which can be developed by consultants or the Forest Service. This documentation is attached to contracts and guides the development of the intended trail product. When permits are received and construction documentation developed, the project is put out to bid as required by local/state and/or funding source requirements. Ideally, for a project of this magnitude the Forest can develop an Indefinite Quantity/Indefinite Delivery (IDIQ) contracting mechanism that prequalifies potential bidders by their experience and success in the construction of similar projects.

FUTURE TRAIL DESIGN

100-foot trail corridors should be delineated in the field for future project phases (beyond the first phase of the 36-mile Chauncey Node trail system. While volunteers assisted with the Chauncey corridor flagging, corridor development in the future will be more efficient if completed by professional trail designers. The corridor design work should be initiated at least a year prior to anticipated construction to allow for permit and construction documentation development.

COST OPINION

Trail construction costs are dependent on a number of factors, including time of year and prevailing soil moisture conditions, subsurface rock and/or moisture conditions, landscape grades, vegetation thickness, type of trail, construction methods, etc. The cost ranges presented below reflect similar shared-use, mountain bike-focused trail construction in similar physiographic locations that have been completed from 2015 to 2017. The current cost opinion is completed only for the Chauncey Node trail system, as future phase trail corridors and features have not yet been determined. Future cost estimates should take average inflation into account.

Cost Estimates Phase 1					
Type	**Feet**	**$/ft low**	**$/ft high**	**Ext Low**	**Ext High**
Surface	3,873	$ 12.00	$ 17.00	$ 46,476.00	$ 65,841.00
Green	36,894	$ 3.50	$ 5.00	$ 129,129.00	$ 184,470.00
Blue	15,096	$ 3.75	$ 5.25	$ 56,610.00	$ 79,254.00
Red	16,053	$ 3.75	$ 5.50	$ 60,198.75	$ 88,291.50
Tread Total	**71,916**			**$ 292,413.75**	**$ 417,856.50**
Crossings	Qty	$/each			
Bridge	3	TBD			
Fords	25	$ 250.00	$ 400.00	$ 6,250.00	$ 10,000.00
Culverts	18	$ 400.00	$ 600.00	$ 7,200.00	$ 10,800.00
Structure Total				**$ 13,450.00**	**$ 20,800.00**
Phase 1 Total (less bridges)				**$ 305,863.75**	**$ 438,656.50**

* Labor only, does not include materials
* * Does not include large bridge at Chauncey Trailhead

Phase 1 Crossings		
Type	**Count**	**Aggregate Length**
Culvert 36" Arch	7	N/A
Culvert 48" Arch	11	N/A
Ford Rock Armor	25	N/A
Bridge	3	48

COST OPINION

Cost Estimates Phase 2					
Type	**Feet**	**$/ft low**	**$/ft high**	**Ext Low**	**Ext High**
Surface	0	$ 12.00	$ 17.00	$ -	$ -
Green	13,557	$ 3.50	$ 5.00	$ 47,449.50	$ 67,785.00
Blue	70,626	$ 3.75	$ 5.25	$ 264,847.50	$ 370,786.50
Red	5,696	$ 3.75	$ 5.50	$ 21,360.00	$ 31,328.00
Tread Total	**89,879**			**$ 333,657.00**	**$ 469,899.50**
Crossings	Qty	$/each			
Bridge	TBD	TBD			
Fords	TBD	$ 250.00	$ 400.00	TBD	TBD
Culverts	TBD	$ 400.00	$ 600.00	TBD	TBD
Structure Total				**TBD**	**TBD**
Phase 2 Total (less bridges)				**$333,657**	**$469,899**

Bailey Tract Trail Plan					
Phase	**Miles**	**Footage**	**Green %**	**Blue %**	**Red %**
1	13.6	71,916	57%	21%	22%
2	17.0	89,879	15%	79%	6%
3	12.5	66,186	28%	59%	13%
4	18.3	96,780	20%	30%	50%
5	26.1	137,666	0%	87%	13%
Total	87.6	462,427	20%	59%	21%

APPENDIX A

BAILEY TRACT TRAIL SPECIFICATIONS

SPECIFICATIONS

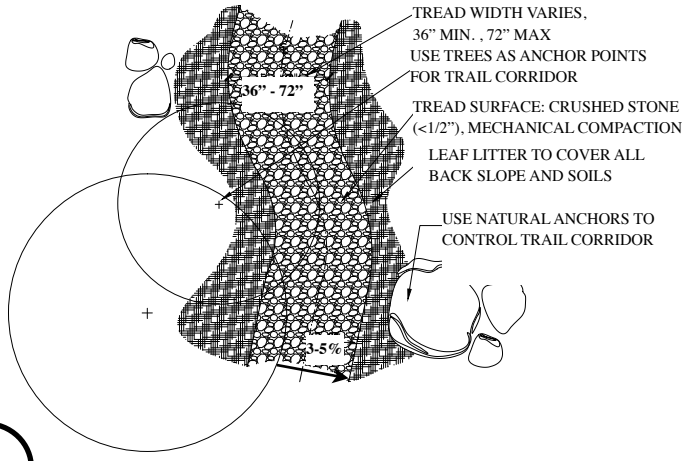
Trail Type Name: All-weather- Aggregate Surface
Difficulty Rating: Easy
Difficulty Symbol: Green Circle
USFS Trail Class: 4
Designed Use: Mountain bike
Managed Uses: Mountain bike, pedestrian

Typical Tread Width: 36”-72” (Sufficient clearance for mobility devices 36” wide)
Typical Corridor Width: 60”-96”
Tread Rugosity: Smooth and even

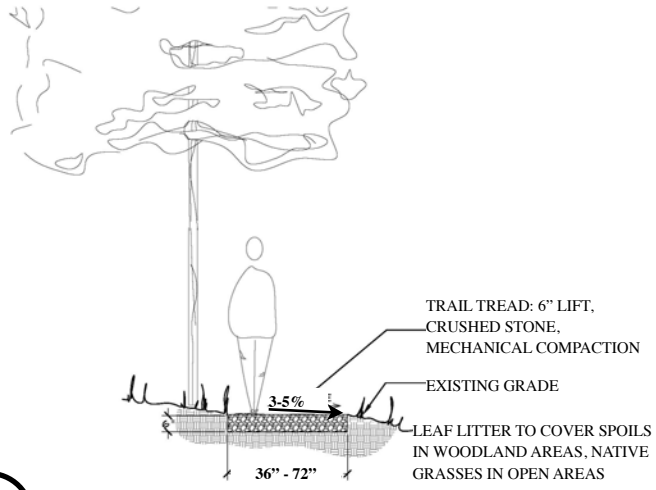
Average Gradient: <5%
Maximum Sustained Grade: 7%
Maximum Grade: 8%
Typical Tread Materials: Cut and fill at grade compacted crushed stone (6” lift of 1/2”-) with sub-base, as needed.
Sideslope Steepness: Flat to 50%, may need retaining walls on backslope if slope is greater

Turn Radius: Wide and open
Trail/Structure Formality: Formal, 90” minimum width
Wet Area Crossing Formality: Formal bridges for minor/major crossings
Duty of Care: High

Intended Experience: The greenway trail should provide a nearly level, minimally sinuous, barrier-free trail experience that is narrower than a typical paved trail but instills an intimate feeling with the surrounding landscape. Mostly accessed directly from trailheads, these trails will provide short walks/rides, with loop lengths of a mile or less. Optional skills development features may be located adjacent to the trail.



1.1 **PLAN DETAIL: ALL_WEATHER TRAIL TYP.**



1.2 **SECTION DETAIL: ALL-WEATHER TRAIL TYP.**

SPECIFICATIONS

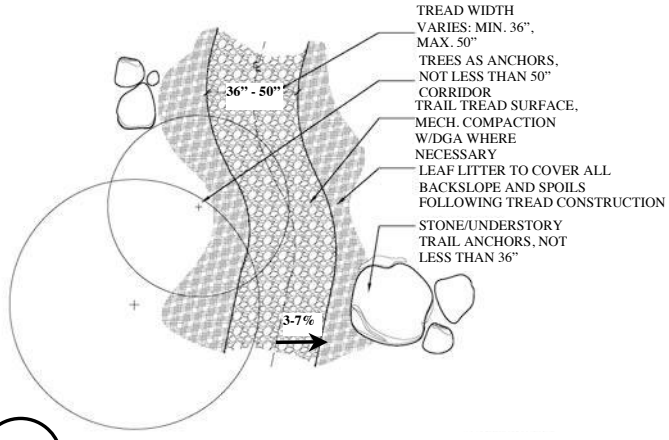
Trail Type Name: Frontcountry- Natural Surface
Difficulty Rating: Easy to Moderate
Difficulty Symbol: Blue Square
USFS Trail Class: 3
Designed Use: Mountain bike
Managed Uses: Mountain bike, pedestrian

Typical Tread Width: 36”-50”
Typical Corridor Width: 48”-60”
Tread Rugosity: Relatively smooth, some roots or rocks, protrusions <3” above trail tread

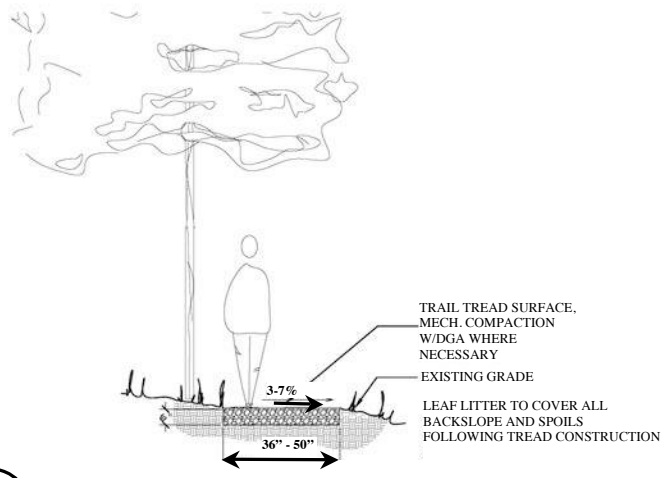
Average Gradient: <8%
Maximum Sustained Grade: 12%
Maximum Grade: 15% with surface treatment
Typical Tread Materials: Natural surface with surfacing amendments where necessary
Sideslope Steepness: Flat to 75%

Turn Radius: Wide and open
Trail/Structure Formality: Formal, 48” width
Wet Area Crossing Formality: Formal bridges for minor/major crossings, 60” minimum width
Duty of Care: Moderate

Intended Experience: The frontcountry trail should provide a well-defined tread with constantly reversing grade and moderate, short climbs and descents. Excavated soil material may be utilized to form rollers, insloped trail segments on outside turns, and superelevated turns to enhance the riding experience. The trail tread may include avoidable obstructions/constructed features that can be easily rolled over without advanced bike handling skills. Alternate, more challenging riding features may be constructed outside the direct riding path.



2.1 N.T.S
PLAN DETAIL: FRONTCOUNTRY TRAIL- TYP.



2.2 N.T.S
SECTION DETAIL: FRONTCOUNTRY TRAIL- TYP.

SPECIFICATIONS

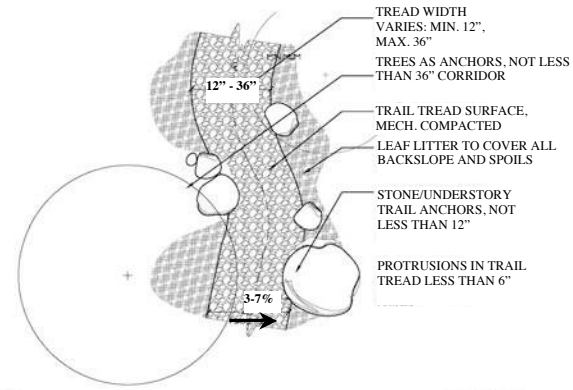
Trail Type Name: Backcountry
Difficulty Rating: Moderate -Difficult
Difficulty Symbol: Blue Square/Black Diamond
USFS Trail Class: 2
Designed Use: Mountain bike
Managed Uses: Mountain bike, pedestrian

Typical Tread Width: 12” - 36”
Typical Corridor Width: 36”-48”
Tread Rugosity: Uneven, with regular rock and root protrusions above trail tread

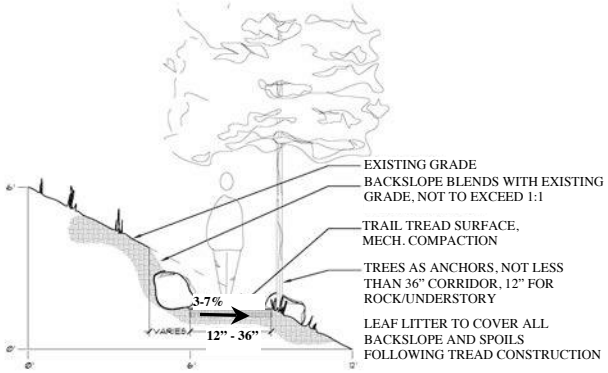
Average Gradient: < 10%
Maximum Sustained Grade: 15%
Maximum Grade: 30%, with armored tread
Typical Tread Materials: Mostly natural surface (native soils) with some rock armoring
Sideslope Steepness: Flat to 75%

Turn Radius: Tight turns with possible switchbacks
Trail/Structure Formality: Low formality, 36 minimum width
Wet Area Crossing Formality: Armored crossings at grade where possible, open bottom metal culverts over intermittent channels and fiberglass bridges over perennial channels.
Duty of Care: Low, except for bridge inspection

Intended Experience: The backcountry trail will provide a narrow, constantly reversing grade and moderate sinuosity with extended climbs and descents that provide a sense of adventure. Tread will be moderately defined by the cleared corridor and anchored by large hardwoods and steeper sideslopes. Most difficult trails (red on maps) should be gravity-optimized for directional travel.



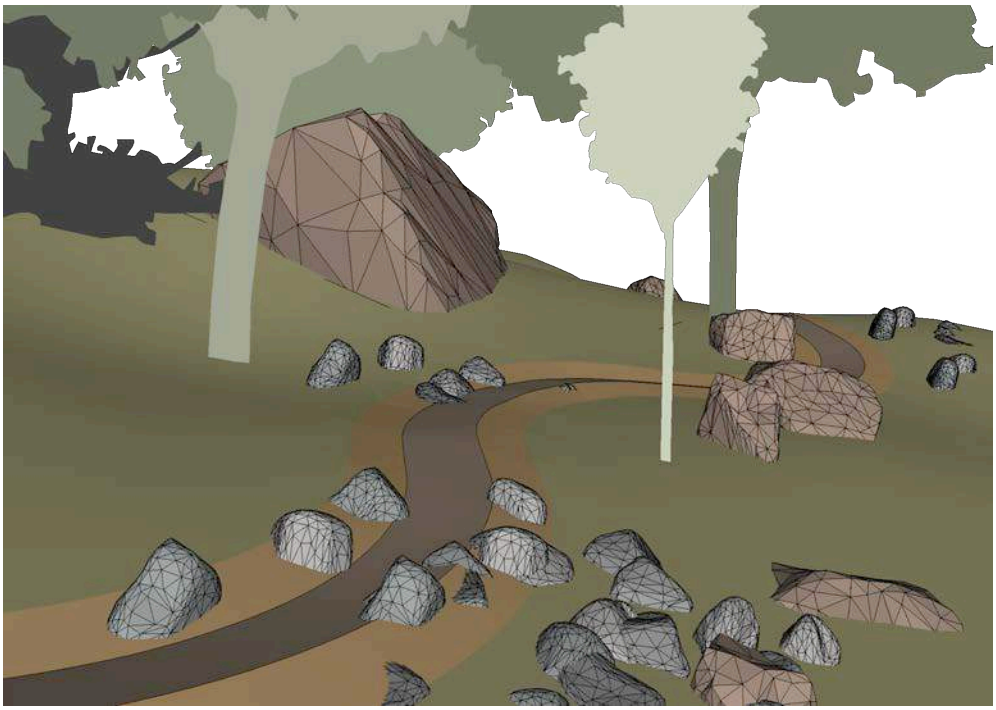
3.1 N.T.S
PLAN DETAIL: BACKCOUNTRY TRAIL TYP.



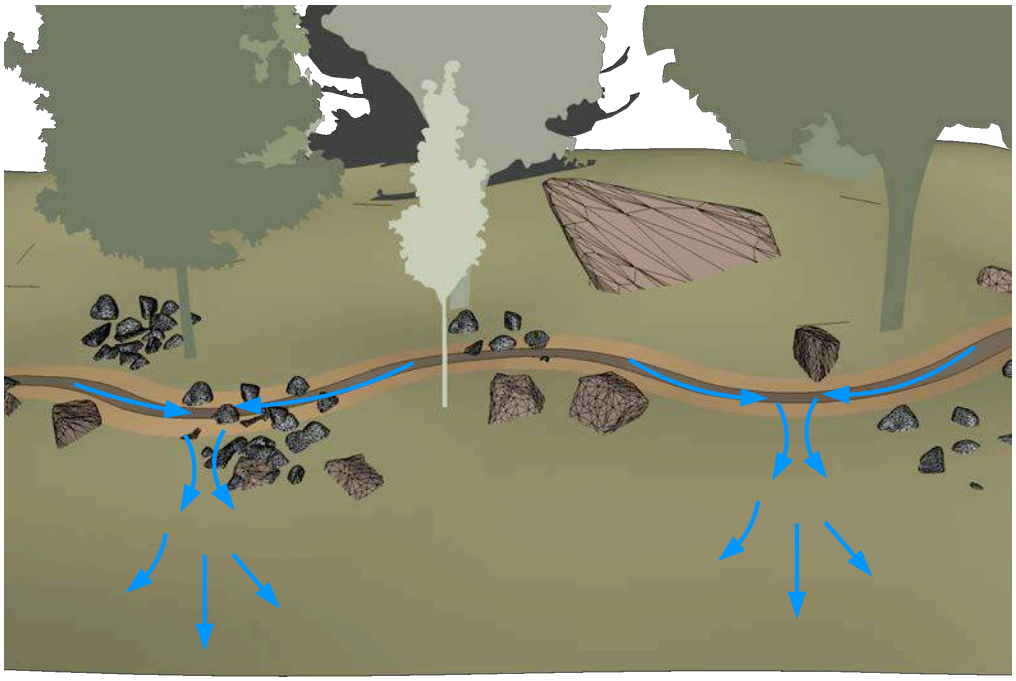
3.2 N.T.S
SECTION DETAIL: BACKCOUNTRY TRAIL- TYP.

SPECIFICATIONS

Typical 1.1: Rolling Contour Trail

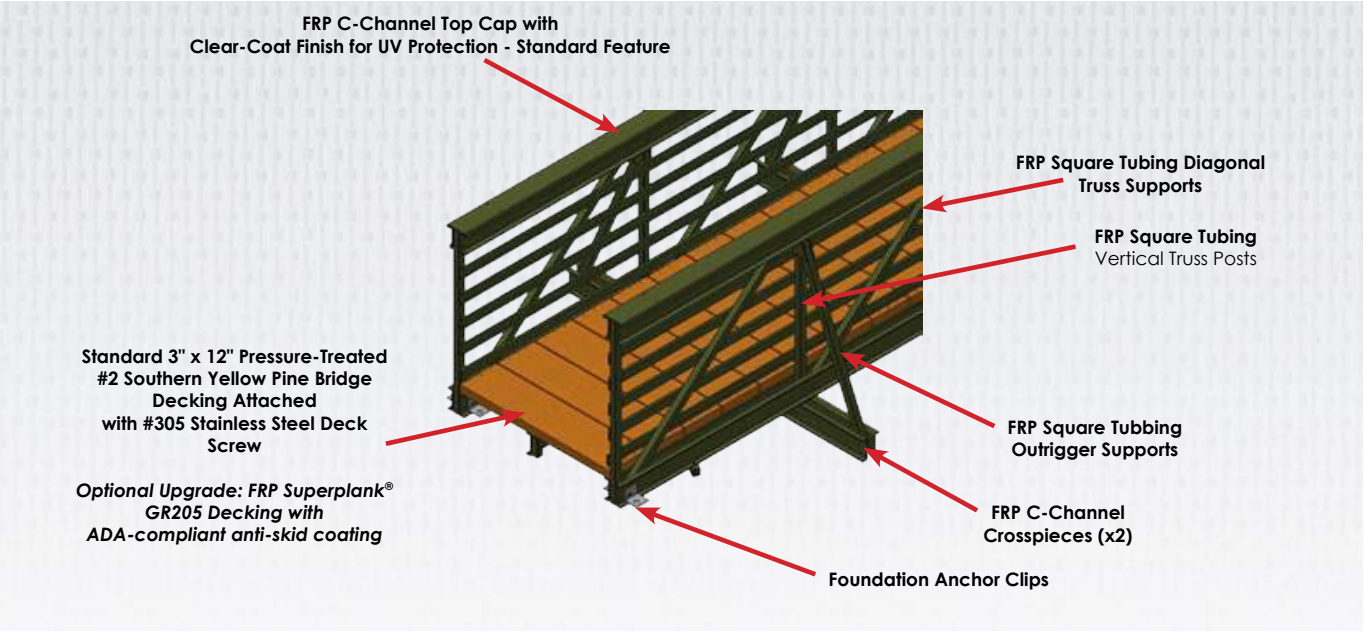


Typical 1.2: Grade Reversals

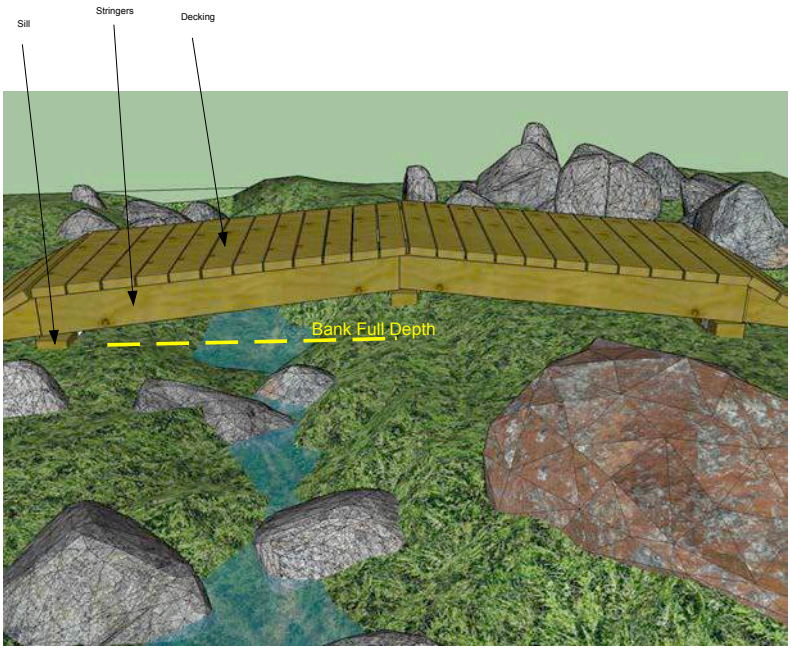


SPECIFICATIONS

Typical 2.1: Engineered, Fiberglass Bridge



Typical 2.2: Puncheon



Notes:

1. Bridges are specified when bank full depth is greater than 1 foot; puncheons are specified when bank full depth is less than one foot. Construction process for bridges and puncheons are identical except for stringer size and footers. See notes 2, 4 and 5.

2. 6X6 ground contact sills, 1-2" above surrounding grade/height of potential flowing channel. 6" diameter 18" depth concrete footers for bridges greater than 18'.

3. 6x6 mud sills secured with 36" #5 rebar (~6" in from outside edge) and placed at locations above and lateral to channels or depressions.

4. Stringers will be 2x8, pressure treated dimensional lumber for puncheon.

5. Stringers will be 2X10 for bridges less than 12'; 2X12 for bridges 12'-17'; Gluelam 2X16 for bridges 18'-23'. All pressure treated. For bridges, cross-bracing on 6' centers.

6. Hardware to connect stringers to mud sills: Simpson Strong Tie Hurricane Clips (H2.5 AZ) (Figure 1.), Tie Plates (TP47), and #9 1.5" hex drive screws (SD9112MB) (Figure 2).

7. Decking is 2x6 rough cut durable hardwood or marine grade pressure treated, fastened with 3.5" decking screws and 30-degree 3" ring shank framing nails.

8. Edges of deck materials should not extend more than 3" from edge of stringers.

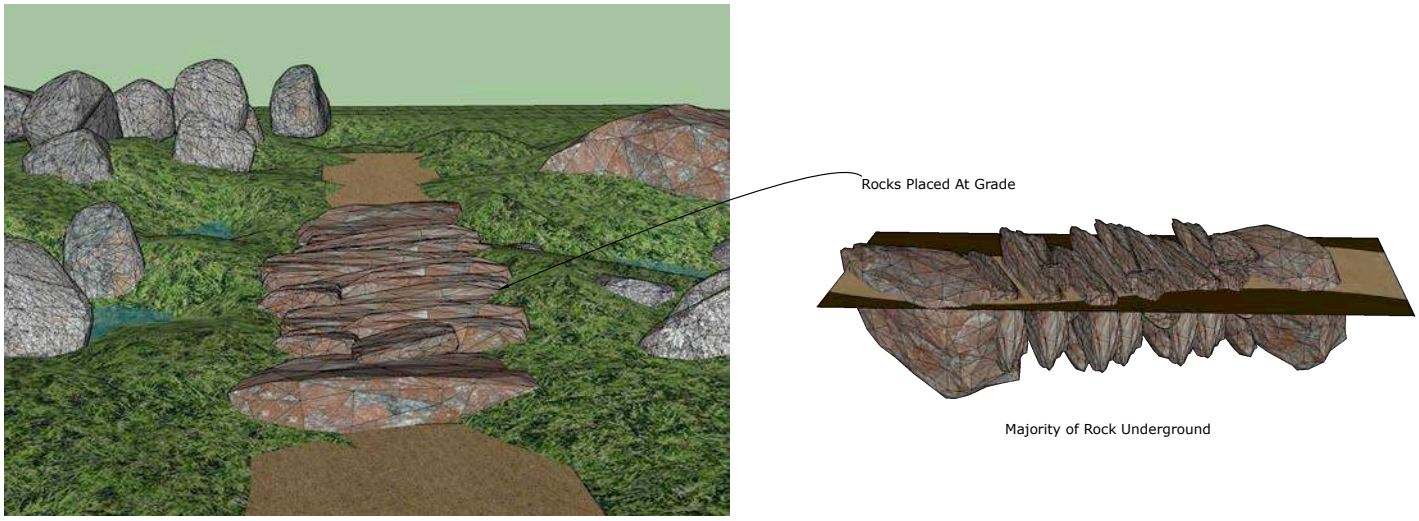
9. Fall zones cleared of woody and sharp debris 8' to all lateral surfaces of bridge.

10. Materials to be procured by Warren County Development Association (WCDA).

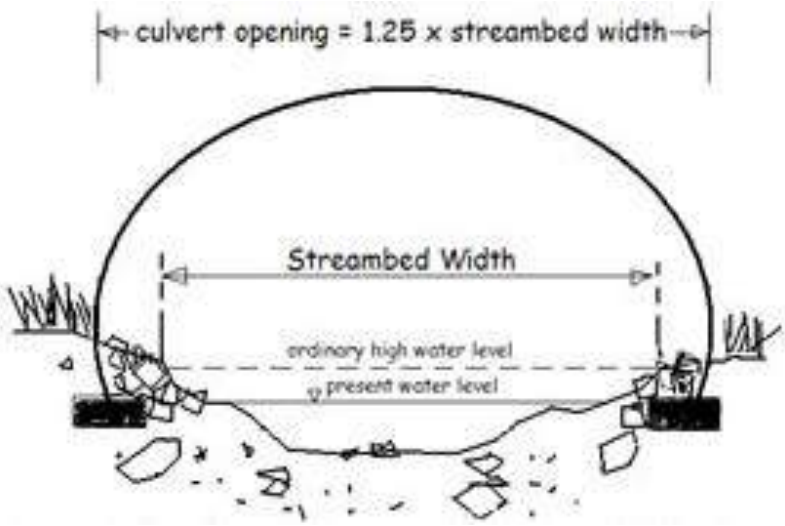
11. Curvilinear construction of puncheon to blend with surrounding topography when possible.

SPECIFICATIONS

Typical 3.1: Armored Ford



Typical 3.2: Arched Half Culvert



APPENDIX B

WAYNE NATIONAL FOREST STANDARDS

WAYNE NAT'L FOREST STANDARDS

Numerous laws and regulations provide direction for management of National Forest System land. Specifically, the Multiple-Use Sustained Yield Act requires that national forests be managed "for outdoor recreation, range, timber, watershed, and wildlife and fish purposes."

The National Environmental Policy Act (NEPA) requires environmental information to be made available to public officials and citizens before decisions are made and before actions are taken on a proposed project. Essential NEPA processes include accurate scientific analyses, expert agency input, and public involvement. Per NEPA, environmental analysis is required before construction can begin on any proposed mountain bike trail system.

The National Forest Management Act (NFMA) requires that National Forest System land be managed for a variety of uses on a sustained basis to ensure in perpetuity a continued supply of goods and services to the American people; creating and implementing a Forest Plan is a requirement of NFMA. The 2006 Land and Resource Management Plan (Forest Plan) guides all natural resource management activities for the Wayne National Forest for the next 10 to 15 years. It describes desired resource conditions, resource management practices, levels of resource production and management, and the availability of suitable land for resource management. The 2006 Forest Plan and Management Area Maps are available on the Wayne National Forest website (http://www.fs.usda.gov/detailfull/wayne/landmanagement/planning/?cid=fsm9_006005&width=full). Within the Forest Plan, the following standards and guidelines should be considered when designing the Master Trail Plan.

Soil Resources:

GFW-WSH-10: Modify resource management practices according to soil characteristics and slope to protect soil productivity and minimize erosion and sedimentation. Refer to soil map unit descriptions and appropriate interpretive tables in the Wayne National Forest Soils Inventory (based on the USDA County Soil Surveys).

Riparian Corridors:

GFW-ARR-1: Prior to implementing any project activity, establish the site-specific boundaries of the riparian corridor. The riparian corridor includes the riparian area and upland areas within the flood-prone area, or 100 feet from the edge of the aquatic ecosystem or wetland, whichever is greater.

GFW-ARR-4: Where possible, do not construct new facilities (such as roads, trails, campsites, and buildings) within riparian areas. Where such facilities must be located in riparian areas, construct and maintain them to minimize adverse impacts to ecological function.

WAYNE NAT'L FOREST STANDARDS

Endangered, Threatened and Sensitive Species:

GFW-TES-9: Retain all shagbark and shellbark hickory trees > 6 inches dbh, unless removal is necessary to protect human safety or to avoid adverse impacts to steep slopes, erodible soils, floodplains or wetlands.

SFW-TES-10: During the non-hibernation season (April 15th –September 15th), do not cut, unless they are a safety hazard:

Trees of any species 6 inches dbh or greater that are hollow, have major splits, or have broken tops that provide maternity habitat.

Snags 6 inches dbh or greater that have Indiana bat roost tree characteristics. Consider any tree with less than 10 percent live canopy to be a snag.

When removal of hazard trees is necessary in a recreation area during the non-hibernation season (e.g., developed recreation sites, access roads, trails), conduct emergence surveys at the identified hazard trees that possess the characteristics identified above, and at any hazard trees that possess large areas of loose bark providing maternity habitat.

GFW-TES-14: Provide water sources that promote aquatic insect production and provide drinking sources for Indiana bats along suitable flight paths, especially in upland areas, and off/away from recreation sites, and designated trails and roads.

Forest Health and Non-Native Invasive Species (NNIS):

SFW-FH-1: Incorporate NNIS risk assessments in project planning, and include NNIS prevention and treatment in project development, analysis, and implementation.

SFW-FH-8: Forest contracts and permits shall include appropriate clauses for the prevention and/or treatment of NNIS.

GFW-FH-15: Encourage the construction and use of NNIS cleaning stations at trailheads.

WAYNE NAT'L FOREST STANDARDS

Recreation:

SFW-REC-4: When choosing location of recreational developments, give priority to:

- Correcting health and safety problems
- Protecting the environment
- Complementing prescribed recreation opportunities
- Meeting public demand
- Availability of suitable access
- Cost of construction, operation, and maintenance.

GFW-REC-5: Consider adjacent State or local recreation facilities, their uses and long-term objectives, before proposing any new recreation development.

Trails:

SFW-REC-16: OHV, mountain bike, and horse trails are open (unless posted closed) for riding from April 15th through December 15th. Close these trails (except for foot travel) during the winter period (December 16th through April 14th) to minimize environmental impacts and maintenance costs. Exception: Trails may be used for administrative purposes and operation/maintenance of approved oil and gas facilities.

GFW-REC-19: Construct, maintain, and sign trails to Forest Service standards and in accordance with the Forest's sign plan.

GFW-REC-20: Manage trails to comply with the management area's Recreation Opportunity Spectrum objective.

GFW-REC-21: Unless a site is interpreted, plan location of trails so that known heritage sites are not readily visible from the trail corridor.

SFW-REC-26: Allow mountain bikes and horses on hiking trails only where designated and signed.

SFW-REC-27: Construct and maintain trails and associated facilities to be cost-effective and minimize user conflicts.

GFW-REC-29: Discourage construction of new trails within riparian areas. Where trails are located in riparian corridors, construct and maintain them to minimize adverse impacts to the ecological function of the area.

WAYNE NAT'L FOREST STANDARDS

GFW-REC-30: Maintain hiking and mountain bike trail tread with natural surfacing to a width of 18 to 24 inches.

GFW-REC-33: Favor loop and two-way trails for hiking, horse, and mountain bike trails.

Scenery Management:

GFW-SM-5: All structures and materials, including signs, bridges, fish and wildlife improvements, and other facilities, should be consistent with the guidelines developed in the Built Environment Image Guide and the Forest Service Sign Guide.

GFW-SM-6: New structures should be compatible with valued cultural features in the landscape such as historic structures. See the landscape character description for identification of the valued cultural features and the Built Environment Image Guide.

GFW-SM-7: Material selection, color, and shape of administrative and recreation facilities should minimize contrasts and blend with natural surroundings and landscape character.

GFW-SM-8: Emphasize the use of native materials.

GFW-SM-49: Whenever possible, use naturalized contours for cut-and-fill slopes rather than straight lines.

GFW-SM-51: When possible, new roads and trails should be located along the periphery of large open areas to maximize opportunities for scenic views from trails and recreation sites.

GFW-SM-95: Enhance visitor experience by locating new recreation sites and trails at or near large attractive trees (for shading), unique topographic features, scenic vistas, cultural sites of interest, and/or large bodies of water.

GFW-SM-96: Utilize natural materials and colors when constructing new or maintaining existing recreation sites/facilities.

The Bailey's tract is within the Historic Forest Management Area. The emphasis of this management area is the restoration and maintenance of the oak-hickory ecosystem through a combination of mostly uneven-aged timber harvest and frequent prescribed fire. The Desired Future Condition of this management area is a mix of vegetation more nearly resembling the historic range that existed prior to 18th/19th century settlement and development. Moderate amounts of non-motorized recreation opportunities are provided, with trails providing access for non-motorized activities in some areas. There is low to moderate probability of experiencing isolation from the sights and sounds of people. Forest visitors experience a moderate feeling of independence, closeness to nature, and tranquility. Recreation facilities fit the natural appearing landscape and are based on site activity, type, and capacity. Motorized trail use is not permitted in this management area.

APPENDIX C:

SIGNAGE BEST PRACTICES

SIGNAGE BEST PRACTICES

SIGNAGE BEST PRACTICES

Interpretive Signage Best Practices
The foundation of interpretation, as defined by the National Park Service, is that "interpretation is driven by a philosophy that charges interpreters to help audiences care about park resources so they might support the care for park resources. Interpretation establishes the value of preserving park resources by helping audiences discover the meanings and significance associated with those resources."

The National Park Service (NPS) and their Interpretive Development Program (IDP) have created core competencies that represent the NPS national standards for interpretation in ten benchmark areas of interpretive work. While these competencies are used to evaluate individual interpreters and their body of work, the benchmarks and their corresponding educational curriculum will provide the framework from which the entity will build their signage planning and implementation project. Specifically the NPS IDP addresses the following relevant topics:

- Interpretive Writing that is "both successful in creating opportunities for the readers to form their own intellectual and emotional connections with the resource and appropriate for the audience, providing a clear focus for their connection with the resources(s) by demonstrating the cohesive development of a relevant idea or ideas, rather than relying primarily on chronological narrative or a series of related facts."
- Media Concept Development including Project Design and Planning, Meaningful and Appropriate Media selection, and incorporating Principles of Media Design.

Best Practices of Artistic Design
Experts in interpretive settings have incorporated cognitive theory into their work for decades (Ham, 1983; Hammitt, 1984; Bitgood, 2000). By using what is known about cognitive processing and memory, interpreters can aim to maximize visitor learning. In one widely used guide on exhibit labels, Serrell (1996, page 9) writes "for long term learning to occur, there must be short term learning; in order to have short term learning, there must be attention, and attention takes time." In short, interpretive signage must first attract visitor attention before any further processing and subsequent learning may occur. It must also take into consideration the concept of limited capacity (Miller, 1956), and communicate messages while demanding minimal effort from the visitor.

One of the main challenges of encouraging mindful attention to interpretive labels in national parks and forests and other leisure settings is that the visitors are in a "non- formal" learning environment (Rounds, 2004). Non-formal learning (also referred to as "free-choice learning" and "learning in leisure settings") describes educational opportunities that are outside of a formal learning setting such as a classroom. There may be no external motivations (money, privileges, or recognition of achievement) for learning in these situations, so the visitor must be highly internally motivated to learn on their own (Screven, 1992; Rounds, 2004). Artistic design elements are used as tools to clearly and effectively communicate messages to visitors without words. Young

SIGNAGE BEST PRACTICES

and Witter (1994) found in their experiment on environmental education brochures, that information presentation and design (collectively, the artistic component) were the most important factors influencing visitor learning. In this study, they found that subjects learned more when exposed to a brochure that included color photographs, color-coded headings when compared to another less visually appealing brochure that had more carefully worded text. Research in museum settings widely supports the idea that labels must be distinct in order to attract attention (Alt & Shaw, 1984; Nelson & Klutas, 2000). Through early research efforts, Alt & Shaw (1984) found that vivid exhibits that displayed short messages attracted more visitors in the British Museum of Natural History. Bitgood (2000), an interpretation expert who has written about the role of attention in exhibit labels, suggested that the most important factor is that the display must be novel and distinct. In a recent study, this idea of vividness and distinction was supported when Nelson and Klutas (2000) found that people tend to direct their attention to those aspects of a perceptual scene that stand out rather than those that blend in to the background or
setting.

Particular design elements that may increase vividness or distinctiveness are size of label (the larger, the more attention is given to it), contrast with the background (labels that don't blend in gain more attention) and presence of multi-sensory characteristics (smell, sound or touch) (Bitgood, 2000). Signs with novel attributes attract more attention and arouse more curiosity than less distinct and unique signs
Color is an important component to legibility, understandability and subsequent learning (Farley & Grant, 1976; Screven, 1992; Wolf & Smith, 1993; Young & Witter, 1994; Cota & Loomis, 1997). Farley and Grant (1976) found that subjects exposed to a color slide presentation learned more than their counterparts, who were shown the same presentation in black and white. Wolf and Smith (1993) demonstrated that color contrast has a significant effect on legibility. In their study, they found that black letters on white background provides the best contrast, making it easier for people to read. Cota and Loomis (1997) supported Wolf and Smith and demonstrated that color contrast additionally has a significant effect on memory recall. Research in interpretive publications has determined that use of color-coded headlines increased learning (Young & Witter, 1994). Young & Witter (1994) compared several different versions of a brochure. They found the most effective brochures had many "headings," that were set apart from the rest of the text by using color and different typefaces.

Typography is another aspect of design that influences how legible a sign is and therefore affects overall understandability of the message. In addition, typography plays an integral role in the overall aesthetics and mood of an interpretive exhibit (Serrell, 1996). Legibility becomes of utmost concern with body text because messages must be communicated very quickly and be easily understood. Typefaces may be either serif or sans serif styles. Serif typefaces have ornamentation at the ends of the main strokes (Times New Roman, for example). Sans serif typefaces do not have ornamentations (Ariel, for example). Sans serif typefaces allow for faster reading, and so are preferable in interpretive signage (Trapp, Gross & Zimmerman, 1999).

SIGNAGE BEST PRACTICES

A considerable amount has been written on conceptual (text) components of exhibits that encourage central processing (Ham, 1983; Hammitt, 1984). Far less has been written on artistic aspects of exhibit design that encourage central processing (Moscardo, 1999; Bitgood, 2000). One that has received a fair amount of attention, however, is the use of hands-on and multi-sensory components (Bitgood, 2000; Arndt, Screven, Benusa and Bishop, 1993; Moscardo, 1999). Arndt et al. (1993) found that visitors interacting with flip-labels in a zoo exhibit exhibited more knowledge gain than others who were exposed to the same exhibit but without the flip-panels. This knowledge gain is commonly attributed to the curiosity aroused by the flip-labels and by engaging kinesthetic senses (Carlson, 1995; Moscardo, 1999; Bitgood, 2000).

Another component of the artistic design that may lead to conscious processing of information is the use of vivid pictures versus illustrations (Standing, 1973). Another concept that must be considered in the artistic design of interpretive signage is to prevent information overload. Studies done on exhibit labels in museum settings show visitors are far more likely to pay mindful attention to bulleted lists, outlines, and chunked paragraphs than one continuous paragraph (Screven, 1992; Bitgood, 1994; Cota & Loomis, 1997; Moscardo, 1999). Chunking, which in this context refers to breaking up one large paragraph into smaller bits of information, makes it easier for visitors to remember information because entire messages are broken down into more manageable pieces (Miller, 1956; Ham, 1983; Cota & Loomis, 1997). Another reason to use chunking is that interpretive signage is non-linear, that is, the conceptual components are written so that they can be read in any order or quantity and still make sense to the viewer (Serrell, 1996). Chunking has been shown to increase average viewing time of an exhibit label (Bitgood, 2000).

Exhibit effectiveness is commonly evaluated in museum settings (Borhegyi, 1965; Falk, 1982; Peart, 1984; Donald, 1991; Cota & Loomis, 1997; Diamond, 1999; Fernandez & Benlloch, 2000; Sandifer, 2003). Exhibit effectiveness is far less commonly evaluated in national parks, forests, or other interpretive settings (Arndt, Screven, Benusa & Bishop, 1993; Bitgood, 2000; Hughes & Morrison-Saunders, 2002). The amount of time a visitor spends viewing an exhibit, knowledge gain, and an exhibit's ability to increase visitors' thinking and problem solving are general realms that are studied in exhibit evaluations (Donald, 1991). Specific measures that are commonly used are attracting power, holding time/power, and short-term knowledge gain (memory recall) (Falk, 1982; Peart, 1984; Cota & Loomis, 1997). Peart (1984, page 221) described attracting power as "the number of subjects from the target population who stop and look at an exhibit, expressed in percentages." Attracting power is an indicator of selective attention. Holding time and holding power are useful in estimating the amount of information that could possibly be absorbed by the audience. These two measures are based on the assumption that time and learning are positively correlated. Holding time is simply the number of seconds a visitor spends actively looking at the display. Holding power is a ratio of the holding time divided by the minimum amount of time it would take to process that sign (Peart, 1984). The minimum amount of time it takes a person to view the content of the sign is figured by averaging the time it takes a sample population to process the entire sign.

SIGNAGE BEST PRACTICES

A well-developed signage system is vital management tool in the 21st century land management context. Especially with large, diverse trail systems such as the Bailey trail system, a human management presence such as park rangers and law enforcement officers will be dispersed. Consistent, clear, well-placed signs often must take the place of humans in providing 1) information and directional assistance, 2) regulations and hazard warnings, and 3) educational and interpretive information.

Informational And Directional Signs

Roadside Signs

A positive experience on a trail begins by easily finding the desired location, be it a developed trailhead, boat launch, or brick and mortar facility. This gross level navigation requires roadside signage prior to the developed facility. With a suite of facilities as broad and diverse as those present on the Floyds Fork Greenway, a universal symbol should be combined with short verbiage and mileage to provide information that can be recognized and comprehended at driving speeds. These clear, roadside signs help encourage trail use and dissuade visitors from creating unauthorized access routes.

Trailhead Signs

Upon entering a developed trailhead facility, large signs with a complete map and description of all the nearby trails and facilities, local regulations, emergency contact information, and educational messages should be located to funnel visitors to the developed facilities such as rest rooms, trails, launch, etc. This main trailhead kiosk is an ideal place to describe trail length and relative difficulty, allowing visitors to make informed decisions about their recreational experience. Trailhead kiosks can incorporate interpretive, programming, volunteer, and printed information such as maps. The total amount of information provided should mesh with the level of facility development. Major trailheads with significant parking should creatively incorporate most information, while striving not to reach "information overload", while smaller trailheads may only require a map board (with location), emergency contact, and basic regulations.

SIGNAGE BEST PRACTICES

Trailside Signs

Signs at trail intersections should provide clear, concise directions for how to stay on the trail or return to a trailhead. This navigation assistance is best provided on wooden or fiberglass posts at heights easily read by trail users, typically 60 – 84 inches from ground level, with standard iconography for allowed uses and difficulty level. Intersection signs can post location identification information to aid in emergencies. Outside of trail intersections, little signage is required on trails. Longer trails may necessitate waymarking, "confidence" signage, also placed on posts with location information.

Regulatory And Warning Signs

Regulatory signage will be paramount in the Floyds Fork Greenway. Human management of delineated rules will be difficult except in spot locations. While it is simple to list dozens of prohibited activities, the success of regulatory signage is usually dictated by its practicality, ease of comprehension, and attitude. Fewer, more practical rules and explanations about why regulations are present almost always achieve higher compliance rates. Images and short phrases are much easier for a broader segment of the public to take note and understand. Positive phrasing of rules engenders a spirit of cooperative management with the public.

Warning Signs

Signs play a vital role in managing risk. These signs alert the public to known hazards and the potential hazards of changing environmental conditions. When appropriate, warning signs should be used to mark known hazards. Position them well in advance of the hazard or risk so that visitors have enough time to read the sign and react. Also consider adding signs before unexpected challenging technical trail features, like drop-offs, narrow bridges, or other elements of increased risk. Where human-vehicle interactions will occur, traditional yield signs, painted crosswalks, stop signs and traffic signals are necessary. Along the trail approaching a road crossing, both "slow" and "stop" signs should be considered. Additionally, consider placing information signs, such as trail name and allowed uses, on either side of a road crossing, as these are trail-system access points.

SIGNAGE BEST PRACTICES

Emergency Signs
No matter how well-signed and maintained, there are likely to be incidents that require immediate maintenance or emergency response. With the duty to warn the public of potential hazards upheld, the ability of signs to help direct a timely incident response helps to demonstrate an ability to minimize the severity of incidents. To facilitate emergency services access, each trailhead or access point could be assigned a physical address by an appropriate local agency and mapped by GPS. This physical address and GPS coordinates should be included on trailhead and intersection signs along with emergency contact information. Emergency management and park maintenance personnel should have complete map sets and sufficient training to mobilize to any site on the Greenway in the most efficient manner practical.

Educational Signs
Effective outreach signage that provides educational and interpretive messaging is vital to effect a positive trail experience, regulatory compliance, and visitor safety, perhaps more than any other management technique. These types of messages are essentially the auto-rangers of modern, extensive trail systems. Educational signs provide guidelines for responsible recreation and trail etiquette. Interpretive signs describe natural or cultural resources and agency or volunteer-led programming.

Responsible Use
It is always necessary in urban interface trail systems to provide guidance on trail etiquette, preparedness, and good stewardship of resources. Again, stated with positive phrasing and reinforced through targeted agency-led or peer-to-peer programming (such as citizen/park ambassador patrols or trailhead presence) attains the highest levels of compliance.

SIGNAGE BEST PRACTICES

Interpretive Signs

Interpretive signs provide information about points of interest along the trail, helping to make an experience interactive for visitors. Often keying on natural, cultural, or historical facets, these signs help frame a larger context for a recreational experience. Recently, interpretive signs have expanded in scope to include skill development contexts that promote safer use or are integrated into self-paced park programming such as play areas, scavenger hunts, seasonal changes, or art-based activities. The keys for types of signs and their density in placement revolve around matching the development level of nearby facilities with the signage. Additionally, in areas where higher speed differentials are expected such as paved trails, interpretive signs and associated activities should be removed from the immediate trail corridor and proper ingress/egress planned.

11.4 Letter of Intent to Form Council of Governments

Letter of Intent
for
Athens county
The City of Athens
The City of Nelsonville
The Village of Buchtel and
The Village of Chauncey,
Quantified Ventures, LLC
April 3, 2018

Purpose

This Letter of Intent ("LOI") has two purposes. First, it outlines the intent of Athens county, the City of Athens, the City of Nelsonville, the Village of Buchtel, and the Village of Chauncey to form a Council of Governments ("COG") to facilitate the financing of the Baileys Trails System and future Outdoor Recreational Infrastructure. Second, it defines the relationship of the COG and Quantified Ventures, LLC ("Quantified Ventures")

Forming a Council of Governments

According to Chapter 167 of the 2014 Ohio Revised Code on Regional Council of Governments, "governing bodies of any two or more counties, municipal corporations, townships, special districts, school districts, or other political subdivisions may enter into an agreement with each other, or with the governing bodies of any counties, municipal corporations, townships, special districts, school districts or other political subdivisions of any other state to the extent that laws of such other state permit, for establishment of a regional council consisting of such political subdivisions."

Furthermore, according to Chapter 167 Section 3 of the 2014 Ohio Revised Code:

(A) The council shall have the power to:

(1) Study such area governmental problems common to two or more members of the council as it deems appropriate, including but not limited to matters affecting health, safety, welfare, education, economic conditions, and regional development;
(2) Promote cooperative arrangements and coordinate action among its members, and between its members and other agencies of local or state governments, whether or not within Ohio, and the federal government;

(3) Make recommendations for review and action to the members and other public agencies that perform functions within the region;
(4) Promote cooperative agreements and contracts among its members or other governmental agencies and private persons, corporations, or agencies;
(5) Operate a public safety answering point in accordance with Chapter 128. of the Revised Code;
(6) Perform planning directly by personnel of the council, or under contracts between the council and other public or private planning agencies.

(B) The council may:

(1) Review, evaluate, comment upon, and make recommendations, relative to the planning and programming, and the location, financing, and scheduling of public facility projects within the region and affecting the development of the area;
(2) Act as an area wide agency to perform comprehensive planning for the programming, locating, financing, and scheduling of public facility projects within the region and affecting the development of the area and for other proposed land development or uses, which projects or uses have public metropolitan wide or interjurisdictional significance;
(3) Act as an agency for coordinating, based on metropolitan wide comprehensive planning and programming, local public policies, and activities affecting the development of the region or area.
(C) The council may, by appropriate action of the governing bodies of the members, perform such other functions and duties as are performed or capable of performance by the members and necessary or desirable for dealing with problems of mutual concern.
(D) The authority granted to the council by this section or in any agreement by the members thereof shall not displace any existing municipal, county, regional, or other planning commission or planning agency in the exercise of its statutory powers.
Refer to 2014 Ohio Revised Code Chapter 167 on Regional Councils of Governments for further details.

Letter of Intent

This LOI signals the support of the local governments to form a COG supporting outdoor recreational infrastructure. The COG will be a political subdivision of the State of Ohio, but will have no regulatory power or other authority possessed by cities, counties or other local governments. The COG's decisions will be not binding on member governments, but are considered and adopted as members' needs require. As a political subdivision, the COG is subject to state laws governing open meetings, access to public records and conduct of public officials. In signing this LOI, the parties agree to putting a good faith effort to form the COG including actions around defining a bylaws, principles and policies, membership, roles and responsibilities, and finances.

Relationship with Quantified Ventures, LLC

Once the COG has been formed, Quantified Ventures agrees to provide expertise and technical assistance to the COG, as part of a program to structure and issue alternate private sector

financing, via Pay-For-Success (PFS) model, pursuant to which the amount of the return to private investors will take into account specified economic outcome(s), in order to assist the COG in meeting the costs of financing the Baileys Trail System. Quantified Ventures will aid the COG, its bond counsel, disclosure counsel and municipal advisor in developing the PFS structure, identifying potential investors, pricing, and issuing the financing for relevant recreational infrastructure projects.

The COG represents that it has the requisite legal authority under state law to utilize PFS and other financing instruments as mentioned above. The COG agrees to provide adequate legal, and financial staff or consultant assistance concerning local management requirements, data, planning, and relevant financial information, so that Quantified Ventures may conduct its analyses and assist the COG in structuring and issuing the PFS transaction. The COG will secure its own bond counsel, disclosure counsel and independent registered municipal advisor, and Quantified Ventures will not act in or provide these roles. The COG will use best efforts to obtain any local, state or federal permits or other approvals required to advance implementation of recreational infrastructure and responsibilities pursuant to a PFS transaction.

Quantified Ventures will be responsible for developing the economic, outcome, and evaluation models for the PFS transaction, identifying a third-party evaluator, conducting risk analysis, and drafting technical memoranda for investor due diligence. Quantified Ventures will design the transaction, including financial structure, term, outcome metric, and performance payment triggers, with input from and through mediated negotiation between the COG, the investors, and any potential philanthropic partners.

Management

Quantified Ventures will manage the workflow and work product of this project. Quantified Ventures will undertake an evaluation together with the COG, concerning the process of recreational infrastructure projects that would be financed by a PFS transaction. Using the DC Water[1] transaction as a prototype, the project will follow the "pay-for-success" model described above.

Work product produced by Quantified Ventures for the COG's PFS transaction shall be the joint property of Quantified Ventures and the COG.

Financial

All fess and expenses incurred by Quantified Ventures in connection with this project will be paid for from funding from The National Forest Foundation, the United States Forest Service, or other 3rd parties. The COG will utilize its own staff and/or consultants, including bond counsel, disclosure counsel and an independent registered municipal advisor, to provide Quantified Ventures with the information necessary, and to participate in the completion of this project. The COG's consultants (including legal counsel) and all other parties to the transaction will be paid for by the COG.

Term

The length of this LOI shall be [nine months, beginning on [_____, 2018 and ending on _____]. The COG and Quantified Ventures may extend the time for performance upon mutual written consent.

No Third-Party Beneficiary

Nothing in this LOI creates a third-party beneficiary or any contractual entitlement to services, products, or financial instruments envisioned in this LOI, or developed as a result of this LOI.

Modification or Termination

This LOI may be modified at any time by mutual written agreement. This LOI may be terminated in writing by either the COG or Quantified Ventures at any time for cause, upon 60 days' written notice to the other parties. Within the 60-day period and prior to termination, the COG or Quantified Ventures shall first be provided an opportunity to cure the cause specified in the notice to terminate. At the end of 60 days, if a cure is unavailable or deemed unsuitable by the terminating party, and this LOI is terminated, work product developed to date by Quantified Ventures shall be and remain the property of Quantified Ventures. Additionally, in the event of termination of this LOI under this provision, the COG will be solely responsible for any outstanding costs due at that time to its own legal, financial, or engineering consultant(s), if any, which have assisted the COG with this project, to the extent required under its contract(s) with said consultant(s), and Quantified Ventures will have no responsibility relating to such costs or consultants.

Disclaimer

Quantified Ventures is not recommending any action to any municipal entity. Quantified Ventures is not and will not be acting as an advisor (whether financial or municipal), agent or fiduciary to any municipal entity and Quantified Ventures will not have any advisory, agency or fiduciary duty to any person pursuant to Section 15B of the Securities Exchange Act of 1934 or Section 975 of the Dodd-Frank Wall Street Reform and Consumer Protection Act. Quantified Ventures is acting for its own interest. The COG should discuss any information and material contained herein, and developed with respect to the activities conducted under this LOI, with any and all internal or external advisors and experts that the COG deems appropriate.

Non-Binding

The primary purpose of this LOI is to ensure the coordination necessary to issue the PFS financing and is not intended to create any legally binding obligations on any party. Subsequent agreements between the COG and Quantified Ventures may be subject to approval by the COG Council.

Agreed to this __ day of ___, 2018.

Quantified Ventures

Athens county Charles Adkins, Commissioner	Athens county Chris Chmiel, Commissioner
Athens county Lenny Eliason, Commissioner	City of Athens Steven Patterson, Mayor
City of Nelsonville Charles Barga, City Manager	Village of Buchtel John Sullivan, Mayor
Village of Chauncey Robert Mattey, Mayor	Quantified Ventures, LLC Eric Letsinger, CEO

[1] District of Columbia Water and Sewer Authority Public Utility Subordinate Lien Revenue Bonds Series 2016B (Environmental Impact Bonds)

12.5 Letters of Support

12.5.1 Supporters

At the time of this writing, the application for the Appalachian Regional Commissoins' POWER Grant has not been finalized. Once it is ready for submission, we will send a request for the lawmakers to send a letter of support for the Bailey's Trail System's application. As of April 15, 2018, Quantified Ventures has obtained verbal commitments to sign a letter of support from the staff of

- Senator Portman (R-OH)
- Senator Brown (D-OH)
- Representative Stivers (R -OH-15)
- Representative Johnson (R -OH-6)
- State Senator Balderson (District 20)

12.5.2 Ohio State Senator Troy Balderson

Senator Balderson's letter of support in the on the following page.

ROB PORTMAN
OHIO

United States Senate

WASHINGTON, DC 20510

COMMITTEES:
ENERGY AND NATURAL RESOURCES
FINANCE
FOREIGN RELATIONS
HOMELAND SECURITY AND GOVERNMENTAL AFFAIRS

April 30, 2018

Scott Hamilton, Executive Director
Appalachian Regional Commission
1666 Connecticut Avenue, NW, Suite 700
Washington, DC 20009-1068

Dear Mr. Hamilton,

I write to bring your attention to the competitive grant application submitted by Rural Action for funding in the Appalachian Regional Commission (ARC) Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) 2018 grant program.

I understand that Rural Action is seeking funding for the Baileys Mountain Bike Trail System. This 86-miles long system of trails is located in Wayne National Forest near the Appalachian Ohio communities of Athens, Nelsonville, Chauncey, and Butchel. Once complete, it will be the longest continuous mountain biking trail system east of the Mississippi River. The Baileys will be a premier outdoor recreation destination for tourists while creating a positive economic impact on the region. Assistance through the ARC POWER program would allow for timely development of this project.

Please give all due consideration to this request. If there are any questions, please contact my grant coordinator, Jason Knox, at (614) 469-6774. Thank you.

Sincerely,

Rob Portman

Rob Portman
United States Senator

448 Russell Senate Office Building
Washington, DC 20510
Phone: (202) 224-3353

312 Walnut Street
Suite 3425
Cincinnati, OH 45202
Phone: (513) 684-3265

1240 East 9th Street
Suite 3061
Cleveland, OH 44199
Phone: (216) 522-7095

37 West Broad Street
Suite 300
Columbus, OH 43215
Phone: (614) 469-6774

420 Madison Avenue
Suite 1210
Toledo, OH 43604
Phone: (419) 259-3895

www.portman.senate.gov

TROY BALDERSON
STATE SENATOR
20TH DISTRICT

COMMITTEES
ENERGY & NATURAL RESOURCES – CHAIR
FINANCE
GOVERNMENT OVERSIGHT & REFORM
PUBLIC UTILITIES
FINANCE SUBCOMMITTEE ON PRIMARY AND SECONDARY EDUCATION
JOINT COMMITTEE ON AGENCY RULE REVIEW

Executive Director Scott Hamilton
Appalachian Regional Commission
1666 Connecticut Avenue, NW
Suite 700
Washington, DC 20009-1068
202.884.7700

April 5, 2018

Dear Executive Director Hamilton and members of the Appalachian Regional Commission,

Please accept this letter of support for the Baileys Mountain Bike Trail System's application for the Appalachian Regional Commission Partnerships for Opportunity and Workforce and Economic Revitalization (POWER) Initiative grant.

The POWER grant will facilitate the development of the Baileys, an 88-mile long trail system designed for cyclists of all skill levels. Once complete, it will be the longest contiguous trail system east of the Mississippi River. The Baileys will become a premier outdoor recreation destination and serve as an anchor for transformational change, allowing Athens County a new opportunity to reshape its economy. The ARC POWER grant would be instrumental in completing this project in a timely manner.

The Baileys is on the Wayne National Forest near the Appalachian Ohio communities of Athens, Nelsonville, Chauncey, and Butchel. In 2015, the Athens Bike Club built a collaborative community partnership with the Wayne and hired Applied Trails Research to develop a Master Plan. Shortly thereafter, the project received national recognition and was selected by the National Forest Foundation to work with Quantified Ventures, a D.C. based impact investing advisory firm, to assess the viability of using Pay for Success (PFS) financing to fund this project. The PFS model leverages private capital and evaluates the economic outcomes of the project, both goals of the POWER initiative.

While the project is estimated to cost $6 million, the benefits to the community far outweigh the investment. Considering the sheer size of the project, the fact that 50 million people live within a 150-mile radius of the Baileys, and that the trails are easily accessible from US 33, Athens County can expect to become a weekend destination for bikers and hikers. The increased tourism will produce more consumers for local businesses and create an economic boost for the region. With an estimated 180,000 visitors a year, the cumulative 10 year impact could generate $20 million in new spending, $7 million in new wages, $7.3 million in new tax revenue, and 66 new jobs for Athens County.

SENATE OFFICE BUILDING • 1 CAPITOL SQUARE • COLUMBUS, OHIO 43215
EMAIL: Balderson@ohiosenate.gov • PHONE: 614-466-8076

The trail system will provide a new sense of pride to the Athens County community. For local residents, the project will present a fun and exciting opportunity to improve community health by engaging in outdoor recreation without travelling far from home. Furthermore, people throughout the state will be able to explore what Southeastern Ohio has to offer.

As a representative of Ohio's 20th Senate district, and an avid cyclist myself, I strongly support the Baileys Mountain Bike Trail Project receiving the ARC POWER grant. If you have any questions, please feel free to contact my office at 614-466-8076. Thank you for your consideration.

Sincerely,

Troy Balderson
State Senator
Ohio Senate District 20

12.6 Dr. Norm O'Reilly's Bio

"Norm O'Reilly is recognized as one of the leading scholars in sport business. He holds the Richard P. and Joan S. Fox Professor of Business and is Chair of the Department of Sports Administration at Ohio University's College of Business. Dr. O'Reilly has expertise in a range of business topics, including marketing, sponsorship, social media, sport finance, social marketing, tourism management, and management education. He has authored or co-authored seven books, 14 case studies in the Harvard/Stanford series, and more than 80 peer-reviewed journal articles. His publications include the 2015 book Global Sport Marketing: Sponsorship, Ambush Marketing and the Olympic Games, with Richard Pound, Rick Burton, Benoit Seguin and Michelle Brunette. At conferences, he has won 11 best paper awards and has more than 135 conference presentations to his credit.

Dr. O'Reilly is the lead researcher on the Canadian Sponsorship Landscape Study, a highlight of the annual Canadian Sponsorship Forum since 2007, currently in its ninth edition. Dr. O'Reilly works closely with industry. He was recognized in 2013 as one of the "Five to Watch" in sport business in Canada by the Globe and Mail and is a lifetime Research Fellow of the North American Society for Sport Management. In 2011, he was the recipient of the University of Ottawa's Media Excellence Award (for media coverage of his research). For nearly 10 years, he has been minority owner and senior advisor with the Consulting Group of Toronto-based marketing agency, TrojanOne, where he has worked for clients including Nike, UFC, the Canadian Paralympic Committee, and many more. He also acts as a specialist on legal cases and has sat on the boards of many sport organizations.

Prior to coming to OU, Dr. O'Reilly taught at the University of Ottawa, the David Falk Center for Sport Management at Syracuse University, the Graduate School of Business at Stanford University, the School of Sports Administration at Laurentian University, and the Ted Rogers School of Management at Ryerson University. He has previously held positions as school director, vice-dean and director of a research centre. Dr. O'Reilly holds a PhD in Management from the Sprott School of Business at Carleton University, an MBA from the Telfer School of Management at the University of Ottawa, an MA in Sports Administration from the University of Ottawa, and a B.Sc. (Kinesiology) from the University of Waterloo. He currently holds visiting/adjunct appointments in Canada and Australia, and also holds the CGA/CPA Accounting Designation.

Prior to joining academia, Dr. O'Reilly had involvement as an administrator, including senior policy officer at Sport Canada, team manager and office manager at Triathlon Canada, and event manager for the 2008 Toronto Olympic Bid. He has been a member of the 2004, 2008, and 2010 Mission Staff for the Canadian Olympic Committee at the Olympic Games, and attended the 2012 Olympic Games in a research capacity."

12.7 Bond Analysis

Federal Bonds by Interest Rate

Date	1 Mo	3 Mo	6 Mo	1 Yr	2 Yr	3 Yr	5 Yr	7 Yr	10 Yr	20 Yr	30 Yr
2/1/18	1.41%	1.48%	1.64%	1.89%	2.16%	2.33%	2.56%	2.72%	2.78%	2.90%	3.01%
2/2/18	1.40%	1.48%	1.65%	1.88%	2.15%	2.33%	2.58%	2.76%	2.84%	2.97%	3.08%
2/5/18	1.40%	1.51%	1.67%	1.85%	2.08%	2.25%	2.50%	2.68%	2.77%	2.92%	3.04%
2/6/18	1.48%	1.52%	1.69%	1.87%	2.10%	2.30%	2.52%	2.70%	2.79%	2.94%	3.06%
2/7/18	1.36%	1.55%	1.73%	1.91%	2.15%	2.33%	2.57%	2.75%	2.84%	3.01%	3.12%
2/8/18	1.32%	1.55%	1.73%	1.91%	2.13%	2.32%	2.57%	2.76%	2.85%	3.03%	3.14%
2/9/18	1.31%	1.55%	1.73%	1.89%	2.05%	2.26%	2.52%	2.72%	2.83%	3.02%	3.14%
2/12/18	1.35%	1.62%	1.82%	1.93%	2.09%	2.30%	2.56%	2.77%	2.86%	3.02%	3.14%
2/13/18	1.34%	1.59%	1.80%	1.95%	2.10%	2.30%	2.54%	2.74%	2.83%	2.99%	3.11%
2/14/18	1.32%	1.58%	1.81%	1.98%	2.17%	2.40%	2.65%	2.84%	2.91%	3.07%	3.18%
2/15/18	1.30%	1.58%	1.82%	1.99%	2.19%	2.40%	2.65%	2.83%	2.90%	3.04%	3.15%
2/16/18	1.35%	1.62%	1.83%	2.00%	2.21%	2.38%	2.63%	2.81%	2.87%	3.02%	3.13%
Average	1.36%	1.55%	1.74%	1.92%	2.13%	2.33%	2.57%	2.76%	2.84%	2.99%	3.11%

State of Ohio Bonds by Interest Rate

Ohio General Obligation Bonds	Date	Interest Rates Low	Interest Rates High
Common Schools Capital Facilities	2004-16	2.50%	5.50%
Higher Education Capital Facilities	2006-16	2.00%	5.30%
Highway Capital Improvements	2007-16	1.30%	5.00%
Infrastructure Improvements	2002-16	2.00%	5.50%
Coal Research and Development	2010-16	1.50%	5.00%
Natural Resources Capital Facilities	2007-16	3.00%	5.00%
Conservation Projects	2007-16	2.00%	5.00%
Third Frontier Research and Development	2007-16	1.10%	5.50%
Site Development	2010-14	2.50%	4.60%
Veterans' Compensation	2011-14	1.20%	4.90%
State of Ohio General Obligation Bonds (Average)		3.52%	
Ohio Revenue Bonds	**Date**	**Interest Rates Low**	**Interest Rates High**
Treasurer of State: State Infrastructure Bank	2006-15	2.00%	6.00%
Buckeye Tobacco Settlement Financing Authority	2008	4.90%	7.50%
State of Ohio Revenue Bonds (Average)		5.10%	
Ohio Certficates of Participation	**Date**	**Interest Rates Low**	**Interest Rates High**
Enterprise Data Center Solutions (EDCS)	2015	2.00%	5.00%
Multi-Agency Radio Communications System (MARCS)	2013-15	3.00%	5.00%
Ohio Administrative Knowledge System (OAKS)	2014	4.00%	5.00%
State Taxation Accounting and Revenue System (STARS)	2008-15	4.10%	5.00%
Ohio Certificates of Participation (Average)		4.14%	

Athens county Bonds by Interest Rate

Athens County Bonds		
Description	Date	Coupon
NorthWest CTR-SER I	3/1/94	3
NorthWest CTR-SER I	3/1/95	3.6
NorthWest CTR-SER I	3/1/96	4
NorthWest CTR-SER I	3/1/97	4.25
NorthWest CTR-SER I	3/1/98	4.5
NorthWest CTR-SER I	3/1/99	4.75
NorthWest CTR-SER I	3/1/00	5
NorthWest CTR-SER I	3/1/01	5.2
NorthWest CTR-SER I	3/1/02	5.4
NorthWest CTR-SER I	3/1/03	5.5
NorthWest CTR-SER I	3/1/11	5.95

Athens County Bonds		
Description	Date	Coupon
Mahoning County Chemical Proj	3/1/94	3
Mahoning County Chemical Proj	3/1/95	3.6
Mahoning County Chemical Proj	3/1/96	4
Mahoning County Chemical Proj	3/1/97	4.25
Mahoning County Chemical Proj	3/1/98	4.5
Mahoning County Chemical Proj	3/1/99	4.75
Mahoning County Chemical Proj	3/1/00	5
Mahoning County Chemical Proj	3/1/01	5.2
Mahoning County Chemical Proj	3/1/02	5.4
Mahoning County Chemical Proj	3/1/03	5.5
Mahoning County Chemical Proj	3/1/13	6

Athens County Bonds		
Description	Date	Coupon
INN Ohio Athens Inc Proj	11/1/97	7.75
INN Ohio Athens Inc Proj	11/1/98	7.875
INN Ohio Athens Inc Proj	11/1/99	8
INN Ohio Athens Inc Proj	11/1/00	8.125
INN Ohio Athens Inc Proj	11/1/01	8.25
INN Ohio Athens Inc Proj	11/1/11	8.625
REF-INN-Ohio Athens Inc PJ	11/1/97	4.7
REF-INN-Ohio Athens Inc PJ	11/1/98	4.9
REF-INN-Ohio Athens Inc PJ	11/1/99	5.1
REF-INN-Ohio Athens Inc PJ	11/1/00	5.3
REF-INN-Ohio Athens Inc PJ	11/1/01	5.45
REF-INN-Ohio Athens Inc PJ	11/1/02	5.6
REF-INN-Ohio Athens Inc PJ	11/1/03	5.75
REF-INN-Ohio Athens Inc PJ	11/1/04	5.85
REF-INN-Ohio Athens Inc PJ	11/1/11	6.25
REF-INN-Ohio Athens Inc PJ	11/1/05	5.95
REF-INN-Ohio Athens Inc PJ	11/1/06	6.05
Athens County Bonds (Average)		5.4326923

City of Athens Bonds by Interest Rate

City of Athens Bonds		
Description	**Date**	**Coupon**
BD ANTIC NTS-FOURTTH SERIES	2000	3.50%
BD ANTIC NTS-FOURTH SER	2000	4.60%
BD ANTIC NTS-EAST ST STR IMPT	2009	2.50%
BD ANTIC NTS-VAR PURP	2008	4.25%
BD ANTIC NTS	2001	4.72%
BD ANTIC NTS	2005	2.75%
BD ANTIC NTS	2000	4.25%
BD ANTIC NTS	2004	1.60%
BD ANTIC NTS	2006	4.50%
BD ANTIC NTS	2005	3.25%
City of Athens Bonds (Average)		3.59%