



White Paper Series 1 | 2022

Economic Potential of the Tennessee RiverLine Water Trail Economic Impacts and Case Study Analysis

Prepared for the Tennessee RiverLine Partnership

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June 2022

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Contents

Foreword.....	6
Executive Summary	7
1. INTRODUCTION	15
2. ECONOMIC POTENTIAL OF THE TENNESSEE RIVERLINE	18
2.1 Current Paddlesport Use on the Tennessee River	19
2.2 Potential Increase in Paddlesport Use and Expenditures	22
2.3 Economic Impacts.....	25
2.4 Health Impacts	30
2.5 Important Considerations.....	33
3. KEY COMPONENTS OF WATER TRAIL SUCCESS	36
3.1 Identified Key Components of Water Trail Success and Case Examples.....	40
3.2 Key Case Analysis Take-Aways for the Tennessee RiverLine.....	51
4. DISCUSSION AND CONCLUDING REMARKS	59
5. REFERENCES	60
6. TECHNICAL APPENDIX	62
A. Establishing a Paddling Use Baseline on the Tennessee River.....	62
B. Tennessee RiverLine Aspirational Scenario	62
C. Economic Impact Methodology	91
D. Health Impact Methodology	92

List of Tables

Table 1. U.S. Water Trail Systems.....	21
Table 2. Water Trail System Types Based on Average Visits Per Mile	22
Table 3. Potential Aspirational Scenario for Tennessee RiverLine	24
Table 4. Economic Impact on Output (GDP)	26
Table 5. Economic Impact on Income, Employment, and Sales Tax Revenue	27
Table 6. Economic Impact on Output (GDP) by State.....	28
Table 7. Average Economic Impact on Output for Urban and Rural Counties	29
Table 8. Economic Impact on Sales Tax Revenue by State.....	30
Table 9. Health-Related Cost Savings from Paddlesport Recreation on the Tennessee River	32
Table 10. Selected Cases Exemplary of Key Components of Water Trail Success.....	39
Table 11. Tennessee Riverline Aspirational Use Scenario	63
Table 12. Total Population of Physically Active Paddlers that Live Near the Tennessee River	93
Table 13. Cost Savings due to Physical Activity (dollars per person per year)	94
Table 14. Medical Cost CPI and Direct Medical Costs	95
Table 15. Calculation for Absenteeism Cost	96
Table 16. Calculation for Presenteeism Cost	97
Table 17. Health Related Costs Attributable to Paddlesport Recreation Access on TN River per Year	99
Table 18. Min, Mean, and Max Health-related Cost Savings per Year	100

List of Figures

Figure 1. Tennessee RiverLine is a 652-mile Water Trail Through Tennessee, Alabama, Mississippi, and Kentucky, Passing Through 32 Counties	7
Figure 2. Tennessee RiverLine is a 652-mile Water Trail from Knoxville, Tennessee to its Confluence with the Ohio River in Paducah, Kentucky.....	15
Figure 3. Annual Expenditures and Visitors for Comparable Water Trails and Aspirational Scenarios for the Tennessee RiverLine.....	25

Foreword

In 2016, University of Tennessee students in a landscape architecture course dreamed up a trail system that could connect residents to the region’s natural resources and connect communities to one another.

Today, with guidance from faculty and support from our partners, that vision has turned into the Tennessee RiverLine—a 652-mile continuous system of water and land trails that is delivering economic and recreational opportunities across four states. The project is a testament to what can be achieved when we bring together communities and partners that share both their resources and their leadership with a shared mission of making life and lives better for the people of the Tennessee River Valley.

Already, 20 of the communities along the river have chosen to enroll in the Tennessee RiverTowns Program, declaring their partnership with the Tennessee RiverLine’s vision. These 20 communities represent more than a million residents who are experiencing the Tennessee RiverLine’s new investments in river access and experiences. Still, we know the potential exists for it to make an even greater impact.

The report in the following pages lays out even more reason to be excited about the future of the Tennessee RiverLine and all it has to offer. In total, all Tennessee River communities are home to more than 2.4 million people in 32 counties and four states. By reframing the river, its adjacent public lands and river communities as a 1.2 million acre river park, a landscape more than twice the size of our celebrated Great Smoky Mountains National Park, we can attract flatwater paddlers, cyclists, hikers, and others from all over the country who want to experience the beautiful hills, valleys, and plains of our region.

The economic impact report projects significant increase in recreational use of the river, leading to new jobs, economic growth, tax revenue, and increased income for residents. We hope the findings in this report will help guide elected officials, policymakers, and community and business leaders as they make decisions about investments and priorities along the river. Together, we know that the Tennessee RiverLine will become a destination for adventure seekers and an asset that people who live along the river and throughout the region will enjoy.



Donde Plowman
Chancellor



Allen Clare
Vice President, River and Resources Stewardship



Executive Summary

Purpose of Study

The Tennessee RiverLine is a vision for a continuous system of paddling, hiking, and biking experiences along the Tennessee River’s 652-mile reach from Knoxville, Tennessee, to its confluence with the Ohio River in Paducah, Kentucky. By reframing the river, adjacent public lands and river communities as a 1.2 million acre “river park”, the Tennessee RiverLine positions the region and river communities as a recreation destination for generations of diverse residents and visitors to the region. First and foremost a 652-mile water trail, the Tennessee RiverLine offers equitable access to river spaces and experiences for canoeing, kayaking, paddle boarding and other water-related recreation. The proposed water trail, which passes through 32 counties in four states, will utilize existing river access points in addition to new river access infrastructure, including multi-use pavilions, riverfront parks, riverside trails and connective greenways. The multimodal system of water trails will provide public access to the Tennessee River, enhance connectivity between cities, parks, and river communities, and attract new paddlers to the region.

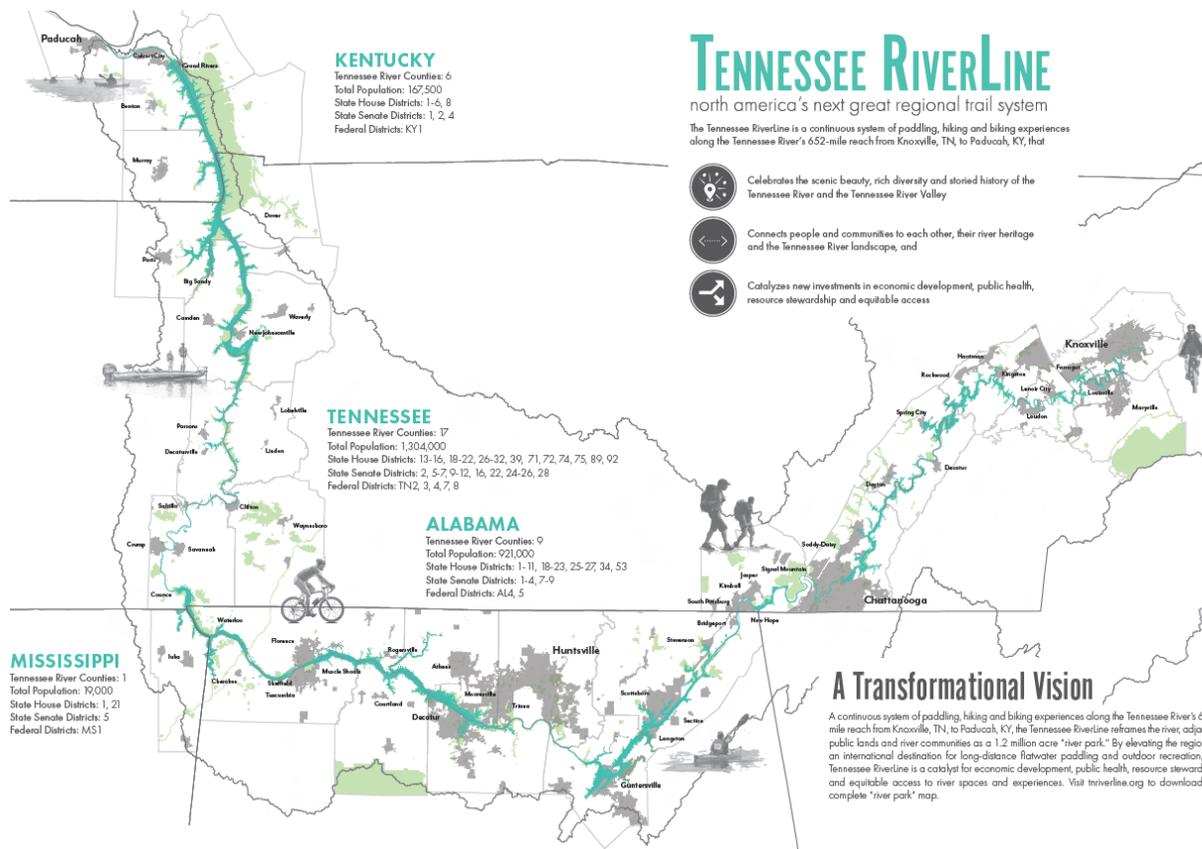


Figure 1. Tennessee RiverLine is a 652-mile Water Trail Through Tennessee, Alabama, Mississippi, and Kentucky, Passing Through 32 Counties

This report estimates the potential economic impacts arising from additional paddlers that will use the Tennessee RiverLine and identifies additional economic and health impacts that are expected but not quantified through this study. Economic impacts are estimated for the Tennessee RiverLine as a whole, for each of the four states that the river passes through (Alabama, Kentucky, Mississippi, and Tennessee), and for a representative urban and rural county. A case study analysis of comparable long-distance trails is also performed to identify *key components of water trail success*, which informs the implementation of the Tennessee RiverLine and provides guidance in maximizing economic benefits. Lastly, estimates of health impacts and a discussion of other potential benefits is presented. A summary of the methodology and findings are presented below, and details and findings are included in the full report.

Aspirational Goal

An aspirational growth scenario is developed using 15 existing studies of comparable water trails in the United States as well as estimated current and potential use of the Tennessee River by paddlers. This study relies on existing studies to estimate the number of annual paddlers who will visit the Tennessee RiverLine and their associated expenditures. Using data on current and potential use and infrastructure on the Tennessee River, each mile of the Tennessee River is assumed to grow to one of three levels for visitors per mile (i.e., use density). These growth categories allow for the development of an aspirational use scenario for the Tennessee RiverLine; although, communities are certainly not restricted to these growth assumptions. This approach is flexible in that a single use density (i.e., visitors per mile) is not assumed for the entire length of the river. The Tennessee RiverLine runs through rural and urban settings, and this methodology allows for different growth scenarios in different sections of the river. In the full report, we demonstrate how estimated annual visitors and expenditures in the aspirational scenario as well as in two intermediate scenarios compare to other paddling destinations in the United States.

Methods Used

Estimates of annual visitors and expenditures are used to estimate the economic potential of the Tennessee RiverLine. New paddlers visiting the Tennessee RiverLine will spend money in the local economies at various paddling destinations along the trail. For example, visitors will spend money at restaurants, outdoor shops, gas stations, hotels, or at entertainment venues, which increase the region's gross domestic product (i.e., output). Annual spending by new paddlers represents direct impacts to output. Total economic impacts to output also include indirect impacts and multiplier effects. For example, spending by new paddlers will lead businesses to purchase inputs and supplies from vendors, and a portion of these additional purchases will occur within the impacted states (i.e., indirect impacts).

The direct and indirect spending in turn creates ripple effects through the economy (i.e., multiplier effects). For example, as a worker at a local rental shop or in the supply chain spends part of their income, the additional purchases in the economy (e.g., at grocery stores, restaurants, entertainment venues, retailers, etc.) lead to further increases in output. Spending by additional paddlers will also lead to the creation of jobs, an increase in personal income for states' residents, and generate tax revenues for state and local communities. Using RIMS II multipliers from the U.S. Bureau of Economic Analysis, these economic impacts are estimated for the Tennessee RiverLine as a whole, for the states across which the Tennessee River traverses, and for a representative rural and urban county.

Economic Potential

Spending by additional paddlers visiting the Tennessee RiverLine will lead to economic impacts for states and local communities. Tennessee River communities are still in the early stages of developing a local vision for their section of the Tennessee RiverLine and beginning to invest in the planning and implementation of associated infrastructure, marketing, and programming. As such, new paddling-related expenditure estimates attributable to the Tennessee RiverLine have not yet been collected. Instead, this study relies on 15 existing studies of comparable water trails in the United States to estimate the number of annual paddlers and their associated expenditures when visiting the Tennessee RiverLine water trail. Whether these paddlers are experiencing the river for a day or less, for a multi-day experience, or to paddle the entire 652-mile river in one continuous trip, visitors will spend money in the local economies at Tennessee River communities and other destinations accessible to visiting and resident paddlers along the trail. The increase in spending associated with the Tennessee RiverLine will in turn support and create jobs, increase personal income for states' residents, increase the region's gross domestic product, and generate tax revenues for state and local communities.

The bullet points below summarize the economic impacts of the Tennessee RiverLine trail when the aspirational goal is met. The time frame to reach or exceed this aspirational goal is a function of communities connecting with and investing in the Tennessee RiverLine as well as the implementation of some of the *key components of water trail success*, which are discussed in the following section. Additional details about these findings and research methods are included in the full report.

- An additional 807,936 paddlers are expected to visit the Tennessee RiverLine trail in addition to the estimated 284,550 paddlers who currently visit the Tennessee River annually. These additional annual visits are expected to increase annual expenditures by \$48.3 million.
- The growth of the Tennessee RiverLine is expected to increase gross domestic product (GDP) up to \$103.8 million annually. This total impact includes the direct increase in spending by

new paddlers (\$48.3 million) in addition to follow-on business purchases of inputs from suppliers (i.e., \$55.4 million in indirect and multiplier impacts).

- The additional spending by new paddlers associated with the Tennessee RiverLine will increase personal income for states' residents up to \$65.5 million annually.
- The increase in economic activity across the four states is expected to increase total employment by 1,959. This increase in employment does not include potential increases in employment due to jobs attracted to the region by the quality-of-life improvements catalyzed by the Tennessee RiverLine.
- Total local and state sales tax revenues are estimated to increase to \$2.6 million.
- The aforementioned economic impacts are calculated for the entire Tennessee RiverLine trail. GDP impacts amount to \$64.0 million for Tennessee (60.7% of the river), \$28.6 million for Alabama, \$10.4 million for Kentucky, and \$734,496 for Mississippi.
- Output impacts are also calculated for a representative urban and rural county along the Tennessee RiverLine. The average impact to output for predominately urban counties is \$4.4 million for the aspirational scenario. Predominately rural counties and completely rural counties capture up to \$3.3 and \$1.6 million in output, respectively.

How can these potential impacts be achieved?

A case study analysis of seven long-distance trails was performed to identify and describe factors that are important for the creation and operation of a long-distance trail that most effectively delivers economic and quality-of-life benefits to trail communities and entire regions. This analysis also highlights specific elements from the cases that are exemplary of best practices. The following *key components of water trail success* highlight important goals for the structure, function, and implementation of the Tennessee RiverLine vision and action items for river communities, public land managers, and program organizers to undertake:

1. **Providing river access infrastructure and associated facilities that meet needs of diverse users, be they locals or tourists.** By accommodating the needs of both tourists and residents, communities will help to ensure that the Tennessee RiverLine will generate the greatest economic impacts through tourism spending while enhancing the quality of life for their residents. Examples can include boat ramps that include floating docks with canoe/kayak slides, nearby equipment rental/storage facilities, camping areas, and wayfinding signage informing the visitor of nearby tourism assets.

2. **Planning, developing, and sustaining operation of access infrastructure that is safe, environmentally sustainable, durable, and universally accessible (where practicable).** Local operators will best serve themselves, the public, and the health of the Tennessee River by building access infrastructure that creates safe recreational opportunities for everyone while protecting water quality and requiring minimal short- and long-term maintenance. Operators should budget for regular and long-term maintenance that will be required to ensure proper service to users.
3. **Ensuring quality and consistency in infrastructure, branding, and public information.** By providing well-designed facilities and communication assets that establish continuity of quality and branding across the system, Tennessee RiverLine partners will be able to support a positive visitor experience.
4. **Addressing economic and social barriers to local participation.** Ensuring that communities realize the full quality-of-life and economic benefits of the Tennessee RiverLine requires that all members of each community have access and are welcomed, particularly those who are underserved by outdoor recreation opportunities due to cultural, socio-economic or physical factors.
5. **Utilizing programs and events to engage and inspire public participation.** By creating social opportunities to activate resident and visitor participation, local operators will build enthusiasm, grow use, and enhance the economic impact and quality-of-life benefits of the Tennessee RiverLine.
6. **Providing online marketing, promotion, and information platforms that are accessible, engaging, inspiring, informative and offer diverse “entry points.”** At all levels, Tennessee RiverLine partners should thoughtfully plan and design a variety of digital communication assets and visitor experience planning tools. Doing so will maximize the number of people who know about the trail and will be inspired to visit. These assets and tools will promote positive user experiences and grow usership through word of mouth.
7. **Developing interpretive assets and programs that enrich the visitor experience and appeal to nature, history, and culture enthusiasts.** Communities and public land managers should engage a visitor’s attention with compelling stories that their community or region has to offer. Doing so will capture visitors’ intellectual and emotional interest and create for them a

meaningful and positive experience, while appealing to established eco- and heritage-tourism markets.

8. **Utilizing partnerships to develop, operate, program, and market the trail.**

Communities, public land managers, and program organizers should collaborate closely with each other to create and sustain the Tennessee RiverLine. Doing so enables each organization to leverage its funding, human talents, equipment, and capacity by sharing these resources with the Tennessee RiverLine team, thereby achieving much greater impact than would be possible through individual effort.

9. **Integrating and cross-marketing the trail with complementary tourism and outdoor recreation assets, including locally owned businesses such as**

outfitters, hospitality providers, etc. Communities, public land managers, and program organizers should utilize cross-marketing strategies to ensure that trail tourists are aware of all activities, events, and services available along the river. Doing so will enhance the visitor experience and maximize the local economic impact of the Tennessee RiverLine.

10. **Creating a central administrative body that provides quality standards, participation outreach to communities, and support that can include funding assistance, marketing, and small business development services.**

Leveraging the Tennessee RiverLine for maximum economic impact will require centralized administration of critical functions that will ensure a consistent visitor experience, position communities for success, and hasten the expansion and development of businesses that serve the trail tourism market.

By investing effort and resources to effectively achieve these goals, program organizers and Tennessee RiverLine communities will provide a unique, positive, and memorable experience for paddlers on the Tennessee River. In doing so, they can reach or even exceed aspirational use levels and maximize local and regional economic impacts. While this study primarily estimates the economic impacts derived from increased spending by new paddlers engaged through the Tennessee RiverLine, it is important to also consider that fully achieving the *key components of water trail success* will position Tennessee RiverLine communities to effectively compete in the “quality-of-life marketplace” that is defining vibrant communities in the 21st Century.

Health and Other Potential Benefits

In addition to estimating the economic potential of the Tennessee RiverLine, we also estimate the health-related cost savings due to increased flatwater paddling on the Tennessee River. The physical activity from paddlesports reduces the risk of several health conditions and lowers the medical costs paid by local residents. The physical activity generated from paddlesports also contributes to the health of the region's workforce. A healthier workforce leads to avoided medical costs, workers' compensation, and lost productivity costs. The bullet points below summarize the key findings for the health-related cost savings associated with the current level of flatwater paddling usage on the Tennessee River.

- Nearly \$24 million in health-related costs are avoided thanks to exercise from current paddling use on the Tennessee River. These cost savings are expected to increase as Tennessee RiverLine alleviates barriers to Tennessee River experiences through investments in programming, amenities, information and other measures.
- The vast majority of these health-related cost savings (\$22.3 million per year for the study area) are direct and indirect medical care cost savings due to paddling exercise on the Tennessee River. Direct medical costs refer to the costs of actually treating the illnesses or medical conditions caused or exacerbated by physical inactivity, which include cardiovascular diseases, diabetes, depression, and certain cancers as well as obesity. These costs include preventive, diagnostic, and treatment services incurred at hospitals and other medical facilities.
- The total reduction in workers' compensation costs is estimated at \$420,000 per year for the study area.
- Businesses in the study area avoid \$1.0 million per year in lost productivity costs because of the paddling exercise their employees experience on the Tennessee River.

These health-related cost savings ultimately accrue to all of society. For example, direct and indirect medical cost savings are paid through insurance companies that will be added to the premium for individuals and businesses who pay for health insurance. Meanwhile, while workers' compensation costs and lost productivity costs are initially covered by businesses, these costs would eventually be passed on to consumers.

In evaluating the economic potential of the Tennessee RiverLine, this study estimates impacts to state gross domestic product, income, employment, and state and local sales tax revenues in addition to health-related cost savings from increases in paddlesport recreation. However, as discussed in the full report, the economic impact of the Tennessee RiverLine may be larger than the numbers presented. For example, this study does not estimate economic impacts from the construction of amenities and

infrastructure along the river. While economic impacts from construction-related expenditures are one-time impacts, investments in river access infrastructure will increase trail use and help communities realize the full economic potential of the Tennessee RiverLine. Additionally, investing in infrastructure allows communities to host events such as festivals or regattas, and these events alone generate additional economic impacts, which are not considered here. Other potential benefits not quantified but discussed include impacts to property values, property tax revenues, and a multitude of unmeasured benefits, such as the natural and quality-of-life amenities provided by the Tennessee RiverLine. Enhancing quality-of-life benefits will position river communities to effectively compete in the “quality-of-life marketplace” and will attract and retain skilled workers and businesses to the region. The Tennessee RiverLine may also positively impact environmental stewardship, and people’s pride in the river may result in an increased effort to clean and preserve the river’s natural beauty. Lastly, this study focuses on the impact of additional paddlers’ use of the Tennessee River, but hikers, bikers, and campers that use greenways, campgrounds, and river access amenities will likely generate additional economic and health impacts.

Conclusion

The Tennessee RiverLine is of historic significance that is positioned to impact the Tennessee Valley region and Tennessee River communities economically for generations to come. Together, the findings summarized here and detailed in the full report should help policy makers, urban or city planners, and community leaders understand the economic potential of the Tennessee RiverLine, recognize the health benefits provided by paddling recreation on the Tennessee River, and provide guidance on how to enhance the capture of these economic and health benefits through purposeful effort and strategic investment to realize the vision for North America’s next great regional trail system.

1. INTRODUCTION

The Tennessee RiverLine is a vision for a continuous system of paddling, hiking and biking experiences along the Tennessee River’s 652-mile reach from Knoxville, TN, to its confluence with the Ohio River in Paducah, KY. By reframing the river, adjacent public lands and river communities as a 1.2 million acre “river park,” the Tennessee RiverLine positions the river landscape as a recreation destination for generations of diverse residents and visitors to the region. First and foremost a 652-mile water trail, the Tennessee RiverLine offers equitable access to river spaces and experiences for canoeing, kayaking, paddle boarding and other water-related recreation. The proposed water trail will utilize existing access points and new infrastructures of public access and river experiences, including multi-use pavilions, riverfront parks, riverside trails and connective greenways. The purpose of these amenities and facilities will vary depending on the identified needs of users and community priorities of their specific locations, but could support activities such as storing and renting paddling equipment, providing directions to and information about nearby points of interest, or providing space for events, retail or public restrooms. The proposed multimodal water trail will provide public access to the Tennessee River, enhance connectivity between cities, parks, and other water trails and overland trails, and attract new recreational users.

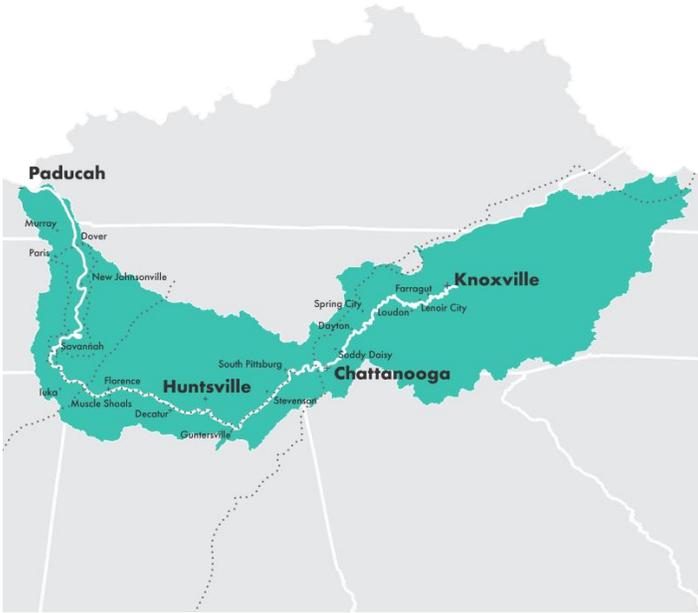


Figure 2. Tennessee RiverLine is a 652-mile Water Trail from Knoxville, Tennessee to its Confluence with the Ohio River in Paducah, Kentucky

These benefits provided by the Tennessee RiverLine have never been more important. The global canoeing and kayaking equipment market is poised to grow by \$105.37 million during 2021-2025.¹ Canoeing and kayaking are also experiencing an increase in participation within the Tennessee River Basin (i.e., in Tennessee, Alabama, Mississippi, and Kentucky).² However, a lack of amenities, facilities and access on waterways was a key challenge for water-based recreation and tourism in Tennessee according to a recreation and tourism working group formed by the State of Tennessee in 2018.³

In this report, we provide estimates of the potential economic and health impacts of the Tennessee RiverLine. It is important for local communities and states to understand the potential benefits from investing in and connecting to the outdoor recreation that the Tennessee RiverLine trail offers. Paddlers who use the trail for the day or non-local visitors who paddle the river for multi-day trips will create benefits for the Tennessee RiverLine communities in Alabama, Kentucky, Mississippi, and Tennessee. Users of the trail will generate local spending, which in turn will support and create jobs, increase personal income for states' residents, increase the region's gross domestic product, and generate tax revenues. Physical activity from the utilization of the trail will also result in health-care related cost savings. The first section of this report estimates these aforementioned economic and health impacts of the Tennessee RiverLine trail. Other potential impacts that are not analyzed quantitatively but are discussed include the potential economic benefits stemming from the construction of river access infrastructure in addition to community programs or events that are held at access points.

As many communities are in the visionary stage of connecting to the Tennessee RiverLine trail, data on visitors and related expenditures specific to the Tennessee RiverLine trail are not available. Instead, this study relies on 15 existing studies of comparable water trails to estimate visitors and visitor spending. Using existing studies and considering current and potential use and amenities along the Tennessee RiverLine trail, three potential growth scenarios are developed, including aspirational goals for trail use and visitors. For each of these growth scenarios, economic impacts are estimated for the entire Tennessee RiverLine trail. The effect of the Tennessee RiverLine trail on output and tax revenues are also estimated for the individual states that the Tennessee River traverses. The Tennessee River passes through both rural and urban settings, and the use and economic impacts in these areas are likely to differ. This analysis accounts for this variation in the development of the growth scenarios, and potential impacts are

¹ https://www.researchandmarkets.com/reports/5135908/global-canoeing-and-kayaking-equipment-market?utm_source=BW&utm_medium=PressRelease&utm_code=txcjl&utm_campaign=1426631+-+Global+Canoeing+and+Kayaking+Equipment+Industry+2020-2024&utm_exec=joca220prd

² <https://outdoorindustry.org/resource/2019-special-report-paddlesports-safety/>

³ https://www.tn.gov/content/dam/tn/environment/water/tn-h2o/documents/plan-&-appendices/wr-tnh2o_plan-app_recreation-and-tourism-chapter.pdf

presented for typical rural and urban counties.

In addition to estimating the economic potential of the Tennessee RiverLine, a case analysis is performed in section three of this report. Urban and rural communities along the Tennessee RiverLine have their own unique character and existing relationship with and access to the river. The Tennessee RiverTowns Program aims to assist communities in connecting with the Tennessee RiverLine and in realizing the associated economic benefits. However, many communities are only in the beginning stages in considering river access infrastructure and the management of new facilities, including marketing, communications, and engagement programs. A case study analysis of seven long-distance trails is performed to identify ten *key components of water trail success*. The implementation of these identified components will enhance communities' capture of the estimated economic and health benefits highlighted in this report.

2. ECONOMIC POTENTIAL OF THE TENNESSEE RIVERLINE

The Tennessee RiverLine project will yield significant economic and health benefits through its utilization by residents of surrounding communities and visitors who seek to experience the river for a day or less, for multi-day experiences, or to paddle the river in one continuous trip. Utilization of the Tennessee RiverLine by visitors and residents would generate local spending and tax revenues, support jobs, help the Tennessee River Valley attract and retain a highly skilled workforce, and help enhance resident's quality of life. For purposes of policy, planning, and regional pride, it is important for residents to understand these potential benefits. Quantifying these values is challenging but necessary in order to determine the impact of public and private activities that may enhance or diminish a valuable natural and cultural asset – the Tennessee River.

This section of the report provides estimates of the potential economic and health impacts of the Tennessee RiverLine water trail on four states: Tennessee, Alabama, Kentucky, and Mississippi. Unlike existing studies of the economic impact of general recreational use (for example fishing, swimming, motorized boating, etc.) on the Tennessee River, this report focuses on paddlesport recreationists (e.g., kayakers, canoers, stand-up-paddleboarders). Using existing studies of other paddling destinations in the United States and data on the current and potential use and infrastructure on the Tennessee River, the study identifies three potential future growth scenarios for the Tennessee RiverLine. Each scenario implies a different level of paddlesport recreation use and visitor expenditure. These estimates of use and expenditures are used to provide forecasts of the economic impact potential of the Tennessee RiverLine in terms of direct spending, indirect/induced spending, income, employment, and sales tax revenues. We also provide estimates of the healthcare costs avoided due to physical activity provided by paddling access on the Tennessee River.

While useful, these estimates do not consider many other benefits of the water trail system including job recruitment, water trail proximity impacts on property values, mental health impacts from river recreation, and economic impacts from construction and events (festivals, boat races, triathlons). While these impacts may be large, data availability limits our ability to provide reliable estimates. These estimates also focus on potential increases in paddlesports recreationists from the Tennessee RiverLine and do not consider impacts from increased use that the Tennessee RiverLine is also likely to generate from trails, greenways, campgrounds, and parks along the river by hikers, bikers, and campers.

2.1 Current Paddlesport Use on the Tennessee River

The Tennessee River stretches 652 miles across Tennessee, Alabama, Mississippi, and Kentucky. More than 4.5 million residents live within its 41,000 square mile watershed and 2.4 million residents live in counties that border the river. The upper reaches of the watershed are characterized by the high mountains and plateaus of East Tennessee and Northeast Alabama while the lower reaches are the coastal plains of Northwest Alabama, West and Central Tennessee, and Western Kentucky. The river and its tributaries are home to more biodiversity than any other river system in North America including many endangered and threatened species of fish, mussels, and snails.

The Tennessee Valley Authority (TVA) operates nine dams and locks on the main stem of the river for navigation, flood prevention, hydropower, water quality and supply, recreation, and economic growth. Because of these dams and locks, the Tennessee River itself is fully navigable by human-powered watercraft and varies from river to reservoir along its 652 river miles. The river also runs through large cities such as Knoxville, TN and Huntsville, AL as well as rural farmland and protected wilderness, which offer a range of user experiences and land-side amenities from paved greenways and waterfront restaurants to hiking trails, developed campgrounds and primitive campsites along the river.

Unfortunately, non-motorized boating use estimates for the Tennessee River have not yet been collected. Instead we infer paddling use estimates from an existing survey-based study of general recreation use (for example fishing, swimming, motorized boating, etc.) on three reservoirs along the Tennessee River.⁴ We find that non-motorized boating recreation is currently responsible for 284,550 annual visits to the Tennessee River. We use this estimate as a baseline for paddling use and assume that Tennessee RiverLine will increase annual paddling use beyond this baseline. More details and further information about the methodology used to infer paddling use estimates for the Tennessee River are available in Technical Appendix A.

The extent, variety, and proximity to large metro areas make the Tennessee River unmatched in the United States as a paddling destination (see Table 1). At 652 river miles, the Tennessee River is longer than most other water trails offering the opportunity for a long-distance paddling adventure found in few other places. The Tennessee River also flows through both urban and rural settings giving visitors the opportunity to paddle in a more natural setting or to enjoy the amenities offered in cities. The Tennessee River's existing average annual paddling visits per mile is relatively low suggesting that much of the river provides a more dispersed recreational experience relative to other water trails included in this study. However, there are also river stretches near cities, state parks, and other amenity clusters where

⁴ Pouyda, N. et al. 2017. Results from visitor and property owner surveys on Chickamauga, Norris, and Watts Bar Reservoir in summer 2016.

visitor density is comparable to other water trails included in the study. Another defining characteristic of the river is that it flows through a region of the country where residents engage in little exercise. This lack of leisure-time physical activity highlights the potential health benefits of the free and low-cost recreational opportunities provided by the Tennessee River.

Economic impacts of water trail systems can be approximated based on estimates of annual expenditures or total visitor spending attributable to the water trail system. Water trails generally fall into two expenditure categories. The first are water trails in rural areas that primarily attract visitors from outside the local area. These water trails are characterized by a relatively small number of predominately out-of-town visitors with high expenditures per visit. These water trails are important for rural economic development as paddling tourists inject dollars into the local economy. However, rural areas provide fewer retail, entertainment, and lodging opportunities which limits their potential economic impact. The second are water trails in more densely populated areas that primarily attract day-use visitors. These water trails are characterized by a large number of primarily day-use visitors that spend less per visit relative to out-of-town visitors. Greater proximity to retail, entertainment, and lodging implies a greater potential economic impact for out-of-town visitors compared to other trail systems situated in rural areas. However, the smaller number of out-of-town visitors lowers the expenditures that can be reliably attributed to the water trail. These benefits of these types of water trails also extend beyond economic impact to include improvements in quality of life for the residents of these more densely populated areas as well as attracting and retaining businesses that are drawn to such natural amenities. The Tennessee River includes sections that fall into both categories since it spans both urban and rural locales. This unique feature provides the potential for both economic development through increased tourism, business activity, and quality of life as well as economic growth, as seen from increases in goods and services for local economies.

Table 1. U.S. Water Trail Systems

Water Trail Systems	States	River Miles	Cities with >100,000 residents	Annual Visits	Visits Per Mile	Percentage of local adults reporting no leisure-time physical activity [†]
Tennessee River Reservoir System	TN, AL, MS, KY	652	3	284,550*	436	33.3
Northern Forest Canoe Trail	NY, VT, NH, ME	740	0	89,399	408	23.2
Rio Grande Wild and Scenic River	TX	260	0	464,157	1,785	27.2
Saint Croix National Scenic Riverway	MN, WI	252	0	638,257	2,533	22.3
Big South Fork National River and Recreation Area	TN	244	0	750,494	3,074	35.1
Buffalo National River	AR	135	0	1,326,283	9,824	30.9
Ozark National Scenic Riverway	MO	134	0	1,221,488	9,116	28.4
Congaree National Park	SC	50	1	159,445	3,189	27.2

* Paddling users only estimated from Pouydal et al. (2017)

† Centers for Disease Control and Prevention. State Indicator Report on Physical Activity, 2014.

Unfortunately, paddling-related expenditure estimates for the Tennessee River have not yet been collected. Instead, this study utilizes economic impact studies already completed in other paddling destinations. Fifteen existing studies of the economic impact of other paddling destinations in the United States are collected from a variety of sources (Blair, 2012; FPS, 2014; Hjerpe, 2017; Johnson, 2002; Polluck, 2007; Thomas and Koontz, 2020).⁵ These paddling destinations include the eight river trail systems in Table 1, three nationally-recognized river and lake systems where paddling is a primary activity (Boundary Waters Wilderness Area, Voyageurs National Park, Dinosaur National Monument) and five regional river trail systems. These studies are grouped into three use categories: low-use density, medium-use density, and high-use density. Low-use density, paddling destinations are characterized by

⁵ Some of the studies refer to water trails as blueways, paddling trails, paddle trails, or river trails. All of these terms imply a long-distance trail along a waterway, but within this document, we generally refer to them as “water trails.”

high expenditures per visit. High-use density, paddling destinations are characterized by low expenditures per visits. These results are presented in Table 2.

Table 2. Water Trail System Types Based on Average Visits Per Mile

Type of Area	Examples	Visits per Mile	Expenditures (2021\$)	Visits	Expenditures per Visit (2021\$)
Low-use density	Roanoke River Paddle Trail, Chattahoochee Valley Blueway, Lake Superior Water Trail, Boundary Waters Wilderness Area, Kickapoo River Water Trail, Voyageurs National Park, Northern Forest Canoe Trail	145	\$13,732,270	70,615	\$159.43
Medium use-density	Suwannee River Wilderness Trail, Rio Grande Wild and Scenic River/Big Bend, Saint Croix National Scenic Riverway, Dinosaur National Monument, Big South Fork NRRRA, Congaree National Park	2,517	\$24,121,956	459,386	\$55.57
High-use density	Ozark National Scenic Riverway, Buffalo National River	9,470	\$57,288,648	1,273,886	\$44.96

With use density at its current level on the Tennessee River, average paddling visits per mile are 436. This places the Tennessee River in the low-use density category similar to places like Boundary Waters Wilderness Area and the Northern Forest Canoe Trail. This level of use density translates into 284,550 total annual paddling visits for the whole 652 miles of the Tennessee River. This measure of river use is then multiplied by the average expenditure per visit measure for the low-use density category (\$113.86) to produce total annual paddling-related expenditures currently incurred on the Tennessee River: \$32.4 million.

2.2 Potential Increase in Paddlesport Use and Expenditures

As the implementation of the Tennessee RiverLine vision expands along the river, it is not known exactly how visitation will grow from its current low-use density category. To examine the future economic impacts of the Tennessee RiverLine, multiple potential use scenarios are considered. Through communications with stakeholders and considering current and potential amenities along the Tennessee RiverLine, each mile of the Tennessee River is grouped into three growth categories. The first are areas where visitation would increase to 9,034 annual paddling visitors per mile. This level of use is consistent

with high-use density destinations such as the Ozark National Scenic Riverway and the Buffalo National River (see Table 3). In this aspirational scenario, 19 miles of the Tennessee RiverLine are assumed to grow into this high-use density area. The second are areas where visitation would increase to 2,080 annual paddling visitors per mile. This level of use is consistent with medium-use density destinations such as the Suwannee River Wilderness and the Saint Croix National Scenic Riverway (see Table 3). An estimated 219 miles of the Tennessee RiverLine are assumed to grow into a medium-use density area. The remaining 414 miles are assumed to experience a doubling of current use density due to Tennessee RiverLine. For a mile-by-mile breakdown of paddling use in this aspirational use scenario, see Technical Appendix B.

Developments along the river are certainly not restricted to these assignments. However, these growth categories allow for the development of an aspirational scenario for the Tennessee RiverLine that is flexible in that a single use category is not assumed for the entire length of the Tennessee RiverLine. The Tennessee RiverLine runs through rural and urban settings, and this methodology allows for different growth scenarios in different sections of the river.

Doubling current use density for 414 miles of the Tennessee RiverLine would yield an additional 180,680 visits annually (see Table 3). The growth in paddling visits would generate an additional \$15.3 million in annual expenditures for these sections of the river. For sections of the river that grow into a medium-use density paddling destination, annual paddling visits per mile would increase by 2,080 (i.e., average visitors per mile for comparable medium-use water trails minus the current use density of the Tennessee River). The 219 miles of medium-use density would result in an additional 455,618 annual paddling visits and an additional \$25.3 million in annual expenditures. Lastly, for the 19 miles of the Tennessee RiverLine that are expected to become a high-use density area, annual paddling visits per mile would increase by 9,034 (i.e., average visitors per mile for comparable high-use water trails minus the current use density of the Tennessee River). For these sections of the river, there would be an additional 171,637 annual paddling visits, which would increase annual expenditures by \$7.7 million. Together, annual paddling visits for the entire Tennessee RiverLine system would increase by 807,936, which would lead to an additional \$48.3 million in annual expenditures.

Table 3. Potential Aspirational Scenario for Tennessee RiverLine

Tennessee RiverLine will...	Examples	Miles of Tennessee River	Additional Annual Visits	Additional Annual Expenditures
...double current use density (436 annual visitors per mile)		414	180,680	\$15,306,431
...increases to medium-use density (2,080 annual visitors per mile)	Suwannee River Wilderness Trail, Rio Grande Wild and Scenic River/Big Bend, Saint Croix National Scenic Riverway, Dinosaur National Monument, Big South Fork NRRRA, Congaree National Park	219	455,618	\$25,320,839
...increases to high-use density (9,034 annual visitors per mile)	Ozark National Scenic Riverway, Buffalo National River	19	171,637	\$7,717,309
Total		652	807,936	\$48,344,578

Figure 3 demonstrates how this aspirational scenario compares to other paddling destinations in terms of annual expenditures and visitors. The baseline demonstrates the current level of estimated paddler visitors (284,550) on the Tennessee River and their associated annual expenditures (\$32.4 million). This existing level of expenditure is less than Boundary Waters Wilderness Area, Ozark National Scenic Riverway, and Buffalo National River but larger than Saint Croix National Scenic Riverway and Northern Forest Canoe Trail. When the baseline and aspirational Tennessee RiverLine are combined, paddler visitors increase to 1,092,485, and annual expenditures grow to \$80.7 million. After reaching the aspirational scenario, the number of visitors to the Tennessee RiverLine is similar to the number of visitors at Buffalo National River and Ozark National Scenic Riverway. Annual expenditures for the aspirational Tennessee RiverLine are higher relative to the comparable water trail destinations since many of the comparable water ways are solely located in rural areas, unlike the Tennessee River that passes through both rural and urban settings. In reaching the aspirational scenario, two additional potential use scenarios are considered, which are shown in Figure 3. These scenarios are stepping stones in reaching the aspirational scenario, and visitors and expenditures are assumed to be a third and two-thirds of those in the aspirational scenario.

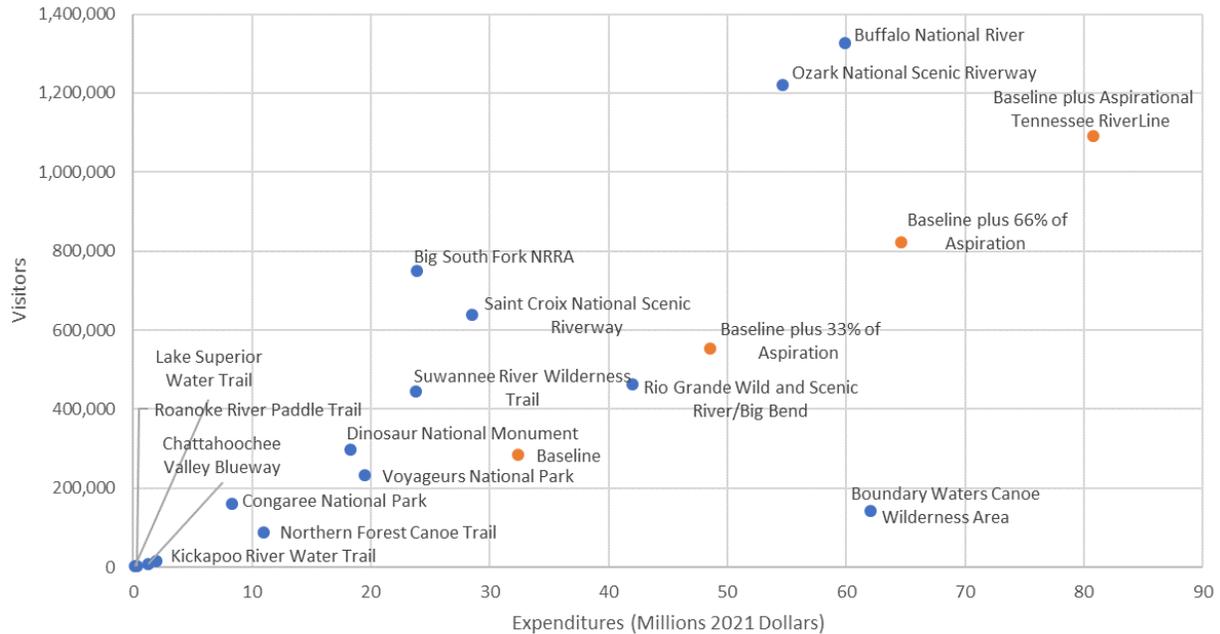


Figure 3. Annual Expenditures and Visitors for Comparable Water Trails and Aspirational Scenarios for the Tennessee RiverLine

2.3 Economic Impacts

Paddlers who visit the Tennessee RiverLine will spend money in the local economies at the various paddling destinations along the trail. For example, visitors will spend money at restaurants, outdoor shops, gas stations, hotels, or at entertainment venues, which will result in a direct increase in spending near the public access hubs. This increase in expenditures will lead to indirect and multiplier impacts through firms’ supply chains for goods and services and ripple effects through the economy, creating additional income and jobs in local areas and across the Tennessee RiverLine states. To enhance capture of these impacts, it is important for these amenities and services to be readily accessible to users through wayfinding, clear information sources and connective pedestrian/transportation systems. These and other strategies to enhance capture of economic impacts are referenced in the case studies section in this study.

To estimate economic impacts, a Regional Input-Output Modeling System (RIMS II) is used along with the most recent multipliers for Tennessee, which are from the U.S. Bureau of Economic Analysis. More details and further information about the methodology in this section are available in Technical Appendix C. Table 4 summarizes the economic impact on output or state gross domestic product (GDP).

Table 4. Economic Impact on Output (GDP)

Growth Scenario	Direct Effects	Indirect and Multiplier Effect	Total Output Impact
Near-term growth (33% of Aspiration)	\$16,114,859	\$18,478,372	\$34,593,231
Midterm growth (66% of Aspiration)	\$32,229,719	\$36,956,744	\$69,186,463
Tennessee RiverLine Aspirational Scenario	\$48,344,578	\$55,435,116	\$103,779,694

As the Tennessee RiverLine grows to its aspirational scenario, direct, annual expenditures will continue to increase. In the near-term scenario, direct expenditures will total \$16.1 million. As the Tennessee RiverLine continues to grow into the midterm scenario, annual spending by visitors will increase to \$32.2 million. In the aspirational scenario, annual expenditures will total \$48.3 million. The additional spending, which is a result of the increase in use of the Tennessee RiverLine water trail, results in businesses purchasing goods and services from manufacturers and vendors across Tennessee River communities in Alabama, Kentucky, Mississippi, and Tennessee. As workers spend their incomes in the local and state economy, additional output, income, and jobs are created across the states. These indirect and multiplier effects for the three different growth scenarios range from \$18.5 million to \$55.4 million in output. Finally, the total impact, which is the sum of direct and indirect/multiplier effects, is shown in Table 4. As the Tennessee RiverLine reaches its near-term growth scenario (one-third of aspirational goal), total output will increase to \$34.6 million. As the Tennessee RiverLine reaches its midterm growth scenario (two thirds of aspirational goal), impacts to output will total \$69.2 million. Finally, visitor spending will produce \$103.8 million in output annually after reaching the Tennessee RiverLine aspirational scenario. For all three scenarios, expenditures and economic impacts are attributable to the growth of the Tennessee RiverLine and are in addition to the current spending and economic impacts that are associated with paddling use on the Tennessee River.

Table 5 demonstrates the total impacts to income and employment for the three growth scenarios for the Tennessee RiverLine. As workers spend their wages and money continues to circulate through the economy, there will be an increase in personal income for states' residents. Across the three growth scenarios, the increase in annual income ranges from \$21.8 million to \$65.5 million. Similarly, the increase in economic activity through direct, indirect, and multiplier effects creates jobs within the states. If the Tennessee RiverLine reaches a third of its aspirational goal, 653 jobs will be created. If the Tennessee RiverLine continues to grow and reaches two-thirds of its aspirational goal, employment will

increase by 1,306. If the Tennessee RiverLine reaches the aspirational scenario, employment will increase by 1,959. These are jobs created from the increase in direct spending and from indirect and multiplier effects. For example, direct spending at outfitters, guides services, and restaurants creates jobs at outfitters, guiding companies, and restaurants. Indirect spending also creates jobs at the companies that supply goods to the outfitter and the food distribution companies that service the restaurant. These increases in employment do not include potential increases in employment due to jobs attracted to the region by the quality-of-life improvements Tennessee RiverLine provides. Spending generated by the Tennessee RiverLine will also generate local and state sales tax revenue, which would range from \$869,342 to \$2.6 million in the aspirational scenario.

Table 5. Economic Impact on Income, Employment, and Sales Tax Revenue

Growth Scenario	Total Income Impact	Total Employment Impact	Local and State Sales Tax Revenue
Near-term growth (33% of Aspiration)	\$21,846,779	653	\$869,342
Midterm growth (66% of Aspiration)	\$43,693,558	1,306	\$1,738,683
Tennessee RiverLine Aspirational Scenario	\$65,540,336	1,959	\$2,608,025

The economic impacts shown above in Tables 4 and 5 are for the entire Tennessee RiverLine trail. Using the total output impacts for each growth scenario and the number of miles *by use category* for each state under the aspirational growth scenario (see Table 3), output impacts are divided among the four states for which the Tennessee River traverses. The Tennessee River is 652 miles, and 396 (60.7 percent) of those miles are within the state of Tennessee. As shown in Technical Appendix B, 132 miles in Tennessee will grow to medium-use density; 13 miles in Tennessee will grow high-use density; and the remaining 251 miles in Tennessee will double its current use density due to Tennessee RiverLine. Given these use categories, total impacts on output in Tennessee will increase to \$64.0 million for the Tennessee RiverLine aspirational scenario. Alabama is the second largest home to the Tennessee River, as 196 miles of the Tennessee River lies within the state. In the aspirational scenario, 49 miles in Alabama are considered medium-use density; 6 miles in Alabama are considered high-use density; and 141 of these miles in Alabama will double its current use density due to Tennessee RiverLine (see Technical Appendix B). Output impacts in Alabama will reach \$28.6 million in the aspirational scenario. Finally, 55 miles and 5 miles of the Tennessee River are within Kentucky and Mississippi, respectively. Visitor spending in these states will produce \$10.4 million and \$734,496 in total output.

Table 6. Economic Impact on Output (GDP) by State

Growth Scenario	Tennessee (396 miles)	Alabama (196 miles)	Kentucky (55 miles)	Mississippi (5 miles)	Total Output Impact (652 miles)
Near-term growth (33% of Aspiration)	\$21,339,387	\$9,527,978	\$3,481,034	\$244,832	\$34,593,231
Midterm growth (66% of Aspiration)	\$42,678,774	\$19,055,957	\$6,962,067	\$489,664	\$69,186,463
Tennessee RiverLine Aspirational Scenario	\$64,018,162	\$28,583,935	\$10,443,101	\$734,496	\$103,779,694

In addition to these state-level impacts, Table 7 provides estimates for typical Tennessee RiverLine communities. Similar to the state-level impacts above, total output impacts and the number of miles *by use category* under the aspirational scenario for each county are used to calculate impacts for a typical urban and rural county in our four-state study area. Fewer places to spend money in addition to smaller existing local economies imply smaller economic impacts for rural communities. Whether a community’s connection to the river is considered a low, medium, or a high-use density area also affects annual expenditures and thus economic impacts. Additionally, the following section discusses *key factors of success*, and implementation of some of these factors will help both rural and urban communities to maximize potential economic impacts. For counties that are considered mostly urban, the average economic impact of the Tennessee RiverLine ranges from \$1.5 million in the near-term growth scenario to \$4.4 million in the aspirational scenario.⁶ For mostly rural counties, visitor spending produces an average of \$1.1 million to \$3.3 million in output. Completely rural counties will experience an average increase of \$547,746 to \$1.6 million in output due to the growth of the Tennessee RiverLine.

⁶ Urban-rural classification is from the U.S. Census Bureau. Counties with less than 50 percent of the population living in rural areas are classified as mostly urban. Counties with 50 to 99.9 percent of the population living in rural areas are classified as mostly rural. Counties with 100 percent of the population living in rural areas are classified as completely rural. For more information, see: <https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html>

Table 7. Average Economic Impact on Output for Urban and Rural Counties

Growth Scenario	Mostly Urban	Mostly Rural	Completely Rural
Near-term growth (33% of Aspiration)	\$1,462,703	\$1,111,269	\$547,746
Midterm growth (66% of Aspiration)	\$2,925,407	\$2,222,539	\$1,095,492
Tennessee RiverLine Aspirational Scenario	\$4,388,110	\$3,333,808	\$1,643,238

Visitors to the Tennessee RiverLine will spend their money in local economies at outdoor shops, restaurants, hotels, etc., and that money will continue to circulate through the economy. Together, this additional spending will expand state and local sales tax bases and produce additional revenue collections for the state and the local communities. Revenues will derive from worker spending in addition to business-to-business transactions which are subject to sales taxation. Using estimates of new personal income accruing to Tennessee, Alabama, Kentucky, and Mississippi and data on each states' state and local sales tax revenues, impacts to state and local sales tax revenues are estimated for each state (see Table 8).⁷ As the Tennessee RiverLine grows, expenditures and sales tax revenues will increase. In reaching the aspirational scenario, sales tax revenues are estimated to be \$1.6 million and \$729,767 for Tennessee and Alabama, respectively. State and local sales tax revenues will increase to \$230,216 and \$21,332 for Kentucky and Mississippi. Together and as also shown in Table 5 above, total impacts to local and state sales tax revenue will range from \$869,342 in the near-term growth scenario to \$2.6 million in the aspirational scenario.

⁷ Data on local and state sales tax revenues are from the U.S. Census Bureau, Census of Governments. For more information, see: <https://www.census.gov/programs-surveys/cog.html>

Table 8. Economic Impact on Sales Tax Revenue by State

Growth Scenario	Tennessee	Alabama	Kentucky	Mississippi	Total Local and State Sales Tax Revenue
Near-term growth (33% of Aspiration)	\$542,237	\$243,256	\$76,739	\$7,111	\$869,342
Midterm growth (66% of Aspiration)	\$1,084,473	\$486,512	\$153,477	\$14,221	\$1,738,683
Tennessee RiverLine Aspirational Scenario	\$1,626,710	\$729,767	\$230,216	\$21,332	\$2,608,025

2.4 Health Impacts

Water trails provide residents that live near the river a free or low-cost opportunity to engage in physical activity. The physical activity from paddlesports reduces the risk of several health conditions and lowers the medical costs paid by local residents. The physical activity generated from paddlesports also contributes to the health of the region’s workforce. A healthier workforce leads to avoided medical costs, workers’ compensation, and lost productivity costs.

This section estimates the health-related cost savings resulting from physical activity due to paddlesports on the Tennessee River. Physical inactivity exacts a high toll on health and quality of life and increases the demand for health care (Rosenberger, et al. 2005). Research demonstrates the importance of physical activity in reducing morbidity and mortality from chronic diseases (Pratt, et al. 2000). Benefits of being physically active include lower incidence of cardiovascular diseases, diabetes, depression, certain cancers, and obesity (Cohen, et al. 2006). The link between recreational access and participation in physical activities is also well established (Roemmich, et al. 2006; Roux, et al. 2007). Thus, the positive impact on health outcomes of physical activity made possible by paddlesport access on the Tennessee River is substantial.

Potential health impacts of the Tennessee River can be approximated based on 1) number of physically active paddlers that use the Tennessee River, 2) the total health-related costs avoided per person per year from moderate physical activity, and 3) the percent of an active paddler’s time spent padding. To estimate physically active paddlers that might reasonably use the Tennessee River for recreation, we use estimates from the Center for Disease Control (CDC)⁸ and the U.S. Census to calculate

⁸ Centers for Disease Control and Prevention. State Indicator Report on Physical Activity, 2014 https://www.cdc.gov/physicalactivity/downloads/pa_state_indicator_report_2014.pdf

the total physically active population in each state. The Centers for Disease Control and Prevention (CDC) recommends that adults participate in at least 150 minutes of moderate-intensity aerobic physical activity per week. According to the CDC State Indicator report, 29 percent (Kentucky) to 36 percent (Mississippi) of residents in our four-state study area meet this guideline and are considered physically active. According to paddlesport industry estimates, 5.5 percent of the population in our four-state study area engages in flatwater paddlesports.⁹ Applying these percentages to the population in each state, we obtain an estimate of 274,374 residents in the four-state study area that are physically active flatwater paddlers. Because proximity to the Tennessee River is the prime determinant of its use, we multiply the percent of each state's population that lives in a county that borders the Tennessee River by the population of physically active flatwater paddlers in each state to arrive at 36,166 physically active flatwater paddlers that would likely recreate on the Tennessee River. Estimates of health-related cost savings in this study are based on this number of physically active flatwater paddlers that likely use the Tennessee River.

The costs reported below are calculated by multiplying these measures of the physically active population of paddlers that use the Tennessee River by estimates of health-related cost savings (\$ per person per year) pulled from existing studies. Since all of a physically active paddler's time will not be spent paddling, we multiply these measures by 0.23; the minimum percent of an active paddler's time spent paddling calculated from industry estimates of weekly hours spent paddling.¹⁰ More details and further information about the methodology in this section are available in Technical Appendix D.

As shown in Table 9, nearly \$24 million in health-related costs are avoided thanks to exercise from current paddling use on the Tennessee River. These cost savings are expected to increase as Tennessee RiverLine alleviates barriers to Tennessee River experiences through investments in programming, amenities, information and other measures. Total health-related cost savings include three components: 1) direct and indirect medical costs, 2) direct and indirect workers' compensation, and 3) lost productivity. Mean estimates are included in Table 9. For minimum and maximum estimates see Technical Appendix D.

⁹ 2019 Special Report on Paddlesports and Safety. The Outdoor Foundation <https://outdoorindustry.org/resource/2019-special-report-paddlesports-safety/>

¹⁰ 2015 Special Report on Paddlesports. The Outdoor Foundation <https://outdoorindustry.org/wp-content/uploads/2017/05/2015-Paddlesports-Research.pdf>

Table 9. Health-Related Cost Savings from Paddlesport Recreation on the Tennessee River

State	Physically active paddlers that live near the TN River*	Medical Care Cost Savings (Direct and Indirect)	Workers' Compensation Savings (Direct and Indirect)	Lost Productivity	Total
Alabama	13,796	\$8,513,924	\$160,251	\$385,915	\$9,060,090
Kentucky	1,728	\$1,066,645	\$20,077	\$56,987	\$1,143,709
Mississippi	234	\$144,482	\$2,719	\$6,533	\$153,735
Tennessee	20,407	\$12,593,639	\$237,040	\$584,473	\$13,415,151
Total	36,166	\$22,318,691	\$420,087	\$1,033,908	\$23,772,685

*Counties that border the Tennessee River

The direct and indirect medical cost savings due to flatwater paddling on the Tennessee River is estimated to be \$22.3 million per year for the study area. Direct medical costs refer to the costs of actually treating the illnesses or medical conditions caused or exacerbated by physical inactivity, which include cardiovascular diseases, diabetes, depression, and certain cancers as well as obesity. These costs include preventive, diagnostic, and treatment services incurred at hospitals and other medical facilities. Utilizing inflation-adjusted estimates of average per-capita annual savings in the ten-county study area (Pratt, et al. 2000), the flatwater paddling activity that takes place on the Tennessee River saves residents a total of \$5.6 million in medical costs. Indirect medical cost savings are based on the diminished quality of life, such as pain and suffering from medical conditions and shorter life expectancy, resulting from adverse health conditions due to physical inactivity. Based on existing research, each dollar of direct medical costs generates three dollars in indirect medical costs (Chenoweth and Sugerman 2005); therefore, savings in indirect medical costs are estimated to be three times the direct costs or \$16.7 million per year.

The second component of health-care cost savings is workers' compensation. Individuals can be eligible to collect workers' compensation payments when injuries occur in the workplace. Research has shown that physical inactivity can increase the risk of suffering strains and sprains and the duration of the recovery period (Chenoworth and Bortz 2005). The total reduction in workers' compensation costs, including both direct and indirect costs, is estimated at \$420,087 per year for the study area.

Estimates of the average per-worker cost of workers' compensation payments as a result of

physical inactivity range from \$6 to \$12 (Chenoworth and Bortz 2005). With a median per-worker estimate of \$10, direct workers' compensation cost savings amount to \$84,017 per year resulting from workers' participation in flatwater paddling on the Tennessee River. Employers incur administrative costs, or indirect workers' compensation costs, when workers claim compensation payments. Examples of indirect workers' compensation costs included training replacement employees, accident investigation and implementation of corrective measures, repairs of damaged equipment and property when workers claim compensation payments. Research estimates the ratio of indirect compensation costs to direct compensation costs to be 4:1 (Chenoweth and Sugerman 2005). In other words, each dollar of direct workers' compensation cost generates four dollars in indirect medical costs. Using the ratio, it is estimated that employers avoided \$336,070 per year in indirect workers' compensation cost due to worker's participation in flatwater paddling on the Tennessee River.

The third component of health-care cost savings lies in lost productivity costs incurred by businesses. There are two ways an employee's physical inactivity can lead to lost productivity. The first is not being present or attending to duty or work (i.e., absenteeism). The second is being at work when they should be at home, either because they are ill or because they are too tired to be effective (i.e., presenteeism). Lost productivity costs for the study area are estimated by multiplying estimated average hours lost per year due to absenteeism and presenteeism by the median salary paid to workers and the number of workers that paddle in each county (Chenoworth and Bortz 2005). It is estimated that businesses in the study area avoid over \$1 million in lost productivity costs per year because of the paddling-related exercise their employees engage in on the Tennessee River.

The benefits estimated in this section can be thought of in terms of cost savings resulting from being physically active. These savings ultimately accrue to all of society. For example, direct and indirect medical cost savings are paid through insurance companies that will be added to the premium for individuals and businesses who pay for health insurance. Meanwhile, while worker compensation costs and lost productivity costs are initially covered by businesses, these costs would eventually be passed on to consumers.

2.5 Important Considerations

This study provides the first indication of the economic and health impact of the Tennessee RiverLine. The study highlights four types of economic impacts created by spending attributable to the future potential river use scenarios created by Tennessee RiverLine: 1) increases in GDP, 2) increases in income, 3) increases in employment, and 4) state and local sales tax revenues. The study also highlights three types of health-related cost savings from paddlesport recreation access on the Tennessee River: 1)

medical care cost savings, 2) workers' compensation savings, and 3) lost worker productivity. However, we discuss several reasons below for why the total economic impact of the Tennessee RiverLine may be much larger than the numbers presented in this study.

First, this study does not include the potential economic impacts that stem from the construction of amenities and infrastructure along the Tennessee RiverLine. Building amenities and infrastructure along the river creates local spending and jobs related to the construction, design, engineering, and landscape management of amenities that serve Tennessee RiverLine users. Suttree Landing Park along the Tennessee RiverLine in Knoxville, Tennessee serves as an example of a recently completed development, which will result in one-time, economic impacts for the local economy and the state. Park improvements included sections of a greenway, park furniture, a playground, restrooms/pavilion, a kayak launch, roadway improvements, a parking lot, and associated landscaping and lighting. Together, construction costs totaled about \$10.5 million, including roughly \$1.8 million in design costs and \$8.7 million in construction costs. Similar construction projects along the Tennessee RiverLine will have economic impacts on local economies. Investments in river access infrastructure will also increase trail use and help communities realize the full economic potential of the Tennessee RiverLine, which is discussed in more detail in the case studies that follow. Additionally, river access infrastructure will allow communities to host events such as competitive race events, festivals, or regattas which can attract thousands of participants to the area. These events will generate additional economic impacts, which are not included in this study. For example, the Head of the Hooch rowing regatta in Chattanooga, one of the largest rowing regattas in the world, attracted participants from over 21 states and 4 countries and generated \$5.5 million in economic impact.¹¹ The Chattanooga Ironman attracted an estimated 21,780 visitors to Chattanooga generating \$13.3 million in economic impact.¹²

Second, this study does not consider a multitude of other potential non-market benefits of the Tennessee RiverLine. For example, potential impacts to property values generated from proximity to the Tennessee River and corresponding impacts to property tax revenues. Another unmeasured benefit is the potential for the recreation opportunities and natural amenities provided by the Tennessee RiverLine to help attract and retain businesses and workers to the region. There is variation in the measurement and definition of quality of life, but the economic literature has identified such location-specific attributes as factors in economic growth. Quality-of-life amenities, including recreational amenities, can affect business' location decisions and attract a skilled workforce (e.g., NRPA, 2018). There are also a number of non-use benefits associated with Tennessee RiverLine. Residents may value the Tennessee River as a

¹¹ <https://www.sportsdestinations.com/management/economics/2017-champions-economic-impact-sports-tourism-13834>

¹² <https://www.utc.edu/sites/default/files/2020-12/ironman14report.pdf>

“gift” that can be passed on to future generations - a bequest value. These additional non-market values are more difficult to measure but can be substantial.

Third, the study focuses on flatwater paddlers as a user group. The hikers, bikers, and campers, that use the trails, greenways, and campgrounds along the Tennessee RiverLine will likely generate additional economic and health impacts that are not considered in this study.

3. KEY COMPONENTS OF WATER TRAIL SUCCESS

The Tennessee RiverLine seeks to catalyze positive economic, social, and environmental impacts along the Tennessee River by establishing the waterway as a recognized international paddling destination, supporting the development of complementary outdoor recreational opportunities (such as hiking and biking), and strengthening connections between communities and the river. The Tennessee River connects urban and rural communities along its 652-mile course, and each of these communities has its own unique character and existing relationship with the river. They also vary with respect to their current access to the river and to other outdoor recreation opportunities. Available financial and human capital, knowledge and expertise, and operational capacity to develop and leverage the benefits of new projects also varies. With this reality in mind, the Tennessee RiverLine organizers have developed the Tennessee RiverTowns Program as a framework for collaboration with communities that aligns coordinated efforts with local priorities and the Tennessee RiverLine’s guiding principles. The Tennessee RiverTowns Program guides participating communities through a three-step process that focuses on (1) education, outreach, and advocacy for participation in the program, (2) planning, design, and development of needed infrastructure, and (3) promoting, managing, and enhancing the water trail and connecting complementary outdoor recreation systems and supporting services. The ultimate goal of the Tennessee RiverTowns Program is to assist all communities in connecting themselves physically, programmatically, and economically to Tennessee RiverLine recreation and leveraging that connection to maximize economic, social, and environmental benefit.

Tennessee RiverLine Guiding Principles:

- Resource conservation and stewardship
- River access, visibility, and awareness
- Wildlife and ecology
- Identity and culture
- Safety
- Recreation and public health
- Education and interpretation
- Social and community connections
- Economic development regionalism
- Equity and diversity
- Engagement and inclusivity
- Design and design thinking

This study focuses on the economic impact and health cost savings associated with visitor and resident use of the Tennessee RiverLine. As previously stated, though, there is common recognition that additional economic effects often come from the enhancement of quality of life afforded by outdoor recreation, which influences business’ location decisions and attracts a skilled workforce to a community. We can describe communities that pursue this economic development strategy as competing in the “quality-of-life marketplace,” whereby they seek to differentiate themselves as particularly attractive places for people to live, work, and play. While the economic impacts of enhanced quality of life are more challenging to quantify than the “direct” economic impacts of the usage of outdoor recreation facilities, a [2019 study by Headwaters Economics](#) suggests that U.S. counties with outdoor recreation economies effectively outperformed non-recreation counties between 2010 and 2016 in attracting and

retaining populations with higher household incomes. This effect was even present among rural counties where those with outdoor recreation economies grew slightly during the study period while their non-recreation counterparts lost population. As such, Tennessee River communities should keep in mind that through their commitment to full participation in the Tennessee RiverTowns Program, they stand not only to reap the economic benefits estimated and presented herein, but they have the potential to effectively compete in the quality-of-life marketplace that is defining thriving local and regional economies in the 21st Century.

Our analysis sought to identify and describe the essential features of long-distance trail programs that successfully deliver such economic and quality-of-life benefits. These features can provide a helpful guideline to support program organizers and communities participating in the Tennessee RiverLine in achieving similar outcomes. We examined 19 long-distance trail programs in the United States, evaluating the planning, design, and implementation of their infrastructure, operations, and marketing and communications. Eleven of these are operated by the National Park Service, 1 by the USDA Forest Service, and the remaining 8 by non-profit organizations, local governments, or a combination thereof. Of the 19 cases we examined, we selected 7 that we believe are most effective at achieving the economic and/or quality-of-life benefits that long-distance trails can provide. These seven cases are:

- Northern Forest Canoe Trail (New York, Vermont, Quebec, New Hampshire, Maine)
- Great Allegheny Passage (Maryland, West Virginia, Pennsylvania)
- Suwanee River Wilderness Trail (Florida)
- The Great Calusa Blueway (Florida)
- Great Miami River Water Trail (Ohio)
- Mississippi Gulf Coast Blueways Trail (Mississippi)
- Cahaba Blueway (Alabama)

This group of cases includes long-distance trails that pass through rural and urban settings similar to those the Tennessee River traverses. Each trail program developed in its own unique way and as such, each has a unique structure and function and strengths and weaknesses that provide opportunity for comparison and evaluation. Taken together, they reveal the “elemental ingredients” of a long-distance trail program that can maximize economic and quality-of-life benefits. Through this evaluation process, we identified the following 10 *key components of water trail success* that provide a valuable set of guidelines or “goals” for program organizers and for Tennessee RiverLine communities:

1. Providing river access infrastructure and associated facilities that meet users’ needs, be they locals or tourists.
2. Planning, developing, and sustaining operation of access infrastructure that is safe, environmentally sustainable, durable, and universally accessible (where practicable).

3. Ensuring quality and consistency in infrastructure, branding, and public information.
4. Addressing economic and social barriers to local participation.
5. Utilizing programs and events to engage and inspire public participation.
6. Providing online marketing, promotion, and information platforms that are accessible, engaging, inspiring, informative and provide diverse “entry points.”
7. Developing interpretive assets and programs that enrich the visitor experience and appeal to nature, history, and culture enthusiasts.
8. Utilizing partnerships to develop, operate, program, and market the trail.
9. Integrating and cross-marketing the trail with complementary tourism and outdoor recreation assets, including locally owned businesses such as outfitters, hospitality providers, etc.
10. Creating a central administrative body that provides quality standards, participation outreach to communities, and support that can include funding assistance, marketing, and small business development services.

These elements strongly echo the Tennessee RiverLine’s Guiding Principles and they provide a framework for presenting demonstrative case examples of infrastructure, operations, and marketing and communications. Additionally, we provide a summary of key analysis take-aways to inform the further development and implementation of the Tennessee RiverLine Program in order to to maximize the capture and magnitude of economic and quality-of-life impacts across the region.

Table 10. Selected Cases Exemplary of Key Components of Water Trail Success

Key Components of Water Trail Success	Northern Forest Canoe Trail	Great Allegheny Passage	Suwanee River Wilderness Trail	The Great Calusa Blueway	Great Miami River Water Trail	Mississippi Gulf Coast Blueways Trail	Cahaba Blueway
1. Providing river access infrastructure and associated facilities that meet users' needs, be they locals or tourists.	X				X		
2. Planning, developing, and sustaining operation of access infrastructure that is safe, environmentally sustainable, durable, and universally accessible (where practicable).	X			X			X
3. Ensuring quality and consistency in infrastructure, branding, and public information.	X		X	X	X	X	X
4. Addressing economic and social barriers to local participation.					X		
5. Utilizing programs and events to engage and inspire public participation.	X		X	X			
6. Providing online marketing, promotion, and information platforms that are accessible, engaging, inspiring, informative and provide diverse "entry points."	X	X	X				
7. Developing interpretive assets and programs that enrich the visitor experience and appeal to nature, history, and culture enthusiasts.			X			X	
8. Utilizing partnerships to develop, operate, program, and market the trail.	X		X				
9. Integrating and cross-marketing the trail with complementary tourism and outdoor recreation assets, including locally owned businesses such as outfitters, hospitality providers, etc.	X	X	X		X	X	
10. Creating a central administrative body that provides quality standards, participation outreach to communities, and support that can include funding assistance, marketing, and small business development services.	X	X			X		

3.1 Identified Key Components of Water Trail Success and Case Examples

1. Providing river access infrastructure and associated facilities that meet users' needs, be they locals or tourists.

A public engagement process is essential for identifying public outdoor recreation needs for infrastructure projects intended to serve a local population. Stage 2 of the Tennessee RiverTowns Program will incorporate such a process and will determine what specific infrastructure needs each community has for river-oriented paddling recreation and associated outdoor recreation facility development. The Tennessee RiverLine intends to serve local “Daily Users” as well as “Weekend Warriors” and “Trail Heroes” who will predominantly consist of recreational tourists seeking multi-day experiences. The Tennessee RiverLine concept has envisioned at least some river access points that would incorporate “pavilions” that could serve multiple functions including canoe/kayak/equipment rental, overnight accommodations, concessions, and retail, as well as event space. Such facilities can also serve as important hubs that serve paddling, hiking/walking and cycling activity, while enabling users to efficiently transition between these modes of recreation or transportation.

Five Rivers Metroparks – one of several park systems that operate facilities along the Great Miami River Trail (GMRT) – operates its “[RiverScape Rentals](#)” facility in RiverScape MetroPark on the Great Miami River waterfront in Dayton, Ohio. This facility provides a good model for serving both paddlers and cyclists. In partnership with local paddle sports and cycling vendors, RiverScape Rentals offers tandem and solo inflatable kayaks (targeted for beginner and first-time paddlers) and stand-up paddleboards. It also provides safety instruction and paddling tutorials for novice users. The facility also rents bicycles (including youth bikes, strider bikes, and attachments) and tandem bikes that visitors can use to explore nearly 300 miles of regional connected paved multi-use trails. Additionally, the RiverScape center features a “Bike Hub” where local bicycle commuters can pay a membership fee to store their bike and have access to a locker room with showers. The center also features a free public bike “workstand” where anyone can use tools to service their bicycle.

Five Rivers Metroparks offers numerous primitive tent campsites throughout its parks in the Greater Dayton area, some of which are along the Great Miami River and along bike-ped trails. These campsites are advertised as “simple places to camp” for the long-distance trail traveler and are available for reservation through the park system’s website. Many of these campsites offer access to restrooms and potable water, along with a covered shelter, grill, and fire ring. Five Rivers MetroParks requires permits to camp and charges modest rental rates.

For a more unique camping experience, billed as the “only floating tent experience in the world” the City of Troy, Ohio, which lies at the upper end of the GMRT, [rents floating tents](#) inside a protected

slough just off the main river channel. Along with floating tents, Troy also makes long-term kayak storage spaces available for rent, which is particularly helpful for regular local users. While not offered by the GMRT or any of the other case studies we selected for highlight here, short-term secure storage for canoes, kayaks, and stand-up paddle boards is a very helpful feature for transient visitors who want to store their equipment safely while visiting the shops, restaurants, accommodations, etc., in adjacent trail towns. The [canoe and kayak lockers](#) along the Huron River National Water Trail in Michigan are an excellent example of such a facility.

Stretching across New York, Vermont, Quebec, New Hampshire, and Maine, the Northern Forest Canoe Trail (NFCT) exemplifies a more developed, comprehensive system of access points and camping facilities in a very remote setting. Along this 740-mile paddling route, the NFCT [a 501(c)3 nonprofit organization] maintains numerous designated primitive campsites featuring either designated tent camping spots or constructed shelters that paddlers can use in lieu of tents. These sites deliberately fill long-distance gaps between trail towns. There are typically no camping facilities in close proximity to the trail towns, with the intent being to generally avoid competition with overnight lodging providers there.

During Stage 2 of the Tennessee RiverTowns Program, community engagement activities facilitated by the Tennessee RiverLine staff will identify local needs for access infrastructure and associated facilities, which will largely inform the design and function of water accesses, associated pavilions, and other features. However, it is important to keep in mind during the planning process that campsites placed at strategic locations (about one-day's paddle apart) is a critical common denominator of long-distance paddling trails that effectively appeals to paddling tourists. Towns that have existing or planned lodging facilities (hotels, recreation hostels, etc.) that they wish for the Tennessee RiverLine to support may elect to forego camping facilities or reduce the capacity of such facilities in their town to minimize competition.

2. Planning, developing, and sustaining operation of access infrastructure that is safe, environmentally sustainable, durable, and universally accessible (where practicable).

Paddling trail access development typically involves utilizing existing accesses (such as motorized boat ramps), natural accesses (where the slope to the water and durability of the ground surface are conducive), and newly built infrastructure. In all cases, planners and developers should seek to maximize the safety, environmental sustainability, and durability of these accesses as much as possible, and utilize [Universal Design principles](#) in the planning and design of new or retrofitted facilities.

As part of its planning process, Cahaba Blueway organizers developed a [Best Practices Guide for Cahaba River Access Points](#), which provides a good framework for how to plan, develop, and operate access infrastructure that is safe, environmentally sustainable, and durable. We recommend referencing

this guide when the Tennessee RiverLine develops its own standards and design guidelines for access projects. In all cases, accesses should be free from unusual natural or manmade hazards, they should minimize the site's stormwater footprint and risk of erosion along the riverbank, and be constructed using materials that minimize the need for maintenance. When maintenance is needed, employing solutions/fixes that support the safe, environmentally sustainable, and durable character of the infrastructure is important.

Planning and developing true universal accesses to waterways can often be challenging due to the increased design and construction costs. The natural conditions of the waterway and/or riverbank can also present design challenges. Given the riverbank modifications and hard infrastructure that designers and builders conventionally utilize for universal access, it can also be difficult to build such accesses that are friendly to the river. However, the generally flatwater nature of the Tennessee River and the availability of low-sloped shoreline (both afforded by impoundments along the river), offer a valuable opportunity to bring both Universal Design and environmentally sustainable design together. The Tennessee RiverLine can play a leading role in planning and developing access points that incorporate pervious, yet durable, materials while providing the infrastructure that will serve all users. Such an approach is not only important for new infrastructure, but it will be key to retrofitting existing motorized boat launches to achieve greater environmental sustainability and to make these facilities more accessibility for diverse users. The Mississippi Gulf Coast Blueways Trail (MGCBT) provides some examples of ADA accessible water access infrastructure in their [Blueway Design Guidelines](#). However, the U. S. Forest Service provides a much more comprehensive guide for how to approach universal access design (complete with example solutions) at <https://www.dcr.virginia.gov/recreational-planning/document/udw04s.pdf>.

Sustaining operations of access infrastructure is arguably a more important consideration than the decision to build it. If local operators are not able to adequately maintain infrastructure due to lack of capacity and/or the infrastructure's lack of durability, the access can easily fall into disrepair. At best, such conditions can fail to serve the user's needs resulting in poor user experiences, impressions and reviews, and at worst, can create hazards that compromise safety. Durable, well-designed access infrastructure will be easier to maintain. Therefore, the Tennessee RiverLine should seek to facilitate local adoption of this approach.

However, even with well-designed and durable infrastructure, regular monitoring and maintenance is very important. Ideally, each Tennessee RiverTown community should be able to care for its own access infrastructure, which is the model that the GMRT and most other trails employ. If a community lacks the internal capacity to properly care for access infrastructure, they can leverage their resources through partnerships with other organizations and through engaging local paddle clubs or

volunteers. If a community lacks the expertise to organize volunteers, then the central administrative body has the opportunity to conduct training to increase that capacity or it can step in to fill the gap. The NCFT provides a good model of how to effectively maintain access infrastructure. Just after the trail's completion in 2006, NCFT organizers assessed the trail's needs and found that many local communities lacked the capacity to properly care for the trail's infrastructure. They determined that the best solution would be to have centralized administration of trail stewardship, with hired stewardship coordinators working in collaboration with local stewardship groups (that did exist) as well as organizing volunteers and leading summer stewardship crews as needed.

3. Ensuring quality and consistency in infrastructure, branding, and public information.

Be they local or visiting from elsewhere, the paddling trail user's experience begins with their search for information about the trail (typically online) and ends when they depart from the trail to return home. The information and infrastructure they utilize between these two points in time provide a critical foundation for what type of experience they will have and what their opinions about the paddling trail will be. If their experience is positive, they will likely return to the trail and encourage others to do the same. If their experience is negative, they will probably never return and are apt to spread the word about their less-than-ideal experience.

Paddling trails that feature quality and consistency in infrastructure, branding, and public information (digital, print, etc.) offer dependability, recognizability, and understandability, which instills a sense of confidence in the user and underpins a positive experience. Such an experience is critical for attracting and retaining local users as well as trail tourists. Whether the infrastructure is rustic or urban and utilizes soft or hard construction materials, the access points, camping facilities, connecting trails, and associated facilities should be well designed and built to deliver consistent service to the user. The NFCT and Suwanee River Wilderness Trail (SWRT) both demonstrate quality and consistency in infrastructure, with an established system of access points and camping facilities all along the length of each trail.

Quality and consistent branding for paddling trails provides a recognizable and marketable identity for the trail. Different trail systems have different guidelines and policies for the use of their brand. Some have a simple logo while others have developed a robust identity package complete with logo, colors, fonts, and unique sign design standards. There is no "right" approach to how a paddling trail should employ branding on signs or in printed or digital resources, but in all cases, a strong and recognizable brand used commonly throughout information resources supports a positive user experience. Some trails such as the SRWT have a simple logo that is included on information and interpretive signs that use state park or other local design standards, while the GMRT and The Great Calusa Blueway

(TGCB) have simple access point signs that appear alongside other informational signs. The NFCT has developed a number of information kiosks that provide valuable wayfinding and interpretive information and that are specifically NFCT branded. These signs are very well designed using the NFCT's identity package and thus are distinctive and immediately recognizable. Cahaba Blueway organizers elected to use that trail's identity package to develop its [Wayfinding Guidelines](#) to help facilitate the creation of consistent information pieces at officially designated Cahaba Blueway access points. Similarly, the MGCBT's [Blueway Design Guidelines](#), provide a valuable reference for delivering consistency and quality in infrastructure, branding, signage, and public information.

Some paddling trails employ a robust sign system to convey wayfinding, safety, and interpretive information, while others use simple access point and wayfinding markers to orient the paddler. Trails that employ the former approach – such as the Cahaba Blueway – naturally have a greater responsibility to repair or replace vandalized signs, which can be costly and cumbersome. Trails that employ the latter approach (like the TGCB and GMRT) rely more on well-designed digital and printed wayfinding and information resources. Among the selected case studies, the NFCT is exemplary of best practices in effectively employing both wayfinding signage and digital resources that are well designed and consistent. We discuss digital public information resources in more detail under *key components of water trail success* #s 6, 7, and 9 below.

4. Addressing economic and social barriers to local participation.

While the organizers and managers of most long-distance paddling trails intend for their trail to attract tourists, engaging and serving the local population is key in order to deliver the quality-of-life benefits of the trail to nearby populations. According to the Outdoor Industry Association's [2019 Special Report on Paddlesports and Safety](#), people who engage in paddlesports only represent about 7.6% of the American population. Of these, 70% are between the ages of 18 and 54, with those over 55 representing only about 14% of paddlers. The average paddler has a household income over \$75,000 and about 72% of paddlers own their own craft. These figures underscore the fact that (1) paddlesports participation is currently restricted to a relatively small portion of the population and (2) those who participate tend to have higher incomes, suggesting that the activity has traditionally been limited mostly to those who can afford the equipment.

Since 2015, participation in paddlesports has generally remained steady among Caucasians, while it has increased slightly among African Americans and Hispanics. Participation has steadily declined since 2013 among adolescents 13 to 17 years of age. A relatively large percentage of paddlers (almost half) are first-time paddlers, which represents a wonderful opportunity to recruit people to the sport. It is widely accepted that outreach to younger paddlers will inspire long-term recruitment.

These figures suggest that providing low-cost access to equipment along with marketing, outreach, and programming specifically designed to welcome traditionally underrepresented groups and to youth may help address economic and social barriers that currently prevent more local participation in paddling trail usage. While it appears that the selected cases largely lack targeted engagement of underrepresented groups, some have facilitated access to rental equipment for modest fees. Exemplary among these is Five Rivers MetroParks along the GMRT, which makes access to kayaks and stand-up paddleboards available for \$15 per person per hour and provides instruction for first-time paddlers. Other paddling trails tend to favor connecting the prospective paddler with local private rental equipment providers, which may or may not be more costly.

The Tennessee RiverLine development process provides a wonderful opportunity to deliberately address economic and social barriers to participating in paddlesports. Low-cost access to rental equipment and free or low-cost orientation and safety programs specifically designed to engage underrepresented user groups will help to inspiring local use of the Tennessee RiverLine. Local park and recreation operators (such as Five Rivers MetroParks) are ideally suited to delivering and sustaining such services. However, leadership from a central administrative body and/or partnering with other outreach organizations may be necessary in order to stand up such operations in communities that lack expertise or capacity. In all cases, it is important to note that the leadership of engagement programs designed to reach underrepresented user groups should, themselves, be members of the target underrepresented groups. Members of an underrepresented user group are more likely to participate in such programs if the individuals leading them are members of the underrepresented group as well, whatever the group may be.

5. Utilizing programs and events to engage and inspire public participation.

While there are some people who naturally gravitate to new outdoor recreation opportunities, simply providing the necessary infrastructure without programmatic engagement often fails to attract broad public participation. Paddlesports require specialized equipment and skills that the average person does not have, so participation in paddlesports benefits greatly from programs and events that engage the public. Likewise, those paddling trails that have interpretive programs and guided nature and cultural tours have greater opportunity to attract tourists looking to learn about the unique places and features along the paddling trail. Those paddling trails that offer a rich calendar of events and regular programming are more successful at inspiring local participation and attracting tourists from afar.

The Lee County, Florida Department of Parks and Recreation, which operates the TCGB, offers blueway-oriented programs and events that include *Calusa Kids*, the *Calusa Blueway Kayak Fishing Tournament*, and the *Battle on the Blueway SUP and Kayak Race*. The *Calusa Kids* program is designed

to get youth involved with competitive paddlecraft racing. Participants register and start participating in competitive races and earn points and prizes for doing so. After they earn 100 points, they receive an official race shirt and goody bag. *Gulf Coast Kayak*, a for-profit paddling guide, rental, and fishing outfitter that partners with Lee County Parks and Recreation, organizes the *Calusa Blueway Kayak Fishing Tournament* each year, which garners significant public participation. The *Battle on the Blueway SUP and Kayak Race* is a sanctioned World Paddling Association event with multiple races and a demo day that is open to all paddlers, and this event brings out thousands of local residents and visitors from elsewhere.

Along both the TCGB and the SRWT, as well as other designated Florida Paddling Trails, [Paddle Florida](#) (a non-profit organization) organizes multi-day paddling/camping trips for all ages and skill levels, providing safe, enjoyable, and informative experiences that help promote Florida as an international ecotourism destination. Each evening on their organized trips, they provide Florida-based entertainment and environmental education programs. They partner with local outfitters to make rental boats and equipment available to participants as needed.

The paddling trail that appears to do the best job of offering a robust schedule of public engagement events and programs is the NFCT. As the principal organizer, the NFCT offers an [extensive schedule](#) of both on and off-water events and activities such as races, speaker series, film festivals, guided paddling tours, volunteer work days, and events hosted by local outfitters and guides. These events and activities support a thriving paddling culture along the length of the NFCT, attract paddling tourists from around the world, and constitute a major component of the economic impact in communities along the NFCT.

6. Providing online marketing, promotion, and information platforms that are accessible, engaging, inspiring, informative, and provide diverse “entry points.”

Effective online marketing, promotion, and information platforms promote public awareness of a paddling trail, inspire participation in the experiences it has to offer, and provide the wayfinding, safety, and local outfitter and hospitality service information needed to support local population and to attract tourists. In order to be truly effective at reaching and engaging the public, these resources must be attractive, easy to use and understand, and be appealing to different types of users.

Outdoor recreation participants seek outdoor recreation experiences, and this is particularly important for the outdoor recreation tourist. Marketing and promotion of paddling trails involves “selling” the prospective user on the experience they can have along the trail and in the towns and other sites of interest that the trail connects. Today, prospective users most often research such experiences online, where they encounter written narratives, photos, and videos that describe the experience. The best online marketing materials appeal to the prospective user’s emotions and inspire them to seek more

information and to plan a trip. Such materials can and should be housed in a variety of locations that include the paddling trail's own website and social media platforms, partner websites, and videos on websites such as YouTube and Vimeo. A paddling trail should seek to maximize coverage in online periodicals such as www.rootsrated.com and www.outsideonline.com that are popular among outdoor enthusiasts and www.travelandleisure.com, which is popular particularly among older travelers. With the outdoor recreation experience being the product that is “for sale,” these materials should provide firsthand accounts of experiences that visitors can have on the trail. They can also contain interpretive information about the trail's special natural, cultural, and historical resources that a prospective visitor may find interesting. Having a variety of articles and information online casts a “wide net” that a prospective user is more likely to encounter. These resources also provide multiple ways or “points of entry” for a person to find out about the trail whether they are simply a paddler, are interested in birds or other wildlife, or history and culture.

In addition to the marketing materials, a paddling trail must make online trip planning information resources available as well. These resources should, at minimum, include wayfinding (often an interactive map) and safety information, links to local outfitters, hospitality providers, guides, etc., and a calendar of events for trail communities.

Among the selected cases, there are two general models for providing the online marketing and trail information content that is crucial for supporting public use. The first is to have a strong central administration of a primary paddling trail website that features experiential narratives, interpretive information, and trip planning information. [NFCT](#) and [GAP](#) are both excellent examples of this approach, providing what are probably the two best promotional and trip planning websites in the nation. Alternatively, a paddling trail can maintain a simpler website focused primarily on providing trip planning information and then partner with local tourism agencies or other organizations to develop promotional content on their sites, with all sites interlinking. The [SRWT](#) is a very good example of maintaining a nice informational website (operated by Florida State Parks) while local and regional tourism partners are largely responsible for providing marketing narratives, photographs, and video content.

7. Developing interpretive assets and programs that enrich the visitor experience and appeal to wildlife watchers and historical/cultural enthusiasts.

According to a [2014 study conducted by Partners for Livable Communities](#), approximately 80% of U.S. tourists take part in cultural heritage activities (including visiting historical landmarks, culturally significant communities, museums, and cultural events) while traveling. A [2016 study by the U. S. Fish and Wildlife Service](#) found that 86 million Americans took part in wildlife watching near their home and

23.7 million Americans traveled at least 1 mile away from their home to do so. As such, developing interpretive resources to enhance the appreciation of wildlife, natural history, ecology, history, and culture along a paddling trail creates a valuable opportunity to attract visitors from near and far. Interpretive resources can come in the form of online written narratives, photos, and videos, printed guides (often printed versions of online resources), mobile apps, signage at access points, and in-person guided tours and programs. These resources serve to add a layer of interest for the visitor and are a very helpful tool in promoting appreciation, conservation, and stewardship of natural and cultural resources.

The MGCBT is a project of the National Park Service and is designed to provide an overarching theme for 7 existing paddling trails across the 6 coastal counties of the Mississippi Gulf Coast Natural Heritage Area. Leveraging the Natural Heritage Area information assets, the MGCBT features well-designed interpretive assets that promote awareness and appreciation of this distinctive region's unique history, people, traditions, and landscapes. The website features a "storymap" with printable .pdf guides that provide descriptions of the natural and historical significance of each route, along with maps highlighting paddling launches, points of historical, cultural, and nature observation interest, and places to get food and beverages. The [MGCBT's Blueway Design Guidelines](#) provide quality standards for the design of interpretive signs.

Through a partnership with its regional tourism office, the SRWT provides the [Suwanee River Wilderness Paddling Guide](#), which is a thorough guide to all aspects of this paddling trail, with an emphasis on interpreting natural and cultural history. Additionally, the SRWT partners with Paddle Florida to offer guided multi-day paddling trips focused on wildlife watching and local cultural and historical appreciation.

8. Utilizing partnerships to develop, operate, program, and market the trail.

With many tasks required to achieve the full quality-of-life and economic benefits that people expect, long-distance paddling trails naturally require the involvement of multiple partners. Whether led by a strong single organization that shoulders most of the development, operation, programming, and marketing responsibility (like the NFCT) or by a consortium of partners that spreads responsibilities more broadly across multiple organizations and agencies (like the SRWT), partnerships are key, and organizers must pursue and cultivate them. Early engagement with key stakeholder groups in the planning process will help identify needs, the roles that existing organizations can play in addressing those needs, and what gaps may remain that organizers need to fill in other ways. There is no right or wrong way to partner. The key is to ensure that each partner contributes what they are able and that all partners are willing collaborators in achieving the goals that will make the trail a success.

Most long-distance paddling trails depend upon broad public-private partnerships among a variety of organizations. These organizations usually include planners, funders, landowners, governments, chambers of commerce, nonprofit development corporations, tourism offices, local business owners, and local user groups. In the early phases of development, a central organizer (whether a single organization or a consortium) may facilitate the planning process and assist local communities in securing funding for capital projects. Later on, this organizer often becomes a central administrative body, and handles coordination among all partners and at least some portion of the public information, communications, and marketing apparatus. Local governmental entities often bear the responsibility of designing, developing, and operating individual facilities along the trail, in collaboration with the central administrative body. They are often the best entities to also deliver regular programming and events to engage their citizenry. Local, regional, and state tourism offices are often heavily involved in the marketing and promotion of the trail, again, in collaboration with the central administrative body. Chambers of commerce and nonprofit development corporations can assist with supporting existing businesses and recruiting new businesses to fill market demands that the trail creates.

If the central administrative body determines that it should play a stronger role in order to fill operational, marketing, communications, informational, or event organization gaps, it may opt to secure nonprofit corporate status or may remain a consortium and be administratively housed in a partner organization. Either way, it must secure funding in order to cover its operations in support of the trail. Funding to support a central administrative body can come from traditional fundraising as well as through local governments that either have or anticipate having enhanced tax revenue from the trail. While none of the selected cases use the model, some long-distance trails elect to form a quasi-governmental recreational authority that is supported by multiple local governments that have representation on its governing board. It is important to note that given the mix of partners available for each long-distance trail, their respective capacities, and the political context within which the trail must operate, each trail has reached its own operating model that works best. For the Tennessee RiverLine, an early assessment and understanding of needs, available partners, and their capacities, as well as local and statewide political considerations will be essential in order to define the best structure, roles, and responsibilities of a central administrative body.

9. Integrating and cross-marketing the trail with complementary tourism and outdoor recreation assets, including locally owned businesses such as outfitters, hospitality providers, etc.

In order to realize the full economic benefits of tourism along a long-distance paddling trail, organizers and operators must keep the experience of the visitor in the forefront of their minds. With the exception of a small minority of die-hard thru-paddlers, most paddling trail tourists will want to plan a

trip that incorporates other experiences and services available along the trail. These experiences and services can include other types of outdoor recreation, eating at local restaurants, staying at local hostels, hotels, or campgrounds, shopping at local retailers, visiting museums and historic places, seeing live music, utilizing a local outfitter or livery service, and attending a local lecture on a subject of interest. Fully developing these opportunities and integrating them into the tourist's trip planning process is essential.

Cross-promoting the paddling trail with complementary tourism and outdoor recreation assets creates the opportunity for the tourist to plan a longer trip and stay multiple nights, which increases their economic impact. The selected case studies that do a very commendable job of such cross-promotion are the GMRT, MGCBT, SRWT, and GAP. Each trail highlights other things to see and do along their respective routes. In the case of the GMRT, the [Great Miami Riverway](#) serves as the primary platform for this cross-promotion, presenting the GMRT alongside the plethora of other outdoor recreation activities and local tourism assets available along the corridor. The [National Park Service's website for the Mississippi Gulf Coast National Heritage Area](#) is a beautifully designed site that integrates all tourism and outdoor recreation assets available in the region, including the MGCBT. Similarly, the GAP's website highlights landmarks and towns that are particularly important points of interest and other outdoor recreation activities available along that trail. The SRWT's website, which is operated by Florida State Parks, highlights the recreation assets within and outside of the state parks that lie along the trail. It also highlights the nearby trail towns or "hubs" and provides links to each town's website.

However, providing an online platform that not only creates awareness of complementary tourism and outdoor recreation assets, but provides a tool to help a visitor plan their itinerary is ideal. The [NFCT's Trip Planner](#) and the GAP's [Plan Your Trip tool](#) are, by far, the best online tools among the selected cases to help a visitor plan a trip that incorporates all the destinations and complementary activities that can create a memorable and enjoyable experience. In addition to enabling the user to customize their itinerary, the tools also offer pre-assembled day, overnight, and thru-trip itineraries that make the planning process easier and ensure that the tourist will see the highlights. Providing the ability to build travel itineraries is the most effective means to increase the economic impacts of tourist visits by encouraging overnight stays.

10. Creating a central administrative body that provides quality standards, participation outreach to communities, and support that can include funding assistance, marketing, and small business development services.

As we have previously discussed, some level of centralized organization/administration is helpful for planning and developing a long-distance paddling trail that features quality and consistency and that effectively delivers quality-of-life and economic benefits to the communities the trail connects. Such a

central administrative body can be in the form of a nonprofit organization that plays a large supporting role, such as with the NFCT, or it can be a coalition of city, county, nonprofit, and regional organizations, as with the Great Miami Riverway. Depending upon the existing partners and their available capacity, the role of the central administrative body can be small or large, providing at minimum a framework for quality and consistency and some level of public information, outreach and marketing. In cases where stronger leadership is needed, the central administrative body can even shoulder the planning, design, and construction of infrastructure, stewardship of that infrastructure, and planning events along the trail. In all cases, some form of central leadership is necessary.

One possible role of a central administrative body that we have not yet explored is that of supporting business development around a paddling trail, and the best example of this is the [Trail Town Program](#) along the GAP wester Pennsylvania, western Maryland. The Progress Fund (a nonprofit Community Development Financial Institution) established the Trail Town Program to assist a dozen towns along the 150-mile GAP that connects Pittsburgh, PA and Cumberland, MD through an economically depressed region. As the GAP was approaching completion in the early 2000s, The Progress Fund observed that simply having a long-distance trail connecting communities was not enough to “organically” spur economic development around trail tourism. The trail was a start, and it did create a trail-based market demand for goods and services, but it took assistance through the Trail Town Program to help each community understand what they needed to do in order to better serve the tourists that were coming down the trail. With a focus on cycling tourists as the “customer,” the program assessed the market by obtaining trail counts and conducting surveys to determine the amenities, goods, and services cycling tourists needed. From these efforts, they developed a “picture” for what features a cycling trail town should incorporate, even going so far as to capture details such as how long a parking space should be to accommodate a bike rack. They then assessed each town’s assets and existing businesses and identified gaps in basic infrastructure, amenities, goods, and services, and used this information to create a plan for action for each community. Subsequently, The Progress Fund made available low-interest loans to small businesses needing capital to assist with start-up or expansion that would fill identified gaps. Currently, the program serves five trails in Pennsylvania, West Virginia, and Maryland, including the GAP.

3.2 Key Case Analysis Take-Aways for the Tennessee RiverLine

Implementation in communities of varying capacities and expertise.

Most long-distance paddling trails connect urban, suburban, and rural communities and act as a common thread that can bring quality-of-life and economic benefits to each community, provided that the trail

collectively achieves each of the *key components of water trail success*, as described above. Achievement of the *key components of water trail success* necessitates that all partners at every level are doing their part and are working together. If any community, large or small, is unwilling to participate or lacks the capacity or expertise to build and operate infrastructure and provide programming to engage usership, and a central administrative body is not there to provide leadership and support, then the trail will not benefit that community as it should. While not certain, it is likely that smaller communities in more rural areas as well as some urban communities will require such support from a central administrative body along the Tennessee RiverLine. Both types of communities often lack resources, expertise, and capacity to undertake “special projects,” and will likely require some assistance. It will be critical to identify gaps in each community’s capacity and expertise during the Tennessee RiverTowns planning process in order to determine what types of support services that a central administrative body or other partners should make available.

Provided that local communities are at the table and they have the short and long-term operational support they need to fill gaps they cannot fill on their own, there is no practical reason why each community along the Tennessee River cannot achieve designation as a Tennessee RiverTown and ultimately realize the benefits of the trail. As evidenced by the *key components of water trail success* and our analysis of trails connecting both urban and rural communities, what is necessary to be successful in serving the local population and attracting trail tourists is consistent across all communities along a trail. Both small and large towns, working in collaboration with a central administrative body, must accomplish the same objectives. The only differences are the scale of infrastructure and facility development and the availability of some services for trail users, which will depend upon market demand.

How to attract tourists.

As previously stated, paddling trail tourists seek unique experiences and there are several *key components of water trail success* and other essential features that are necessary in order to make those experiences available:

- Camping locations along the paddling route at regular intervals (ideally one-day’s paddle apart). Preferably, these sites should incorporate a shelter and access to potable water and restrooms.
- Quality and consistency across all infrastructure and branding, signage, and public information, including wayfinding signage that directs tourists to local points of interest, services, and amenities.

- Programs (educational, guided tours, etc.) and race events, including those that are sanctioned by bodies such as the World Paddling Association.
- Other types of outdoor recreation opportunities as well as local restaurants and pubs, lodging, retailers, museums and historic places, cultural events, outfitters, etc. should be available in RiverTown communities.
- Online tourism materials and tools that inspire interest in visiting and make it easy for a tourist to plan their itinerary and discover other recreational opportunities, services, and amenities available in RiverTown communities.
- A fully developed interpretive program that includes digital, print, and signage resources along with educational programming that explain the cultural, historical, and natural significance/uniqueness of the river and its communities.

Each community should be equipped to host trail tourists, with local business districts providing dining, beverages, lodging, basic services (e.g., transportation and medical services), and other things to do. They should take advantage of their assets and create a mix of outdoor recreation, shopping, and historic/cultural attractions. Basic amenities that include parking, waste receptacles, bathrooms, water fountains, signage into town, town and trail information, benches, picnic tables, and pavilions are important features that communities should have as well.

How to engage the local population and realize quality-of-life benefits.

With only 7.6% of Americans involved in paddlesports, the majority of local populations along the Tennessee River are not predisposed to engaging with the Tennessee RiverLine, and it will take some time to build a “Tennessee RiverLine culture.” Marketing and programming to local populations, even in communities where existing paddlesports participation is relatively high, will be key to this process and it will be particularly important to reach traditionally underserved and underrepresented groups. Existing paddlesports enthusiasts and clubs should be engaged as partners in building brand visibility and programming locally and across the region.

Marketing in communities can rely heavily upon social media and online resources as well as paid and earned print and broadcast media. Programming should come in a variety of forms from educational programs, paddling orientation and safety classes, and guided tours to events and races. Each program or event is a chance to attract the attention and engagement of local residents and it also provides opportunity for earned media coverage that will garner that attention. Communities that have a rich slate of programs and events will engage more local users.

Because paddlesports have inherent economic barriers to participation due to the relatively high cost of equipment, access to affordable rental kayaks and stand-up paddleboards will be essential for engaging people who lack resources to own their own. Free or subsidized orientation/safety classes will also aid in the adoption of paddlesports as an activity among this population.

Social barriers are also a very important consideration when seeking to engage local populations, and the best way to address these barriers is through outreach and programs. Orientation/safety classes and guided tours specifically designed and targeted to underrepresented groups in paddlesports will be effective in engaging their interest and participation. Such classes are most successful at building paddlesports engagement if they target youth between 13 and 17 years of age because learning paddling as an adolescent predisposes participation as an adult. It is important to note that such programming is most effective if its leadership is also a member of the underrepresented group. Partnerships with local organizations that serve underrepresented groups and regional/national recreation affinity groups such as Outdoor Afro or Latino Outdoors would aid in these regards.

How to build an outdoor recreation business climate.

As The Progress Fund observed along the GAP, outdoor recreation-oriented business does not necessarily arise on its own when you build a long-distance trail. While some existing businesses may benefit from the simple presence of the trail, without focused effort to connect the community to the trail, provide the amenities, goods, and services tourists need, and support businesses meeting those needs, economic development will likely be very slow. In order to take full advantage of the economic potential of a long-distance trail and hasten the development of a recreation-oriented business climate, Tennessee RiverTown communities will benefit tremendously from a structured support program.

The benefit of a structured support program is evidenced by the impacts of The Progress Fund's Trail Town Program along the GAP. From 2007 to 2015 the GAP's local economic impact rose precipitously from 25% to 40% of local income and netted 65 new businesses in 270 jobs (note that this increase occurred during the Great Recession!). During that time, The Progress fund provided \$8 million in loans to 32 Trail Town related businesses. While the Trail Town Program appears unique in its offering of small business loans, other regions and states have recognized the merits of such a program and have adopted much of the Trail Town Program model. Among these is the Florida Trail Towns Program, which is operated through the Florida Office of Greenways and Trails. While this program does lack the small business loan support, it provides a good example of a self-assessment process that helps a community identify their assets and gaps in serving trail tourists of all kinds, including paddlers. Their self-assessment instrument is [available online](#), and may serve as a template for developing a similar

instrument for use in the Tennessee RiverTowns Program.

While creating a self-assessment framework for Tennessee RiverTowns will be very helpful in understanding the gaps that communities need to fill in infrastructure, amenities, goods, and services, we believe the program should provide more support for communities that will enable them to effectively fill identified gaps and hasten the development of an outdoor recreation business climate. This additional support should involve guidance/assistance with market analyses (demand and supply), business recruitment, and small business financing. A collaborative partnership between the Tennessee RiverLine and state Small Business Administration offices, local foundations, economic development authorities, workforce development agencies, and local nonprofit development corporations can help organize and bring this support to bear for Tennessee RiverTown communities.

Businesses and Jobs in Long-Distance Trail Towns.

As previously noted, the ability of a long-distance paddling trail to generate business opportunity and to support job growth is fundamentally dependent upon the propensity of partner communities and a centralized administrative body to effectively build needed infrastructure, to operate, market, and program the system, and to support trail-oriented businesses in their establishment and expansion. Developing a long-distance trail and creating the organizational and programmatic infrastructure necessary to realize its full economic potential takes decades. While many long-distance trail systems throughout the United States are still relatively early in their development as economic assets, two of our selected cases provide examples that we can look to as models for creating business opportunities and job growth: the NFCT and GAP. Both of these trails traverse through regions that experienced significant loss of industry and economic decline in the latter half of the 20th century and they demonstrate how trail and trail town development can be an effective strategy in creating new business and employment opportunities that can sustain and even grow populations.

Northern Forest Canoe Trail

Throughout the Northern Forest Region between New York, Vermont, Quebec, New Hampshire, and Maine, traditional industries such as forestry, agriculture, mining, and manufacturing dominated the local economies and culture for most of the 1900s. Due to technological innovations and global competition, the role of these industries began to decrease by the late 1990s and facilities in many areas began to close. As a result, populations in a number of communities began to decline – some to the point that they ceased to function as residential centers. However, villages and towns with outstanding natural amenities (those close to coastal, mountain, lake, and forested areas) began to attract tourists and new

residents (often second homeowners) looking for outdoor amenities that enhance quality of life.

After 6 years of planning and access construction along a historical trade route linking 740 miles of waterways, a nonprofit coalition officially inaugurated the NFCT in 2006. In 2007, the coalition commissioned an [economic impact study](#) of the trail within six regions representing 1/3 of its total length. The regions that were the focus of the study encompassed those with economies still largely dependent upon traditional industries and those that had begun to transition to a natural amenities-based economy. Those regions with economies based upon natural amenities had begun to develop the businesses that would provide the goods and services necessary to serve NFCT paddlers, while those that had not yet transitioned lacked such businesses. A major goal of the study was to identify opportunities and challenges in better utilizing the paddling trail for economic development.

Among the 6 regions, the study found that approximately 90,000 paddlers annually created \$12 million in total economic impacts and supported 280 jobs within communities. The study found that there was, indeed, a dichotomy between regions with traditional economies versus those with natural amenity-based economies. How well-suited a region was to capturing visitor expenditures dictated the economic outcome. Those regions that had available goods and services for paddlers such as guides and outfitters, grocery stores, restaurants, retail, and lodging saw significantly higher numbers of paddlers and realized as much as 40 times the economic impact over those regions with few trail-oriented goods and services. Events such as multi-day canoe races brought a surge of visitors to the regions that held them. Many event participants stayed at local lodging establishments and were found to spend, on average, 75% more than the typical paddler group, underscoring the importance of both events and lodging in realizing the full economic benefits of a long-distance trail.

While as of 2007, the NFCT had not attracted or created new business, this report underscored the idea that in order to take advantage of the economic opportunity offered by a long-distance trail, the towns it connects must have the businesses that offer the goods and services that paddlers need. In towns that already had outdoor recreation-oriented businesses, the study found that the greatest opportunities lay in expanding those businesses. Program operators acknowledged that business development support in communities lacking trail-oriented businesses was key to spreading the economic benefits of the trail more broadly across the region.

Great Allegheny Passage

Once economically dependent upon coal, coke, lumber, paper, and manufacturing, western Pennsylvania and western Maryland suffered many negative economic effects during the late 20th and early 21st Centuries. Globalization, population shifts, and changing production patterns disrupted the

economic systems that had once been a source of wealth for the region. It is within this economic context that the GAP was planned and built over 35 years between 1978 and 2013. Thanks to the presence of the trail and to concerted business development efforts as the trail came online, the 12 communities the GAP connects have begun to diversify and show signs of growing local economies. However, rather than extractive and manufacturing industries, these cities and towns now feature bike shops, bistros, and bed-and-breakfasts that employ hundreds of people and sustain local quality of life.

The 2021 [Great Allegheny Passage Economic Impact Report](#) provides insight into the evolution of trail tourist spending effects and businesses development over the past 20+ years in the 5 counties and 12 communities that the trail connects along this 150-mile length. The analysis places a special focus on a Trail Impact Zone, which is a geographic area that includes all census tracts within ½ mile of the trail where most of the direct spending by GAP users occurs and where businesses that serve GAP users are principally located. Primarily using 2019 survey data provided by business owners and GAP users, the study reveals a multitude of trail usage and tourism spending patterns as well as detailed information about local business development trends.

The study found that the GAP has a total economic impact in the 5-county region of \$121 million per year. This impact consists of \$74.66 million in direct expenditures by GAP users, \$21.57 million in indirect impacts, and \$24.5 million in induced impacts. Businesses that primarily serve GAP users fall into one of three (NAICS) industry categories: Food & Accommodations, Retail Services, and Arts, Entertainment, & Recreation, which account for \$38.3 million, \$26.3 million, and \$4.5 million respectively in total impact. Together, these business sectors count for 87% of direct spending from GAP tourism.

The impacts of GAP tourism are most geographically concentrated in areas with larger populations and larger user counts due to the fact that these areas have more activity on and adjacent to the trail. For example, the 2019 total economic impact of the trail in Pittsburgh and Allegheny County, PA was \$46.3 million. In rural Allegany County, MD, which experiences lower use counts, the total was \$31.2 million. However, the study found that the per capita economic impacts in smaller, rural areas were significantly greater than in more populated areas due to the fact that trail tourism spending in such locations is more likely to come from overnight users (generating higher impacts per user) and that the populations of those areas is significantly smaller. The total economic impact per 1,000 residents in rural Allegany County, MD was \$436,700. This figure is almost 12 times greater than the impact per 1,000 residents in urban/suburban Pittsburgh and Allegheny County, PA, which was \$37,900. Such a finding underscores the importance of overnight accommodations in less populated rural areas in generating significant economic benefit for communities that may have traditionally experienced greater economic disparity.

Trail-oriented goods and services offered by businesses in the Trail Impact Zone include dining, lodging, food-to-go, bicycle rental or sales, arts and historic sites, trip planning, transportation, outdoor gear, and camping. Sixty-three percent of these businesses offer multiple goods and or services too GAP users. Such diverse offerings make businesses more financially sustainable. They also improve the user experience for trail tourists and they enhance quality of life for residents by providing greater benefits. Most trail-oriented businesses within the Trail Impact Zone were established within the last 20 years, which is contemporaneous with significant expansion and completion of the GAP. Several businesses pre-dated the GAP and have benefited from the creation of the trail. Forty-four percent of businesses within the Trail Impact Zone were founded specifically to serve GAP users and are most likely to provide lodging, tour services, and bicycle-oriented goods and services. Restaurants and retail businesses were less likely to have been established primarily to serve GAP users, but nevertheless have also benefitted from the presence of the trail. Most GAP businesses have fewer than 100 employees and tend to be locally owned, which helps retain direct GAP spending within the local economy.

The study found that GAP tourism spending supports approximately 1,400 jobs within the 5-county region. In the decade since the Great Recession, total employment across all industries within the Trail Impact Zone grew modestly by approximately 4.8% in spite of the fact that population within the Trail Impact Zone declined by 3.1%. At 12%, the job growth within the key trail business sectors inside the Trail Impact Zone far exceeded the rate of growth of the same sectors in the broader 5-county region (4.8%) and two state area (6.8%) during this time. These numbers suggest that the GAP is supporting a healthier economy within the Trail Impact Zone.

Economic impact studies of the GAP were previously conducted in 1998, 2009, and 2012. While methodological differences and the fact that the trail was not completed until 2013 make direct comparisons among the studies difficult, the direct economic impacts were found to be \$7.9 million in 1998, \$40.7 million in 2009, and \$50 million in 2012. As previously stated, the direct economic impact in 2019 was found to be \$74.66 million. Even when adjusting for inflation, the data show that the GAP's overall estimated economic impact from tourism and rate of direct spending per visitor have increased steadily and significantly since 1998. It is important to note that this increase has been significantly the result of to the work of The Progress Fund and the Trail Town program to support local business development.

However, despite the GAP's successes, poverty is a significant and persistent problem within the Trail Impact Zone, and more so than in surrounding areas of Pennsylvania and Maryland. In 2019 the poverty rate within the Trail Impact Zone was 20.7% and for the combined region of Maryland and Pennsylvania it was 11.3%. While the GAP has not been a panacea for the economic woes of the communities it connects, it nevertheless benefits these communities substantially. Sixty percent of GAP

tourists report their income to be between \$50,000 and \$200,000. Because these visitors tend to be high earners who spend money on lodging, goods, and food in the towns the trail connects, the region benefits greatly through trail tourism spending. While the development of such a trail can in some circumstances raise the risk of gentrification and displacement of lower-income residents, this does not seem to be the case with the GAP. The study found that the types of business investment and consumer spending the trail attracts was less likely to cause development pressure and displacement of longtime residents. This finding suggests that particularly in smaller, rural communities, such trail development is socially sustainable while being economically beneficial.

4. DISCUSSION AND CONCLUDING REMARKS

This report provides estimates of the potential economic and health impacts of the Tennessee RiverLine trail. As the Tennessee RiverLine trail is still an aspirational vision for a continuous system for water recreation along the Tennessee River's 652 miles, many communities have yet to build new infrastructure or develop marketing, communications, or engagement programs at access points. Therefore, this study relies on existing studies of comparable water trails to estimate visitors and their associated expenditures. In the aspirational scenario, an additional 807,936 paddlers are expected to visit the Tennessee RiverLine trail in addition to the estimated 284,550 paddlers who currently visit the Tennessee River annually. Spending by additional paddlers will result in economic benefits for local communities and the states for which the Tennessee River traverses. The growth of the Tennessee RiverLine is expected to increase output or state gross domestic product up to \$103.8 million annually. Through direct, indirect, and multiplier effects, the spending is expected to increase personal income for states' residents, up to \$65.5 million. The increase in economic activity will increase employment by 1,959, and local and state sales tax revenues are expected to rise to \$2.6 million. In addition, a case study analysis is performed on seven long-distance trails in the United States, and ten *key components of water trail success* are identified. These findings should help policy makers, urban or city planners, and communities understand the economic potential of the Tennessee RiverLine and provide guidance on how to maximize the capture of economic benefits.

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6. TECHNICAL APPENDIX

A. Establishing a Paddling Use Baseline on the Tennessee River

Our methodology for inferring paddling usage proceeds in three steps. We first calculate annual recreation days on the 9 reservoirs that are the main stem of the Tennessee River. To achieve this step we convert the annual recreation days on three reservoirs (Watts Bar, Chickamauga, and Norris) provided in a study on general recreation on TVA reservoirs¹³, into an annual recreation days per shoreline mile estimate. We then multiply this recreation day per shoreline mile estimate by the total shoreline miles on the 9 reservoirs that are the main stem of the Tennessee River. This produces a total of 44.82 million annual recreation days on the main stem of the Tennessee River.

In step 2, we calculate the total annual paddling recreation days on these nine reservoirs. To complete this step, we multiply the total annual recreation days on the nine reservoirs by the percentage of survey respondents that used a watercraft during their visit (on average 42.47% for the three reservoirs included in the TVA study). We then calculate annual paddling recreation days on the 9 reservoirs by multiplying the number of boating recreation days by the percentage of individuals observed using a canoe or kayak during their visit (4.03%). This produces a total of 767,736 annual recreation days that involve a canoe or kayak.

In step 3, we convert this measure of annual paddling recreation days to a measure of annual paddling visits. This conversion from days to visits is necessary since most of the comparable water trails used in our analysis only provide data on annual visits. Based on a trade report on the paddlesport industry, the average canoe or kayak trip in the United States lasts 2.70 days.¹⁴ We divide 767,736 annual recreation days that involve a canoe or kayak by 2.7 to produce 284,550 annual flatwater paddling recreation visits on the main stem of the Tennessee River.

B. Tennessee RiverLine Aspirational Scenario

An aspiration use scenario for Tennessee RiverLine was created by designating each river mile into one of three paddling growth scenarios. The first would double existing use (+436 visits/year). The second would achieve paddling use density comparable to other medium-use density destinations in the United States (+2,080 visits/year). The third, would achieve paddling use density comparable to other

¹³ Pouydal, N. et al. 2017. Results from visitor and property owner surveys on Chickamauga, Norris, and Watts Bar Reservoir in summer 2016.

¹⁴ 2015 Special Report on Paddlesports. The Outdoor Foundation <https://outdoorindustry.org/wp-content/uploads/2017/05/2015-Paddlesports-Research.pdf>

high-use density destinations in the United States (+9,034 visits/year). River mile designations, presented in Table 11, were based on proximity to urban centers as well as the presence of river access and experience amenities along each river mile.

Table 11. Tennessee Riverline Aspirational Use Scenario

	Existing Use Doubled	+ 436 visits/year
	Medium Use Density	+ 2,080 visits/year
	High Use Density	+ 9,034 visits/year

Existing River Access and Experience Amenities

River Mile	County	State	River Left	River Right
652	Knox	TN		Forks of the River
651	Knox	TN	Ijams Nature Center	
650	Knox	TN		
649	Knox	TN		Ned McWerter Park/JWP Boat Ramp
648	Knox	TN	Suttree Landing	Volunteer Landing/Downtown
647	Knox	TN		Neyland Stadium, UT Campus
646	Knox	TN		UT Campus, Third Creek
645	Knox	TN	UT Research Park	UT Campus
644	Knox	TN	UT Research Park	
643	Knox	TN	UT Research Park, Marine Park Boat Ramp	Sequoyah Hills East Launch
642	Knox	TN		Cherokee Park/Greenway, Sequoyah Hills West Launch
641	Knox	TN		
640	Knox	TN		Lakeshore Park/Fourth Creek Access
639	Knox	TN	Maloney Road Boat Ramp	
638	Knox	TN	IC King Boat Ramp	
637	Knox	TN		
636	Knox	TN		
635	Knox	TN	Little River Confluence	Duncan Marina, Sandbar
634	Blount/Knox	TN	James Bend Blount County Park	
633	Blount/Knox	TN		
632	Blount/Knox	TN		
631	Blount/Knox	TN		
630	Blount/Knox	TN	George's Creek Boat Ramp	
629	Blount/Knox	TN		
628	Blount/Knox	TN		

627	Blount/Knox	TN	Travis Marine, Travis Marine Boat Ramp	
626	Blount/Knox	TN		
625	Blount/Knox	TN	Keller Bend Park	Louisville Landing Marina, Louisville Boat Ramp
624	Blount/Knox	TN		
623	Blount/Knox	TN		Lowes Ferry Boat Ramp
622	Blount/Knox	TN	Admiral Farragut Park, Carl Cowan Park, Carl Cowan Boat Ramp	
621	Blount/Knox	TN		
620	Blount/Knox	TN		Poland Creek Boat Ramp
619	Blount/Knox	TN		
618	Blount/Knox	TN		
617	Blount/Knox	TN	Concord Park Boat Ramp, Concord Park Marina	
616	Blount/Knox	TN	The Cove, Concord Park Boat Ramp	
615	Blount/Knox	TN	Choto Marina, Choto Boat Ramp	
614	Blount/Knox	TN		
613	Blount/Knox	TN		
612	Blount/Knox	TN		Ish Creek Confluence (Boat Ramp, Marina Up Cove)
611	Blount/Knox	TN		
610	Blount/Loudon	TN		Lake View Boat Ramp
609	Blount/Loudon	TN	Shady Grove Boat Ramp	
608	Blount/Loudon	TN	YWCA Camp Tripoint	
607	Loudon	TN		PJ's Landing Marina and Boat Ramp
606	Loudon	TN		
605	Loudon	TN		Yarberry Point Campground and Boat Ramp
604	Loudon	TN		
603	Loudon	TN	Fort Loudon Marina, Calhouns, Lenoir City Boat Ramp	
602	Loudon	TN	Fort Loudoun Lock and Dam, TVA Overlooks and Fishing Areas	

601	Loudon	TN	Downtown Lenoir City	Tellico Dam Boat Ramp, Little Tennessee River Confluence
600	Loudon	TN		
599	Loudon	TN		
598	Loudon	TN		
597	Loudon	TN		
596	Loudon	TN		
595	Loudon	TN		
594	Loudon	TN		
593	Loudon	TN		
592	Loudon	TN		City of Loudon Boat Ramp, Downtown Loudon
591	Loudon	TN		
590	Loudon	TN		
589	Loudon	TN		
588	Loudon	TN		
587	Loudon	TN		
586	Loudon	TN		
585	Loudon	TN		
584	Loudon	TN		
583	Loudon/Roane	TN		Tennessee National Boat Ramp and Docks
582	Loudon/Roane	TN	Cave Creek Boat Ramp	
581	Loudon/Roane	TN		
580	Loudon/Roane	TN		
579	Loudon/Roane	TN		Pond Creek Boat Ramp
578	Roane	TN		
577	Roane	TN	Dogwood Boat Ramp	
576	Roane	TN		
575	Roane	TN		
574	Roane	TN		Whitestone Inn
573	Roane	TN	Johnson Creek Boat Ramp	
572	Roane	TN		Laurel Bluff Boat Ramp
571	Roane	TN	Long Island Marina and Boat Ramp	
570	Roane	TN		Riley Creek Campground and Boat Ramp, Mournays Cove Boat Ramp
569	Roane	TN	Bell Cove Boat Ramp	

568	Roane	TN	Clinch River Confluence, City of Kingston Parks and Ramps, Fort Southwest Point	Southwest Point Golf Club
567	Roane	TN		
566	Roane	TN		
565	Roane	TN		
564	Roane	TN		
563	Roane	TN	Caney Creek Confluence, Roane County Park and Kayak Launch and Campground, RV Park	KOA Campground, Marina and Boat Ramp
562	Roane	TN		
561	Roane	TN	Browns Chapel Boat Ramp	
560	Roane	TN		
559	Roane	TN		
558	Roane	TN		
557	Roane	TN		Shady Grove Boat Ramp
556	Roane	TN	Rockwood Ferry Ramp	
555	Roane	TN		Thiefneck Island WMA
554	Roane	TN	New Hope Boat Ramp	Thiefneck Island WMA
553	Roane	TN	Tom Fuller Boat Ramp, City of Rockwood	Thiefneck Island WMA
552	Roane	TN	Winton Chapel Boat Ramp	Thiefneck Island WMA
551	Roane	TN		Thiefneck Island WMA
550	Roane	TN	Boy Scout Camp Buck Toms	Camp John Knox Presbyterian Center
549	Roane	TN		
548	Roane	TN		Bayside Marina and Ramp
547	Roane	TN		Blue Springs Marina and Ramp
546	Roane	TN	Hog Back Ridge Boat Ramp	
545	Roane	TN	Rockwood First Baptist Church Camp, Terrace View Marina and Ramp, Lakeside Resort Marina and Ramp, Roddy Ramp, Arrowhead Ramp	
544	Meigs/Rhea	TN	Cedine Bible Camp	
543	Meigs/Rhea	TN	Eden Marina, Ramp and Campground	

542	Meigs/Rhea	TN		
541	Meigs/Rhea	TN		Campground on the Lakeshore Marina, Ramp and Campground, Big Spring Ramp, Hornsby Hollow Stream Access,
540	Meigs/Rhea	TN		Euclache Marina and Ramp
539	Meigs/Rhea	TN		Lakeview Ramp, Sam's Boat Dock Marina and Ramp
538	Meigs/Rhea	TN		Foshee Ramp, Foshee Pass Recreation Area, Foshee Pass Campground
537	Meigs/Rhea	TN		
536	Meigs/Rhea	TN		
535	Meigs/Rhea	TN		
534	Meigs/Rhea	TN		
533	Meigs/Rhea	TN		
532	Meigs/Rhea	TN	Spring City Embayment - 6 linear cove miles, 5 ramps, two camps, one marina	
531	Meigs/Rhea	TN		Watts Bar Recreation Area, Beach and Ramp, Meigs County Park
530	Meigs/Rhea	TN		Watts Bar Dam
529	Meigs/Rhea	TN		Pinhook Ramp
528	Meigs/Rhea	TN		
527	Meigs/Rhea	TN		
526	Meigs/Rhea	TN		
525	Meigs/Rhea	TN		Sewee Creek Ramp
524	Meigs/Rhea	TN		
523	Meigs/Rhea	TN		
522	Meigs/Rhea	TN		
521	Meigs/Rhea	TN		
520	Meigs/Rhea	TN		
519	Meigs/Rhea	TN		
518	Meigs/Rhea	TN		
517	Meigs/Rhea	TN		
516	Meigs/Rhea	TN		
515	Meigs/Rhea	TN		
514	Meigs/Rhea	TN		Goodfield Ramp
513	Meigs/Rhea	TN	Cottonport WMA Access Ramp	Cottonport Marina, Ramp and Campground
512	Meigs/Rhea	TN		
511	Meigs/Rhea	TN		

510	Meigs/Rhea	TN		
509	Meigs/Rhea	TN		
508	Meigs/Rhea	TN		
507	Meigs/Rhea	TN		
506	Meigs/Rhea	TN		
505	Meigs/Rhea	TN	Frazier Park Ramp	
504	Meigs/Rhea	TN	City of Dayton Embayment - 3 linear cove miles, one marina, two campgrounds, two ramps, four parks	Armstrong Ferry Recreation Area
503	Meigs/Rhea	TN	Garrison Boat Ramp	
502	Meigs/Rhea	TN		
501	Meigs/Rhea	TN		Hiwassee Island WMA
500	Meigs/Rhea	TN		Hiwassee Island WMA
499	Meigs/Hamilton	TN	Blythe Ferry Boat Ramp	Blythe Ferry Boat Ramp, Cherokee Removal Memorial Park
498	Meigs/Hamilton	TN		
497		TN		
496	Hamilton	TN		
495	Hamilton	TN	Sale Creek Embayment - 2 linear cove miles, three ramps, two marinas, one campground	
494	Hamilton	TN		Grasshopper Creek Recreation Area Campground and Ramp
493	Hamilton	TN		
492	Hamilton	TN		
491	Hamilton	TN		Elbridge Boat Ramp
490	Hamilton	TN	Possum Creek Recreation Area Campground and Ramp	Island View Boat Ramp
489	Hamilton	TN		
488	Hamilton	TN	Soddy Creek Embayment - 3 linear cove miles, two marinas, three ramps, four parks	
487	Hamilton	TN		
486	Hamilton	TN		Ware Branch Ramp
485	Hamilton	TN		Skull Island Campground and Ramp

484	Hamilton	TN		
483	Hamilton	TN		Harrison Bay State Park
482	Hamilton	TN	Harbor Lights Marina and Ramps	Harrison Bay State Park
481	Hamilton	TN		Harrison Bay State Park
480	Hamilton	TN	Chester Frost Campground, Camp Columbus	Harrison Bay State Park, Campground
479	Hamilton	TN	Chester Front Park, Boat Ramp	Harrison Bay State Park, Marina and Boat Ramp
478	Hamilton	TN		Harrison Bay State Park, Wolfever Bridge Ramp, Savannah Bay Ramp, Harison Ramp, Tyner Ramp
477	Hamilton	TN		YMCA Camp
476	Hamilton	TN		Pecan Point Boat Ramp, Vincent Road Ramp
475	Hamilton	TN		
474	Hamilton	TN		Booker T Washington State Park
473	Hamilton	TN		Booker T Washington State Park, Boat Ramp, Campground
472	Hamilton	TN	Gold Point Marina, Lakeshore Marina and Ramp	Chickamauga Marina and Ramp
471	Hamilton	TN	Chickamauga Dam, Overlooks and Fishing Area	
470	Hamilton	TN	Tennessee River Park Greenway, Boat Ramp	Dupont Park
469	Hamilton	TN	Tennessee River Park Greenway	
468	Hamilton	TN	Tennessee River Park Greenway, Boat Ramp	
467	Hamilton	TN	Tennessee River Park Greenway	
466	Hamilton	TN	Tennessee River Park Greenway	
465	Hamilton	TN	Tennessee River Park Greenway	
464	Hamilton	TN	Tennessee River Park Greenway, Ross' Landing + Marina, 21st Century Waterfront, TN Aquarium Chattanooga Downtown	Coolidge Park, Renaissance Park Ramp, Outdoor Chattanooga

463	Hamilton	TN	Tennessee River Park Greenway	Moccasin Bend
462	Hamilton	TN	Tennessee River Park Greenway	Moccasin Bend
461	Hamilton	TN	Tennessee River Park Greenway	Moccasin Bend
460	Hamilton	TN		Moccasin Bend
459	Hamilton	TN	Brown's Ferry Marina and Ramp	Moccasin Bend
458	Hamilton	TN		
457	Hamilton	TN		Williams Island
456	Hamilton	TN		Williams Island Campground
455	Hamilton	TN		Williams Island
454	Hamilton	TN		
453	Hamilton	TN	Suck Creek Ramp	
452	Hamilton	TN		
451	Marion	TN	TN River Gorge	TN River Gorge
450	Marion	TN	TN River Gorge	TN River Gorge
449	Marion	TN	TN River Gorge	TN River Gorge
448	Marion	TN	TN River Gorge	TN River Gorge
447	Marion	TN	TN River Gorge	TN River Gorge
446	Marion	TN	TN River Gorge	TN River Gorge
445	Marion	TN	TN River Gorge, Prentice Cooper Campground	TN River Gorge, TVA Raccoon Mountain
444	Marion	TN	TN River Gorge	TN River Gorge, TVA Raccoon Mountain, Boat Ramp
443	Marion	TN	TN River Gorge	TN River Gorge, TVA Raccoon Mountain
442	Marion	TN	TN River Gorge	TN River Gorge, TVA Raccoon Mountain
441	Marion	TN	TN River Gorge	TN River Gorge
440	Marion	TN	TN River Gorge	TN River Gorge, Sullivan's Boat Ramp
439	Marion	TN	TN River Gorge	TN River Gorge
438	Marion	TN	TN River Gorge	TN River Gorge
437	Marion	TN	TN River Gorge	TN River Gorge
436	Marion	TN	TN River Gorge	TN River Gorge
435	Marion	TN	TN River Gorge	TN River Gorge
434	Marion	TN	TN River Gorge	TN River Gorge
433	Marion	TN	TN River Gorge, Bennett's Lake Ramp	TN River Gorge
432	Marion	TN	TN River Gorge	TN River Gorge
431	Marion	TN	TN River Gorge	TN River Gorge, Hales Bar Marina and Ramp

430	Marion	TN		TVA Seredino Ramp, Anchor Inn Bait and Tackle Ramp
429	Marion	TN	I-24 Rest Area (Island)	Running Water Public Use Area
428	Marion	TN	Marion County Campground, Ramp and Park	
427	Marion	TN		
426	Marion	TN		
425	Marion	TN	Shellmound Campground and Ramp	Maple View Ramp, Nickajack Cave WMA
424	Marion	TN	Nickajack Dam and Fishing Area	
423	Marion	TN		
422	Marion	TN		
421	Marion	TN		
420	Marion	TN		
419	Marion	TN	Battle Creek Confluence	
418	Marion	TN	JC South Pittsburg Ramp	Blue Ridge Ramp
417	Marion	TN	Kellerman Ramp	
416	Marion	TN		
415	Jackson	AL		
414	Jackson	AL	Bridgeport	
413	Jackson	AL		
412	Jackson	AL	Bridgeport Ferry Ramp	
411	Jackson	AL		
410	Jackson	AL		
409	Jackson	AL		
408	Jackson	AL		
407	Jackson	AL		
406	Jackson	AL		
405	Jackson	AL		
404	Jackson	AL		
403	Jackson	AL	Snodgrass Bridge Ramp	
402	Jackson	AL		
401	Jackson	AL	Stevenson/Crow Creek Embayment - four cove miles, two ramps, one campground, one park	
400	Jackson	AL		
399	Jackson	AL		
398	Jackson	AL		
397	Jackson	AL		
396	Jackson	AL		
395	Jackson	AL		

394	Jackson	AL	Mud Creek Embaymet, five cove miles, one Ramp	
393	Jackson	AL		
392	Jackson	AL		
391	Jackson	AL		
390	Jackson	AL		
389	Jackson	AL		
388	Jackson	AL		
387	Jackson	AL		
386	Jackson	AL		BB Comer Bridge Boat Ramp
385	Jackson	AL		
384	Jackson	AL		
383	Jackson	AL		
382	Jackson	AL	Clemons Road Ramp,	Chisenhall Boat Ramp
381	Jackson	AL		
380	Jackson	AL		
379	Jackson	AL		
378	Jackson	AL		
377	Jackson	AL	Scottsboro Coves - fifteen cove miles, five ramps, one marina, two parks	
376	Jackson	AL		
375	Jackson	AL		Langston, Langston City Park and Ramp, Eagle's Nest RV Park
374	Jackson	AL		
373	Marshall	AL		
372	Marshall	AL		
371	Marshall	AL		
370	Marshall	AL		
369	Marshall	AL	Waterfront Boat Ramp	
368	Marshall	AL		
367	Marshall	AL		Little Mountain Ramp
366	Marshall	AL	Girl Scout Camp, Camp Ney A Ti	
365	Marshall	AL	Seibold Campground and Ramp	
364	Marshall	AL	River Bend Marina, Lakeside Campground Ramp	Minky Road Ramp
363	Marshall	AL		Lake Guntersville State Park, Town Creek Boat Ramp

362	Marshall	AL		Lake Guntersville State Park, Boat Ramp, Beach, Marina, Campground
361	Marshall	AL		Lake Guntersville State Park
360	Marshall	AL		
359	Marshall	AL		Guntersville Cove - Big Springs Creek - six cove miles, five marinas, four ramps, Guntersville greenway
358	Marshall	AL	Marshall County Park and Ramp	
357	Marshall	AL		Guntersville Cove - Brown's Creek - seven cove miles, one marina, four ramps, two parks, greenway
356	Marshall	AL		Riverview Campground
355	Marshall	AL		
354	Marshall	AL		
353	Marshall	AL		
352	Marshall	AL	Honecomb Creek Embayment - four cove miles, one marina, two camps, two ramps	YMCA Camp Cha-La-Kee
351	Marshall	AL		
350	Marshall	AL		
349	Marshall	AL	Guntersville Dam	
348	Marshall	AL	Guntersville Dam Ramp 2	Guntersville Dam Ramp 1
347	Marshall	AL		
346	Marshall	AL		
345	Marshall	AL		
344	Marshall	AL		
343	Marshall/Madison	AL		
342	Marshall/Madison	AL		
341	Marshall/Madison	AL		
340	Marshall/Madison	AL		
339	Marshall/Madison	AL		
338	Marshall/Madison	AL		

337	Marshall/Madison	AL		
336	Marshall/Madison	AL		
335	Morgan/Madison	AL		
334	Morgan/Madison	AL	Ditto Landing Park, Marina and Ramp	
333	Morgan/Madison	AL		
332	Morgan/Madison	AL		
331	Morgan/Madison	AL		
330	Morgan/Madison	AL	Carol D. Hudston Recreation Area Stream Access Site	
329	Morgan/Madison	AL		
328	Morgan/Madison	AL		
327	Morgan/Madison	AL		Charest Cove Campground
326	Morgan/Madison	AL		
325	Morgan/Madison	AL		
324	Morgan/Madison	AL	Easter Posey Recreation Area	
323	Morgan/Madison	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
322	Morgan/Madison	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
321	Morgan/Madison	AL	Wheeler Wildlife Refuge, Triana Boat Ramp	Wheeler Wildlife Refuge, Talucah Beach Stream Access Point
320	Morgan/Madison	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
319	Morgan/Madison	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge, Cotaco Creek Cove - three cove miles, one ramp
318	Morgan/Madison	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge

317	Morgan/Madison	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
316	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
315	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
314	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
313	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
312	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
311	Morgan/Limestone	AL	Wheeler Wildlife Refuge, Mooresville/Limestone Creek Embayment - five cove miles, one ramp	Wheeler Wildlife Refuge
310	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge
309	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Wheeler Wildlife Refuge - Flint Creek Embayment, five cove miles, three ramps, two parks
308	Morgan/Limestone	AL	Wheeler Wildlife Refuge	Point Mallard Park
307	Morgan/Limestone	AL	Wheeler Wildlife Refuge	
306	Morgan/Limestone	AL	Wheeler Wildlife Refuge	
305	Morgan/Limestone	AL	Wheeler Wildlife Refuge, Riverwalk Marina and Ramp	
304	Morgan/Limestone	AL	Swan Creek WMA	
303	Morgan/Limestone	AL	Swan Creek WMA	Brickyard Landing Marina and Ramp
302	Morgan/Limestone	AL	Swan Creek WMA	Jay's Landing Marina
301	Morgan/Limestone	AL	Swan Creek WMA	
300	Morgan/Limestone	AL	Swan Creek WMA	
299	Morgan/Limestone	AL	Swan Creek WMA	

298	Morgan/Limestone	AL		
297	Morgan/Limestone	AL	Cowford Campground and Ramp	
296	Morgan/Limestone	AL		
295	Lawrence/Limestone	AL		
294	Lawrence/Limestone	AL		Decatur/Wheeler Lake KOA, Terry's Point RV Park
293	Lawrence/Limestone	AL		
292	Lawrence/Limestone	AL		
291	Lawrence/Limestone	AL		
290	Lawrence/Limestone	AL		
289	Lawrence/Limestone	AL		
288	Lawrence/Limestone	AL		
287	Lawrence/Limestone	AL	Lucy's Branch Marina and Ramp	
286	Lawrence/Limestone	AL	Riverview RV Campground	
285	Lawrence/Lauderdale	AL	Elk River Confluence - five ramps within four miles	Goldfield Branch Ramp
284	Lawrence/Lauderdale	AL		
283	Lawrence/Lauderdale	AL		Spring Creek Ramp
282	Lawrence/Lauderdale	AL		
281	Lawrence/Lauderdale	AL		
280	Lawrence/Lauderdale	AL		
279	Lawrence/Lauderdale	AL	Wheeler State Park	
278	Lawrence/Lauderdale	AL	Wheeler State Park, Joe Wheeler State Park Marina and Ramp	

277	Lawrence/Lauderdale	AL	Wheeler State Park
276	Lawrence/Lauderdale	AL	Wheeler State Park, Second Creek Ramp
275	Lawrence/Lauderdale	AL	Wheeler Dam, Wheeler Dam Village and Wheeler State Park, Wheeler Northside Campground,
274	Lawrence/Lauderdale	AL	Wheeler Dam Village, Fisherman's Resort Campground, Wilson Lake Ramp
273	Lawrence/Lauderdale	AL	
272	Colbert/Lauderdale	AL	Doublehead Resort Ramp
271	Colbert/Lauderdale	AL	Muscle Shoals Sailing Club Ramp
270	Colbert/Lauderdale	AL	
269	Colbert/Lauderdale	AL	
268	Colbert/Lauderdale	AL	Colbert Alloys Boat Ramp
267	Colbert/Lauderdale	AL	
266	Colbert/Lauderdale	AL	
265	Colbert/Lauderdale	AL	Turtle Point Yacht Marina, Lock Six Boat Ramp
264	Colbert/Lauderdale	AL	Hwy 72 Ramp, Waterfront Marina
263	Colbert/Lauderdale	AL	
262	Colbert/Lauderdale	AL	
261	Colbert/Lauderdale	AL	
260	Colbert/Lauderdale	AL	Steenson Marina and Ramp
259	Colbert/Lauderdale	AL	Wilson Dam, Wilson Dam Reservation Ramp (Left), Rockpile Landing Recreation Area
258	Colbert/Lauderdale	AL	TVA Rockpile Landing Recreation Area
257	Colbert/Lauderdale	AL	TVA Rockpile Landing Recreation Area and Boat

				Ramp
256	Colbert/Lauderdale	AL	McFarland Park Marina and Boat Ramps (2)	
255	Colbert/Lauderdale	AL	McFarland Park, Cypress Creek Confluence	
254	Colbert/Lauderdale	AL	Seven Mile Island WMA	Sheffield Riverfront Park and Ramp
253	Colbert/Lauderdale	AL	Seven Mile Island WMA	
252	Colbert/Lauderdale	AL	Seven Mile Island WMA	
251	Colbert/Lauderdale	AL	Seven Mile Island WMA	
250	Colbert/Lauderdale	AL	Seven Mile Island WMA	
249	Colbert/Lauderdale	AL	Seven Mile Island WMA	
248	Colbert/Lauderdale	AL	Seven Mile Island WMA	
247	Colbert/Lauderdale	AL	Seven Mile Island WMA	Pride Station Ramp
246	Colbert/Lauderdale	AL	Seven Mile Island WMA	
245	Colbert/Lauderdale	AL	Seven Mile Island WMA	
244	Colbert/Lauderdale	AL	Seven Mile Island WMA	Cane Creek Road Ramp
243	Colbert/Lauderdale	AL	Seven Mile Island WMA	
242	Colbert/Lauderdale	AL		
241	Colbert/Lauderdale	AL		
240	Colbert/Lauderdale	AL		
239	Colbert/Lauderdale	AL		
238	Colbert/Lauderdale	AL		
237	Colbert/Lauderdale	AL	Natchez Trace Parkway	Natchez Trace Parkway, Colbert Ferry Ramp
236	Colbert/Lauderdale	AL		

235	Colbert/Lauderdale	AL		
234	Colbert/Lauderdale	AL		
233	Colbert/Lauderdale	AL		
232	Colbert/Lauderdale	AL		
231	Colbert/Lauderdale	AL	Brush Creek Road Ramp	
230	Colbert/Lauderdale	AL		
229	Colbert/Lauderdale	AL		
228	Colbert/Lauderdale	AL		
227	Colbert/Lauderdale	AL	Waterloo Riverside Ramp, Waterloo Creekside Ramp	
226	Colbert/Lauderdale	AL		
225	Colbert/Lauderdale	AL	Lauderdale County WMA	Bear Creek Embayment - 7 cove miles, one marina, five access points
224	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	
223	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	
222	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	JP Coleman State Park
221	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	JP Coleman State Park, Marina Trace Drive Boat Ramp
220	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	JP Coleman State Park, Boat Ramp 1 & 2
219	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	JP Coleman State Park
218	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA, Panther Creek Campground	JP Coleman State Park
217	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	
216	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	

215	Tishomingo/Lauderdale	MS/AL	Lauderdale County WMA	Yellow Creek/Tenn Tom Waterway Embayment - seven ramps, two marinas, one campground
214	Hardin	TN	TVA State Line Island Ramp	
213	Hardin	TN		
212	Hardin	TN		
211	Hardin	TN		
210	Hardin	TN	Bruton Branch State Park Ramp	
209	Hardin	TN		
208	Hardin	TN		Pickwick Landing State Park, Marina, Boat Ramps, Beach, Campground
207	Hardin	TN	Pickwick Dam	
206	Hardin	TN	TVA Pickwick Dam Boat Ramps and Campground	
205	Hardin	TN		
204	Hardin	TN		
203	Hardin	TN		
202	Hardin	TN		
201	Hardin	TN		Shiloh National Military Park
200	Hardin	TN		Shiloh National Military Park
199	Hardin	TN		Shiloh National Military Park, Pittsburg Landing
198	Hardin	TN		Shiloh National Military Park
197	Hardin	TN		
196	Hardin	TN		
195	Hardin	TN		
194	Hardin	TN		Perkins Bluff Ramp, River Heights Ramp
193	Hardin	TN		
192	Hardin	TN		
191	Hardin	TN		
190	Hardin	TN	Wayne Jerrolds Riverpark and Ramp	Savannah Ramp
189	Hardin	TN		
188	Hardin	TN		
187	Hardin	TN		
186	Hardin	TN		
185	Hardin	TN		
184	Hardin	TN		
183	Hardin	TN		

182	Hardin	TN	Craven's Landing Ramp	
181	Hardin	TN		
180	Hardin	TN		
179	Hardin	TN		Dickey Landing Ramp
178	Hardin	TN		
177	Hardin	TN		
176	Hardin	TN		
175	Hardin	TN		
174	Hardin	TN		
173	Hardin	TN		
172	Hardin	TN	Wilkinson Ferry Ramp	Saltillo Landing Ramp
171	Decatur/Hardin	TN		Saltillo Marina
170	Decatur/Hardin	TN		
169	Decatur/Hardin	TN		
168	Decatur/Hardin	TN		
167	Decatur/Hardin	TN		
166	Decatur/Hardin	TN		
165	Decatur/Hardin	TN		
164	Decatur/Hardin	TN		
163	Decatur/Hardin	TN		
162	Decatur/Hardin	TN		Riverstone Marina and Ramp
161	Decatur/Hardin	TN		
160	Decatur/Hardin	TN		
159	Decatur/Wayne	TN	Clifton Marina and Ramp	
158	Decatur/Wayne	TN	Old Clifton Ferry Ramp	Downtown Clifton, Old Clifton Ferry (walk-in access, no vehicles to ramp)
157	Decatur/Wayne	TN		Clifton City Park
156	Decatur/Wayne	TN		Glenkirk Landing Boat Ramp, Old Clifton Quarry

155	Decatur/Wayne	TN		Beech Creek Boat Ramp
154	Decatur/Wayne	TN		
153	Decatur/Perry	TN		
152	Decatur/Perry	TN		
151	Decatur/Perry	TN		
150	Decatur/Perry	TN		
149	Decatur/Perry	TN		
148	Decatur/Perry	TN		
147	Decatur/Perry	TN		
146	Decatur/Perry	TN		
145	Decatur/Perry	TN		
144	Decatur/Perry	TN		
143	Decatur/Perry	TN		
142	Decatur/Perry	TN		
141	Decatur/Perry	TN		
140	Decatur/Perry	TN	Mermaid Marina and Boat Ramp, Fisherdale Marina (all in cove)	
139	Decatur/Perry	TN		
138	Decatur/Perry	TN		Drop Anchor RV Park
137	Decatur/Perry	TN		Faria's Cypress Creek Marina and Boat Ramp
136	Decatur/Perry	TN	Perryville, Beech Bend Park Ramp, Beech River Perryville Ramp, Lost Creek Boat Dock Marina and Ramp	
135	Decatur/Perry	TN	Perryville Campground, Perryville Marina and Ramp, Pike's Peak Campground	
134	Decatur/Perry	TN		
133	Decatur/Perry	TN	Alley Bluff TVA Wild Area	Moustail Landing State Park
132	Decatur/Perry	TN		Moustail Landing State Park
131	Decatur/Perry	TN	Busseltown Boat Ramp, Goodin Branch Ramp	Moustail Landing State Park, Lady's Bluff TVA Small Wild Area
130	Decatur/Perry	TN	TN National Wildlife Refuge - Busseltown Unit	
129	Decatur/Perry	TN	Brodies Landing Boat Ramp	

128	Decatur/Perry	TN	Cherokee Heights Ramp	
127	Decatur/Perry	TN	Woodland Shores Ramp	
126	Decatur/Perry	TN		
125	Decatur/Perry	TN		
124	Decatur/Perry	TN		
123	Decatur/Perry	TN		
122	Decatur/Perry	TN		
121	Decatur/Perry	TN		Crooked Creek Campground and Marina, Deerpoint Campgrounds, Marina and Ramp
120	Benton/Perry	TN		
119	Benton/Perry	TN	Morgan's Creek Ramp	
118	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit, Tie Yards Boat Ramp	TN National Wildlife Refuge Duck River Unit
117	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit
116	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit, I-40 intersection	TN National Wildlife Refuge Duck River Unit, Tennessee River Camp Resort, Cuba Landing Marina and Boat Ramp, I-40 intersection
115	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit
114	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit
113	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit
112	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit, Eagle Creek Ramp	TN National Wildlife Refuge Duck River Unit
111	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit, Duck River Confluence, Gaynor Slough Ramp, Paint Rock Ramp
110	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit, Pool 6 Ramp
109	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit, Grassy Lake Ramp, Old Mill Landing Ramp, Clear Lake Ramp
108	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit

107	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit, Pool 1 Ramp, New Johnsonville Pump Station Ramp
106	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit
105	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	TN National Wildlife Refuge Duck River Unit
104	Benton/Humphreys	TN	TN National Wildlife Refuge Duck River Unit	
103	Benton/Humphreys	TN	Camden Bottoms WMA, Camden Landings Ramp	
102	Benton/Humphreys	TN	Camden Bottoms WMA	
101	Benton/Humphreys	TN	Camden Bottoms WMA	New Johnsonville Campground, Marina and Boat Ramp
100	Benton/Humphreys	TN	Camden Bottoms WMA	
99	Benton/Humphreys	TN	Beaverdam Marina and Ramp, Beaver Dam State Ramp	
98	Benton/Humphreys	TN	Eva Beach Recreation Area, Eva Beach Ramp, Nathan Bedford Forrest Ramp	Johnsonville State Historic Park
97	Benton/Humphreys	TN		Johnsonville State Historic Park, Pebble Isle Campground, Marina and Ramp
96	Benton/Humphreys	TN	Nathan Bedford Forrest State Park, Pilot Knob Ramp	Johnsonville State Historic Park
95	Benton/Humphreys	TN		
94	Benton/Humphreys	TN		
93	Benton/Humphreys	TN		
92	Benton/Humphreys	TN		Bear Creek Ramp
91	Benton/Humphreys	TN		
90	Benton/Humphreys	TN		

89	Benton/Humphreys	TN	Harmon Creek Resort Campground and Ramp	Mason's Boat Dock Campground, Marina and Ramp
88	Benton/Humphreys	TN		
87	Benton/Humphreys	TN		
86	Benton/Humphreys	TN		Eagle Bay Marina and Ramp
85	Benton/Humphreys	TN		
84	Benton/Humphreys	TN	Little Crooked Creek Ramp	
83	Benton/Humphreys	TN		
82	Benton/Houston	TN		White Oak Creek Ramp
81	Benton/Houston	TN		
80	Benton/Houston	TN	Bass Bay Marina and Ramp	
79	Benton/Houston	TN		Cane Creek Campground, Marina and Ramp, Danville Landing and Ramp, Southernaire Marina, Campground and Ramp, The Landing Campground
78	Benton/Houston	TN		
77	Benton/Houston	TN		
76	Benton/Houston	TN		
75	Benton/Houston	TN	Lick Creek Ramp	
74	Benton/Stewart	TN		
73	Henry/Stewart	TN	TN National Wildlife Refuge Big Sandy Unit	Leatherwood Marina and Ramp, Leatherwood Public Access Ramp
72	Henry/Stewart	TN	TN National Wildlife Refuge Big Sandy Unit	
71	Henry/Stewart	TN	TN National Wildlife Refuge Big Sandy Unit, Bennett's Creek Bay	Brownfield Riverside Resort Campground and Ramp

Ramp				
70	Henry/Stewart	TN	TN National Wildlife Refuge Big Sandy Unit	
69	Henry/Stewart	TN		
68	Henry/Stewart	TN	Big Sandy River Confluence and Embayment, 8 camgrounds, 3 marinas, 8 ramps, 3 parks and 3 walk-in access points on 12 cove miles	Fat Daddy's Campground, Marina and Ramp
67	Henry/Stewart	TN	Paris Landing State Park	
66	Henry/Stewart	TN	Paris Landing State Park, State Park Campground, Marina and Ramp	LBL National Recreation Area, Gray's Landing Camping Area Boat Ramp
65	Henry/Stewart	TN	Breakers Resort Marina and Ramp	LBL National Recreation Area, LBL Regional Water Trail
64	Henry/Stewart	TN		LBL National Recreation Area, LBL Regional Water Trail, Mint Spring Walk-in Access, Piney Campground South Ramp
63	Henry/Stewart	TN	4 campsites, marinas and boat ramps on 2 cove miles	LBL National Recreation Area, LBL Regional Water Trail, Piney Campground, North Ramp, St Mary's Church Walk-in Access
62	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail
61	Calloway/Stewart	KY/TN	Bud's RV Campground	LBL National Recreation Area, LBL Regional Water Trail
60	Calloway/Stewart	KY/TN	Patterson's Point Boat Ramp	LBL National Recreation Area, LBL Regional Water Trail, Boswell Landing Campground Ramp, Blue Spring and Panther Bay Walk-in Access points
59	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail, Hickory Shed Landing Walk-in Access Point
58	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail

57	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail, Byrd Bay, Azotus Church Walk-in Access Points
56	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail
55	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail
54	Calloway/Stewart	KY/TN	Boyd's Ranch Boat Ramp	LBL National Recreation Area, LBL Regional Water Trail, Clay Bay Walk-in Access Point
53	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail, Ginger Bay Backcountry Area Ramp, Vinson Landing Walk-in Access Point
52	Calloway/Stewart	KY/TN	Blood River Confluence and Embayment, 4 marinas and ramps, 2 campgrounds on 7 cove miles	LBL National Recreation Area, LBL Regional Water Trail
51	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail, Rushing Creek Campground and Walk-in Access Point, Dilday Landing Walk-in Access Point
50	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail
49	Calloway/Stewart	KY/TN		LBL National Recreation Area, LBL Regional Water Trail, Jones Creek Boat Ramp
48	Calloway/Trigg	KY		LBL National Recreation Area, LBL Regional Water Trail
47	Calloway/Trigg	KY		LBL National Recreation Area, LBL Regional Water Trail, Redd Hollow Backcountry Campground and Ramp
46	Calloway/Trigg	KY	Sunset Harbor Hill Campground and Ramp, Pacer Point Boat Ramp	LBL National Recreation Area, LBL Regional Water Trail, Colson Hollow Group Camping Area and Ramp

45	Calloway/Trigg	KY	Kenlake Resort State Park	LBL National Recreation Area, LBL Regional Water Trail, Mays Hollow Walk-in Access, Turkey Bay OHV Area Ramp
44	Calloway/Trigg	KY	Kenlake Resort State Park	LBL National Recreation Area, LBL Regional Water Trail
43	Marshall/Trigg	KY	Kenlake Resort State Park, Lost Creek RV Park and Campsite	LBL National Recreation Area, LBL Regional Water Trail
42	Marshall/Trigg	KY	Kenlake Resort State Park, Kenlake Marina and Boat Ramp, Kenlake Campground	LBL National Recreation Area, LBL Regional Water Trail, Fenton Self Service Campground and Ramp
41	Marshall/Trigg	KY	Kenlake Resort State Park, Aurora Oaks Campground	LBL National Recreation Area, LBL Regional Water Trail
40	Marshall/Trigg	KY	Kenlake Resort State Park, Cherokee Lane Boat Ramp	LBL National Recreation Area, LBL Regional Water Trail
39	Marshall/Trigg	KY		LBL National Recreation Area, LBL Regional Water Trail
38	Marshall/Trigg	KY	Major Embayment, 4 Marinas, 7 Ramps 3 Campgrounds and 3 Parks on eight cove miles	LBL National Recreation Area, LBL Regional Water Trail
37	Marshall/Trigg	KY		LBL National Recreation Area, LBL Regional Water Trail, Higgins Bay Walk-in Access
36	Marshall/Trigg	KY		LBL National Recreation Area, LBL Regional Water Trail, Sugar Bay Campground Ramp
35	Marshall/Lyon	KY	Hickory Hill Resort Marina and Ramp, Cozy Cove Resort Marina and Ramp, Shawnee Bay Resort Marina and Ramp	LBL National Recreation Area, LBL Regional Water Trail, Ingran's Landing Walk-in Access
34	Marshall/Lyon	KY		LBL National Recreation Area, LBL Regional Water Trail

33	Marshall/Lyon	KY	Hester's Resort Campground, Marina and Ramp, Southern Komfort Marina, Campground and Ramp, Bee Spring Campground, Marina and Ramp	LBL National Recreation Area, LBL Regional Water Trail
32	Marshall/Lyon	KY		LBL National Recreation Area, LBL Regional Water Trail, Smith Bay Campground Ramp
31	Marshall/Lyon	KY	Birmingham Bay Point Campground and Ramp, Major Cove Access with 4 Marina, 4 Ramps and 2 campgrounds on Four Cove Miles	LBL National Recreation Area, LBL Regional Water Trail
30	Marshall/Lyon	KY	Moors Resort RV Campground, Marina and Ramp, Buckhorn Bay Park Rd Ramp	LBL National Recreation Area, LBL Regional Water Trail, Pigsah Point Backcountry Area Ramp, Hillman Ferry Campground South Ramp, Hillman Ferry Campground
29	Marshall/Lyon	KY		LBL National Recreation Area, LBL Regional Water Trail, Hillman Ferry Campground and North Ramp, Moss Creek Picnic Area Walk-in Access
28	Marshall/Lyon	KY		LBL National Recreation Area, LBL Regional Water Trail, Twin Lakes Campground, Ramp and Walk-in Access
27	Marshall/Lyon	KY	Little Bear Public Use Are Ramp	LBL National Recreation Area, LBL Regional Water Trail
26	Marshall/Lyon	KY		LBL National Recreation Area, LBL Regional Water Trail
25	Marshall/Livingston	KY	Sled Creek Boat Ramp	LBL National Recreation Area, LBL Regional Water Trail, Barkley Canal - Connection to Lake Barkley
24	Marshall/Livingston	KY	Kentucky Dam Village State Park, Marina and Ramp	Lighthouse Landing Marina, Crockett Frontiers Campground
23	Marshall/Livingston	KY	Kentucky Dam Village State Park, Boat Ramp	

22	Marshall/Livingston	KY	Kentucky Dam, Kentucky Dam Village State Park, Kentucky Dam Boat Basin and Campgrounds	
21	Marshall/Livingston	KY		
20	Marshall/Livingston	KY		
19	Marshall/Livingston	KY		
18	Marshall/Livingston	KY		
17	Marshall/Livingston	KY		
16	Marshall/Livingston	KY	Hadex Ferry Ramp Access	Hadex Ferry Park and Boat Ramp
15	Marshall/Livingston	KY		
14	Marshall/Livingston	KY		
13	Marshall/Livingston	KY		
12	Marshall/Livingston	KY		
11	Marshall/Livingston	KY		
10	Marshall/Livingston	KY		
9	Marshall/Livingston	KY		
8	McCracken/Livingston	KY		
7	McCracken/Livingston	KY		
6	McCracken/Livingston	KY		
5	McCracken/Livingston	KY		
4	McCracken/Livingston	KY	Clark's River Confluence and Boat Ramp	
3	McCracken/Livingston	KY		
2	McCracken/Livingston	KY		
1	McCracken/Livingston	KY		
0	McCracken/Livingston	KY	Paducah Public Landing and Boat Ramp Area	

C. Economic Impact Methodology

Potential economic impacts for the Tennessee RiverLine are calculated using a Regional Input-Output Modeling System and RIMS II multipliers, which are from the U.S. Bureau of Economic Analysis (BEA). The most recently available multipliers are used, which are from 2019. Multipliers are calculated by the BEA and are specific to Tennessee. The multipliers are calculated from the North American Industry Classification System (NAICS). The output multipliers represent the total dollar change in output that occurs in all industries for each additional dollar of output delivered to final demand by industry. For example, the average output multiplier for all industries in 2019 is 2.15. The income multiplier represents the total dollar change in household earnings for each additional dollar of output delivered to final demand. The employment multipliers represent the total change in the number of jobs that occur in all industries for each additional one million dollars of output delivered to final demand by industry. The average income and employment multiplier for all industries in 2019 is 0.58 and 13.0, respectively.

One primary purpose of this study is to analyze the benefits of the Tennessee RiverLine to the local and state economies. The economic benefits accruing to the Tennessee River communities in Alabama, Kentucky, Mississippi, and Tennessee are measured by the increase in production of goods and services as measured by state gross domestic product, the number of jobs created, and the amount of personal income that is generated for states' residents. A fiscal benefit accounted for in this study is the additional sales tax revenue generated for state and local governments due to the increase in economic activity associated with the Tennessee RiverLine.

The economic impacts on state gross domestic product or output are further broken down into direct, indirect, and multiplier effects. Direct effects represent spending by paddling visitors to the Tennessee RiverLine. These expenditures include spending on lodging, food, supplies, equipment, gas, entertainment, etc. in the region while visiting the Tennessee RiverLine. Indirect effects arise as businesses purchase raw materials, services, supplies, and other operating services that help support jobs in regional businesses. The economic effects of the Tennessee RiverLine increase as the share of raw materials and other inputs acquired within the region increase. Only the portion of expenditures actually retained by an in-state vendor can be used in the calculation of the firm's indirect income benefit to the states' economy. For example, if kayaks are purchased from a local outdoor shop, but the kayaks were actually manufactured outside the Tennessee RiverLine states, only the mark-up of the kayaks above cost would be the source of new income in the states. State and local governments gain benefits resulting from taxes on these sales, but this impact is counted separately. Therefore, the size of indirect impacts depends primarily on the dollar value of regionally purchased goods and services (i.e., supply chains) and whether

these same goods and services are produced within the region or imported to the states.

Multiplier effects are created as additional income generated by the direct and indirect effects is spent and re-spent within the local economies in Alabama, Kentucky, Mississippi, and Tennessee. For example, paddler visitors spend money at restaurants, and part of the wages received by restaurant employees will be spent on retail sales. A portion of the sales receipt will be used to pay the employees of the retail establishments. In turn, these employees will spend a portion of their income in the local economies on items such as groceries, housing, clothing, etc., which adds to the amount of regional output directly attributable to the Tennessee RiverLine visits. The multiplier effect is the value of goods and services purchased by in-state workers whose salaries and wages are affected by the increase in economic activity related to the Tennessee RiverLine. It should be noted that during each of these subsequent rounds of spending, a portion of the income generated leaks out of the states' economies through taxes, savings, and spending outside the region, thereby diminishing the increment to total state income attributable to these firms.

The total economic impact attributed to the Tennessee RiverLine is the sum of the direct, indirect, and multiplier effects. The model used in this report was developed by the Howard H. Baker Jr. Center for Public Policy at the University of Tennessee and relies on RIMS II multipliers to calculate economic impacts noted above. Inputs into the model include a baseline estimate of current paddler visits to the Tennessee River; estimates of additional visitors and annual expenditures using data from comparable water trails where economic impact studies have already been completed; and use density assumptions by mile for the Tennessee River. These inputs allow for the calculation of the output, income, employment, and sales tax revenue impacts accruing to the Tennessee River communities in Alabama, Kentucky, Mississippi, and Tennessee.

D. Health Impact Methodology

The Centers for Disease Control and Prevention (CDC) recommends that adults participate in at least 150 minutes of moderate-intensity aerobic physical activity per week. According to the CDC State Indicator report, 29 percent (Kentucky) to 36 percent (Mississippi) of residents in our four-state study area meet this guideline and are considered physically active. According to paddlesport industry estimates, 5.5 percent of the population in our four-state study area engages in flatwater paddlesports. Applying these percentages to the population in each state, we obtain an estimate of 274,374 residents in the four-state study area that are physically active flatwater paddlers. Because proximity to the Tennessee River is the prime determinant of its use, we multiply the percent of each state's population that lives in a county that borders the Tennessee River by the population of physically active flatwater paddlers in each

state to arrive at 36,166 physically active flatwater paddlers that would likely recreate on the Tennessee River. Estimation of health-related cost savings is based on our estimate of 36,166 physically active flatwater paddlers that live near the Tennessee River (Table 12).

The number of physically active flatwater paddlers that live near the Tennessee River was multiplied by the avoided costs associated with physical inactivity. Three types of costs were included: healthcare (both direct and indirect), workers’ compensation costs (both direct and indirect) and lost productivity (Table 13). Direct medical costs refer to the costs of actually treating the illnesses or medical conditions caused and/or exacerbated by physical inactivity, which include cardiovascular diseases, diabetes, depression and certain cancers as well as obesity. Indirect medical costs come from the impact on an individual’s quality of life resulting from adverse health conditions due to physical inactivity. Individuals can be eligible to collect workers’ compensation payments when injuries occur at the workplace. At the same time, an employer incurs administrative costs, or indirect workers’ compensation costs when workers claim compensation payments. There are two ways lost productivity costs to business can occur resulting from employee’s physical inactivity. The first one is through absenteeism, defined as “not being present or attending to duty or work”. The second is through presenteeism, defined as “being at work when you should be at home, either because you are ill or because you are too tired to be effective” (Chenoworth and Bortz 2005). Costs are presented in terms of the annual average costs of being a physically inactive per person. In other words, these benefits are the costs avoided by people utilizing the Tennessee River to exercise at a level that incurs positive health benefits.

Table 12. Total Population of Physically Active Paddlers that Live Near the Tennessee River

State	Total population	Working Age Population ^a	Total Active Population ^b	Physically Active Flatwater Paddlers ^c	Physically Active Flatwater Paddlers that Live Near the TN River ^d
Alabama	5,024,279	2,868,863	1,316,808	73,027	13,796
Kentucky	4,505,836	2,658,443	965,015	53,517	1,728
Mississippi	2,961,279	1,679,045	663,223	36,781	234
Tennessee	6,910,840	4,215,612	2,002,416	111,049	20,407
Total	19,402,234	11,421,964	4,947,462	274,374	36,166

^a U.S. Census

^b Centers for Disease Control and Prevention. State Indicator Report on Physical Activity, 2014

^c 2019 Special Report on Paddlesports and Safety. The Outdoor Foundation

^d Author’s calculations

Table 13. Cost Savings due to Physical Activity (dollars per person per year)

Costs	Low	Mean	High	Source
Direct Medical Care Costs	431	664	898	Pratt, et al. (2000)
Indirect Medical Care Costs	1,292	1,992	2,693	Chenoweth and Sugerman (2005)
Direct Workers' Compensation Costs	6	10	12	Chenoworth and Bortz (2005)
Indirect Workers' Compensation Costs	24	40	48	Chenoweth and Sugerman (2005)
Lost Productivity	Varies by state			Chenoworth and Bortz (2005)

The costs of physical inactivity fall into these categories:

Direct Medical Cost: These refer to the costs of actually treating the illnesses or medical conditions caused and/or exacerbated by physical inactivity. Pratt, et al. (2000) finds direct medical costs range from \$216 to \$446 with a mean of \$330 in 2000 dollars. Given the high medical-cost inflation rate in recent years, these costs were multiplied by the medical cost CPI to reflect costs in 2021. Medical costs CPI was obtained from the Bureau of Labor Statistics. Inflated direct medical cost per person per year in this section ranges from \$431 to \$898 with a mean of \$664 in 2021 dollars (Table 14).

Indirect Medical Costs: Indirect medical costs come from the impact on an individual's quality of life resulting from adverse health conditions due to physical inactivity. A dollar value is assigned to pain and suffering from medical conditions and shorter life expectancy associated with physical inactivity. The ratio of indirect medical costs to direct medical costs is 3:1 based on Chenoweth and Sugerman (2005). Indirect medical costs used for analysis ranges from \$1,292 to \$2,693 per person per year with a mean of \$1,992.

Direct Workers' Compensation Costs: Individuals can be eligible to collect workers' compensation payments when injuries occur at the workplace. It has been shown that physically inactive individuals are more likely to incur workers' compensation injuries and have longer recovery periods. Chenoworth and Bortz (2005) estimate a range of worker compensation costs from \$6 to \$12 per person per year with a mean of \$10.

Indirect Workers' Compensation Costs: When workers claim direct compensation, employers incur administrative costs, or indirect workers' compensation costs. Indirect workers' compensation costs have been estimated at about four times larger than direct workers' compensation costs. Consequently, per person per year indirect workers' compensation costs range from \$24 to \$48 with a mean of \$40. This ratio is higher than direct/indirect medical costs ratio because extraneous circumstances will delay and/or impair an individual's return-to-work time frame as well as on-the-job performance (Chenoweth and Sugerman 2005).

Lost Productivity: Lost productivity is the largest contributor to the costs of physical inactivity. There are

two ways lost productivity costs can occur resulting from employee’s physical inactivity. The first one is through absenteeism, defined as “not being present or attending to duty or work”. The second is through presenteeism, defined as “being at work when you should be at home, either because you are ill or because you are too tired to be effective”. They are calculated based on the data and methods from (Chenoweth and Bortz 2005). The median salary paid to workers in the state, the number of workers and average hours lost due to absenteeism and presenteeism were used for calculation. Table 15 and 16 show how costs were calculated.

Table 14. Medical Cost CPI and Direct Medical Costs

Year	Annual Percentage Change	Multiplier	Medical Costs		
			Min	Mean	Max
2000			214	330	446
2001	4.6	1.046	224	345	467
2002	4.7	1.047	234	361	488
2003	4	1.04	244	376	508
2004	4.4	1.044	254	392	530
2005	4.2	1.042	265	409	553
2006	4	1.04	276	425	575
2007	4.4	1.044	288	444	600
2008	3.7	1.037	299	460	622
2009	3.2	1.032	308	475	642
2010	3.4	1.034	319	491	664
2011	3	1.03	328	506	684
2012	3.7	1.037	340	525	709
2013	2.5	1.025	349	538	727
2014	2.4	1.024	357	551	744
2015	2.6	1.026	366	565	764
2016	3.8	1.038	380	587	793
2017	2.5	1.025	390	601	813
2018	2	1.02	398	613	829
2019	2.8	1.028	409	630	852
2020	4.1	1.041	426	656	887
2021	1.2	1.012	431	664	898

Sources: Pratt et al. (2000), Chenoweth (2005), Bureau of Labor Statistics

Table 15. Calculation for Absenteeism Cost

State		Avg Hours Lost per Year	Lost Hours as % of Workload	Median Compensation	Lost Compensation per Worker	# of Workers	Total Lost Compensation	% of Workers Physically Inactive	Total Lost Productivity Due to Inactivity	% of Workers that Paddle	Total Lost Productivity Avoided by Paddling	Per Capita Lost Productivity Cost
Alabama	Min	3.5	0.00175	\$50,536	\$88.44	1,758,609	\$155,527,863	0.541	\$84,140,574	0.055	\$4,666,229	\$ 2.65
	Mean	18.08	0.00904	\$50,536	\$456.85	1,758,609	\$803,412,502	0.541	\$434,646,164	0.055	\$24,104,403	\$ 13.71
	Max	24.88	0.01244	\$50,536	\$628.67	1,758,609	\$1,105,580,921	0.541	\$598,119,278	0.055	\$33,170,219	\$ 18.86
Kentucky	Min	3.5	0.00175	\$50,589	\$88.53	1,666,637	\$147,548,624	0.637	\$93,988,473	0.055	\$5,212,369	\$ 3.13
	Mean	18.08	0.00904	\$50,589	\$457.32	1,666,637	\$762,194,033	0.637	\$485,517,599	0.055	\$26,925,607	\$ 16.16
	Max	24.88	0.01244	\$50,589	\$629.33	1,666,637	\$1,048,859,930	0.637	\$668,123,775	0.055	\$37,052,495	\$ 22.23
Mississippi	Min	3.5	0.00175	\$45,081	\$78.89	958,126	\$75,588,237	0.605	\$45,730,883	0.055	\$2,536,122	\$ 2.65
	Mean	18.08	0.00904	\$45,081	\$407.53	958,126	\$390,467,235	0.605	\$236,232,677	0.055	\$13,100,881	\$ 13.67
	Max	24.88	0.01244	\$45,081	\$560.81	958,126	\$537,324,381	0.605	\$325,081,250	0.055	\$18,028,204	\$ 18.82
Tennessee	Min	3.5	0.00175	\$53,320	\$93.31	2,724,545	\$254,227,294	0.525	\$133,469,329	0.055	\$7,401,880	\$ 2.72
	Mean	18.08	0.00904	\$53,320	\$482.01	2,724,545	\$1,313,265,564	0.525	\$689,464,421	0.055	\$38,235,995	\$ 14.03
	Max	24.88	0.01244	\$53,320	\$663.30	2,724,545	\$1,807,192,878	0.525	\$948,776,261	0.055	\$52,616,789	\$ 19.31

Table 16. Calculation for Presenteeism Cost

State		Avg Hours Lost per Year	Lost Hours as % of Workload	Median Compensation	Lost Compensation per Worker	# of Workers	Total Lost Compensation	% of Workers Physically Inactive	Total Lost Productivity Due to Inactivity	% of Workers that Paddle	Total Lost Productivity Avoided by Paddling	Per Capita Lost Productivity Cost
Alabama	Min	131.5	0.06575	\$50,536	\$3,322.74	1,758,609	\$5,843,403,986	0.541	\$3,161,281,556	0.055	\$175,316,871	\$ 99.69
	Mean	140.75	0.070375	\$50,536	\$3,556.47	1,758,609	\$6,254,441,909	0.541	\$3,383,653,073	0.055	\$187,649,046	\$ 106.70
	Max	150	0.075	\$50,536	\$3,790.20	1,758,609	\$6,665,479,832	0.541	\$3,606,024,589	0.055	\$199,981,222	\$ 113.72
Kentucky	Min	131.5	0.06575	\$50,589	\$3,326.23	1,666,637	\$5,543,612,572	0.637	\$3,531,281,208	0.055	\$195,836,138	\$ 117.50
	Mean	140.75	0.070375	\$50,589	\$3,560.20	1,666,637	\$5,933,562,506	0.637	\$3,779,679,316	0.055	\$209,611,684	\$ 125.77
	Max	150	0.075	\$50,589	\$3,794.18	1,666,637	\$6,323,512,439	0.637	\$4,028,077,424	0.055	\$223,387,230	\$ 134.03
Mississippi	Min	131.5	0.06575	\$45,081	\$2,964.08	958,126	\$2,839,958,042	0.605	\$1,718,174,615	0.055	\$95,285,723	\$ 99.45
	Mean	140.75	0.070375	\$45,081	\$3,172.58	958,126	\$3,039,726,954	0.605	\$1,839,034,807	0.055	\$101,988,330	\$ 106.45
	Max	150	0.075	\$45,081	\$3,381.08	958,126	\$3,239,495,865	0.605	\$1,959,894,999	0.055	\$108,690,938	\$ 113.44
Tennessee	Min	131.5	0.06575	\$53,320	\$3,505.79	2,724,545	\$9,551,682,616	0.525	\$5,014,633,373	0.055	\$278,099,187	\$ 102.07
	Mean	140.75	0.070375	\$53,320	\$3,752.40	2,724,545	\$10,223,569,035	0.525	\$5,367,373,744	0.055	\$297,661,298	\$ 109.25
	Max	150	0.075	\$53,320	\$3,999.00	2,724,545	\$10,895,455,455	0.525	\$5,720,114,114	0.055	\$317,223,408	\$ 116.43

To estimate the total cost savings, we not only need the number of physically active flatwater paddlers that utilize the Tennessee River, we also need to apply the percentage of these paddlers' exercise that is due to paddling to avoid over-estimate. According to the 2015 Special Report on Paddlesports produced by The Outdoor Foundation¹⁵, a flatwater kayaker and canoer spends an average of 30.2 hours paddling each year or 0.58 hours each week. This weekly paddling activity is 23.23% of the minimum physical activity recommended by the CDC. This percentage is utilized to calculate the total cost saving that are actually attributed to flatwater paddling activity on the Tennessee River. Table 17 shows the avoided costs of each category by multiplying the values of Table 13 by the total number of physically active flatwater paddlers living near the Tennessee River and 23% to obtain cost savings attributed to flatwater paddling on the Tennessee River.

¹⁵ 2015 Special Report on Paddlesports. The Outdoor Foundation <https://outdoorindustry.org/wp-content/uploads/2017/05/2015-Paddlesports-Research.pdf>

Table 17. Health Related Costs Attributable to Paddlesport Recreation Access on TN River per Year

State	Direct Medical Care Costs			Indirect Medical Care Costs			Direct Workers' Compensation Costs			Indirect Workers' Compensation Costs			Lost Productivity		
	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max	Min	Mean	Max
Alabama	\$1,380,288	\$2,128,481	\$2,876,674	\$4,140,863	\$6,385,443	\$8,630,023	\$19,230	\$32,050	\$38,460	\$76,920	\$128,201	\$153,841	\$328,014	\$385,915	\$424,912
Kentucky	\$172,926	\$266,661	\$360,397	\$518,777	\$799,984	\$1,081,190	\$2,409	\$4,015	\$4,818	\$9,637	\$16,061	\$19,274	\$48,437	\$56,987	\$62,746
Mississippi	\$23,424	\$36,121	\$48,818	\$70,271	\$108,362	\$146,453	\$326	\$544	\$653	\$1,305	\$2,176	\$2,611	\$5,553	\$6,533	\$7,193
Tennessee	\$2,041,696	\$3,148,410	\$4,255,123	\$6,125,088	\$9,445,229	\$12,765,370	\$28,445	\$47,408	\$56,890	\$113,779	\$189,632	\$227,558	\$496,781	\$584,473	\$643,534
Total	\$3,618,333	\$5,579,673	\$7,541,012	\$10,855,000	\$16,739,018	\$22,623,036	\$50,410	\$84,017	\$100,821	\$201,642	\$336,070	\$403,283	\$878,786	\$1,033,908	\$1,138,386

There are approximately 36,166 physically active flatwater paddlers living near the Tennessee River within the 4-state study region. Physical activity results in annual direct medical cost savings of \$5.6 million, with a range of \$3.6 million to \$7.5 million and annual indirect medical cost savings of \$16.7 million, with a range of \$10.9 million to \$22.6 million; annual direct worker compensation cost savings of \$0.08 million with a range of \$.05 million to \$0.1 million and annual indirect worker compensation cost savings of \$0.34 million with a range of \$0.2 million to \$0.4 million; annual lost productivity savings of \$1.0 million with a range of \$0.88 million to \$1.1 million (Table 17).

Total avoided cost savings attributed to preserved open space amount to \$23.8 million, with a range of \$15.6 million to \$31.8 million (Table 18).

Table 18. Min, Mean, and Max Health-related Cost Savings per Year

State	Physically active paddlers that live near the TN River	Min	Mean	Max
Alabama	13,796	\$5,945,316	\$9,060,090	\$12,123,911
Kentucky	1,728	\$752,187	\$1,143,709	\$1,528,425
Mississippi	234	\$100,879	\$153,735	\$205,727
Tennessee	20,407	\$8,805,789	\$13,415,151	\$17,948,476
Total	36,166	\$15,604,171	\$23,772,685	\$31,806,539