

# The Economic Benefits of Greenways in the Pikes Peak Region

*Prepared for*

**The Greenway Fund**

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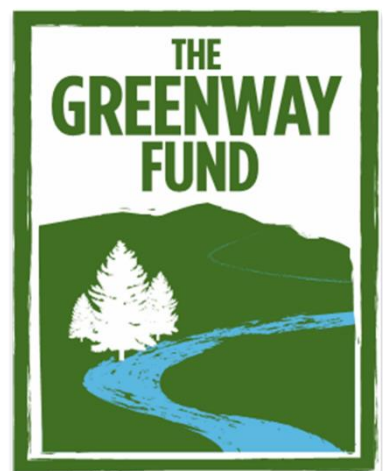
Tom Binnings & Jason Doedderlein

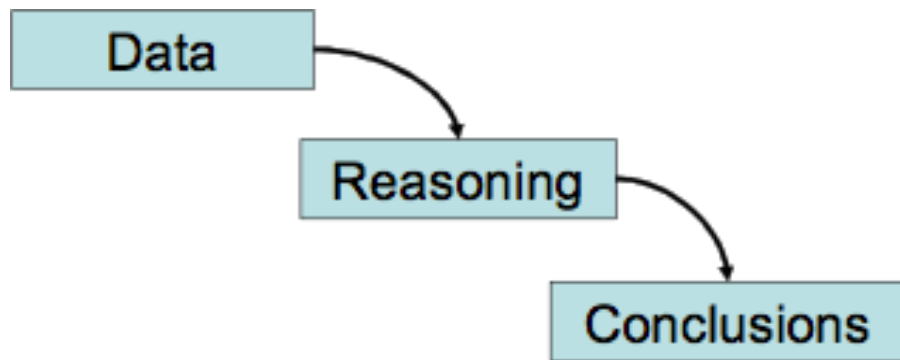


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# Introduction

## Purpose

*Genuine [economic] value lies in the power to sustain or enrich life*

Lewis Mumford<sup>1</sup>

Lewis Mumford's view of economic value was undoubtedly influenced by his study of cities and urban architecture. Given the role of urban waterways historically and the growing greenway movement today, his fundamental assessment of economic value is a good starting point for this study. There are those who see greenways in a historical context as having little economic value or as being an economic burden on the community. If this view of greenways as a cost instead of an asset prevails, an incredible opportunity will be missed to renovate the urban landscape in the coming decades.

This study hopes to offer an economic perspective to better assess the genuine value of greenways as we increasingly live in an era when public investment must undergo greater scrutiny. Without allocated valuations, decision-makers and community stakeholders are bound to prioritize spending on greater speculation, less complete information, and general perceptions which may be unduly based upon historical challenges as opposed to the possibilities that emerge from future visions. This, by its very nature, can result in misallocation of scarce economic resources if the future attempts to break from the status quo of the past. To help articulate the vision of The Greenway Fund, this investigation considers the asset nature of greenways, the returns they show for communities, and the economic benefits of specific greenway projects in the Pikes Peak region.

Greenways offer recreational opportunities and improve community health. People commute along them and they often attract tourists and their coveted spending. Greenways also have an impact on the communities through which they run. They generate economic and local tax impacts, promote neighborhood and educational activities, and contribute to greater environmental, human and community health. Many of the secondary and even tertiary benefits considered here may not be generally acknowledged, especially in an economic context, as those benefits are numerous and not always economically quantifiable.

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<sup>1</sup> Lewis Mumford, (October 19, 1895 – January 26, 1990) was an American historian, sociologist, philosopher of technology, and literary critic. Particularly noted for his study of cities and urban architecture, he had a broad career as a writer. Bio from Wikipedia

In answering the question, “what are the economic benefits of greenways” and this report specifically addresses three community assets:

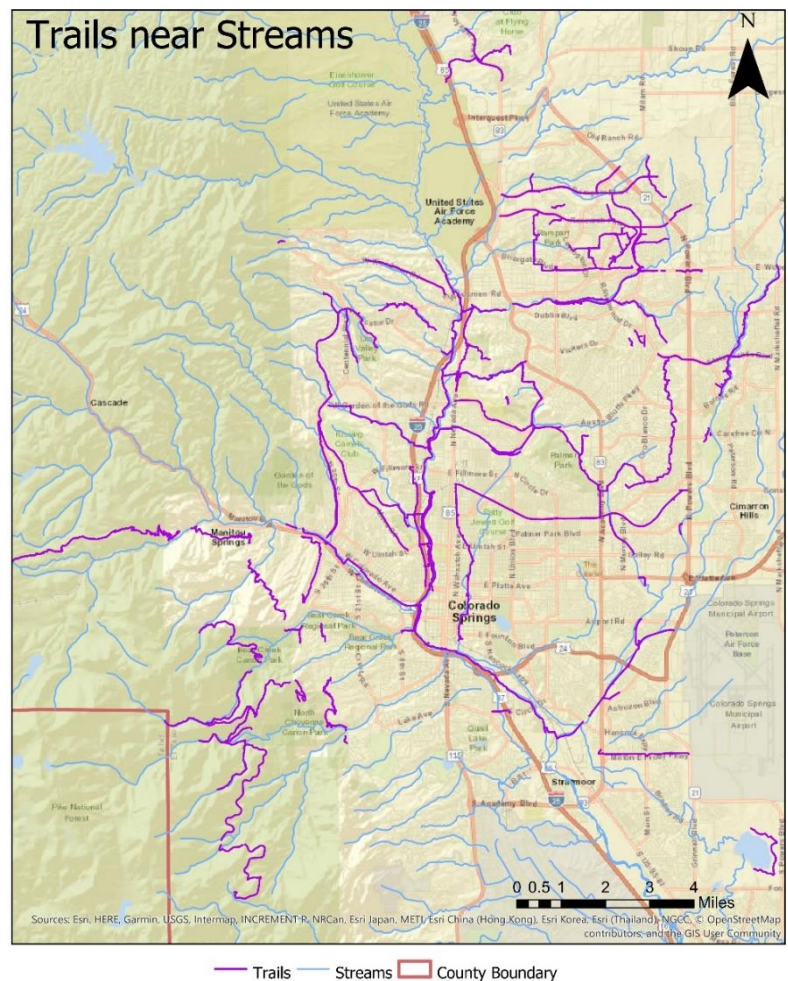
- the Legacy Loop, encircling downtown Colorado Springs;
- the Midland Trail, connecting historic Manitou Springs and Old Colorado City while running between Garden of the Gods and Red Rocks Park;
- Sand Creek as it runs from Airport Road Powers Boulevard towards the confluence with Fountain Creek through a low and moderate income area of Colorado Springs.

These three trails provide a lens for exploring future greenway projects within socio-economic contexts by comparing and contrasting the economic impacts of the different greenways. The answers and information obtained during the research has offered many insights and some surprises as to the impacts greenways have on the surrounding area and the greater community at large.

## Greenways Defined

The temptation is to define greenways based upon waterway networks such as the Fountain Creek Watershed. While this approach has merit as noted in the adjacent map showing many trails in El Paso County running near or in waterways (see purple trails versus blue riparian areas), the definition has been broadened where greenways are viewed within an urban economic and planning context. The “open space” concept began emerging in the 1970s as cities expanded and environmental concerns grew. Today there are numerous definitions but at the core there is “green” as in more natural and “ways” as in corridors and networks.

Perhaps the best overall definition comes from the European Greenway Association, which in 2004 defined “greenways as both protecting



environmental values and the network of routes that are allocated for only the motorless vehicles (on horseback, bicycling or etc.) in order to increase the health of environmental life” (Salici, 2013).

This definition certainly applies in El Paso County to include urban area paths along Fountain, Monument, Sand, and Cottonwood Creeks, as well as rail trails along abandoned railroads and trails on mesa ridges. These are in addition to the numerous trails entering the mountains and Pike National Forest from Colorado Springs – many of which have been used for hiking for over a century.

One might note that Colorado Springs and the Pikes Peak Region have a long history of human interaction with nature in greenspaces for recreational purposes, but what is different now is the emergence and growing emphasis on urban greenways. Urban greenways make the benefits associated with greenways more accessible to more households, which expands regional recreational opportunities while also decreasing pressure from the overuse of traditional trails in the region. As greenways are integrated into planning visions and strategies for the region, economic implications emerge.

## **Methodology**

### Overview

There is not large body of literature in either academic or applied economics addressing the economic impact of greenways. This study attempts to cut a new path for viewing the impacts. It is predicated on the relatively large body of work on the economic value of urban parks as well as traditional cost-benefit analysis.

Under traditional cost-benefit analysis, projects can be evaluated from the perspective of societal and economic benefits generated relative to public and/or private costs incurred or investments required. In this sense, the benefit to cost ratio is similar to a return on investment analysis – return or benefit resulting from the cost or investment expended.

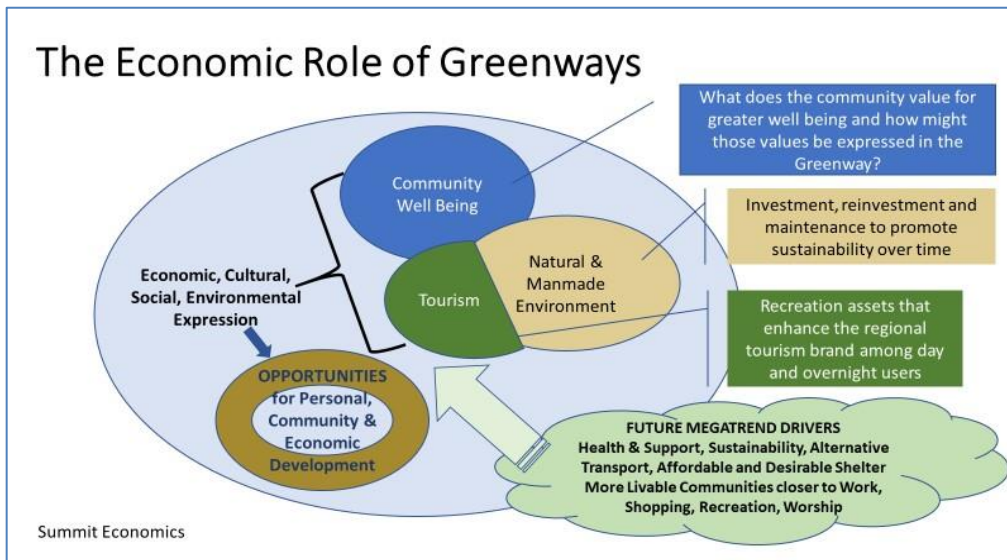
To engage in such an analysis, the project has to be well-defined and the costs have to be well-understood. Given the purpose of this study, specific costs associated with the overall greenway or specific greenway projects are unknown and it is not the intent to calculate a return on investment<sup>2</sup>. Instead, the focus here is to quantify benefits that might accrue to three specific greenway trail segments and thereby begin to understand the potential of each segment, as well as greenways in general. It is hoped that this approach can assist in future

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<sup>2</sup> While not the focus, this report does offer some observations regarding investments in the Conclusion section.



prioritizing, visioning, planning, and advocating for greenway usage, development, and redevelopment.



As shown in the adjacent graphic, greenways provide benefit to: 1) Community Well Being, 2) the Natural and Manmade Environment, and 3) Tourism. Every household, neighborhood, or community has a sense of their overall well-

being. Increasingly, economic literature is moving beyond traditional economic measures, such as market value created or gross production and output, to consider whether individuals or groups are “happy” however they might define it. “Happiness” is an element of well-being, as is health, social connectedness, economic security, sense of community and even culture.

Well-being does not equate to wealth or income, although economic security helps. Some cultures exist in below-average economic conditions and report high levels of wellbeing.<sup>3</sup> While historically there has been a dearth of empirical research on this matter, we are seeing signs of emerging research around happiness and overall quality of life as opposed to economic standards of living and income levels. For instance, research done by Buettner, a National Geographic Fellow, while not robust from an academic point of view, leads him to conclude “our data show that people tend to be happiest close to water and when they have access to nature, green spaces, and fruits and vegetables. Walkability and bikeability also always correspond to higher well-being” (Buettner, 2017).<sup>4</sup>

On the commercial side of the equation, usage of greenways can cause neighboring real estate to change use – typically to more dense development, often with a mix of uses within a single structure (i.e., residential, hotel, office, retail). As greenways become heavily used for transportation as well as recreation, new commercial nodes can emerge as economic thresholds are achieved. In these situations urban design often transforms and the greenway

<sup>3</sup> Many South and Central American countries are examples of high reported happiness despite lower economic income and wealth (<https://www.nationalgeographic.com/magazine/2017/11/worlds-happiest-places/>).

<sup>4</sup> <http://www.cnn.com/2017/11/22/health/happiest-cities-blue-zones/index.html>

becomes the front door or show piece of the real estate rather than a negative externality historically associated with floodplains or urban dumping grounds.

An additional economic role of greenways is that the presence of nature in urban areas can help keep the local area cleaner and cooler. It can also serve an educational role by exposing students and the population at large to natural elements and ecosystems. This can promote an ethos of natural sustainability and intergenerational obligation.

If a quality natural environment is desired by the local population, they will use it and typically want to be closer to it. This can drive people's decision where to locate residences, stores, and offices, and often increases the amount of resources dedicated to developing, maintaining, and redeveloping manmade improvements including both private and public property.

The tourist element may only exist marginally in some places, but greenways are becoming a place to share with out-of-town visitors along with other unique community assets that drive local pride. In the case of the Pikes Peak Region, tourism, especially outdoor tourism, is a significant local industry and the potential impact of greenways is substantial.

These three realms evolve over time based upon societal megatrends which influence most communities and sub-cultures. The megatrends and three realms are expressed in the area through economic, social, cultural, and environmental outcomes. Economically, a greenway may increase property values and local tax collections. Socially, there may be more community engagement or a higher degree of social interaction among households and groups, culturally, aspects of greenway or nature may become what economic anthropologists call "sacra" or sacred elements to be preserved, and environmentally, efforts to maintain the natural qualities may persist.<sup>5</sup>

From these expressions emerge opportunities for personal, community, and economic development. If the desirability of the expressions is growing, being pushed by megatrends, opportunities are better positioned for being pursued and being realized through the push of momentum towards critical tipping points or thresholds where new realities become apparent<sup>6</sup>.

This report largely drew upon existing economic and scientific literature documenting the economic benefits of urban greenspaces. The intent was to understand the current impacts of

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<sup>5</sup> An excellent local example of the power of local "sacra" in Colorado Springs was the substantial outcry over placing a metal frame in Garden of the Gods. In other words the Garden of the Gods is a local sacra which has value far beyond market value.

<sup>6</sup> A good example of this transformation taking place is the giant online retailer Amazon searching for a second headquarters. While traditional labor force requirements and tax incentives will play significant roles, there is discussion surrounding Amazon's culture. Twenty percent of Amazon employees do not use motorized transport to get to work and 15% live in the same zip code in which they work (New York Times, Oct 26, 2017).

greenways on the communities within which they exist. Most of these benefits have been quantified in the literature to some degree or another. As greenways evolve we expect much more research will be conducted. The effort herein attempts to use what is known and generally accepted to document the economic outcomes of greenways as a starting point. In this sense it is a prospective view of what might be, given current conditions and trends.

As the research began it became apparent that the studies in this arena, dating back over a century, are largely based around urban parks. As evidenced by this, Colorado Springs recently had a study done by the Trust for Public Lands reviewing the economic impacts of the city's parks. Where available, greenway studies were used, however, much of the modeled impact on surrounding neighborhoods is drawn from the expansive park literature and we use this to support the findings on greenways.<sup>7</sup>

Through this research we also obtained a deeper understanding of the historical uses of urban waterways and how those uses have changed over time, including the modern era where perceptions of these waterways have shifted from a waste sink to an urban asset and redevelopment opportunity.

#### Modeling Three Greenway Segments

Economic modeling pursues quantification to get reasonable economic views of reality. Given that this study models greenways prospectively, or into the future, as well as for present conditions, it relies on existing observations as well as assumptions in guiding future trajectories. Given the potential geographic breadth of greenways in the Fountain Creek watershed, forecasting their future is a daunting task. Furthermore, modeling at the macro level (of an entire watershed) makes detailed considerations difficult. To make it more manageable, Summit Economics has created three cases where modeling can be more focused, accurate in documenting meaningful present conditions, forecasting future potential, and useful in stimulating discussions and collaborative deliberations.

From this perspective this report intends to:

- Enhance understanding of greenways for strategic and advocacy planning;
- Promote Return on Investment thinking;
- Advocate neighborhood level as a better basis for discussion, critique, and planning;

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<sup>7</sup> It is also worth noting that other local studies are being conducted such as "City of Colorado Springs Bike Study" to be published final March 2018 pending finding City of Colorado Springs City Council approval and an ULI study of southeast Colorado Springs titled "Urban Land Institute Advisory Services Program: Colorado Springs, Colorado January 7-12, 2018". This economic impact of greenways was completed without the benefit of the results of these concurrent studies.

- Promote better understanding of the economics of greenways through comparative discussions of different greenway segments;
- Create a tool that might assist in studying additional segments in the future.

This modeling was first done for the Legacy Loop and then refined before being applied to the Manitou – Old Colorado City (MOCC) section of the Midland Trail and Sand Creek between Hancock and Airport in the area to the west of the Colorado Springs Airport. The El Paso County assessor’s office 2017 data set was used to aggregate property values and other household information for various areas within the county. The information allowed for comparisons of locations near greenways to similar areas not as close to greenways.

### Research Approaches

Extensive secondary research was conducted to develop values that can be applied to greenway usage to document benefits (especially trail related) and surrounding property values. The model uses, as a foundation, research findings of Dr. John Crompton of Texas A&M University. His research on parks and open space create the standard for analysis related to property values. He concludes that there is a “proximate value” associated with real estate and greenspaces. This value is derived from greenspaces exerting a definite influence on surrounding property values; especially those within 500-600 feet of the greenspace (Crompton J. L., 2004).<sup>8</sup> The impact on value, can be positive or negative. Secondary research was also conducted on additional benefits associated with greenways.

Existing studies and plans of Fountain Creek watershed were reviewed including work on the Fountain Creek watershed through the Visioning Task Force and other groups. Efforts by these groups culminated in both a Strategic Plan and Master Plan and should be consulted for sensitive areas that may be harmed by better access and/or intensive usage of greenways.

Additional data and information was gathered in the form of mapping. The maps provided a tool for developing a more thorough understanding of the complexity and opportunity within the watershed. The types of maps reviewed include floodplain, formal trails, destination nodes such as schools, planned stormwater projects, population density, health density, master plans and wetlands, among others.

Limited observations were conducted of the three trail segments during the month of October 2017. In addition, data from usage counts on the Monument Valley Park section of the Legacy Loop (northwest section of the loop) were reviewed.<sup>9</sup> This data was helpful for looking at usage

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<sup>8</sup> In this report “proximate” value is used interchangeably with “proximity” value to help facilitate understanding of some of the correlations between location, property values, and greenway usage.

<sup>9</sup> The counts were taken adjacent to the Colorado College athletic fields

by month, day, and hour. An online “heatmap” of usage by bike and on foot confirmed observations as well as some of the research surrounding greenways.

Finally, through our research, we came across some unique concepts in the evolving field of greenways studies for funding projects and ongoing maintenance and operations of parks and greenways. These approaches were supplemented with our own knowledge regarding public finance and emerging financing mechanisms and are outlined in the study.

## History of Urban Waterways

Urban greenways today tend to be adaptive reuse of abandoned railroad rights of way and natural riparian drainage areas that existed before the city developed. In fact, urban waterways were often viewed as liabilities or nuisances in many cases as urbanization overlaid natural watersheds resulting in changed hydrology through the urban area. To minimize flooding and erosion, which limited economic uses, urbanized watersheds were increasingly channeled with concrete, rip rap, and other materials.

Historically, river corridors were the main transportation corridors preceding and during the industrial age. The less dramatic topography associated with riparian corridors led to roads and railroads being placed adjacent to waterways. Prior to the industrial age, these corridors served to move people and goods by water, horse drawn wagons or foot traffic. They often became locations for manufacturing and storage due to the proximity to the transportation. The drainage areas also frequently became an entry point for poorer individuals when migrating into urban areas due to the availability of water, waste removal, open space, and access to resources.

From this perspective, urban greenways are emerging in urban areas replacing land uses that have become rather obsolete with uses more suitable for serviced based and wealthier economies. Most notable are natural areas for recreation and physical activity in modern societies which have become more prone to sedentary lifestyles. As the future evolves this modern role and the emerging need for alternative transportation and “smart” cities is likely to continue driving greenways into greater use and desirability within the urban fabric.

A great example of this transition can be seen along the South Platte River and Cherry Creek in Denver.

### Denver's Transformation

Today, many communities in Colorado have redeveloped their waterways consistent with the modern era. These include the Riverwalks in Pueblo and Castle Rock as well reorienting commercial and higher density development towards waterways in communities like Durango, Breckenridge, and Salida. Denver was one of the first cities in America to begin to make massive changes to how it treated its waterway and to see value in the decaying abandoned industrial zones. These changes, much like the fire on the Cuyahoga, were instigated by a disaster.

On June 16<sup>th</sup> in 1965, within the space of four hours, fourteen inches of rain fell north of Palmer Lake, Colorado. (Prendergrast, 2015) This deluge sent a wall of water flowing down small tributaries to Plum Creek, and from Plum Creek the wall pushed into the South Platte River, several miles southwest of Denver. As the water pushed into the Denver metro area it began

sweeping up houses, bridges, and everything that had been dumped into the river and piled along its banks (Stevens, 1981) with another \$183 million (\$1.4 billion in 2017 dollars) of damage in downstream areas. (Matthai, 1969)

The 1965 flood required Denver to reevaluate how it had treated the South Platte River and the role humans had to play in impacting the natural environment. In 1969 the city formed the Urban Drainage and Flood Control District (“UDFCD”), to begin the task of trying to maintain the waterway and minimize the risk of future floods. In 1974, what was to become the Greenway Foundation was created with \$2 million of city money, with the task of improving the waterway, from an environmental perspective. That \$2 million would be leveraged to create one of the most extensive and modeled greenway systems in the country.

A 1980 article in the Rocky Mountain News describes how quickly the transformation of the Platte happened: “In a brief space of five years, the Platte River Project has transformed a blighted, degraded river—little more than an open sewer—into a major amenity for Denver. (Warren, 1980)”

Today, the river is the centerpiece of Denver’s urban development vision, with a plan to build upon what has already been accomplished because it has become apparent the economic opportunities that exist when cities transform their waterways into assets. This plan, part of the “DenverVision” created by Mayor Michael Hancock, aims to build a series of “transformational projects that will create recreational and development opportunities, improve river access and better utilize the entire (river) corridor – including 24 miles of waterfront space – through a mix of retail, residential, hotel, industrial and office real estate.” (DenverVision)

According to DenverVision, over the next two decades, the Platte River corridor, as projected by the City of Denver, is expected to generate 22,000 jobs (including 1,800 jobs during the construction period), \$550 million in economic benefit, and up to \$4.3 million annually in new revenue for the city. The plan is a continuation of the transformation that began in 1974 and will “create beauty and opportunity from a vastly under-utilized natural resource” with a total economic impact expected to be \$5.4 Billion.<sup>10</sup>

Other cities have followed suit. One study notes, “In the 1990s, there was an exponential growth in interest in developing greenway trails”. (Crompton J. L., 2004) This urban trend accompanies the development of “rail trails” or the repurposing of abandoned railroad lines from the industrial age. When combined with the emerging renaissance of inner cities and continued constraints associated with automobile based transportation systems, the result focuses new urban planning paradigms on “smart growth” and new urbanism both of which

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<sup>10</sup><https://www.denvergov.org/content/dam/denvergov/Portals/690/documents/New/Smart%20Jobs%20Development.pdf>

focus more on self-contained, mixed use communities seeking to transform the urban landscape, including greenways. In this context greenways are increasingly viewed as a sustainable urban planning strategy (Salici 2013)<sup>11</sup>.

For brief summaries of what other cities have done and the results they have seen, please refer to the “Case Studies” section in the Appendix A.

## **The Changing Role of Rivers in Civilization**

Human history began on the banks of Rivers. Fossilized remains of our earliest known hominid ancestors were found next to Ethiopia’s Awash River. Evidence of the historic change from mostly nomadic hunting and gathering tribes to stable farming communities first appears in the narrow river valleys within the mountains of the Middle East. And the first civilizations emerged in the third millennium BCE along the Euphrates, Tigris, Nile and Indus, and a little later along the Yellow River in China. (McCully, 2001)

### Industrialization

The harnessing of the power of steam to drive engines ushered in the industrial revolutions. This momentous turning point in human history occurred along the rivers and streams of northern England. Industrialization had a profound impact on rivers. The burdens placed on urban waterways grew as they increasingly became waste sinks for what was disposed from growing populations and industrial processes. The new machines also significantly increased humanity’s ability to change nature, allowing us to have a much greater impact than we had previously been capable.

As the demands placed upon urban waterways grew, they began to exceed the river ecosystems’ ability to remove and/or process the waste. As pointed out in one book reviewing river’s histories, “The once natural waterways had acquired many new functions. Not only did it have to guarantee the steady flow of increased navigation, but it also had to supply drinking water, dispose of wastes, and serve as an important source of energy” (Evenden, 2012). The abuse of the rivers by an industrializing world continued unabated despite common outbreaks of typhoid and cholera epidemics. The focus was on economic growth, which preceded technologies to build treatment systems or manage the wastes going into our waterways. “Typhoid outbreaks continued with great frequency (into the early 1900’s)... Installing water treatment, rather than sewage treatment, systems was typical for the time” (Evenden, 2012).

As an example, by the early 1930s, many of the communities along the Potomac, upstream of Washington D.C. had stopped using land for the disposal of their human waste and instead built

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<sup>11</sup> <https://www.intechopen.com/books/advances-in-landscape-architecture/greenways-as-a-sustainable-urban-planning-strategy>



sewage systems to move the waste away from the town and into the river. These public works were able to move untreated household waste more efficiently to the river, but caused significant potential health issues for those communities downstream, as well as damaging the health of the rivers. (Evenden, 2012). It was as the dual purpose of disposer of wastes and supplier of drinking water that led to changing perceptions of how we are to treat our waterways.

### Changing perceptions

The nation's rivers had increasingly been used in an unsustainable way and by the 1950s, sewage treatment slowly began to become more common. However, due to the exploding population, and despite the improvements made in treatment, by the late 1950s the Potomac River actually was subjected to "a 36 percent greater sewage load than it did in 1932" (Evenden, 2012). The impact of this pollution was significant.

The explorer, John Smith, wrote of fish runs on the Potomac being so plentiful they could be "caught using frying pans" (Smithsonian, 2016). With rapid urbanization these fish runs were collapsing and in 1962 the deaths of millions of migratory fish began to catch people's attention.

The fishing industry in the Illinois River similarly collapsed once Chicago redirected its waste from its drinking supply, Lake Michigan, to other communities' drinking supply, the Illinois River. In economic parlance, overwhelming riparian systems with waste became a classic case of the tragedy of the commons.

It could be said that the modern era of urban rivers as well as the environmental movement, began on June 22<sup>nd</sup>, 1968. The heavily industrialized Cuyahoga River, running through Cleveland and into Lake Erie was so polluted with debris and oil that it caught fire that day. This was not the first time. It had caught fire, in total, thirteen times. The largest fire occurred in 1952 causing "over \$1 million in damage to boats, a bridge, and a riverfront office building"<sup>12</sup>.

However, the fire of 1969 captured the attention of *Time* magazine. This publicity, combined with a growing environmental consciousness, led to significant state and federal action, including the creation of the Clean Water Act, the Great Lakes Water Quality Agreement, the federal Environmental Protection Agency (EPA) and the Ohio Environmental Protection Agency (OEPA). In essence, during the 1960's the concept of riparian corridors transformed to

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<sup>12</sup> [https://en.wikipedia.org/wiki/Cuyahoga\\_River](https://en.wikipedia.org/wiki/Cuyahoga_River)

a community's "commons," which needed protection. From this period on, the physical and social connection of riparian areas became connected to creating community with a different sort of economic returns.<sup>13</sup>

### The Modern Era

The following passage encapsulates the transformation over the past 50 years:

If you were asked to describe a typical urban waterfront in the United States, what would your answer be? Perhaps you would talk about a public park with well-kept landscaping, space for recreation, and facilities for cultural events such as outdoor concerts. The answer to the same question would have been very different 50 years ago, and might have involved an industrial site, such as a power plant or a factory, or something equally unrelated to leisurely purposes (Smithsonian, 2016).

Waterfronts during the industrial era were categorized by commercial and industrial uses, including "warehouses, mills, power plants, and factories" (Smithsonian, 2016). The combination of this unwelcoming environment and the condition of urban rivers made these waterways largely inaccessible and ignored by the cities that had been founded along, and expanded from the banks.

However, with a population less tolerant of industry dumping its wastes directly into waterways and an economy shifting from an industry-base to a service-base, "numerous urban waterfronts experienced declining economic significance, becoming underutilized or even abandoned. The subsequent phase for urban waterfronts, in many cases, has proven to be a kind of renaissance, as these sites have been rediscovered and repurposed as civic centers" (Smithsonian, 2016).

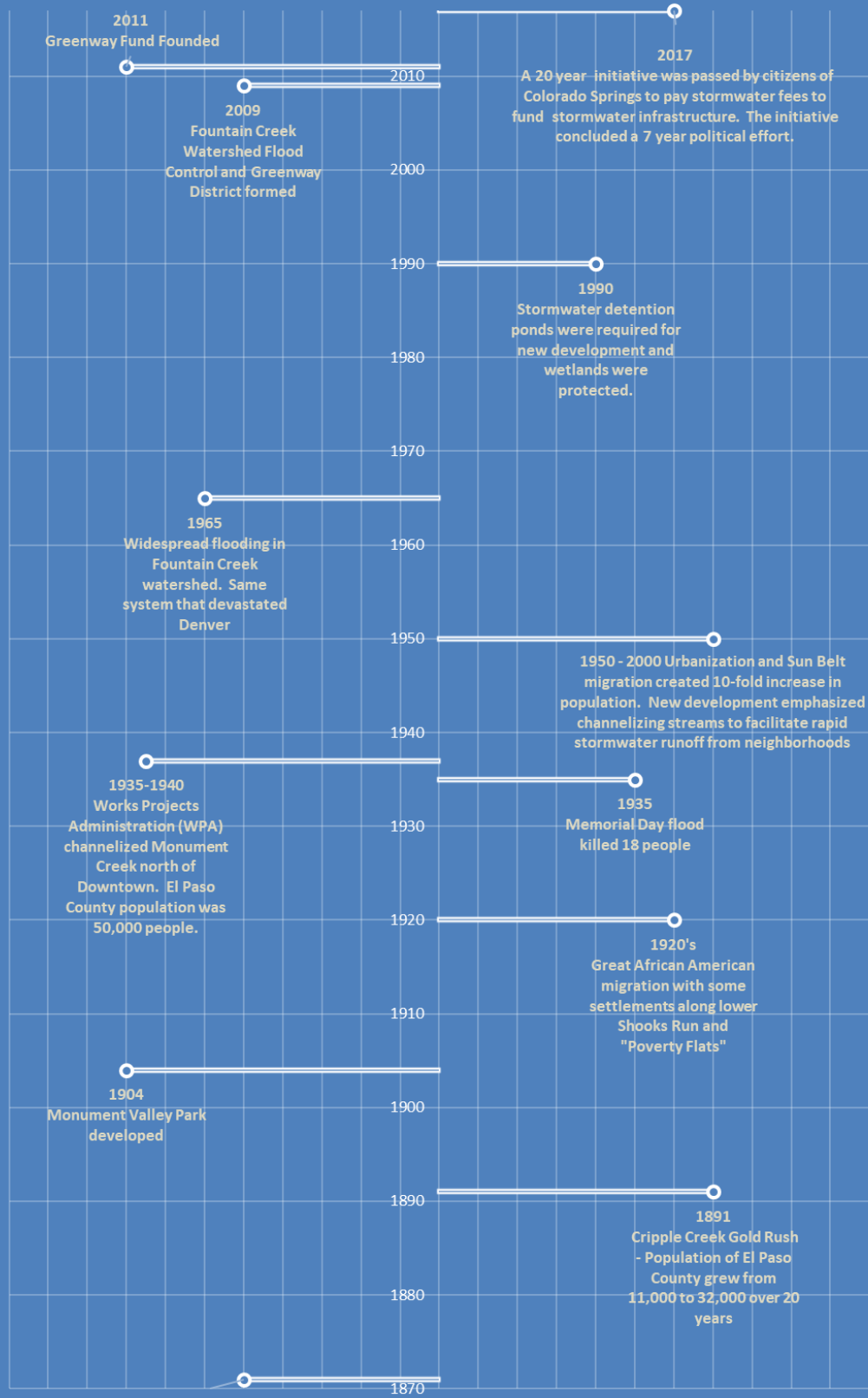
### **Pikes Peak Regional Waterways**

The modern history since 1870 of riparian greenways in the Fountain Creek watershed is summarized in the following graphic.

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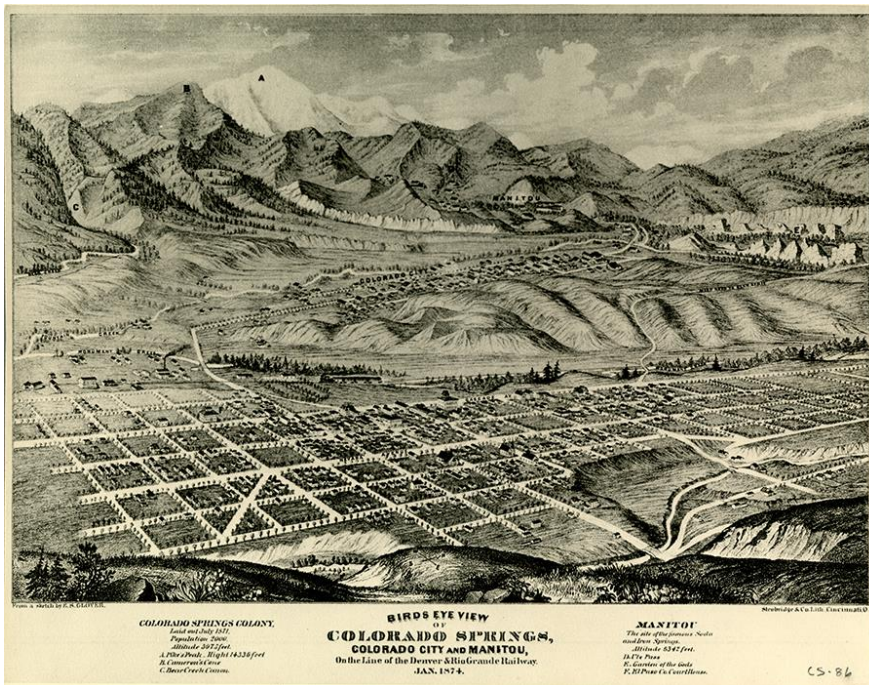
<sup>13</sup> In his now classic *Tragedy of the Commons* from 1968, author Garrett Hardin cites the tragedy of polluting rivers: "The rational man finds that his share of the cost of the wastes he discharges into the commons is less than the cost of purifying his wastes before releasing them. The law adapted to this newly perceived aspect of the commons." [http://www.garretthardinsociety.org/articles/art\\_tragedy\\_of\\_the\\_commons.html](http://www.garretthardinsociety.org/articles/art_tragedy_of_the_commons.html)

## FOUNTAIN CREEK WATERSHED MODERN HISTORY



Various Sources, Summit Economics

Unlike most urban areas, Colorado Springs and El Paso County did not develop next to any significant river or body of water. It is an anomaly. The scenic beauty of the area, at the foot of Pikes Peak, inspired General William Jackson Palmer, the founder of the Denver & Rio Grande Railway, to plat Colorado Springs along the banks of Monument Creek, just north of its confluence with Fountain Creek – approximately 41 miles upstream from the Arkansas River. With water storage on the slopes of Pikes Peak and veins of coal in the area, the fundamentals for a settlement existed. Given the area's beauty, a tourist destination was born.



As shown in the adjacent 1874 “Bird’s Eye” view of the town, the creeks were left alone as floodways and functional water delivery, railroad corridors, and possibly waste disposal sites. Over time urban encroachment found its way into the greenways of the day. The main uses locating in the floodplain included stables, light industrial, the powerplant, railroads and warehouses. As in-migration flowed into the community during events such as the Cripple Creek gold rush and the African American

migration of the 1920s, low lying areas such as Poverty Flats close to the confluence of Fountain and Monument Creeks (currently America the Beautiful Park) as well as south Shooks Run close to Fountain Creek developed spontaneously or without formal planning and investment.

One can assume the creeks retained a rather pastoral flavor through much of the early history as shown in the photo which was featured on postcards of the time with Cheyenne Mountain in the background. Monument Valley Park, where the picture was





taken, was developed in 1904-07 to integrate the ambiance next to the downtown which included the railroad depot and Antlers Hotel.

Everything changed on Memorial Day, 1935, when a major flood occurred in both Fountain and Monument Creeks. All but one of the bridges crossing the creeks were destroyed and 18 people died. This resulted in an emphasis on flood control and the Works Progress



Administration (WPA) subsequently channeled Monument Creek and rebuilt the park prior to WWII. At the time the population of El Paso County was about 50,000 people. Another, less devastating flood occurred in 1965. It was from the same storm system that devastated the South

Platte and Cherry Creek corridors in Denver.

As Colorado Springs and El Paso County developed over the next 50 years the emphasis on managing the greenways making up the Fountain Creek Watershed focused on keeping residential development out of the floodplains and channeling creeks, runs, and ravines to quickly expel runoff into the main creeks. By 2010, the County's population had grown almost 13 times to 646,000 people adding at least 70,000 people per decade from 1950 onward. Even though a national movement to preserve riparian areas by managing stormwater beyond basic flood control emerged in the 1990s, the Fountain Creek watershed was a latecomer to the effort. Other than implementing state and federal requirements to detain stormwater on new development sites to mitigate erosion and urban pollution, little was done to develop sustainable funding sources except in some of the smaller municipalities. Wetlands protection, erosion control, and greater sensitivity to watershed preservation and restoration did emerge with the shifting stormwater emphasis.<sup>14</sup>

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<sup>14</sup> Photos are from the Colorado Springs Pioneers Museum archives.

Additionally, new urban development increasingly valued connecting trail systems in new neighborhoods and the rail trail movement began emerging nationally. Hence, the evolution of greenways is part of a broader political socio-economic progression with the Pikes Peak Region being a follower rather than leader.

Unfortunately, the modern era continues to see ongoing challenges. While Colorado Springs, which houses most of the County's population, recently adopted a stormwater funding mechanism, issues surrounding water quality remain. According to the Colorado Department of Public Health and Environment, multiple segments within the Fountain Creek watershed do not currently meet water quality standards for E. coli.<sup>15</sup> The problem peaks in the warmer months. Until resolved the condition could discourage substantial water engagement as part of greenway recreation. In addition, homeless camps appear more prevalent in riparian areas, especially along the major creeks. While Colorado Springs' measured rate of homelessness matches both Colorado and national rates at 194 homeless per 100,000 people, the problem appears far from resolved which creates what economists refer to as a negative externality on greenway development and neighborhoods immediately adjacent to concentrations of the homeless populations. Such degradation derives partially from a tragedy of the commons created by overuse associated with urban storm and irrigation water runoff and partially from degradation resulting from inappropriate use of a community asset to be enjoyed by all people.

Faced with the trends, changes, and challenges, a greater segment of the region is becoming interested in the next chapter of the evolution of the Fountain Creek watershed – namely greenway development, redevelopment, restoration, and management.

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<sup>15</sup> The classification is in accordance with CDPHE, Regulation #93. A watershed-wide plan to manage E. coli is currently underway with multiple partners, and will identify additional data needs, best management practices, and public outreach opportunities.

## Benefits of Greenways

This section of the report considers the most obvious benefits associated with greenways. After delineating the benefits, we present secondary research findings associated with the benefits to highlight key variables driving the model as outlined in the following section.

### Geographic Dispersion of Benefits

An important aspect of greenways is the geographic dispersion of the impact of the benefits. The greatest impacts tend to accrue closest to the greenway in question (the immediate location). From there, impacts spread out to the neighborhood which might be .75 miles across and politically be represented by a neighborhood association. From there, clusters of neighborhoods form what one might consider a community or “part of town” identity such as the “Downtown area”, “the Westside”, or “Powers area”. From community we go to the region, which for the purposes of this study is El Paso County encompassing most of the Fountain Creek watershed. Then there is the “supra-regional” which includes tourists generally from more than 50 miles away.

The adjacent table lists the identifiable benefits we associate with greenways (rows) and categorize the degree of benefit by geographic area (columns) relative to the location of the greenway. The darker colors conceptually indicate a greater concentration of benefit within the given area.

As shown in the table, locations within 500 feet of the greenway receive the most substantial benefit (or

cost if the greenway has negative impacts). As one moves further away from the greenway the degree of benefit diminishes in general. This less concentrated benefit does not necessarily mean the majority of total benefit is realized closest to the greenway. A very popular greenway, while having a significant impact on real estate within 500 feet, especially residential

Potential Benefits	Geographic Range of Impact				
	<500 ft Immediate	500-2000 ft Neighborhood	Section of Town Community	Metro Area Regional	Supra- Regional
<b>Property</b>					
Proximity Pricing					
Urban Redevelop/Develop					
Manmade Asset Quality					
Property Taxes					
<b>Common Non-Property</b>					
Health					
Recreation					
Transportation					
<b>Economic Development</b>					
Tourism & Related Tax					
Workforce Enhancement					
<b>Community Development</b>					
Local Engagement					
Social Interaction					
Education					
<b>Natural Environment</b>					
Wetlands					
Natural Capital					
Flood Control					
Stormwater					
Summit Economics					

properties, might attract thousands of people from the entire metropolitan area for special recreational purposes and day trips. This study primarily models the benefits denoted by the two darker shades.

## Benefits Modeled

While one can argue all benefits have some ultimate economic impact, some are not easy to quantify and some will be only marginally relevant. The benefits selected for quantification in this study are highlighted in the adjacent table. They were selected because secondary research exists documenting the benefits. Hence there is greater justification in the modeling effort.

Benefits Included and Excluded	
Included	Excluded
<b>Property Asset Values</b>	
Proximity Pricing Urban Development/ Redevelopment	Manmade asset quality
<b>Common Non-Property and Non-Tax</b>	
Health	Workforce Enhancement
Recreation	Jobs and income created from investment in greenways
Transportation	
Tourism	
<b>Annual Tax Impacts</b>	
Annual Property Taxes related to property/ asset values	Taxes from sales of recreational equipment or home improvements to regional residents
Taxes from sales to Tourists	
<b>Community Development</b>	
	Local Engagement
	Social Interaction
	Education
<b>Natural Environment</b>	
Natural Capital	Wetlands
	Flood Control
	Stormwater

Note, the benefits fall into five broad categories: real estate property asset values, common non-property and non-tax, annual tax impacts, community development, and natural environment. Most of the economic related research exists in the first two categories.

The excluded benefits are not substantially researched as related to parks and greenways even though one can intuitively surmise that a relationship exists. Even though flood control and stormwater investments in riparian areas certainly enhance access to the greenways in many cases, it's unclear whether greenways benefit other investments made in the drainage areas provide a reciprocal benefit for flood control and stormwater efforts. Similarly, a more highly used greenway, by definition, creates greater social interaction and probably creates more community engagement in response to having a that resource in the neighborhood. One would assume educational opportunities are greater with greenways close to schools, which is often the case.

Other economic factors which are also not included in the model are manmade asset quality, workforce enhancement, and traditional economic impacts from investment creating jobs and income. As greenways have more positive impacts on property values (as discussed below) one might expect greater property repairs and improvements (i.e. reinvestment) to occur from individual property owners. While notable, the amounts are not well researched and are



considered relatively minor and therefore are not included under asset quality, jobs and income creation, or sales tax revenues from such improvements.<sup>16</sup> Sales taxes on recreational equipment to use in the greenways are also not included.

During our interviews and research, it became apparent that workforce recruitment into the Pikes Peak Region is greatly assisted by the region's outdoor reputation or brand. This image can be very positive and a regional selling point in economic development. Greenways can enhance the reputation and therefore aid in workforce retention and recruitment. There are numerous other anecdotes from hearings supporting the greenway and economic development angle. At a congressional hearing, another business executive, the CEO of the Billings Montana Chamber of Commerce remarked that trails and other infrastructure are not merely community amenities but are essential for recruitment of businesses. (ASLA, 2012) A recent study attempted to examine the reasons for business location decisions with respect to the trail along the Missouri River. Researchers found that one-fifth of businesses along the trail identified the trail as a reason for them locating their businesses there.<sup>17</sup> Speaking on the impact greenways have on the decisions companies make about where to locate their businesses, the CEO of Samuel Beall III noted that a key factor in the decision on where to relocate his company's corporate headquarters, was the presence of the Greenway Trail in Maryville, Tennessee. The Vice President for Development of the Research Triangle Foundation in North Carolina noted that "Investing in our greenway system has made us more competitive in the world market place, and in fact is one reason that companies choose to locate in the Park." (ASLA, 2012) These statements are a testament to the significant impact greenways have on business location and relocation decisions.

Despite the regional importance of greenways to workforce and economic development, it is premature to try to evaluate regional impacts except at a very high level which contrasts with the focus of this study being on specific greenway trail segments. Given this study focuses on neighborhood and community level impacts, we do not perform traditional economic impact analysis which is most frequently found at the regional level (County and above).

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<sup>16</sup> This should be reflected in building permit activity for existing properties and homes in an area. A review of El Paso County Assessor data suggests a narrow range of average residential renovation/addition permit values between areas and relative to El Paso County totals. It also appears lower priced neighborhoods may actually have a greater share of total county renovation/addition residential permits than higher priced, and older neighborhoods.

<sup>17</sup> <http://www.downtowngreenway.org/planning/economic-development/>

## Secondary Research

### Proximate Value & Property Taxes

The value placed upon greenways in the market can be seen through the increase in property values found in close proximity to the greenway. The desire to reside close to a greenway for recreation, transportation, and/or because of its aesthetic appeal is reflected by homeowner's willingness to pay a greater amount to receive those benefits. This is known in economics as "proximate value" and is derived from a concept known as "hedonic pricing", which acknowledges the value of a home to a homebuyer is a sum of a number of constituent parts all implicitly valued by the buyer. Calculating the total additional value accumulated by properties within close proximity to the greenway provides economists with a way to infer the overall value of the greenway, as well as calculate the fiscal benefits of that value, through increased property tax receipts (Crompton J. L., 2004). One can also assume that if people value something more, then they are far more likely to be actively using what they value. From this perspective, proximate residential values are a proxy of actual use of greenways in a given neighborhood.

Proximate value is not simply an abstract or theoretical economic concept. Real estate markets consistently show that homes closer to well-maintained and connected greenways will sell for a premium over similar homes located further from the greenway.<sup>18</sup> A review of past studies shows that more than 30 reports have observed this effect.<sup>19</sup> Though it must be acknowledged that the preponderance of studies conducted have looked at urban parks, the effects seen in these parks is validated through the few studies of greenways that have found similar impacts. In fact, it has been observed that greenways appear to generate additional value over what tends to be seen in parks. This is largely attributed to the additional benefit of having access to a trail, and the alternative transportation connectivity resulting from the trail (relative to roads and mass transit), in addition to the value of the greenspace. As observed in one study, "It is a trail's functionality or activity potential that is likely to confer added value" (Crompton J. L., 2004).

The proximate value impact generally holds true, with decreasing significance, to approximately 2000 feet from the greenway, with about 75 percent of the impact happening within the first 500 feet (Crompton J. L., 2004). The significance of the proximate value is impacted by the uses of the space and the quality of the greenway. Though generally the impact is positive, the

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<sup>18</sup> Crompton J. L., Estimates of the Economic Benefits Accruing from an Expansion of Houston's Bayou Greenway Network, 2012

<sup>19</sup> Crompton J. L., Measuring the Economic Impacts of Parks and Recreation Services, 2010

impact can be negative if the green space becomes blighted, littered, noisy, or a congregation area for those engaged in illegal or other undesirable activities (Crompton J. L., 2004). Another source of negative impact might originate from heavily used access points. From this perspective it is possible for an overall greenway to generate positive proximate value while certain enclaves along the greenway may be negative.

Greenspaces show the most capitalized value, through pricing, when they are “large, high quality, natural resource based... well-maintained and regarded with affection by the community” (Crompton J. L., 2004) For these types of greenspaces, as one meta-study by the foremost expert in this field shows, “a positive impact of 20% on property values... is a reasonable starting point.” However, this same study shows that there is significant evidence that “derelict” greenspaces can have a negative impact on adjacent property values of, on average, 15% (Crompton J. L., 2004). Hence, research suggests that there can reasonably be a 35% swing, or greater, between the possible impacts of greenways.

A key element of proximate value is that once realized, it does not continue to accumulate incremental property value. In other words, when a greenway is developed, if people recognize the benefit of being in close proximity, then the property value rises. When the property is sold it embodies the greenway’s value and the seller who realized the greenway appreciation walks away with more cash than they would otherwise have realized without the greenway. The new owner has paid a higher price for the property which embodies the value of the future benefit they anticipate receiving by being close to the greenway. When the buyer becomes a seller at a later date the proximate value passes on to future residents. Of course, the proximate value can change further over time as demographics and greenway conditions change leading to further increases or decreases.

The change in property values has the result of having a proportionate impact on annual property taxes. Given that, generally, greenways result in higher property values, greenways show a positive impact on property tax receipts in perpetuity as long as the value of the greenway is maintained and generates actual or perceived benefits. In this sense, a portion of the property tax paid annually is really a tax on the greenway itself paid by those who benefit the most.

### Urban Development and Redevelopment

Urban development and redevelopment theory and research existed long before research focused on the impact of greenway investment. Most of the theoretical basis lies in the socio-spatial context of urban areas. Put simply, one might think of how different social groups (e.g., businesses, races, income groups, special interest groups) interact within urban geography. Much research in this general realm tends to take a lifecycle perspective where investment occurs within a given location, agglomeration effects attract more investment until the area

achieves some level of maturity (e.g., all land is developed) and then the urban capital that was developed naturally depreciates unless maintained and/or becomes technologically obsolete. Such “disinvestment” triggers a decline stage where entire neighborhoods can be forgotten and at the very least do not attract new capital investment or reinvestment.

One can argue that the urban greenway movement is part of the modern urban redevelopment movement. Whereas prior to the 1980s extensive focus was on use of federal resources and razing “blighted” neighborhoods, the modern focus operates within greater fiscal austerity at all levels of government and seeks to make greater use of market forces. This is apparent in the emergence of Enterprise and Opportunity zones in the 1980s-90s. One popular redevelopment vector prior to 2000 focused on the development of sports and entertainment venues to spur activity and investment. New public investment strategies emerged including Business Improvement Districts (BIDs), Tax Increment Financing (TIF), and the more formal use of Public-Private Partnerships (P3s). All of this is framed within a new emphasis of urban planning on market rationality, forecasts of continued public austerity, and striving to make neighborhoods and entire cities more competitive in the evolving social framework (Gotham, 2001). As we move forward into the 21<sup>st</sup> century, these themes appear to be carrying over with the addition of the Millennial generation, new personal technology that appears to be transforming virtually every facet of modern life (especially the social-spacial context), and growing concerns of exorbitant healthcare costs combined with declining health across all age groups in America.<sup>20</sup>

Public investment in a local greenway or along an urban waterway will often act as a catalyst for private investment (Chicago Council on Global Affairs, 2017). This has been seen in cities across the country and is discussed in deeper detail in Appendix A “Case Studies”. The concept is well documented: the government invests money to improve an area thereby making it more attractive for private investors to funnel money into the area to generate development and redevelopment. Greenway investment is especially notable as foundational to stimulating mature and declining urban neighborhoods and surrounding communities. It is also known that greenfield developers of vacant land increasingly value natural open space and incorporate it into their land planning and entitlement. The more attractive the natural features in or adjacent to a new development, the more likely the development will be associated with more expensive homes and premium lot pricing. Wise developers essentially program proximity pricing into their development and business plans.

A review of existing studies shows that the cities that have undertaken a significant investment in the revitalization of their urban waterways have shown subsequent public investment to be 9

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<sup>20</sup> For a discussion of urban redevelopment see: Gotham, Kevin Fox. (2001). “Urban Redevelopment Past and Present.” *Critical Perspectives on Urban Redevelopment*, Volume 6, pages 1–31. <http://www2.tulane.edu/liberal-arts/upload/introductionch01.pdf>

to 40 times greater than the original public investment (Riverlife, 2015). Another study, specific to greenway investment, observes that “... that \$5-\$12 of private investment can be made for every \$1 of urban greenway investment”, while the city reviewing those studies saw a \$30 return for every \$1 of public investment.<sup>21</sup>

In addition to beautifying a previously under-utilized resource, such private investments, “bolster tax revenues, drive consumer spending, create new jobs, and increase the city’s visibility and overall competitiveness” (Chicago Council on Global Affairs, 2017). Entire areas can be redefined during this reinvestment process leading to economic tipping points as urban revitalization spreads beyond the immediate properties and even the neighborhood and makes communities more competitive in attracting talent, businesses, active retirees, and tourists.

### Health Benefits

Medical costs for people who are obese, in one Colorado study, were \$1,429 higher annually, on average, than those of normal weight. Obesity-related issues including heart disease, stroke, type 2 diabetes and certain types of cancer are among the leading causes of preventable death (Colorado Parks and Wildlife, 2014).

A review of the existing evidence on the health benefits of engaging in regular exercise shows that physical activity improves weight loss, reduces blood pressure, enhances cardiac function and so forth. These factors, in turn, lead to the reduction in the diseases mentioned above that are the leading causes of preventable deaths (Warburton, 2006). Many health groups, including the World Health Organization, encourage adults to engage in at least 150 minutes of moderate intensity physical activity (such as walking and cycling) a week (WHO, 2006)<sup>22</sup>. Trails and greenways are avenues for people to meet the recommended levels of physical activity and thus enjoy improved health outcomes. Availability and access to trails and greenways has been found to greatly increase physical activity. Another study investigated whether living near a trail or a path made individuals more likely to walk or cycle on that path and increase their levels of physical activity (Krizek, 2006).

One review of trail users of a newly built greenway showed that 55 percent of the users were exercising more than they did prior to access to that trail (David Bunting, 2005). Other studies showed an inverse relationship between trail usage and the distance of one’s home from the trail (Troped, 2001). Recently researchers examined the patterns of physical activity after two new trails were completed in Morgantown, West Virginia. They wanted to discover whether the construction of the new trails affected the physical activity levels of residents in any way.

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<sup>21</sup> <http://www.downtowngreenway.org/planning/economic-development/>

<sup>22</sup> [http://apps.who.int/iris/bitstream/10665/43524/1/9789241594547\\_eng.pdf](http://apps.who.int/iris/bitstream/10665/43524/1/9789241594547_eng.pdf)

They found that 22.5% of residents who used the new trails were people who had not been exercising before, while 77.5% of users were habitual exercisers. Of those who were already habitual exercisers, 52% reported an increase in their levels of physical activity (Gordon, 2004).

Physical inactivity and obesity are modifiable risk factors for many diseases. Thus, the health benefits associated with increased physical activity through trails and greenways have tangible economic benefits. One study, conducted in 2004, concluded that an individual who exercised regularly incurred about \$351 less in medical care costs annually than an individual who did not (Leutzinger, 2004). Another study carried out a cost-benefit analysis of bike and pedestrian trails in Lincoln, Nebraska. The researchers compared the costs of constructing and maintaining these trails to the health benefits of using the trails. Using estimated data from the national medical expenditure survey, they found that the direct health benefits of using the trails was about \$564 per person, which was far greater than the per capita costs of the trail, \$209 (Wang, 2005).

This knowledge exists on a wide enough scale that the Surgeon General is asking American communities to install trail systems (ASLA, 2012). When it occurs, individuals and their households benefit, as do employers through greater productivity and the health industry through less per capita demand in the face of labor shortages. Of course, in the short-term, changes in behavior will benefit both public and private insurers as claims decrease.

### Recreation

In the emerging urban landscape, greenways are largely used for recreation. Biking, walking, birding, picnicking, running and other sorts of recreational activities regularly take place along greenways. These recreational activities in turn bring about a great deal of economic benefits in addition to those noted above. Recreation opportunities keep within the community some of its members who would have gone elsewhere for recreation if it were not readily available, thus keeping money from leaving and being spent elsewhere. Keeping this money in a community prevents the leakage of this money to other jurisdictions. Additionally, local residents who need to purchase gear and clothing to use on the greenways may make their purchases locally, or at the very least pay local sales taxes, thus improving the economy of the community.

An approximation of value, though not a direct measure of economic impact, is known as “Unit-Day-Value” (UDV). This metric was designed by the US Army Corps of Engineers. It is used to quantify the benefits to those who directly use recreational opportunities. UDV is conceptually similar to what economists call “willingness to pay”, which is what residents would be willing to pay in the market to obtain a good. The difference between what they are willing to pay and what they actually pay represents savings to the residents, since they end up not having to spend that amount of money for the good (Crompton J. L., *Measuring the Economic Impacts of Parks and Recreation Services*, 2010). For example, perhaps a walker uses a greenway for free.

However, were that greenway not available that same person may have been willing to spend \$5 to go to a local state park to receive a similar benefit. (USACE “Economics Guidance Memorandum”, 2015)<sup>23</sup>

In many cases different benefits are additive. For instance, people seek recreational opportunities. In the absence of accessible outdoor and active opportunities, they might choose substitutes such as going to the movies. Not only is the substitute more costly, but it is also less healthy. From this perspective the willingness to pay for recreation can be added to the health benefit.<sup>24</sup>

### Transportation

Seventeen percent of Colorado residents used a bicycle for transportation. Of those individuals, 62% prefer to ride off-street on a paved bike path. Forty-eight percent of Coloradans walk for transportation (BBC Research & Consulting, 2016)

Greenways provide safe, clean, smooth, uninterrupted paths for transportation. When individuals can bike or walk on a path free from the noise and potential dangers associated with road transportation, some fraction of the time they will chose to replace driving with alternative means of transportation. This benefits not just the individual, but the society as a whole by reducing the number of vehicle miles driven within a city, and the associated pollution, congestion, and accidents that come with driving.

One study estimated that for every mile not driven, benefits to the individual and society add up to \$2.73 per mile (Trust for Public Land, 2013). The societal benefits are derived from accidents that are avoided, reduction in the levels of congestion, health benefits, and reduced ground level pollution. Another study from Houston showed that about half of all ground level ozone pollution is caused by exhaust fumes from vehicles (Surface Transportation Policy Project [STPP], 2000).<sup>25</sup> Reducing the number of vehicle miles driven within the city have a positive impact on ground level pollution and the respiratory and other health problems it causes.

Reducing accidents has society and economic benefits as well. Accidents do not just affect the individuals involved in the accident and their insurance companies. Most of the time, the police and sometimes the fire department or ambulance services are involved in such car crashes, and

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<sup>23</sup> Derived from Crompton J. L., Measuring the Economic Impacts of Parks and Recreation Services, 2010. See <https://planning.erdc.dren.mil/toolbox/library/EGMs/EGM16-03.pdf>

<sup>24</sup> Not considered here, but implicit in Crompton’s hedonic proximate pricing is contingency value. Some people perceive value to themselves simply knowing the asset is nearby.

<sup>25</sup> Also (Crompton J. L., Estimates of the Economic Benefits Accruing from an Expansion of Houston's Bayou Greenway Network, 2012)

this imposes greater costs in the community. Increased congestion, wasted fuel, and lost productivity caused by accidents also impose costs.

In addition to the aforementioned cost savings from reduced vehicle usage, there are the savings a person enjoys by not driving their vehicle such as the gas, the maintenance, and possibly even insurance or car payments that will not be made if the individual doesn't use a car. These savings can then be spent within the community. Any savings that would otherwise have left the community as insurance, car payments or the like, but now stay in the community in the form of increased spending represents a net gain for the community.

### Tourism

The Tourism industry is extremely large. Measured by basic employment impact, it is the largest industry in Colorado. Tourists bring money into an area through their expenditures on food, lodging, activities, retail and a myriad of other things. This influx of cash has both a direct impact at the point of sale, as well as multiplier effects. The multiplier is made up of the direct impacts where the money spent by the tourists become wages and business incomes, and then the indirect and induced impacts which come from the further expenditures of those wages and business incomes as those dollars continue to flow throughout the community.

Traditional economic impact analysis estimates the direct, indirect and induced impacts.<sup>26</sup>

Tourists do not need to come from out-of-state to have an impact. A tourist, in this case, is simply anyone who is visiting from outside of the area spending money that would not be otherwise spent in that area. How one defines the area under review for impact is important. A common definition of tourism is someone must come from more than 50 miles away to be considered a tourist, however that definition is dependent upon the situation.

Because the geography of the analysis is important, some tourism benefits can accrue to one area in a community competing with another one within the same city. For instance, if a greenway simply shifts tourist traffic and spending from Downtown Colorado Springs to Old Colorado City, there is no net benefit to the City unless the tourists spend more money in Old Colorado City than they would have in Downtown. In the competitive mode there can be a winner and a loser on any transaction, but the mutual benefit of a growing regional tourist market should make both parties better off in the longer run if greenways can attract more tourists or the existing tourists spend a little extra time or money in the region. The extra time or money visitors spend in Colorado Springs has a regional economic impact.

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<sup>26</sup> In addition to creating a traditional economic impact or benefit on a community, tourists also realize health, recreation, and transportation (to a lesser degree) benefits. These benefits accruing to tourists are not considered as part of this benefit study since it is more difficult to measure in some cases and the benefit does not accrue to the Pikes Peak Region. Only the traditional direct impacts of tourism are considered.



In addition to the economic benefits from visitors, there are also some residents who will choose to stay in Colorado Springs instead of traveling elsewhere to enjoy recreation. The money those “tourists”, who are retained in the city, spend also has a direct economic impact; however, this elimination of economic leakage is difficult to measure. Also, not typically measured are the family and friends who change their behavior to entertain their tourist visitors. This can be significant given 42% of overnight visitors to the Pikes Peak Region are visiting family and friends during their tour. This study excludes leakage mitigation but does include some local spending while with their tourist visitors.

Currently, the likelihood of tourists visiting Colorado Springs to specifically visit the existing greenways is low. However, it is possible that some tourists spend extra time and/or money in Colorado Springs to visit the greenways, such as the greenway along Monument Creek north of downtown. The historical postcards showing Monument Creek imply that the greenway has tourist appeal dating back a century.

Interconnected greenways also provide the opportunity for hosting events. These events in turn attract visitors from outside of the area. For example, a review of the 2017 American Discovery Trail marathon results, run along the Pikes Peak Greenway, was reviewed to determine how many participants were from outside of the area. Of the 222 runners, 36 were from out-of-state, 68 were from Colorado but outside the Pikes Peak region (mostly the Denver metro area), and 27 were from the Pikes Peak region but not from Colorado Springs. In total over half were tourists to Colorado Springs.

It could be argued that those visiting from outside of Colorado Springs, but within Colorado, do not spend any time or money in Colorado Springs outside of the race, and as such this category of visitors does not have any economic impact on the community with the greenway. In reality they spend less money than others, but still spend. At the very least, in this case they must still pay the race fee in the community. Those who do come from other states will likely spend a night or more, if for no reason other than to acclimatize themselves. Thus, the race directly creates an economic impact through the race fee and money visitors from other states spend, and the race would not exist without the greenway, so in a sense, the economic impact of visitors is one of the recreational benefits that has a regional impact.

Future growth in tourist use of area greenways is promising. Colorado Springs has evolved to where it has high appeal to younger tourists, family tourists, and even business tourists who might extend their travel for a little vacation time. The scenic beauty sells itself and the Pikes Peak Region is more affordable than many tourism alternatives. Recreational assets like The Manitou Incline get visitors from Denver and throughout the U.S., while the Ring the Peak Trail will add to the area's reputation for adventure tourism. The Olympic Museum, near the Legacy Loop, will also draw tourists. The lodging market is already responding with new hotels in downtown and along the Monument Creek corridor. As the Pikes Peak Region enters this new phase, greenways can serve as an addition to the outdoor assets and even become an intra-regional focal point for day trips which represents 58% of the 23,000,000 tourists who visited the Pikes Peak Region in 2016. The research findings related to local tourism come from state editions of the annual Longwoods Report<sup>27</sup> and the 2008 Colorado Welcome Center Survey.

Selected Colorado and Pikes Peak Region Tourism Statistics		
Pikes Peak Region Visitors		
Total visitors in 2016 [1]		23,000,000
Overnight visitors		9,700,000
Marketable Trips		4,900,000
Family & Friends		4,100,000
Business		800,000
Day trips		13,300,000
Other Statistics		
Total Lodging Nights [2]		1,140,000
Number of Family & Friend Parties [3]		1,281,250
Out-of-State Overnight visitors [4]		5,824,000
Manitou Springs Market Share of Region		22%
Out-of-State Visitors who bicycled on visit [5]		7%
Daily spending per overnight Colorado Springs visitor [5]	\$	93.92
Percent of Colorado Visitors adding activities [6]		25%
Percent of Colorado Visitors adding a day [6]		7%
Percent of Colorado Visitors Engaging in...		[6]
Outdoors		66%
Arts/Culture/History		15%
Hiking		13%
Biking		3%
[1] 2016 Longwoods as cited in June 2017 in the CSBJ and Sept 2017 in Gazette. [2] Based on Rocky Mountain Lodging Report [3] Average party size visiting family and friends is 3.2. [4] Estimated using 12% 2016 growth rate to 2015 overnight out-of-state visitors from Summit study. [5] Longwoods Colorado Report. [6] 2008 Colorado Welcome Center survey		
Compiled by Summit Economics		

Local data, also from Longwoods, comes from reports in local newspapers and other local sources. The statistics are shown in the adjacent table.

### Natural Capital

“Natural Capital” refers to the benefits received from nature without cost that would otherwise have to be built or created if nature were not providing the service. Perhaps this is the fundamental source of greenway value. Some examples of natural capital are stormwater reduction, flood mitigation, and water purification. The term “green infrastructure” is generally used to describe the intentional use and construction of natural capital in urban environments, but even when not done with intentionality, green spaces provide natural capital benefits.

<sup>27</sup> Longwoods International, <http://industry.colorado.com/longwoods-international>

Ecological restoration of waterways brings about immediate benefits to the ecosystem, specifically water flow and flood mitigation, waste treatment and anti-pollution, and water supply benefits. Monetary values can be assigned to all of these “green” benefits because they reduce the operating costs of the departments and organizations created to provide the function that the natural capital is providing. These benefits reduce the need for larger capital costs of mitigating or reversing major processes of environmental degradation, thus reducing the pressure on city and state budgets (Chicago Council on Global Affairs, 2017).

Secondary research shows that, compared to costs that would otherwise be incurred, targeted use of green infrastructure results in cost savings between 15% to 80% (ASLA, 2012). For example, New York City chose to invest \$1.7 billion in watershed conservation. This initial capital investment was accompanied by about \$30 million annually in operating expenses. By investing in this admittedly expensive green infrastructure, the New York City government was able to avoid constructing water treatment systems estimated to cost \$8-\$10 billion, with annual operating costs of about \$365 million. Other cities have found similar benefits, though on smaller scales.

Chicago created a “Green Alleys” program with the aim to remove impervious surfaces in the City’s alleys which do not allow water to penetrate, forcing run offs, and replace them with pervious surfaces that allow water to percolate into the soil, preventing this water from running into storm drains and burdening the cities fragile stormwater infrastructure.<sup>28</sup> This initiative was found to be more effective at managing storm water than conventional methods of storm water management by a factor of 3 to 6 (ASLA, 2012).

A study done on a projected greenway system in Houston Texas showed that without the implementation of the greenway system, 4,800 acres of green space would be developed. After development, 47% of that erstwhile green space would be covered with impervious surfaces, which would in turn “generate an additional 2 billion gallons of runoff per year”. Using traditional stormwater treatments to avoid this additional amount of runoff would cost about \$1.7 million per annum, so the installation of the projected greenway system would lead to savings worth that amount. Additionally, the wetlands, treed areas, open spaces, and riparian areas in the proposed greenway system would provide natural capital estimated at an extra \$16.6 million per year (Crompton J. L., Estimates of the Economic Benefits Accruing from an Expansion of Houston's Bayou Greenway Network, 2012).

These greenways generate the aforementioned benefits by capturing precipitation and slowing its runoff into local waterways. As greenways are made of pervious surfaces and soil or plant life, most of the precipitation either infiltrates the earth or evaporates from the soil or plant life. In this way “urban green spaces function like ministorage reservoirs.” The major benefits

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<sup>28</sup> [https://www.cityofchicago.org/city/en/depts/cdot/provdrs/street/svcs/green\\_alleys.html](https://www.cityofchicago.org/city/en/depts/cdot/provdrs/street/svcs/green_alleys.html)

of slowing runoff result in a reduction of capital costs incurred during the process of stormwater management. In addition to these cost savings with respect to stormwater management, slower runoffs also reduce the costs of flooding. Every year, on average, 100 Americans lives are lost and more than \$2 billion is incurred from damage caused by flooding. In fact, flooding accounts for 90% of all U.S. natural disasters (ASLA, 2012). Research has shown that green spaces reduce the frequency, significance, and duration of flooding events, thus having an additional economic impact from avoided costs associated with these events.

The additional grasses and trees brought about by an increase in green spaces also increase the absorption of many air pollutants. This in turn improves overall air quality and reduces the stress placed on individuals with respiratory issues, whose health conditions are exacerbated by air pollution. For example, while reviewing Houston's greenway plan, an American Forests report (2000) estimated that the tree cover in Houston had declined by about 16 percent over the past thirty years, and that this decline in tree cover had led to a \$38 million dollar increase in air pollution removal services over that time period (Crompton J. L., 2012).

# Economic Modeling

## Overview

There are three dimensions considered in modeling for economic impact purposes. These include geography, time, and risk. For the purposes of this study risk is assumed away so single best estimates can be derived.<sup>29</sup> The notion of modeling the economic impacts of the entire Fountain Creek watershed as the geography is too cumbersome given the primary impacts appear closer in proximity to improved and maintained greenways.<sup>30</sup> In addition, the investment associated with greenway development requires more project specificity. Given the degree of uncertainty about plans and targets, economic impact as modeled here focuses on benefits, both existing and potential, for neighborhood level geography associated with specific greenways. These are highlighted by creating a matrix listing the types of benefits as described in the previous section and estimating for each benefit:

- Current benefits estimated as existing;
- Current Potential Incremental benefits assuming levels of activity and value associated with successful greenways nationally are achieved given the current and planned general level of greenway physical investment (including stormwater investments that enhance the greenways) as well as greenway programming to promote safe use;
- Growth Potential from urban development and redevelopment assuming future greenway projects and programming promote the image and functionality of the greenways for recreation and transportation.

The model is based upon the secondary research discussed previously and applied to three areas and trail segments to facilitate a more detailed view of how greenways generate economic benefits. By utilizing this approach, it is hoped a greater understanding of the economics of greenways will emerge – an understanding that can be applied, at least conceptually, to specific projects in the future.

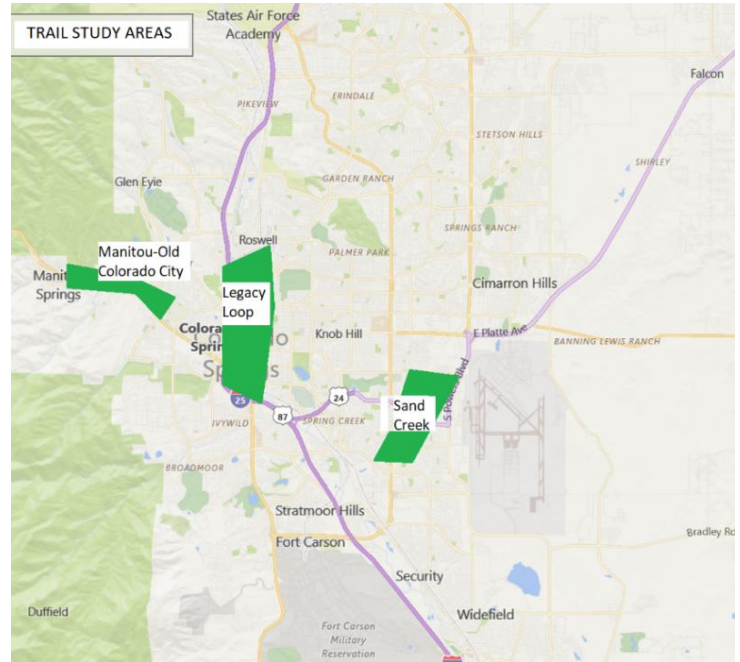
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<sup>29</sup> Due to the nature of greenway and park research, a single number is typically cited for different variables and used to generate impact estimates. There is also risk associated with the permanency of greenway investments in floodplains which we assume are appropriately mitigated through planning and design.

<sup>30</sup> Modeling the entire watershed would include such a grand vision in such a distant future as to be rather meaningless.

The three areas and segments modeled are:

1. The Legacy Loop surrounding the central city core of Colorado Springs as it undergoes downtown redevelopment;
2. The Manitou – Old Colorado City section of the Midland Trail (MOCC) through “no man’s land” which in its heyday was a middle-class tourist area and which today is the recipient of substantial public investment for road and transportation improvements after years of substantial urban decline;
3. Sand Creek through southeastern Colorado Springs which is known as a low to moderate income sector of the city with greater health challenges.



The relative use of these greenways can be seen in the heatmap by Strava Labs. This map combines the levels of running, hiking, and biking activity based upon data warehouses from active trail users wearing GPS enabled exercise devices. The map clearly shows more intense uses (bright white) accessing mountain trails to the west, the west side of the Legacy Loop and Downtown Colorado Springs, regional parks (north and south of the Midland MOCC) and northeast of the Legacy Loop (Palmer Park). On a relative basis Sand Creek has low usage, Midland MOCC and eastern half of the Legacy Loop have moderate usage, and the western Legacy Loop has high usage.<sup>31</sup>

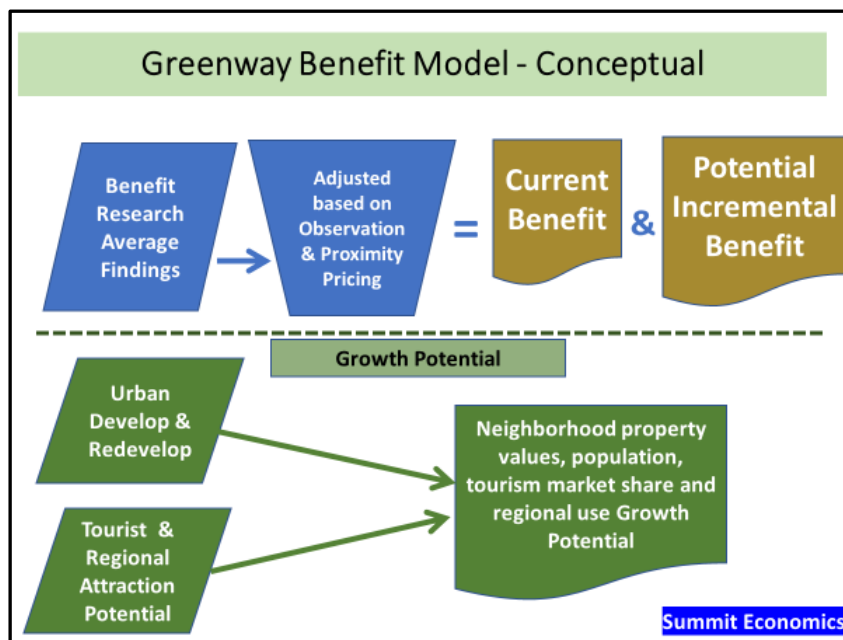


## Conceptual Framework

Economic benefits can emanate throughout an economy like waves. Sometimes there is a single wave from a single investment such as building a new trail. Investment in the trail

<sup>31</sup> Strava Labs, <https://labs.strava.com/heatmap>. See Appendix B for a breakout of foot use and bike use by greenway.

creates jobs and once the trail is completed the wave dissipates and there is no longer an impact from trail building. At other times the waves repeat at a certain frequency like benefits from regular trail use. Finally, some impacts permanently raise a tide as if the wave rose and then never subsided – such as a significant and permanent impact on property values. Using this analogy, we refer to the frequency of time impacts which can be simplified into one-time temporary, one-time permanent, or on-going. Since this report does not consider the cost of greenway investment or maintenance, we only consider the one-time permanent and on-going beneficial impacts. Property value impacts fall under the one-time permanent benefit while all other benefits are modeled on an annual basis, including the property taxes from the changed property values.



The basic logic of the model is shown in the graphic. Based upon the research highlighted in the previous section, each benefit addressed in this study uses the average benefit finding (top left) and then adjusts or segments that benefit (moving left to right on the upper line) into Current Benefit realized and Potential Incremental Benefit. The adjustment is based upon several

observations along each trail as well as the amount of the proximity property value from a greenway location realized relative to a maximum potential of 20% as discussed previously and below. These benefits apply to both one-time permanent benefits (property values) and on-going annual benefits.

The second major model component (the graphic's bottom half) are benefits resulting from tourism and from additional urban development and redevelopment in neighborhoods surrounding the greenways. This modeled element results in additional vacant land being developed and some redevelopment of existing properties. The timeframe in which the development/ redevelopment is assumed is the next half century which is typical when considering urban redevelopment as there are so many unknowns until clear momentum has been achieved and expresses itself in the local, relevant markets. No existing residential improved properties are assumed to redevelop and no land or properties within floodplains are considered. After adjusting assumptions are made, the result is some of the potential new development/ redevelopment in terms of land acreage and new construction is projected to



come to fruition. In all cases mixed use development is assumed with 80% being residential.<sup>32</sup> The amount of development/redevelopment translates into population growth in the neighborhood along with the higher total property valuations in the neighborhood.

Additional Growth Potential comes from the greenways' tourism market share and ability to attract individuals from throughout the region to work and play close to the greenway. This creates long-term Growth Potential beyond current estimates (bottom right of graphic).<sup>33</sup>

## **Study Area Descriptions**

This brief introduction of the three study areas provides an overview for understanding existing conditions in each area. In each study area a 2,000 foot boundary was drawn around the greenway. This became the primary benefit zone generating all the property value increases and traffic for recreation and transportation. While clearly there are people living out of the 2,000 foot zone who benefit from use of the greenways, without census type intercept surveys there is no way of knowing the extent of the broader geographic benefit. When forecasting growth potential, percentages of the regional population are applied to account for the regional benefit. Tourist estimates are based on observation or research conducted in the past regarding tourist market share of given locations.

### Legacy Loop

The Legacy Loop is the signature, initiation project of the Greenway Fund along with its inaugural vision program known as "Boats, Beaches, and Bikes" which seeks to develop a portion of the Pikes Peak Greenway along Monument Creek as a complete recreational asset with water access. The Legacy Loop is a greenway redevelopment project that endeavors to enhance the regional and tourist appeal of existing greenways circling Downtown Colorado Springs and its surrounding neighborhoods while complementing overall core city redevelopment efforts.

The Legacy Loop has a history of its own. According to Matt Mayberry, Director of the Colorado Springs Pioneer Museum, mention of "the emerald necklace" as a trail encircling Colorado Springs goes back to 1912 and may have been part of the city's founder's vision (Stanley,

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<sup>32</sup> Given the knowledge of the stark differences in neighborhoods along the different trails segments studied and modeled, the real estate portions of the analysis were broken into smaller sections along the trails for review. This provided the opportunity to review the sections independently to better understand the neighborhoods and potential benefits.

<sup>33</sup> Implicit in the growth potential modeling are economic thresholds and tipping points being realized as a result of positive greenway developments resulting from greater usage and property values.



2018)<sup>34</sup>. In more recent years the Legacy Loop has been a key component of Downtown plans, including the most recent “Experience Downtown Master Plan” authored by the Downtown Partnership. The plan’s Goal 3 includes: “Complete the Legacy Loop, to include seamless connections into Downtown, wayfinding signage, programmatic activities, user amenities and areas of access to the creek”<sup>35</sup>. As shown in the following graphic from Norris Design (2015), such a goal would engage Monument Creek in ways never done before in Colorado Springs.

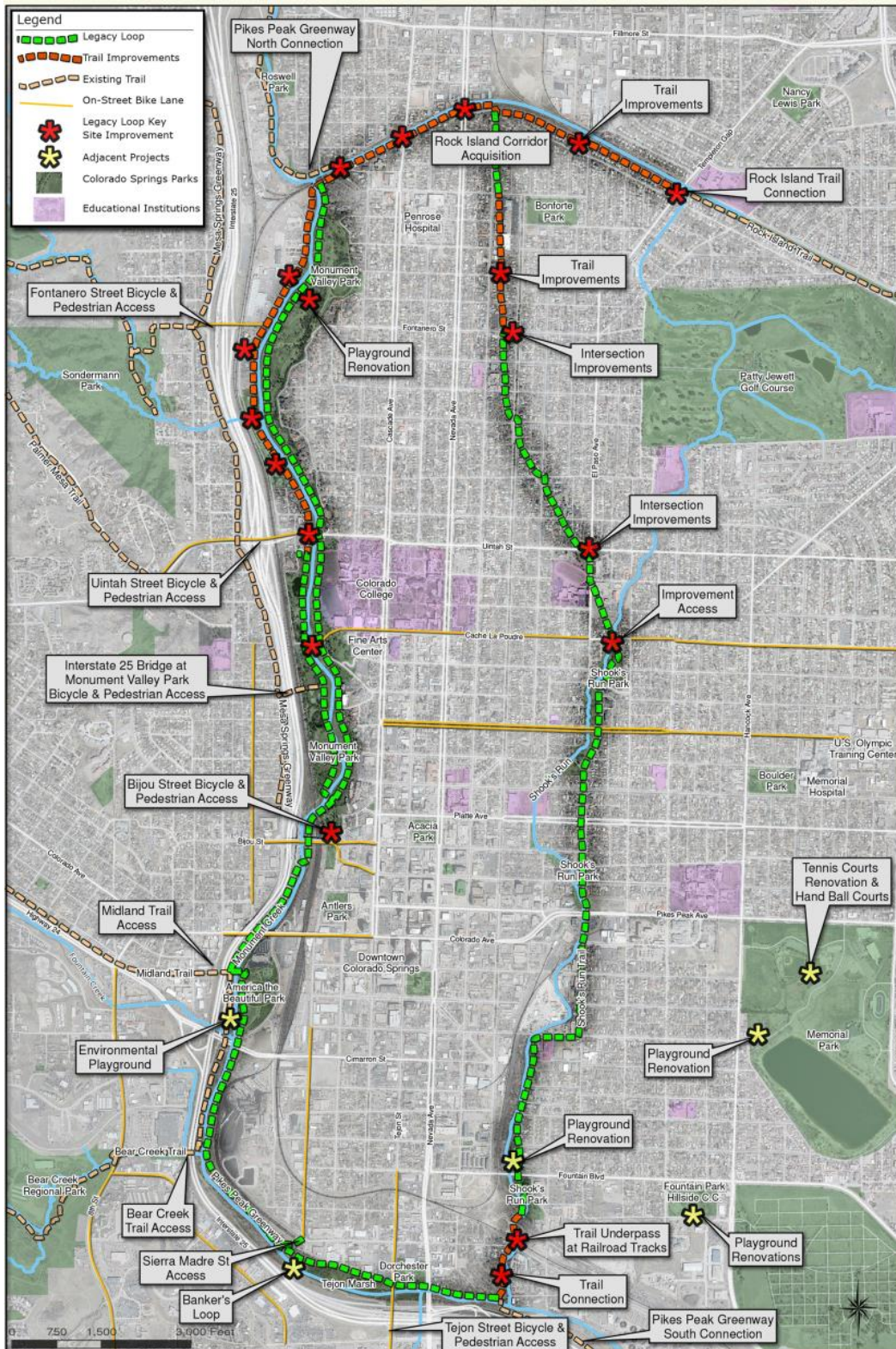


As shown on the following map (see next page), most of the trail system exists today. Yet overall it has gaps and the full connectedness of the loop trail is limited to the more adventurous; especially on the northern and southeastern extents of the trail. The trail loops through most of the oldest neighborhoods in Colorado Springs and encircles the Downtown area in the southern mid-section of the loop. In total the Legacy Loop covers 10 miles and portions of it have over a 100 year history along Monument Creek and decades of use along the eastern portions following northern areas of Shooks Run and an abandoned railroad ROW.

<sup>34</sup> See J. Adrian Stanley’s article in the *Colorado Springs Independent*, <https://www.csindy.com/coloradosprings/springs-pushes-to-finish-the-legacy-loop-a-century-after-it-was-first-envisioned/Content?oid=10521666>

<sup>35</sup> [https://coloradosprings.gov/sites/default/files/execsummary\\_sept2.pdf](https://coloradosprings.gov/sites/default/files/execsummary_sept2.pdf)



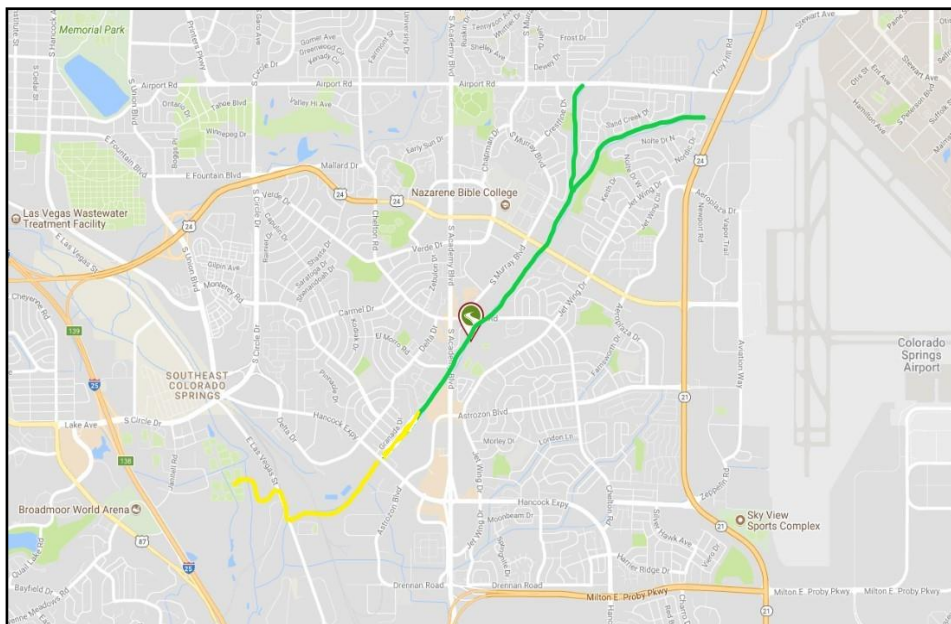


Trails and Open Space Coalition

The Legacy Loop is scheduled to complete Phase 1 by the autumn of 2018. Phase 1 received over \$3 million in funding from GOCO which, along with other contributions, will complete connectivity along the northern end of the Legacy Loop, along the Rock Island Trail (an abandoned rail and active channeled drainageway). In addition, a parking lot and Legacy Plaza are being built on City owned land off the underutilized Fontanero Street exit off I-25, wayfinding and signage assets are being installed, and select access points to the creek itself and underpass improvements are being made. These improvements will provide a regional and tourist access point to the most used portion of the Pikes Peak Greenway trail which is also the only area that we know of to have put in place a usage count system.

### Sand Creek

The Sand Creek trail runs primarily through a residential area with housing between 15 and 40 years old. The newer units tend to be condominiums and townhomes as well as single family detached neighborhoods on the far eastern and northern extent of the study area. The trail itself, a wide concrete slab, is in great shape, but appears very under-utilized based upon observations during normally peak trail activity times.<sup>36</sup> The observations are borne out by



<sup>36</sup> From the Pikes Peak Greenway Trail count, Saturday late morning with warm, clear weather in October should have many trail users. If the usage indices are multiplicative, then the formula would be 1.96 (10 AM) X 1.11 (Saturday) X 1.12 (October) = 2.44 of average usage. Only 1 adult and child were observed together along multiple segments even though the YMCA parking lot was over 50% full. Other observations, which were limited, yielded similar results. Observations are consistent with the Strava Labs heatmap.

Strava data which shows decent foot traffic but low bike traffic on the trail. The entire area sits west of the Colorado Springs Airport.

The improved part of the trail runs from Airport Road on the north to halfway between Academy Blvd and Hancock Expressway on the southwest (see green line on map). Only that portion of the unimproved trail north of Hancock is included in the present study area.

Most notable about the Sand Creek Trail is the improved trail is isolated from other greenway trail systems thereby providing only localized functionality. It's approximately 3 miles long. The improved section of the trail does provide usage for neighborhood level shopping, services, schools, and recreation. Sand Creek does provide informal trail access further to the southwest (see yellow line on previous map) as it runs through an industrial area, and the more adventurous can find their way to the Pikes Peak Greenway with a mountain bike or hiking. Unfortunately, from an image perspective they must pass the County Jail along their path.

To the northeast, Sand Creek forks and East Sand Creek breaks off running somewhat parallel to Sand Creek but further to the east. East Sand Creek follows government owned land, but if developed would encroach upon the northwestern edge of the Colorado Springs Municipal Airport which also serves as a military facility. East Sand Creek does not run into private owned land until it ventures northeast of Platte Ave.

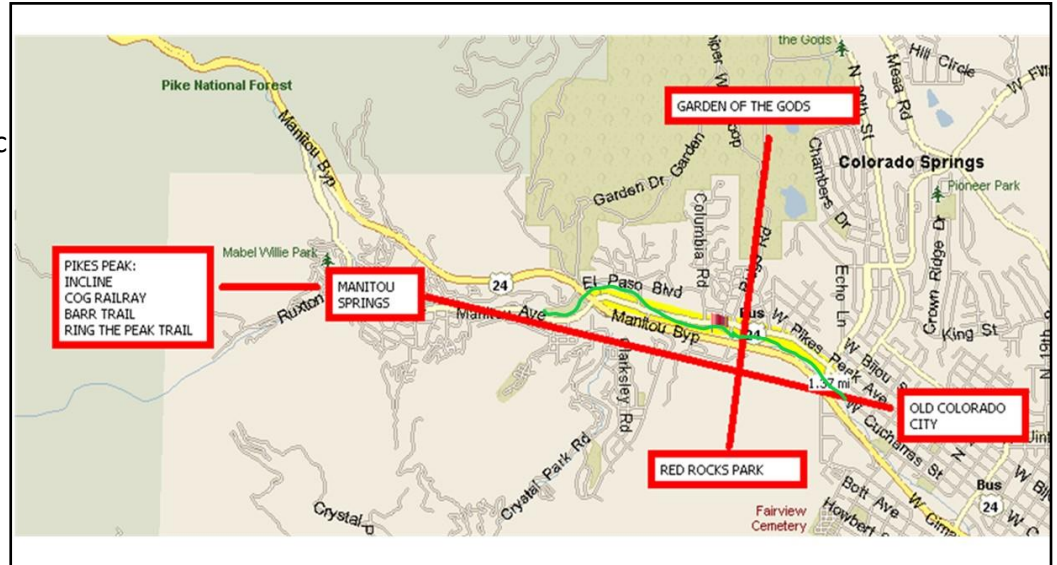
The main Sand Creek crosses Airport Road and quickly runs into vacant, stranded residential and industrial parcels of ground. Informal paths can be seen from overhead imagery crisscrossing the area, and if one follows Sand Creek north-northeast after 2.6 miles from Airport Road the creek comes within 1 mile of the Rock Island Trail with Palmer Park Blvd being a connector. Continuing northeast 1.3 miles, Sand Creek crosses Powers Blvd close to Waynoka Road and enters the Springs Ranch Country Club just east of First and Main, the largest regional shopping center in eastern Colorado Springs.

Recent efforts have been made to promote Sand Creek as a "balloon tire" bicycle recreational asset. These are off road bikes with very large fat tires (hence the name) which enable riding on sand, snow, and loose gravel. This is a specialty niche within the bike world that is growing in popularity. Such an activity is considered suitable for riding in the creek bottom itself which, as its name implies, is sand. Sand Creek could draw a growing number of riders from the region and well as day tourists.



## Midland Trail from Manitou Springs to Old Colorado City (MOCC)

The Midland Trail is largely developed with a wide concrete trail running from Downtown Colorado Springs to historic Manitou Springs. It runs a few blocks south of historic Old Colorado City which was redeveloped with preservation guidelines back in the 1970s. The portion of the Midland Trail studied herein is the western portion



running from 26<sup>th</sup> Street in Colorado Springs into Manitou Springs to Mayfair Ave (See green line on previous map). The study segment of the trail also runs between the nationally famous Garden of the Gods municipal park and Red Rock Canyon Open Space (Red Rocks Park). A review of Strava Lab data shows the trail is more actively used by cyclists than pedestrians. Pedestrian usage picks up between 31<sup>st</sup> and 26<sup>th</sup> Streets close to Old Colorado City and then when the trail enters the area of Manitou Springs southwest of Highway 24.

The only missing segment of the trail is at Columbia Road, which is historically known as Adams Crossing. This final crossing is currently under construction as part of the Westside Avenue Action Plan -- a multi-jurisdictional effort to completely redevelop what is locally known as “no-mans-land”. The study area includes portions of Colorado Springs and Manitou Springs as well as a portion of unincorporated El Paso County and part of neither city. Much of the area in Manitou Springs is also part of a unique Urban Renewal Authority (URA) which contains the only two retail marijuana stores in El Paso County and receives substantial incremental sales tax from those retail outlets.<sup>37</sup> The study area is narrower than the other areas studied due to U.S. Highway 24 running parallel to the study area to the south thereby creating a geographic impediment.

<sup>37</sup> Colorado Springs and El Paso County have numerous medical marijuana facilities, but both the County and Colorado Springs have chosen not to license retail marijuana. Manitou Springs, as a home rule city, chose to license two retailers. According to the Urban Renewal Authority’s plan, upon City Council approval, the municipal sales tax increment will be allocated and distributed in accordance with the tax increment financing provisions of Section 31-25-107 (9), C.R.S. See the URA website at [http://www.manitouspringsgov.com/library/documents/general/planning/ura\\_urban\\_renewal\\_plan.pdf](http://www.manitouspringsgov.com/library/documents/general/planning/ura_urban_renewal_plan.pdf)

In its heyday most of the study area was a middle-class tourist attraction at the base of Pikes Peak. Many of the single-family residences were seasonal homes. However, with changes in the tourist industry, much of the area entered the phase of urban decline, similar to the southern reaches of the Legacy Loop. As is common in the urban decline phase of neighborhoods, the area has become home to very low value uses such as old motels becoming homes to people on the edge of homelessness. Furthermore, Fountain Creek in this area has a significant homeless population which generally inhabits areas south and southeast of downtown Colorado Springs (the southern Legacy Loop), up Fountain Creek and into the Pike National Forest. In stark contrast to the low economic value uses in the area, many of the residences sit in the highly desirable intersection of revitalized historic areas and highly desirable park systems. This contrast creates substantial neighborhood conflict which moves beyond traditional neighborhood gentrification debates.

The Midland Trail is slated for additional improvements by the URA such as trail connectors from Manitou Avenue as it undergoes major pedestrian and bike friendly improvements. As a result of the road and access improvements, the greenway will run in close parallel to a revitalized walkable and bikeable corridor slated for urban renewal with money to invest. Further west of the Study area, within the older historical confines of Manitou Springs, there are plans to develop the Creek Walk Trail. Further west, the Creek Walk Trail will eventually link to the grand vision of the Ute Pass Trail and Ring the Peak Trail which in decades to come are likely to create trail connectivity to Woodland Park and around Pikes Peak. This should attract more tourists and regional visitors to Manitou Springs and the MOCC.

## Comparative Statistics by Study Area

Before considering modeled results for key benefits in the different study areas, it is worth reviewing some key statistics to help understand how the study areas compare to one another.

### Demographic Data

The adjacent table shows the population, median income, median age, education levels, and job status of each study area. These statistics are related to the geography within 2,000 feet of the trails. Some relevant density metrics are also calculated.

Comparative Population Demographics - 2,000 Foot Zone			
	Legacy Loop	Sand Creek	Midland-MOCC
Population	50,431	35,013	15,235
Median HH Income	\$ 41,675	\$ 44,205	\$ 50,000
Median Age	39.1	28.4	44.4
Education Attainment (Percent)			
Less than High School	8%	16%	5%
High School	21%	29%	17%
Some College/Assoc Degree	35%	40%	35%
Bachelor Degree or Higher	36%	15%	43%
Job Status (Percent)			
Civilian Job	57%	55%	61%
Not in Labor Force	35%	30%	33%
Density			
Trail Miles	10	3	2.6
Persons per trail mile	5,043	11,671	5,860
Persons per residential Parcel	6.3	8.0	8.6
American Community Survey via El Paso County Assessor website, Summit Economics			

The Legacy Loop covers the largest area as a 10-mile trail and has the largest population. The population per trail mile is lower than the other areas because as a loop the 2,000 feet range

from trails overlaps on the northern and southern ends of the trail. In addition, the area encompasses downtown which is largely non-residential. The lower population per residential parcel implies relatively more people living in single family residences as well as small apartment houses around the Legacy Loop. All three areas have much higher population density when compared to El Paso County which shows 3.1 persons per residential parcel.<sup>38</sup>

The median household income is lowest around the Legacy Loop as it includes an older population relative to Sand Creek and low- income households especially around the southern half of the loop and areas west of I-25. The Midland MOCC Trail section has the highest median household income of the three areas when all households within 2,000 feet of the trail are considered. All three areas have median household incomes significantly below El Paso County's median household income of \$57,487. The lower incomes around the Legacy Loop relative to Sand Creek are not due to education attainment which is substantially higher around the Legacy Loop relative to Sand Creek. The Midland MOCC area has this highest education attainment levels as well as the highest participation rate in the Civilian Job market. This also helps explain the lower incomes in Sand Creek and the Legacy Loop; although in the case of Sand Creek there are many military personnel, which decreases both the Civilian Job and Not in Labor Force percentages.

#### Real Estate Parcels and Valuation

The adjacent table shows dramatic differences between Sand Creek and the other areas in terms of land use and property values.<sup>39</sup> Sand Creek is almost entirely a residential area while the Legacy Loop and Midland MOCC have

substantial commercial components. In fact, the Legacy Loop which contains Downtown Colorado Springs is very similar to the Midland MOCC in all metrics except for a higher percent

Real Estate Parcels and Valuation - 2,000 Foot Zone			
	Legacy Loop	Sand Creek	Midland-MOCC
Parcels (Total and Percent by land use type)	10,416	4,603	2,261
Commercial	10.6%	1.5%	10.5%
Exempt	7.7%	1.8%	4.6%
Industrial	0.5%	0.0%	0.0%
Residential	77.4%	95.6%	78.2%
Vacant Land	3.8%	1.2%	6.8%
Valuation/Parcel	\$ 336,940	\$ 199,641	\$ 253,459
Commercial	\$ 658,736	\$ 1,267,683	\$ 345,612
Exempt	\$ 817,068	\$ 749,678	\$ 230,288
Industrial	\$ 210,966	\$ 1,760,000	
Residential	\$ 256,801	\$ 172,937	\$ 261,585
Vacant Land	\$ 106,190	\$ 155,560	\$ 32,614
Parcel Count by Valuation (in Thousands and Percent by range)			
<\$100k	13.9%	12.2%	13.1%
\$100-\$200	33.7%	76.1%	32.9%
\$200-\$300	29.1%	9.6%	28.8%
\$300-\$400	9.1%	0.2%	12.8%
\$400-\$500	5.1%	0.3%	5.5%
>\$500k	9.0%	1.6%	6.9%
El Paso County Assessor, Summit Economics			

<sup>38</sup> All demographic data related to population is from the El Paso County Assessor office's GIS interface with the American Community Survey (ACS) published by the U.S. Census Bureau. The data is 2016. The Assessor's office discloses that small area data is prone to inaccuracies which is certainly the case when measuring smaller zones within 500 feet of trail segments.

<sup>39</sup> All data is from the El Paso County Assessor based on 2017 appraisals which are based upon sales from July 2014 through June 2016.

of exempt properties and a higher average valuation per parcel. Note the average value per commercial parcel in the Sand Creek area is much higher than the other, older areas since it has fewer, but larger parcels.

Residential values are substantially higher along both the Legacy Loop and Midland MOOC. Average value per vacant land parcel in the Midland MOOC are much lower due to smaller parcels with many encompassing land within the flood plain.

### Sales and Investment

Metrics related to the number of parcels sold as well as remodeling building permits reflect investment activity in each of the study areas. As shown in the table, Sand Creek has shown the most active real estate market in terms of growth rates in the number of real estate parcels sold. Only in 2014 did the percentage growth of parcels sold in Sand Creek fall below the other

two areas. The Legacy Loop and Midland MOOC show highly volatile sales growth – possibly due to the greater concentration of commercial and exempt properties.

It appears Sand Creek is doing relatively well due to the affordable housing nature of the neighborhood. The turnover rate of Sand Creek parcels in 2016 was more than two times the rate in the other areas (see Last 12 Months of Sales - Parcels as % of Total in

<b>Real Estate Sold and Residential New Investment - 2,000 Foot Zone</b>			
	Legacy Loop	Sand Creek	Midland-MOCC
Annual Growth in Parcels Sold [1]	9.0%	20.3%	3.1%
2013 Sales Growth	-2.1%	5.9%	-30.0%
2014 Sales Growth	27.7%	14.8%	28.6%
2015 Sales Growth	12.4%	38.2%	30.6%
2016 Sales Growth	-2.2%	22.2%	-17.0%
Last 12 Months of Sales			
Parcels	473	422	84
Avg Price/Sale	\$ 331,982	\$ 221,872	\$ 369,424
Parcels as % of Total in Area	4.5%	9.2%	3.7%
Residential Permits			
New	21	0	4
Remodel	360	249	70
Average Value/Remodel	\$ 15,726	\$ 13,997	\$ 16,713
Remodels as % of Residential Parcels	4.5%	5.7%	4.0%
Remodel Value /Residential Value	6.1%	8.1%	6.4%
[1] The overall annual growth rate in the number of parcels is the simple average of the four individual years 2013 to 2016.			
El Paso County Assessor, Summit Economics			

Area). There were no new housing units developed in Sand Creek in 2016. The 21 new units in the Legacy Loop area were probably related to a single townhome or condo project. Overall, the three areas had similar levels of reinvestment into residential properties with the number of remodeling residential permits ranging from 4.0% to 5.7% of total residential parcels and the value of the remodeling ranging from 6.1% to 8.1% of total residential values. This data reflects active investment in Sand Creek and possible speculative holding in the other areas, especially the Midland MOOC where dramatic changes are occurring with public infrastructure in the area despite the challenging homeless problem.



## Residential Proximity Pricing

The approach taken was intended to generally isolate residential property values in similar neighborhoods in terms of property size and age, and then compare them to one another as a group based upon the distance the group is from the greenway. The groups include residential properties within 500 feet of the greenway (the < 500 group), residential properties 500 to 2,000 feet from the greenway (the 500 – 2,000 group), and baseline properties adjacent to the 2,000 foot boundary, but beyond 2,000 feet from the greenway. All data was collected from the El Paso County Assessor's new platform that allows a variety of information to be summarized from user defined areas within the county.<sup>40</sup>

The key element in estimating the magnitude of the proximity pricing benefit is based upon research presented in the previous section of this study which concludes greenways, when well maintained and regularly used, typically increase the value of homes within 500 feet of the greenway by 20% relative to similar properties in the baseline category and by a much smaller percentage for properties 500 to 2,000 feet from the greenway. This model assumes a 20% potential is achievable within 500 feet and compares that potential to existing conditions.<sup>41</sup> The results from the three study areas are shown in the adjacent table.

<b>Residential Values Relative to Baseline</b>	<b>Legacy Loop</b>	<b>Sand Creek</b>	<b>Midland MOOC</b>
Existing			
< 500 Feet of Trail	13.1%	-1.1%	4.2%
500 to 2,000 Feet of Trail	1.5%	1.9%	2.5%
Remaining Potential			
< 500 Feet of Trail	6.9%	21.1%	15.8%
500 to 2,000 Feet of Trail	2.2%	0.7%	1.5%

El Paso County Assessor, Summit Economics

The Legacy Loop, which is by far the most used trail, shows an existing average price premium of 13.1% for the <500 feet group relative to the baseline. Moving to the 500 - 2,000 feet zone along the Legacy Loop, the average price premium drops to 1.5%. In contrast, residential properties within 500 feet of the Sand Creek greenway show lower values than their baseline comparables on average. This implies the housing market views Sand Creek as neutral or slightly negative closer to the trail. The Midland MOCC greenway shows a 4.2% premium within 500 feet which is consistent with observation from the standpoint that the Midland MOCC has usage between the observed relative extremes of the Legacy Loop (high usage) and Sand Creek (little usage).

<sup>40</sup> The link to the Assessor's system is <http://community.spatialtest.com/co/elpaso/#/Area-Overview/map/38.815245,-104.50332400000002,10>

<sup>41</sup> Research shows that approximately 25% of the total benefit from proximity pricing accrues to the < 500 feet group. This allows for an allocation of the benefit between the < 500 and 500 – 2,000 groups.

As an important reminder, this model is not a rigorous academic research study, but rather applies research findings to three cases. In doing so, we find the property groups appear conceptually consistent with limited observations of actual usage of the trails in the different greenways. We also find in the case of the Legacy Loop and the Midland MOCC that greater relative property values are found in the closer <500 feet group.

When combined, the premiums found within 2,000 feet of the Legacy Loop result in a total additional market value of \$93.8 million. Given the population living within 2,000 feet, the current proximity pricing benefit is \$1,859 per person. As shown under the Per Capita section of the following table, that premium is more than twice the premium currently being realized in Manitou-Old Colorado City (\$856) and almost 7 times the benefit in Sand Creek (\$268).

Residential Proximity Pricing		Total Potential		Current		Current Potential Increment		Growth Potential	
Common-Size Percentages									
Sand Creek		100%		16%		84%		0%	
Manitou-Old Colorado City		100%		45%		55%		0%	
Legacy Loop		100%		57%		43%		0%	
Per Capita									
Sand Creek		\$	1,633	\$	268	\$	1,364	\$	-
Manitou-Old Colorado City		\$	1,886	\$	856	\$	1,030	\$	-
Legacy Loop		\$	3,246	\$	1,859	\$	1,387	\$	-
Total Increase in Property Value									
Sand Creek		\$	57,160,947	\$	9,389,652	\$	47,771,295	\$	-
Manitou-Old Colorado City		\$	28,735,136	\$	13,037,718	\$	15,697,419	\$	-
Legacy Loop		\$	163,704,135	\$	93,759,147	\$	69,944,988	\$	-

When compared to the Total Potential benefit from proximity pricing, it appears the Legacy Loop has already achieved 57% of potential (see Common-Size Percentages section of the table) while the Midland MOCC section has achieved 45% and Sand Creek has only achieved 16%. The Current Potential Increment column in the table shows the potential that could still be realized if the property group <500 feet of the greenways realize their full 20% premium and the 500-2,000 group ultimately achieves a premium equal to approximately 25% of the total pricing premium found within 2,000 feet of the greenways.

Differences in per capita Total Potential exist because of differing population densities (smaller household size and fewer apartments) creating a smaller denominator and differing ratios of residences in the <500 group versus 500-2,000 feet group as 75% of total impacts are felt within 500 feet of the greenway. Such is the case with the Legacy Loop which has 6.3 persons per residential parcel (compared to 8.0 and 8.6 in the other areas) and has 28% of all residential parcels within 500 feet as opposed to 18% and 21% in the MOCC and Sand Creek areas respectively.

While there is still incremental benefit to be realized in all three areas of between \$1,030 and \$1,387 per person, there is no guarantee that any future incremental premiums will be achieved. Furthermore, if the greenways degrade from a physical and/or social perspective (e.g. becoming havens for illicit activities), the incremental premium could become negative. Also note that the Current premiums have already been realized and are incorporated into the price paid when homes are purchased. As a result, there is no economic benefit to the broader community except in the higher annual property taxes that are paid. Property taxes are addressed later in this report. The households that live in homes as a greenway becomes popular benefit as the pricing premium grows. When they sell or refinance their home based upon higher appraisals, the appreciation rate realized is above average and the household receives the entire benefit as measured here.<sup>42 43</sup>

There is no Growth Potential as the Proximity Pricing analysis and modeling only addresses current properties as opposed to new residential units that might be developed in the neighborhoods. That benefit is addressed in the next sub-section along with changing land use from industrial, commercial, and exempt use to higher density residential or mixed use.

## **Development & Redevelopment Growth Potential**

As discussed in the Secondary Research section of this study, greenways are increasingly being viewed as community investment opportunities that can drive subsequent public and private investment and create one-time permanent benefits in the form of new real estate development and redevelopment as well as appreciation for commercial and other non-residential properties. The additional urban capacity then sustains on-going benefits such as health, recreation, and transportation.

In the case of the three trail segments studied here, all exist within developed urban areas. While the Sand Creek area does have some large parcels of vacant land that could be stimulated by the neighboring greenway's reputation as a recreation and transportation asset, there is very limited large parcel vacant land around the Legacy Loop that is not in the floodplain and essentially none on the Midland MOCC greenway. This means that most

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<sup>42</sup> To the degree that housing along greenways have higher than community-wide average appreciation rates, lower income households can be negatively affected as they will have to pay higher rents or move from the neighborhood. The broader community can benefit economically in the shorter-term to the extent local households pull additional equity out of their homes and spend the cash on local goods and services.

<sup>43</sup> The proximity pricing premiums are not spread evenly across any given group. For instance, there is a significant difference between the northern and southern parts of the Legacy Loop. The modeling accounts for these differences by extending the baseline group from all groups within 2,000 feet, but needless to say some properties will have more Potential Increment than others.

greenway benefits that stimulate future growth for the Legacy Loop and Midland MOCC must come from redevelopment.

Redevelopment is a long-term endeavor. Even when there is massive initial investment in a given location, it typically takes at least a decade for market and subsequent private investment to hit critical thresholds that manifest in economic tipping points and result in sustainable market force creating widespread neighborhood level momentum. As this process unfolds over time, a speculative stage (i.e., buying and holding real estate with little investment in the existing asset) often precedes the tipping point and can hinder investment. This evolutionary process requires modeling based upon numerous assumptions over a very long period of time. The intent here is to demonstrate what might reasonably happen with successful greenways. All benefits in this section are deemed to be one-time permanent benefit from greater urban density and none is considered a Current benefit.<sup>44</sup>

In the model utilized we assume a 50 year time-frame. All vacant land within 500 feet of the greenway and not in the floodplain was considered potential development land. Some developed commercial, exempt, and industrial properties within 500 feet were considered for redevelopment if the total value of the property (land and improvements) did not generally exceed approximately \$12 per square foot of land.<sup>45</sup> Only selected parcels in the 500 – 2,000 feet area were considered. Generally, to be considered for redevelopment in the 500 – 2000 feet area, a property had to be larger, could be part of an assemblage, and generally could not be separated from the greenway by a geographic boundary such as I-25. The most notable properties considered as potential include:

- Legacy Loop: The entire southwestern corner of the loop (south of the railroad and west of Nevada Avenue), the auto parts recycling yards on the southeastern edge, the concrete plant and vacant Gazette building, land north of the Rock Island Trail, and the City equipment yard on the northwestern edge. In addition, 40% of the vacant lots east of the eastern stretch of the Legacy Loop were included.<sup>46</sup>

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<sup>44</sup> One could argue that there is Current benefit associated with non-residential properties based upon speculative investment around emerging greenway usage.

<sup>45</sup> This is based upon the notion that improvements must be substantially depreciated and/or functionally obsolete with little value in order to justify purchasing the asset to demolish improvements and develop new improvements. Substantial renovation of existing assets could also occur to modernize the assets, but is not factored in this model.

<sup>46</sup> Redevelopment of the Drake property and neighborhood immediately to the east were considered to be attributable to the eventual Drake decommissioning and not the Legacy Loop. The old St. Francis Hospital building was also not included. None of the substantial redevelopment currently underway in the downtown area is

- Sand Creek: All vacant parcels and their adjacent low value commercial and exempt parcels, especially those east of Academy Boulevard, were considered.
- Midland MOCC: All older motel properties, a portion of the RV park, and horse stables north of the greenway as well as the entire industrial area south of Hwy 24 between 31<sup>st</sup> and 26<sup>th</sup> streets.<sup>47</sup>

Of the total land available for development or redevelopment, only 48%, 53% and 74% was assumed to be realized or developed within 50 years in Sand Creek, Midland MOCC, and the Legacy Loop neighborhoods respectively. The land portion of the redevelopment was assumed to increase from current weighted averages to \$6.39 per square foot yielding an incremental real increase in land values as a result of redevelopment.<sup>48</sup> Redevelopment was assumed to be 80% residential and the balance commercial with an average number of stories equaling 3.5 (Legacy Loop), 3.0 (Midland MOCC), and 2.5 (Sand Creek). Exclusive of land costs, improvements were modeled at \$150 per square foot for the Legacy Loop and Midland MOCC and \$125 for Sand Creek.

Commercial properties within 500 feet area not included in the redevelopment potential were assumed to appreciate in real terms (above and beyond general market appreciation due to

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included even though one could argue that the Legacy Loop could be attributed some value given its inclusion in the *Experience Downtown Master Plan*.

<sup>47</sup> The industrial area south of Hwy 24 (a major arterial) was included due the close proximity of Fountain Creek to the Hwy 24 – 26th Street intersection. The industrial area will be heavily influenced by the Red Rocks Open Space as it evolves more towards higher density residential development. Proximity to Fountain Creek could be a factor with safe pedestrian access across Hwy 24.

<sup>48</sup> Land value is the average of 80% multi-family and balance equal parts retail, restaurant, shopping center, child care, congregate living, and convenience center using average land values and coverage ratios from Turner Research 2000-2015 in El Paso County. Land values inflated by 15% to express in 2017 dollars.

inflation) yielding some benefit from the greenway without any redevelopment. No commercial property appreciation was considered in the 500 – 2,000 feet range. The model does not include any substantial renovation of existing properties and in this regard is conservative.

The results of the modeling are

Greenway Neighborhood Redevelopment Model -- 50 Years							
	Sand Creek		MOCC		Legacy Loop		
Real Appreciation of Existing Commercial							
Percent Appreciation					11%	9%	16%
Commercial Value Real Appreciation					\$ 9,387,508	\$ 2,467,171	\$ 5,362,374
Vacant Land Developed & Redevelopment							
Percent of Total Available Developed/Redeveloped					48%	74%	53%
Total Acres Developed/Redeveloped					64.3	33.5	93.3
Total Land Value Increment/Square Foot					\$ 4.68	\$ 1.76	\$ 1.28
Total Incremental Land Value					\$ 13,097,684	\$ 2,574,516	\$ 5,211,327
Building Development					\$ 324,998,873	\$ 244,073,416	\$ 793,025,442
Total Property Value Increase					\$ 347,484,065	\$ 249,115,103	\$ 803,599,144
Percent Attributable to Greenway					65%	33%	65%
Property Value Increase Attributable to Greenway					\$ 225,864,642	\$ 82,207,984	\$ 522,339,443
Housing & Population Growth							
Number of Residential Units					1,809	2,185	3,845
Total Population					3,617	4,370	7,690
Percent Population Growth within 2,000 feet					10%	12%	15%
** All development and redevelopment to occur withing 2,000 feet of greenways							
Summit Economics							

summarized in the adjacent table. Of the Total Property Value Increase, only 65% are assumed to be attributable to the greenways in Sand Creek and the Legacy Loop and 33% in the Midland MOCC area. The higher 65% attributable ratios are due the lack of obvious other influences on the properties in questions while the lower 33% increase for the Midland MOCC results from substantial urban reinvestment underway and planned on the Manitou Blvd/Colorado Ave corridor. The incremental land values are driven by more redevelopment in the Midland MOCC and Legacy Loop as opposed to new development on vacant ground in Sand Creek. Commercial appreciation rates on non-redeveloped, commercial properties are assumed based upon reviews of numerous sub-areas associated with each greenway<sup>49</sup>.

The estimated development/redevelopment results in new housing units, population increases, and growth rates based upon 1,100 square feet per unit (1,150 in Sand Creek) and two persons per new unit.

As shown in the following table, virtually all of development/redevelopment benefits are based upon Growth Potential. Only the commercial property appreciation is listed as a Current Potential Increment since it does not depend upon new real estate investment.

<sup>49</sup> To construct the property value model elements, ten sub-areas were created for more detailed consideration in the Legacy Loop, eight for Sand Creek, and four for Midland MOCC. This allowed for more detailed consideration of commercial property appreciation potential depending upon current value levels and the perceived intensity of impact on the <500 commercial properties. Properties considered as potential available redevelopment sites were not appreciated even though the number of acreage actually redeveloped was discounted.

Development/Redevelopment	Total Potential	Current	Current Potential Increment	Growth Potential
Common-Size Percentages				
Sand Creek	100%	0%	3%	97%
Manitou-Old Colorado City	100%	0%	1%	99%
Legacy Loop	100%	0%	1%	99%
Per Capita				
Sand Creek	6,451	-	174	6,277
Manitou-Old Colorado City	5,396	-	53	5,343
Legacy Loop	10,358	-	69	10,288
Total Increase in Property Value				
Sand Creek	225,864,642	-	6,101,880	219,762,762
Manitou-Old Colorado City	82,207,984	-	814,166	81,393,817
Legacy Loop	522,339,443	-	3,485,543	518,853,900

Like the Proximity Pricing benefits, the Development/Redevelopment per capita benefits are approximately twice as high in the Legacy Loop neighborhood than in Sand Creek and Midland MOCC. In the case of the Midland MOCC the lower per capita benefit is due to the lower attribution of redevelopment to the greenway.

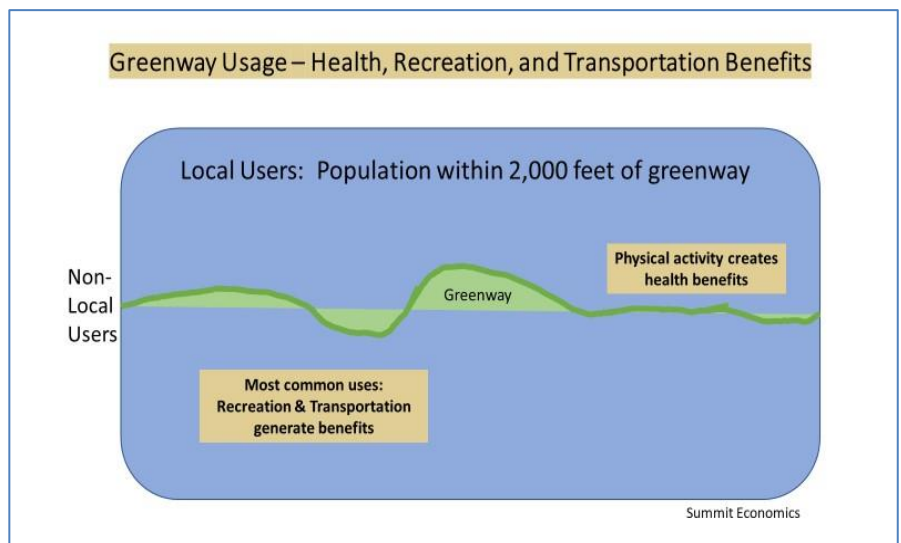
## Economic Benefits from Recreation, Transportation & Health

### General Approach

The most fundamental economic benefits from greenways associate with recreation (including exercise) and transportation.

Such active uses create subsequent health benefits. The magnitude of the economic benefits are documented in the Secondary Research section of this report.<sup>50</sup> As shown in the graphic, the benefits accrue to locals living within 2,000 feet of the greenway and non-local users from other areas.

Consistent with research in the realm of economics, geography, and human activity, one would



<sup>50</sup> As noted previously in this study, there are numerous cultural benefits of greenways which are far more difficult to quantify. These include education, creating a focal point for community and neighborhood congregation and interaction, and enhancing the appreciation of nature and the environment amongst an urban population.

expect that most greenway usage is localized simply based upon the opportunity created by closer proximity.

To estimate trail usage we have made approximations extracted from common usage numbers for Colorado. From these numbers and estimates of the number of people living within 2,000 feet of the greenways we estimate the number of potential unique users and total usage which considers the frequency of use and distances traveled per use. The resulting Current Potential usage has to be adjusted based upon two discounting factors:

1. Actual usage of each greenway based upon its unique characteristics and preferences of the surrounding population relative to Colorado averages. This was done by limited observation and looking at the current proximity pricing which is a well-documented indicator of how much people value a location. In essence, the higher the existing housing premium found in a neighborhood, within 2,000 feet of greenways, the greater the implied appreciation of having the greenway in close proximity and probable use.
2. The greenway's trail "market" share of all potential unique users given competing opportunities for recreation and non-motorized transportation in the neighborhood. While recreation and non-motorized transportation rate can be applied to the neighborhood population in general, it does not mean they specifically use the greenway. Market shares were estimated based upon the relative usage heatmaps of Strava Labs as well as competing opportunities for recreation in close proximity to each neighborhood.<sup>51</sup>

#### Usage Results by Greenway

The resulting level of activity in each greenway neighborhood related to recreation and non-motorized or alternative transportation is considered "Usage" and is shown in the accompanying table. The market shares of total Current and Potential

Total and Greenway Share of Neighborhood Usage for Recreation & Transportation			
	Legacy Loop	Sand Creek	Midland MOCC
Total Recreation & Transportation Usage			
Total Population < 2,000 Feet	50,431	35,013	15,235
Total Current Usage in Area	26,606	5,952	8,404
% of Neighborhood Population	53%	17%	55%
Total Potential Usage in Area	35,676	24,608	10,898
% of Neighborhood Population	71%	70%	72%
Greenway Market Share of Usage			
Current Recreation	55%	20%	15%
Potential Recreation	65%	40%	25%
Current Transportation	20%	20%	15%
Potential Transportation	40%	30%	40%
*Neighborhood defined as area within 2,000 feet of greenways			
Summit Economics			

<sup>51</sup> Two additional steps were taken to calibrate the model. Once estimates were generated for greenway trail usage on the Legacy Loop, the results were compared to actual counts along the Pikes Peak Greenway at Colorado College. Usage and market share were then adjusted to reasonably match the actual count in order to preliminarily "verify" the model before proceeding to apply the model to Sand Creek and the Midland MOCC. Once the model was applied to all areas, the results were checked against one another for consistency and deviation based upon physical and data observations of each area.



Usage allocated to the greenways currently are also shown. As noted in the table, Potential Usage is roughly the same as a percent of neighborhood population (70% to 72%) for each greenway since the Potential is based on secondary research averages not specific to any neighborhood. In contrast, Current Usage as a percent of population is far lower along the Sand Creek greenway (17%) relative to the other two areas. This is based upon proximity value realized relative to potential within 500 feet and 500-2,000 feet of the greenways as well as a general review of demographic differences and total recreational opportunities in each area. Here the differences between the greenways is quite dramatic with the Legacy Loop shown to have the highest Current Usage. The market shares for each greenway are used to allocate percent of total recreation and non-motorized transportation usage within each neighborhood to each greenway.

The Midland MOCC is shown to have the lowest market share except for Potential Transportation. Without some sort of survey of users, allocation of market shares are based upon relative usage for individuals wearing exercise monitors to generate Strava Labs' heatmaps and anticipated changes from greenway and known neighborhood infrastructure improvements in the future. In the case of the Midland MOCC, currently the trail appears negatively impacted for walking and running due to homeless and near homeless populations as well as world class alternatives in very close proximity.<sup>52</sup> Assuming the negative impacts are reasonably addressed, the area shows upside, but it will have to compete with a new pedestrian and bike oriented configuration currently under construction along Colorado and Manitou Avenues. The underpass at Columbia Street should enhance the use of the Midland Trail for transportation.<sup>53</sup>

### Research Findings Used

To recap some key findings related to health, recreation, and transportation from the secondary research:

- Health benefits were derived from a combination of studies. Research of trail users showed that 23% of users did not exercise prior to the existence of the trail and 59% (when the 23% are included) reported a greater level of exercise after the construction of the trail. Another study showed that the average health care cost savings, per person using the trail, was \$564 whereas the cost of constructing and maintaining the trail, per person per year, was \$209, generating a societal savings of \$355 annually.

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<sup>52</sup> The same could be said for the southern half of the existing Legacy Loop.

<sup>53</sup> As a general rule walking use is far more common than biking, and recreation (which includes exercise), is far more common than transportation.

- Transportation benefits are compiled from reduced fuel consumption, accidents, pollution, congestion and savings on gas, health care costs, and other variables. The research finds personal and social benefits to be \$2.73 per mile not driven. The model uses \$1.37, or half of the research number, to adjust for health care costs (estimated separately) and to discount the number since some transportation oriented walking and biking transportation would not occur rather than substitute for motorized travel. In other words, some people would not transport if the greenway was not there and thus their mileage not driven is zero. Mileage per round trip was assumed at 1 mile per walking trip and 7.65 miles per bike trip.<sup>54</sup> Transportation usage was based upon Census Bureau commuting data and research on the incidence of biking and walking for transportation in Colorado.
- Recreational benefits are based on the US Army Corps of Engineers who calculated a recreational value equivalent to \$3.90 per event for individuals walking, biking, jogging, or picnicking along a greenspace. This number is known as a “Unit-Day-Value” (UDV) and was assumed at 4 UDV's per week for regular users and .5 UDV's per week for occasional users. The ratio of occasional to regular users was 2:1 based upon research findings.

In estimating the health, transportation and recreation benefits, two largely distinct approaches were used for each benefit and averaged to derive the Current Potential benefit. The Current benefit was based upon current usage estimates as noted above as a percentage of Current Potential.

Regional usage attributed to users from within El Paso County, but outside of the neighborhoods were based on assumptions derived partially:

- From the usage counter at Colorado College and the Pikes Peak Greenway's (PPGW) current popularity (for the Legacy Loop);
- The potential for Sand Creek to be connected to the Pikes Peak Greenway to the south and to Stetson Hills and Banning Lewis Ranch to the northeast as well as become a popular balloon tire biking destination;<sup>55</sup>
- The current market share of tourism in the Midland MOCC area which attracts family and friends from the region as well as the area's growing popularity as a regional

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<sup>54</sup> Biking transportation trips were found to be 65 minutes (mean) and 37 minutes (median). Fifty-one minutes at 9 MPH was used.

<sup>55</sup> As noted previously in this report, balloon tires are an innovation in the fat tire mountain biking market. Balloon tires are very fat tires which enable riding on snow, sand, and loose gravel.

destination day trip which will be enhanced with transportation improvements currently being constructed.

Growth Potential was estimated based upon neighborhood population growth (see development and Redevelopment section) and Potential per capita benefit.

### Model Results

The health, recreation, and transportation (HRT) benefits are aggregated and shown in the following table. Several aspects stand out from the results. Total Potential per capita HRT is the greatest along the Legacy Loop greenway followed by the Midland MOCC and then Sand Creek. The model reflects the same findings as the Proximity Pricing where the majority of Total Potential (58%) has already been realized along existing segments of the Legacy Loop – more than 1.75 times the benefit for Midland MOCC and 5.6 times higher than Sand Creek. In contrast, Sand Creek has the greatest unrealized Potential Current Increment that could come

<b>Annual Benefits: Health, Recreation, &amp; Transportation</b>	<b>Total Potential</b>	<b>Current</b>	<b>Current Potential Increment</b>	<b>Growth Potential</b>
<b>Common-Sized Percentages</b>				
Sand Creek	100%	15%	76%	9%
Manitou-Old Colorado City	100%	37%	41%	22%
Legacy Loop	100%	58%	30%	12%
<b>Per Capita</b>				
Sand Creek	\$ 353	\$ 53	\$ 266	\$ 33
Manitou-Old Colorado City	\$ 465	\$ 170	\$ 191	\$ 104
Legacy Loop	\$ 516	\$ 298	\$ 154	\$ 64
<b>Total Annual Benefit</b>				
Sand Creek	\$ 12,348,937	\$ 1,862,341	\$ 9,330,232	\$ 1,156,364
Manitou-Old Colorado City	\$ 7,082,495	\$ 2,586,991	\$ 2,916,928	\$ 1,578,576
Legacy Loop	\$ 26,019,085	\$ 15,016,850	\$ 7,785,326	\$ 3,216,908

from greater incremental future use of the greenway. Growth Potential per capita is greatest along the Midland MOCC due to the potential higher density future growth from redevelopment in the area relative to its smaller population base.<sup>56</sup>

<sup>56</sup> As a general rule redevelopment tends to have higher population density than new development on vacant parcels unless the new development is taking place in a higher density neighborhood. The benefit of greenways therefore tends to increase with density unless there are substantial alternatives for recreation and transportation or the higher density development/redevelopment has a negative influence on the greenway.

The detail of Total Potential by greenway and by type of benefit is shown in the following table. The greatest differential shows up as being recreation along the Legacy Loop compared to Sand Creek and MOCC (\$282 versus \$124 and \$139 respectively). This is because a much greater market share of recreation is, and will continue to be, attributable to the Legacy Loop versus

other outdoor recreational assets in the area (see previous Share of Neighborhood Usage table). Sand Creek and MOCC have roughly the same total Recreation benefit per capita because, even though MOCC has a smaller Potential Current

<b>Total Per Capita Benefit Detail</b>				
	Legacy Loop	Sand Creek	Midland MOCC	
Health	\$ 141	\$ 147	\$ 199	
Recreation	\$ 282	\$ 124	\$ 139	
Transportation	\$ 94	\$ 82	\$ 127	
Total	\$ 516	\$ 353	\$ 465	

Increment, it has far greater Growth Potential on a per capita basis. In the case of transportation benefit, the MOCC should benefit greatly from a larger increase in market share as the underpass is completed at Columbia and the much higher rate of neighborhood population growth is realized. The MOCC also has a higher health benefit due to population growth and the draw of Manitou Springs, Old Colorado City, Red Rocks Open Space and Garden of the Gods regionally.

## Natural Capital

Natural capital are the services provided by nature that if not provided would have to be replicated by human engineered solutions, which tend to be more costly. One study of a greenway system in Houston Texas yielded a 3.5% annual return on the greenway investment from natural capital. Using an average trail cost of \$141,500 per mile of trail we calculate the value of the natural capital based upon total trail length.<sup>57</sup>

The table shows all benefits as Current with no Current Potential Increment. Many variables could increase or decrease this annual return; however, this provides one approximation that

<b>Annual Benefits: Natural Capital</b>	<b>Total Potential</b>	<b>Current</b>	<b>Current Potential Increment</b>	<b>Growth Potential</b>
Common-Sized Percentages				
Sand Creek	100%	125%	0%	-25%
Manitou-Old Colorado City	100%	125%	0%	-25%
Legacy Loop	100%	125%	0%	-25%
Per Capita				
Sand Creek	\$ 0	\$ 0	\$ -	\$ (0)
Manitou-Old Colorado City	\$ 0	\$ 1	\$ -	\$ (0)
Legacy Loop	\$ 0	\$ 1	\$ -	\$ (0)
Total Annual Benefit				
Sand Creek	\$ 13,269	\$ 16,586	\$ -	\$ (3,317)
Manitou-Old Colorado City	\$ 10,298	\$ 12,872	\$ -	\$ (2,574)
Legacy Loop	\$ 43,568	\$ 54,461	\$ -	\$ (10,892)

<sup>57</sup> The cost per mile assumes a 5 feet wide trail and averages granular, asphalt, and concrete costs. The estimates are from <http://nirpc.org/media/3539/appendixbtrailcosts.pdf>. An alternative cost estimate is \$1 million per mile for a "Tier 1" trail which includes 10-12 feet of concrete and a 4 foot gravel shoulder. (Stanley, 2018)

might be better thought of as a starting point for future investigation. The table shows a negative benefit of 25% of the Total Benefit in all cases due to Growth Potential. This serves as a reminder that as greenways develop, attract usage, and become very popular, which is assumed to occur with all of the other benefits; it can create a negative benefit or cost as natural capital is diminished from overuse. Further refinement is challenging without ecological and natural system investigation as well as greenway design.

## **Tourism**

Tourists receive similar benefits associated with local residents; especially related to health and recreation. Since Tourists are not local residents, the health and recreation benefits were not included in the previous analyses. Neither are they included here since this study focuses on benefits to the region or a sub-set of the region. The region does benefit economically to the extent tourists spend more money in the region as a result of greenways. The tourism benefit considers this perspective based upon research specific to Colorado, Colorado Springs, and Manitou Springs. However, there is no established connectivity, other than anecdotal, of the three greenways to local tourism. From this perspective the model largely considered Growth Potential of tourism assuming such a connection is established through promotion and reputation of the greenways among the region's residents and the tourism industry who make recommendations to tourists to utilize the greenways during their visits.

None of the greenways are thought to draw tourists to the region at the present time, but all three are considered to have significant potential and tourists do use the greenways to differing degrees. The expenditures differ by type of tourist (day versus overnight) and range from \$10 to \$75 per visitor depending upon the type of tourist and type of expenditure. In the case of the Legacy Loop and MOCC, day tourists' expenditures represent 45% to 47% of the total as opposed to only 9% for Sand Creek. The tourism benefits include total expenditures by tourists in the region. Overnight visitors' expenditures includes visitors staying an additional night due to the greenway (5% of Current and Current Potential Increment) or whose decision to tour the area was influenced by the greenway (10% of Growth Potential). The calculated tourism benefits include overnight tourists' expenditures specific to each greenway's neighborhood; some of which substitute for or replace expenditures that would have been made by tourists at other destinations within the region (39%, 36%, and 26% of the total for the Legacy Loop, MOCC, and Sand Creek respectively).

The Midland MOCC is considered the most heavily used simply due to its proximity to four of the Region's major tourist attractions – Garden of the Gods, Manitou Springs, Old Colorado City, and Pikes Peak (see table on following page). It should also benefit from the road transformation and underpass at Columbia which adds to its Potential Increment without any new growth. The Legacy Loop appears to enjoy some tourism activity from overnight visitors staying in the downtown area and certainly has neighborhood family and friends of tourists

referring to the Legacy Loop. It stands to benefit incrementally in the coming few years due to the Phase 1 improvements off Fontanero as well as the completion of the Olympic Museum and hotels either planned or under construction. Sand Creek also realizes neighborhood family and friend referrals, but not to the degree of the Legacy Loop due to Sand Creek's apparent reputation within the neighborhood (based upon its lack of a proximity pricing premium). As a result, one can infer minimal tourist usage at Sand Creek. The table below shows that in all cases the Current benefit is less than 20% of the Total Potential benefit.

Annual Benefits: Tourism	Total Potential	Current	Current Potential Increment	Growth Potential
Common-Sized Percentages				
Sand Creek	100%	0%	1%	99%
Manitou-Old Colorado City	100%	17%	17%	66%
Legacy Loop	100%	4%	20%	76%
Per Capita				
Sand Creek	\$ 82	\$ 0	\$ 0	\$ 81
Manitou-Old Colorado City	\$ 480	\$ 82	\$ 82	\$ 317
Legacy Loop	\$ 222	\$ 8	\$ 45	\$ 169
Total Annual Benefit				
Sand Creek	\$ 2,855,636	\$ 6,720	\$ 15,680	\$ 2,833,237
Manitou-Old Colorado City	\$ 7,313,997	\$ 1,244,557	\$ 1,244,557	\$ 4,824,882
Legacy Loop	\$ 11,189,358	\$ 398,640	\$ 2,258,959	\$ 8,531,759

In contrast to the lack of Current and Current Potential Increment activity, the Growth Potential is substantial. Just like all the other non-Current benefits, how and when the greenways realize growth is undetermined. In this model all we can do is envision what might happen if Sand Creek is integrated to the regional trail networks; especially to the northeast into the growing areas of the city and to tourist destinations like the National Museum of WWII Aviation. In addition, Sand Creek has the potential to ride the balloon tire bike wave and become a day destination activity for avid bikers both regionally and from tourists living just outside the 50 mile range.

The Legacy Loop stands to benefit greatly from what economists call "agglomeration effects" resulting from long-term growth in regional tourism given national trends and the emerging market of Millennials. The Legacy Loop would add moderately to the reputation of Downtown Colorado Springs with its completion and revitalization and redevelopment of land uses on the southern half of the loop. The same rationale can be made for Midland MOCC. There is great Potential Growth for the MOCC as it revitalizes along with Manitou Boulevard and Colorado Avenue west of Old Colorado City. The access to the outdoors and history puts the MOCC in the position to be a great connector which in itself adds to the overall appeal of the Manitou Springs and Westside tourist markets.

## Regional Tax Benefit

Tax benefits are derived from additional property taxes currently and potentially received by local governments as a result of the proximity pricing premium associated with greenways and from higher property valuation due to additional new development and redevelopment. The model also estimates tourist generated local sales tax receipts and Lodging and Auto Rental Tax (LART) receipts from lodging only.

Total Property and Sales Tax Impacts	Total Potential	Current	Current Potential Increment	Growth Potential
Common-Sized Percentages				
Sand Creek	100%	2%	17%	81%
Manitou-Old Colorado City	100%	11%	11%	78%
Legacy Loop	100%	9%	9%	83%
Per Capita				
Sand Creek	\$ 49	\$ 1	\$ 8	\$ 40
Manitou-Old Colorado City	\$ 79	\$ 8	\$ 9	\$ 62
Legacy Loop	\$ 111	\$ 10	\$ 9	\$ 92
Total Taxes				
Sand Creek	\$ 1,708,014	\$ 34,967	\$ 284,709	\$ 1,388,338
Manitou-Old Colorado City	\$ 1,202,982	\$ 127,089	\$ 134,410	\$ 941,483
Legacy Loop	\$ 5,607,432	\$ 486,663	\$ 477,461	\$ 4,643,307

In the case of property taxes the overall effective tax rate is used for the neighborhood the properties are located in. The Midland MOCC property tax rate is calculated using the rate for Manitou Springs. For redevelopment, a weighted average effective tax rate is applied assuming 80% of the redevelopment is residential. The combined local sales tax rate for El Paso County and Colorado Springs is used, including special sales taxes such as the Pikes Peak Regional Transportation Authority (PPRTA). A 2% rate is used for the LART since it applies to lodging only. No net new sales tax is generated from local and regional residents as they are assumed to be substituting one type of taxable sale to taxable sales related to greenways.

## Conclusions & Recommendations

### Recap of Economic Benefits

This study attempts to document reasonable current and future benefits of three greenways in El Paso County, Colorado including Manitou Springs and Colorado Springs. With the exception of areas within 500 feet of the Legacy Loop, little of the potential benefits have been realized at the present time. That leaves significant Current Potential based upon what secondary research literature suggests is achievable.

Recap of Benefit Categories								
	Total Potential		Current	Current Potential Increment	Growth Potential			
Sand Creek								
Population			35,013	3,617				
Per Capita Benefits								
Total Asset Values	\$	7,923	\$	274	\$	1,373	\$	6,277
Annual Non-Tax Benefits	\$	438	\$	54	\$	267	\$	117
Total Annual Tax Impacts	\$	49	\$	1	\$	8	\$	40
As Percent of Total								
Total Asset Values	100%		3%	17%	79%			
Annual Non-Tax Benefits	100%		12%	61%	27%			
Total Annual Tax Impacts	100%		2%	17%	81%			
Legacy Loop								
Population			50,431	7,690				
Per Capita Benefits								
Total Asset Values	\$	13,604	\$	1,859	\$	1,456	\$	10,288
Annual Non-Tax Benefits	\$	750	\$	307	\$	201	\$	242
Total Annual Tax Impacts	\$	111	\$	10	\$	9	\$	92
As Percent of Total								
Total Asset Values	100%		14%	11%	76%			
Annual Non-Tax Benefits	100%		41%	27%	32%			
Total Annual Tax Impacts	100%		9%	9%	83%			
Midland MOCC								
Population			15,235	4,370				
Per Capita Benefits								
Total Asset Values	\$	7,282	\$	856	\$	1,084	\$	5,343
Annual Non-Tax Benefits	\$	966	\$	256	\$	277	\$	434
Total Annual Tax Impacts	\$	79	\$	8	\$	9	\$	62
As Percent of Total								
Total Asset Values	100%		12%	15%	73%			
Annual Non-Tax Benefits	100%		26%	29%	45%			
Total Annual Tax Impacts	100%		11%	11%	78%			



The Legacy Loop neighborhood already benefits the most from its greenway. That is due to its long and generally positive reputation as embodied in property values which, based upon research and valuation theory, results from greater usage and appreciation by neighboring residents. The Midland Trail between Manitou Springs and Old Colorado City and between Garden of the Gods and Red Rocks Open Space currently enjoys significant benefits, but it is rather muted based upon socio-economic and automobile traffic conditions within 500 feet of the MOCC. Sand Creek is a relatively unused greenway due possibly to the lack of regional connectedness with other greenways and trail systems. It also may suffer from a lower socio-economic stigma associated with safety – whether or not true.

The benefit to asset values is the largest benefit which is to be expected since in a theoretic sense other benefits realized by households are somewhat embodied in the asset values which change over time to reflect perceptions and usage levels associated with the neighboring greenways. The largest component of asset values (70% to 79%) comes from Growth Potential associated with vacant lot development and current land use redevelopment which in all cases assumes higher residential density and 80% residential land use in those future developments. Renovation of existing buildings is not considered in the model. Overall, development and redevelopment triggered by successful greenways would be the most noticeable benefit along with actual usage on the greenways.

The large potential impact from future development and redevelopment translates in the largest potential tax benefits. It results largely from annual property taxes on future property assets, but also includes future potential tax impacts of tourism. Not considering Growth Potential, the Current and Current Potential Increment available to be realized with current property assets and population can generate tax benefits of between 2.5% (Sand Creek) and 3.2% (Legacy Loop) of total annualized benefits where the total annualized benefit equals Annual Non-Tax Benefits (health, transportation, recreation, tourism, and natural capital) and Total Asset Values annualized using a 2.5% real (discounting inflation) social return on investment rate. The Midland MOCC falls in the middle at 2.9% when this calculation is made.<sup>58</sup> In other words, property and sales taxes generated from all benefits accruing to residents and businesses equate to approximately 2.9% of the benefit realized, excluding Growth Potential.

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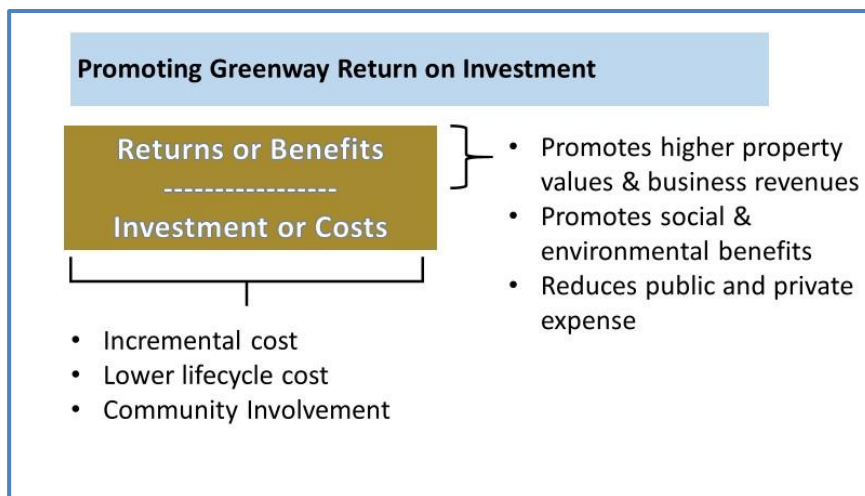
<sup>58</sup> By way of example, using MOCC, Current and Current Potential Increment Taxes = \$17. The relevant Non-Tax Annual Benefits = \$533. Total Asset Values of \$1,940 annualized at a 2.5% rate = \$48.50.  $\$17/(\$533+\$48.50)=.0292$  or 2.9%.

## Return on Investment Perspective

By reviewing the three greenways of the Fountain Creek watershed, it becomes apparent that there are two key strategies for promoting greenways through future economic impact analyses. The first is to consider the medium-to-long-term potential cost and benefits of major projects, including both new development and redevelopment. In this report we have only considered the benefits. The second strategy is to advocate and organize through alliances that can take on small, high success projects. These can be better understood within a return on

investment (ROI) context. As noted in the adjacent graphic, improving any return on investment involves increasing the return or benefit side and/or reducing the investment or cost side.

On the benefit side, more usage is generally better, similar to highest and best use in real estate. However, if greenway usage is so intense as to become



a nuisance to nearby neighbors, the positives turn into negatives resulting in deterioration of proximity values. The returns must be sustainable over the long-term via asset and environmental preservation. Intensive shorter-term usage may not be optimal even if it generates highest revenues and economic value. In this sense, there are many nuances to the benefit side.

On the cost side, lower cost investment for the same potential benefit can take numerous forms. For example:

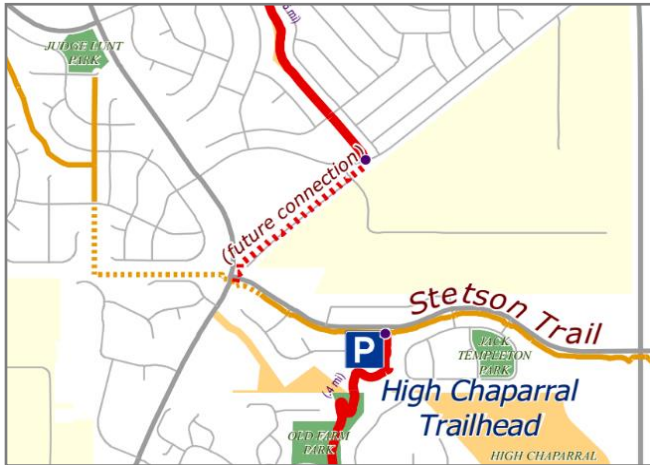
- Piggybacking onto other investments like stormwater or flood control structures;
- Connecting two or more large trail networks with a short trail connector;
- Sustaining water quality at a level encourages activities next to flowing water;
- Reducing transportation and recreation impediments at key locations;
- Utilizing signage to promote usage;
- Promoting higher density development and redevelopment;
- Promote neighborhood involvement at the greenway level including the formation of exercise groups, artists groups, nature or birdwatching groups, community gardens, etc.;

- Taking advantage of existing natural and manmade features in the greenway;
- Encouraging design orientations that embrace greenways.

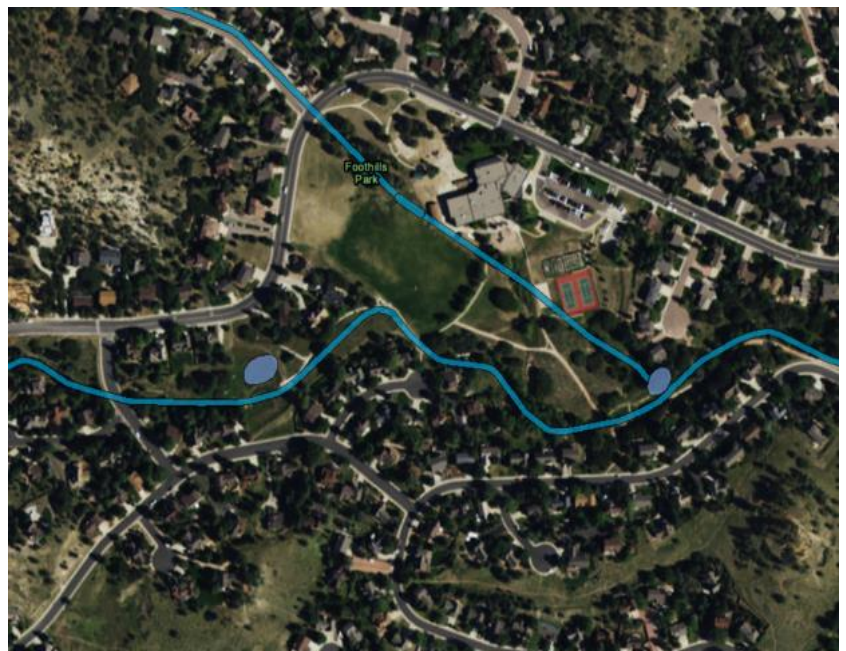
Decreasing lifecycle costs on the investment side can greatly increase the ROI. Annual maintenance costs need to be programmed into designs as should risks associated with environmental and socio-economic factors influencing different parts of greenways. For instance, incorporating flood risks into greenway trail design is important. Community involvement at the neighborhood level could be a very cost-effective way to manage such

issues and provide labor for maintenance and repairs.

To illustrate these prospects, consider two cases. The first is the obvious potential to continue to develop extensive trail networks by focusing on short connectors that combine two or more different networks. As shown in the graphic (to the left), some of these connectors may not technically be greenways, but may go a long way to creating a larger overall continuous network of trails.



The second opportunity involves pushing greenway improvements and maintenance down to the neighborhood level as a form of community organizing and development. Many of the tributaries (blue lines on the overhead view to right) have wetlands (light blue ovals). As shown in the overhead view, these can be tucked into residential neighborhoods and within close proximity to schools (Foothills Elementary in the Rockrimmon neighborhood as shown). In the process of engaging the neighborhood with wetlands, both an educational benefit and improved environmental awareness can take place along with periodic clean-up. Neither of these benefits have been modeled in this study.



## Future Prospects

As El Paso County continues to urbanize at a rate of roughly 11,000 people per year, one can assume that future greenways will incorporate additional tributaries of Fountain Creek and may connect to reservoirs planned for later phases of the Southern Delivery System (SDS). Colorado Springs's commitment to invest approximately \$20 million per year in stormwater improvements will both improve access to existing greenways and lead to the creation of new greenways.

Other opportunities exist when viewing greenways with a sustainable planning strategy. The Pikes Peak Region is known for its scenic beauty, outdoor access, and climate. This is consistently considered the key strength of the region by its residents and tourists. While natural areas are generally associated with the mountains and mountain access, greenway development has the potential to bring the outdoors closer to home. Currently, companies recruiting a younger, educated workforce tout the outdoors. Fifty-two percent of all Millennial respondents to a 2016 survey focused on outdoor recreation indicated they volunteer for an outdoor organization (Heritage Series, 2017).<sup>59</sup> This bodes well for the future of greenways as alternative transportation corridors and provides an excellent, time limited opportunity for brand or image development of regional greenways since life-long brand preferences are established when people are in their late teens to early 30s.

One can also assume that emerging technology such as balloon tire bikes will provide access to greenways even without formal trail development in much the same way as fat tire mountain bikes created bike access to trails previously limited to hiking and horseback. Even with existing technologies, we see trends associated with the informal use of public and even private lands. The Manitou Incline is a perfect example. Informal usage is a clear market indicator of expressed preferences and should be leveraged. Over time informal use can become a formal recreational asset.

One of the emerging challenges facing greenways may be hybrid bikes which combine human power with silent electric power assist motors as well as the growing use of Segways and other electric powered personal transport devices. Whether these are appropriate for greenways depends on the intensity of usage, but regardless the introduction will be a contentious challenge that may provide limited licensing opportunities. It also provides opportunity for development of and education around greenway ethics.

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<sup>59</sup> Roughly the same percentage of all respondents indicated they volunteer of outdoor organizations. Pikes Peak Outdoors Leisure & Recreation Survey, 2016 [https://test.elpomar.org/media/filer\\_public/53/17/53174f5d-514c-4ca1-881d-90b4caac0e19/mountains\\_matter\\_to\\_millennials\\_white\\_paper\\_2016.pdf](https://test.elpomar.org/media/filer_public/53/17/53174f5d-514c-4ca1-881d-90b4caac0e19/mountains_matter_to_millennials_white_paper_2016.pdf)

While Colorado Springs, along with the entire state, has a strong reputation for physical health in indices such as the Gallup-Healthways Wellbeing Index, lower income households are more likely to suffer from chronic, lifestyle diseases such as diabetes.<sup>60</sup> Targeted greenway advocacy in areas like the southern halves of both Sand Creek and the Legacy Loop should yield greater marginal health improvements over time. Similarly, Colorado and Colorado Springs rate high on emerging Happiness Indices and appear to be attracting more and more retirees. The appeal of nearby greenways is likely to increase among the aging population throughout the watershed. This will complement the affinity younger people and many of their employers have for the greenways.

Existing improved (partial or complete) greenways often traverse older urban areas. As is the case with the Midland MOCC and Legacy Loop, greenway investment can stimulate urban redevelopment with higher density which then increases the benefits received from the greenway. Such a self-reinforcing loop is what we expect and have modeled in this study and essentially places greenways on par with other infrastructure and community improvements used to stimulate development and redevelopment such as road interchanges and stadiums.

## **Monitoring & Improving Greenways**

As a result of the research and modeling associated with this study, we recommend consideration of the following specific elements to institutionalize the advocacy of greenways for the future health of neighborhoods, communities and the entire region.

1. Map informal trails differentiating public and private lands.
2. Compile all maps and map links remotely associated with greenways and surrounding communities, as well as all background research, into an online depository.
3. Strava Labs heatmaps are based on their extensive database from exercise trackers like Fitbit. Such devices are increasingly used by people monitoring their health and exercise. The data might be acquired and utilized to create usage indices of various greenway and trail networks.
4. Many assumptions had to be made regarding users of greenways for this study. While there is extensive research regarding geographic impediments to use and socio-economic interactions, specific data is unavailable. Conducting a daylong annual census of trail users could provide great insight into the type and range of benefits. This data can easily establish trends over time to assist in identifying opportunities and challenges.

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<sup>60</sup> [http://info.healthways.com/hubfs/Gallup-Healthways%20State%20of%20American%20Well-Being\\_2016%20Community%20Rankings%20vFINAL.pdf?t=1488863538439](http://info.healthways.com/hubfs/Gallup-Healthways%20State%20of%20American%20Well-Being_2016%20Community%20Rankings%20vFINAL.pdf?t=1488863538439)

5. Monitor property values on a periodic basis such as every five years. As data becomes more readily available along with methods for sorting, segmenting, and combining it, the ability to monitor changes in proximity value and specific property investment increases. The process used in this study was based upon summary data metrics from the Assessor's office, but it could be enhanced through emerging tools and database access to create more meaningful metrics at a reasonable cost.
6. Monitor redevelopment, including substantial commercial renovations. To establish the correlation with greenways, even if anecdotal, interview and/or survey the larger development, redevelopment, and renovation projects as they emerge. Current research by Summit Economics along the South Platte and Cherry Creek Greenways in Denver is yielding promising results.
7. Promote greenways through tourist, recreation, and alternative transportation channels, especially using social media and smartphone apps.
8. Entice suppliers of goods and services such as bike rentals, massage tents, and small public markets into greenway access points.
9. Overlay enterprise and opportunity zones over greenways and adjacent properties to possibly create special incentives for designs that orient improvements to greenways and promote higher density development adjacent to greenways.
10. Research innovative community engagement, bicycle, hiking, water, recreation, and exercise programs around the world to model greenway programs after.
11. Engage community, neighborhood and education groups to develop collaborations for increasing greenway benefits, sustainability, advocacy, and usage.
12. Attempt to position greenways comparable to regional cultural assets and regional parks. The advantage of greenways is they can provide alternative and healthier access to many destinations while providing recreational value.
13. Search for reasonable methods to incorporate business location decisions and workforce recruitment savings into the economic benefit model developed here.
14. Advocate for greenway development and regional connectivity with greenfield real estate developers as emerging trends in real estate suggest that the hottest product is the green space community. Many greenfield real estate developers are designing their developments and communities around green space, building greenways and trails into their real estate offerings.
15. Become part of stormwater, flood control, and other watershed related planning and implementation efforts.

## Funding Mechanisms

Funding is limited by definition. However, greenways are reasonably positioned in the public eye; especially among younger generations whose perception will dominate the future. This provides for new twists and narratives to entice traditional funding mechanisms for greenway development and maintenance. The traditional mechanisms include:

- General Funds & Bonds
- Philanthropic Funds
- Foundational Funds
- Government Grants

Especially relevant in coming quarter century is the health narrative. However, community development also seeks new paradigms for success and environmental sustainability is looking for locally based “poster children”. Greenways are an entre in these cases and others which may open traditional funding sources not previously considered. The nice thing about greenways is that they can start out as inexpensive trails and evolve into nicer greenways with more amenities. In the meantime, and by allowing the use of a simple trail, we can discover where usage is highest and thus where to place amenities.

Due to increasing fiscal constraints, funds for capital investments and operating and maintenance expenses have become increasingly scarce. This is resulting in efforts to create more designated funding streams within the public sector. The Great Outdoors Colorado (GOCO) fund and the Trails and Open Space (TOPS) tax in Colorado Springs are early examples and more appear to be developing, especially in the areas of parks and conservation.

In order to continue expanding, maintaining, and improving urban greenways, a shift from traditional funding methods offers significant opportunities. The following funding mechanisms should be creatively explored.

### Tax-Increment Financing (TIF)

TIF funding is a mechanism well-known and utilized through the creation of special zones such as urban renewal districts, business improvement districts, downtown development authorities, tourism zones, and even private developments. They require government support for whichever entities would be foregoing the tax increment. The concept is that a baseline is established for a given tax revenue stream within a defined area, prior to development. Presumably the tax increment would not be generated “but for” the investment made which is enticed by the granting of the TIF.

This mechanism is frequently used for urban renewal and redevelopment, and increasingly incentivize to new development, but is infrequently applied to greenways or other “green

infrastructure” improvements, despite the well-catalogued tax benefits. Despite its infrequent use, it has been used, with Millennium Park in Chicago as the prime example and its use may be expanded in the future as the landscape of public finance and development incentives evolves.

#### Improvement Districts:

Improvement districts are a special taxing area within a city or country. Most cities have a “Business Improvement District (BID)” that encompasses the downtown core. This district has voted to add a small additional mill levy onto their property-tax bill. They can also be financed by a sales tax. District revenues fund improving the district’s safety, maintenance, beautification, etc. There is an assortment of various districts each with their nuances, but each has the same construct of a defined area electing to form a district and tax itself in order to achieve some stated improvement.

Such a district could be formed within some given distance of the Legacy Loop (i.e. .5 miles or even 500 feet). All properties within that district would be assessed an additional property tax or may be the designated recipient of the sales tax for a pre-established period of time.

It should be noted that such a district cannot simply be “formed” but must go through a process culminating with those within the district voting to become a district and to tax themselves. It’s a two-step process with the landowners petitioning to form the district and then tenants and landowners vote to tax themselves. The benefit of the district is that it frees the improvements from the constant struggle to receive general funding and is funded by those who directly receive the greatest benefit.

As with the TIF, improvement districts, though a widely used mechanism within cities, have not been frequently used to fund green improvements. One notable exception is the use of a BID in New York City in funding Bryant Park. It could become a viable mechanism for both property owners and commercial enterprises to tax themselves in funding a greenway.

#### Enterprise and Opportunity Zones

While typically reserved for job creation and training as well as affordable housing development, redevelopment, and renovation in designated low income neighborhoods, this mechanism can potentially leverage the Greenway Fund’s ability to offer and/or influence grant and debt financing to private non-profit and for-profit entities looking to locate or grow close to the greenways.

#### Concessions and Special Events:

Though a smaller and more challenging revenue stream, earned income from activities such as concessions and special events has played a progressively larger role in raising revenue. It is possible to grant special, time-limited concessions to goods and service providers located in



greenways or adjacent properties controlled by greenways. These might even be done in conjunction with private land owners who could mutually benefit through revenue sharing agreements. State and national parks often grant private concessions for a period of time to help fund the parks.

### Social Enterprise and Green Investing

While around for quite some time, increased environmental and social awareness is on a growth trajectory. Private enterprises and individuals are looking to have an impact beyond generating profits. This effort to self-select how to invest and distribute returns is giving rise to social enterprises, conscious capitalism, and similar forms where a critical element of organizational branding purports a “higher purpose”. Similarly, communities are increasingly pursuing green bonds and more investment advisors are niched into social investing. This trend could be leveraged to designate greenways as beneficiaries.

### Other Mechanisms to Consider

While not prevalent in the literature, public tax and fee theory and concepts invite us to look at rational nexus, fairness, and simplicity aspects public finance. Depending upon specific project locations, the following should be explored:

1. Park fees during the redevelopment process;
2. Redesign where public funding already exists for infrastructure related to stormwater or private redevelopment;
3. Real Estate transaction fees for properties within a special district;
4. Greenway fees for unique and/or heavily used areas;
5. Tourist taxes;
6. Urban Renewal Authority infrastructure improvements;
7. Additional tax on bicycle purchases;
8. Public Private Partnerships – possibly in conjunction with long-term land leases or land trusts;
9. Designated use of new development impact fees and tradeable credits by developers and private individuals, especially where there are obvious returns on natural capital;
10. GoFundMe initiatives among specialty recreationalists to make up for small gaps in funding.

## Final Thoughts

This economic investigation of the contributions of greenways in Colorado Springs reveals tremendous potential value if greenways are perceived as assets. Similarly, poorly maintained drainageways can impose a cost on neighbors resulting in lower property values. Capturing increased proximity value and the resulting higher property tax collections, when combined with the economic benefits of health, recreation, transportation, natural capital, and tourism, warrants community investment in future of the region's greenways. Such investment can help transform aging neighborhoods, become an avenue for community engagement and development, and enhance regional branding for economic development. Summit Economics commends the creation of the Greenway Fund in 2011 and believe its vision of and advocacy for the future regional landscape will play a critical role in realizing the potential economic benefits highlighted in this report.

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## Appendix A: Case Studies

What follows are brief descriptions of cities that have made investments into their waterfronts, riverways, and/or greenways and the changes and impacts that have occurred as a result of those investments.

### Proximate Value

It has been understood for many years that a property's proximity to attractive and well-maintained urban parks tends to increase their property values. However, significantly fewer studies have been done on the impacts resulting from revitalizing waterways or waterfronts, and even fewer looking specifically at greenways.

Below is a summary of some of those studies.

#### Atlanta, Georgia<sup>1</sup>

The Atlanta Beltline consists of a series of trails and connectors encircling the downtown area. An analysis was undertaken reviewing the properties located within one-half mile of various trail segments, subsequent to their construction.

Along one stretch, the Southwest Segment, an increase in property values of 68% was seen over the four years reviewed. The other three segments experienced median price increases of 40% to 51%, while the homes outside of the half mile study area saw only an 18% value increase over the four years.

These changes resulted in premiums in appreciation over that time of between 18% and 27% above homes located outside of the study area.

#### Boulder, Colorado<sup>2</sup>

One of the most cited studies, possibly because it was one of the original to look at the effect of trails on properties, was done in Boulder in 1978 reviewing residential sales over the previous 10 years.

The table below shows the results of the study based upon distance (in feet) from trails.

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<sup>1</sup> Immergluck and Balan. 2017. *An Analysis of Home Price Trends Near the Atlanta Beltline, 2011 to 2015*. Georgia Institute of Technology

<sup>2</sup> Crompton, J. L. (2004). *The Proximate Principle: The Impact of Parks, Open Space and Water Features on Residential Property Values and Property Tax Base*. Ashburn, Virginia: National Recreation and Park Association.

Walking Distance from Greenbelt	Average Value of House
30	\$54,379
1,000	50,348
1,283	49,172
2,000	46,192
3,200	41,206

A regression of the findings shows that, with other variables being accounted for, every foot further from the trail, a home's value was reduced by \$4.20, resulting in homes located next to the greenway being valued 32% greater than those located 3,200 feet away

#### Austin, Texas<sup>3</sup>

A study of one development along an Austin, Texas area trail, the Barton Creek Greenbelt, showed "a statistically significant, \$44,332 rise in property value, representing 12.2% of the average value of all homes adjacent to this amenity and 20.2% of the average of all homes in the Barton area."

#### Pittsburg, Pennsylvania<sup>4</sup>

Pittsburg undertook a significant redevelopment project within the previously blighted Three Rivers Area. During the years of the study, property values increased by 60% within the redevelopment area, while only increasing 32% outside of the redevelopment area. (Tulsa) Additionally, a historically depressed and underdeveloped area, the South Side, saw increases of 117%.

The redevelopment investment led to an increase in estimated tax revenue of \$7 to \$16 million, while the annual debt payment was only \$3.3 million, resulting in a substantial net gain in tax revenues for the city while bolstering its appeal to businesses, workers, and tourists.

#### Indianapolis, Indiana<sup>5</sup>

A 1999 study looked at the Indianapolis Greenways System to better understand its impact on local property values. The study reviewed property sales within one-half mile of the trails and found that approximately 14% of a home's value within the reviewed area was a result of the trails.

#### Green Bay, Wisconsin<sup>6</sup>

After a local study showed that lots along a regional trail sold both quicker and for an average of 9% more than comparable lots located further from the trail, local developers began to restructure the pricing of future lots located along the trail, pricing them 26% higher than "slightly larger lots not located along the trail"

<sup>3</sup> Crompton, J.L. 2005. *The Impact of Greenways on Property Values: Evidence from Austin Texas*. National Recreation and Park Association

<sup>4</sup> Riverlife. (2015). *Three Rivers Park: Economic Impact Analysis*. Riverlife.

<sup>5</sup> Crompton, J. L. (2004). *The Promimate Principle: The Impact of Parks, Open Space and Water Features on Residential Property Values and Property Tax Base*. Ashburn, Virginia: National Recreation and Park Association.

<sup>6</sup> Crompton, J. L. (2004). *The Promimate Principle: The Impact of Parks, Open Space and Water Features on Residential Property Values and Property Tax Base*. Ashburn, Virginia: National Recreation and Park Association.

## Revitalization Examples

Often, a city focuses on revitalizing its water and river fronts, but less quantitative benefits are cited. Below are some of the cities that have undertaken significant investments and the results that followed.

### Denver, Colorado<sup>7</sup>

Based on the overwhelming success of the improvements made along the South Platte River (mentioned earlier) the City has initiated “a series of transformational projects that will create recreational and development opportunities, improve river access and better utilize the entire corridor... through a mix of retail, residential, hotel, industrial and office real estate.”

This is one of the major economic development initiatives being undertaken by the city and is expected to “generate 22,000 jobs..., \$550 million in additional economic benefit to Denver residents and businesses, and up to \$4.3 million annually in new revenue for the city”

### Chattanooga, Tennessee<sup>8</sup>

Chattanooga was one of the earliest cities to initiate a major redevelopment of its riverfront, doing so in the early 80s and continuing through to this day.

Over \$1.2 billion of public and private investment has been made in the waterfront/downtown area since 1990. The first goal was the “creation of the Tennessee River Park along a 22-mile stretch of the Tennessee River” creating a “world class corridor of linear parks” and specifically aimed at “reconnecting the city with its river, not only physically but by active use”.

Since investment began the City has seen River Park become a reality along with an aquarium and a new minor league stadium, which attracts, on its own, nearly 250,000 people per year.

These changes have led to significant fiscal and economic impacts for the city, but more so the attitudes of the people who live there.

A 2008 survey, which compared attitudes from 2 years prior, at the height of the economic boom, showed:

- 60 percent of Chattanooga residents are “very satisfied” with life in the Chattanooga area—up from 49 percent in 2006.
- 61 percent stated that they are “not at all likely” to move away from the area in the next three years—up from 48 percent in 2006.
- 71 percent believe that things in their neighborhood are going in the right direction.

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<sup>7</sup><https://www.denvergov.org/content/dam/denvergov/Portals/690/documents/New/Smart%20Jobs%20Development.pdf>

<sup>8</sup> Echenthal and Windeknecht. 2008. *A Restoring Prosperity Case Study: Chattanooga*. Brookings Institute.



Such changes are unexpected given the turn of the economy from one of the largest booms in history to the depths of the worst economic downturn in modern history and many pointed to the improvements and investments made by the city as a reason for the positive attitudes of residents.

#### Detroit, Michigan<sup>9</sup>

Typical of most waterfronts in the US, Detroit has historically had a “working/industrial riverfront largely inaccessible to the public.” However, the city made significant investments into the area, converting it to useable space and parks, spurring adjacent economic development. This development has been an integral part in its recruitment efforts to get corporate tenants to move into the city, helping to revitalize the downtown.

#### Pittsburg, Pennsylvania<sup>10</sup>

The city of Pittsburg and the investment made in its waterfront was mentioned earlier in regards to the impact that investment had on property values and how that increase more than paid for the payment obligations on the debt.

However, additionally, the city’s \$130 million investment in this 13-mile, interconnected downtown park system was a catalyst for a total of over \$2.5 billion in overall riverfront development investment and \$4 billion in “riverfront and adjacent development”. This resulted in \$20 of public investment, at a minimum, for every \$1 of public investment.

Below is a review of other such projects, including the Chattanooga and the BeltLine projects mentioned in the previous section.

Public Space	Total Cost (To Date)	Development Catalyzed	ROI Ratio	Property Value % Increase
Smale Riverfront Park	\$88M	\$750M	9:1	37% (2008–2013)
Atlanta BeltLine	\$400M	\$2,400M	6:1	24% (2002–2005)
21st Century Waterfront	\$120M	\$2,000M	17:1	27% (1995–1999)
Rose Kennedy Greenway	\$35M	\$1,400M	40:1	49% (2005–2009)

#### Shanghai, China<sup>11</sup>

Shanghai has seen city-led investments in the upgrading of key public spaces along its waterfront and historic “Bund” district. This has led to “dramatic increases in private development interest in the area.”

<sup>9</sup> Smithsonian. (2016). Urban Waterways and the Impact of History. *Urban Waterways Newsletter*.

<sup>10</sup> Riverlife. (2015). *Three Rivers Park: Economic Impact Analysis*. Riverlife.

<sup>11</sup> Smithsonian. (2016). Urban Waterways and the Impact of History. *Urban Waterways Newsletter*.

## Spending<sup>12</sup>

People tend to spend money while using trails, on the way to or from trails, or on equipment for use while on the trails. Below is a summary of some of the findings on what users tend to spend as a result of their use of the trail.

In 1999, a study was conducted to review the economic impacts of Ohio's Little Miami Scenic Trail. This study found that users tended to purchase "an average of \$13.54 (\$20.04 in 2018 value) on food and other goods per visit, plus an average of \$277 (\$410 in 2018 value) annually on clothing and equipment."

A study done reviewing trails in Orange County, Florida found that businesses adjacent to the West Orange Trail estimated that 11 percent of their business "was a direct result of trail users".

A 2010 study of additional Orange County trails found that, on average, a user spent \$20 per visit on food and beverages and other items.

In the tourism-dependent area of the Outer Banks in North Carolina, cyclists were discovered to generate \$150 per day per user, making significant local fiscal and economic impacts.

## Social and Environmental Benefits<sup>13</sup>

A 2004 study done in Canada estimated that "individual and society benefits add up to \$2.73 for every mile not driven".

The Bayou Greenway Initiative in Houston was projected to lead to \$13.9 million in health benefits annually.

The use of bicycles for commuting on trails, as opposed to the use of cars, has several benefits. Operating costs are reduced, as are vehicular crashes. Additionally, there is a reduction in air pollution and ground level ozone and the health benefits that come from improved air quality.

The city of Houston anticipates saving \$1.7 million annually by creating green space instead of development due to avoidance of 2 billion gallons of additional runoff that would result from development of that open space.

In addition to the amount saved, the value of ecosystem services supplied by the 4,800 acres of open space was estimated to be \$16.6 million per year.

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<sup>12</sup> Trust for Public Land. (2013). *Charleston Rail Line Linear Park: Building on the Past, Prospects for the Future*. Washington, D.C.: Trust for Public Lands.

<sup>13</sup> Crompton, J. L. (2012). Estimates of the Economic Benefits Accruing from an Expansion of Houston's Bayou Greenway Network. *Journal of Park and Recreation Administration*, 83-93.

The total estimated economic impacts being generated from the social, health, and environmental benefits are expected to be \$117.1 million on an investment of \$480 million into the Bayou Greenway.

## **Business and Talent Attraction and Retention<sup>14</sup>**

One study of businesses along the Missouri River Trail found 20% citing the trail as an influence in their decision to choose that location.

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<sup>14</sup> <http://downtowngreenway.org/planning/economic-development/>

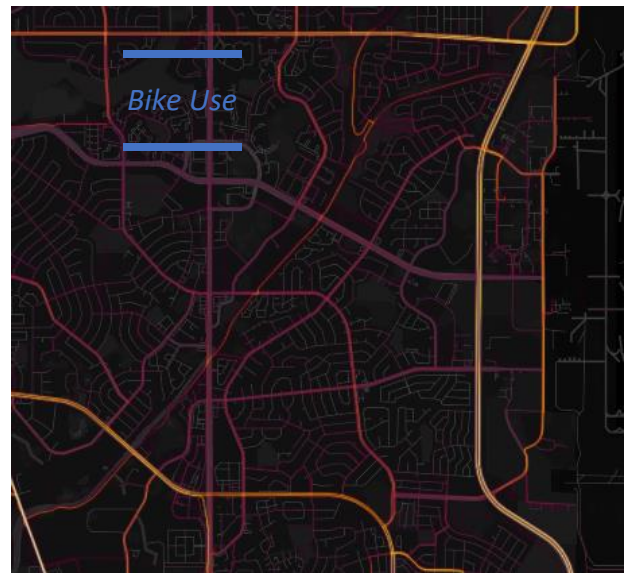
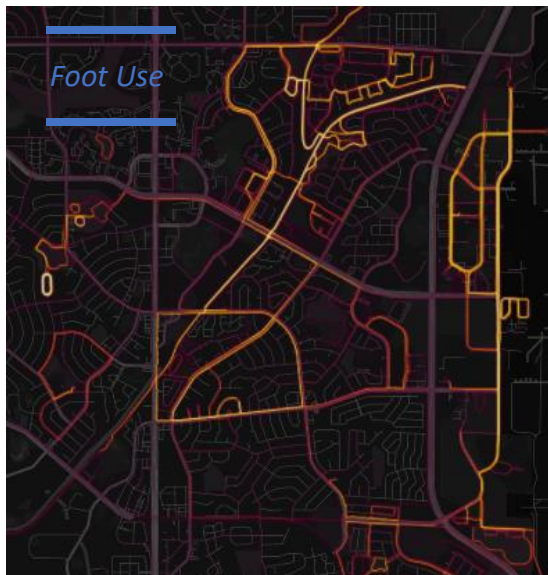
## Appendix B:

### Strava Labs Heat Maps of Trail Usage

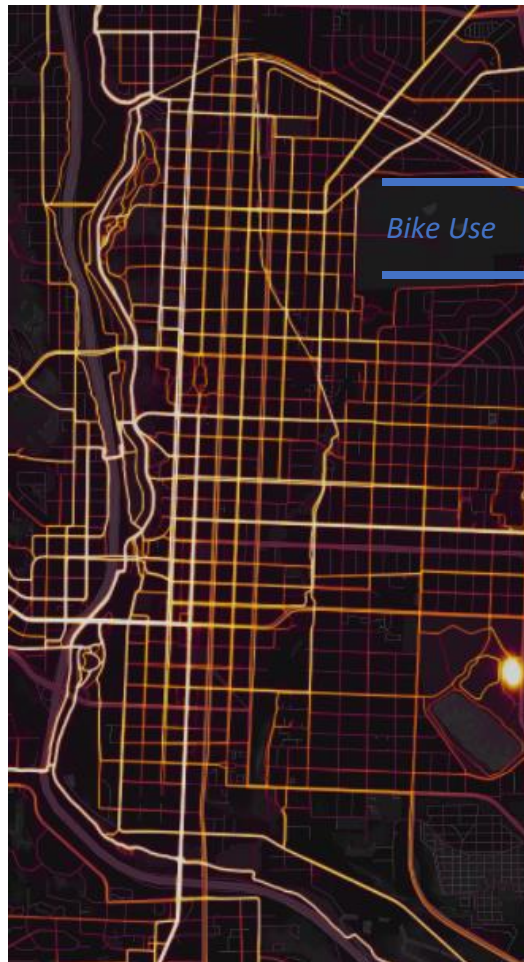
#### (Foot vs Biking)

Source: Strava Labs, <https://labs.strava.com/heatmap>

#### Sand Creek:

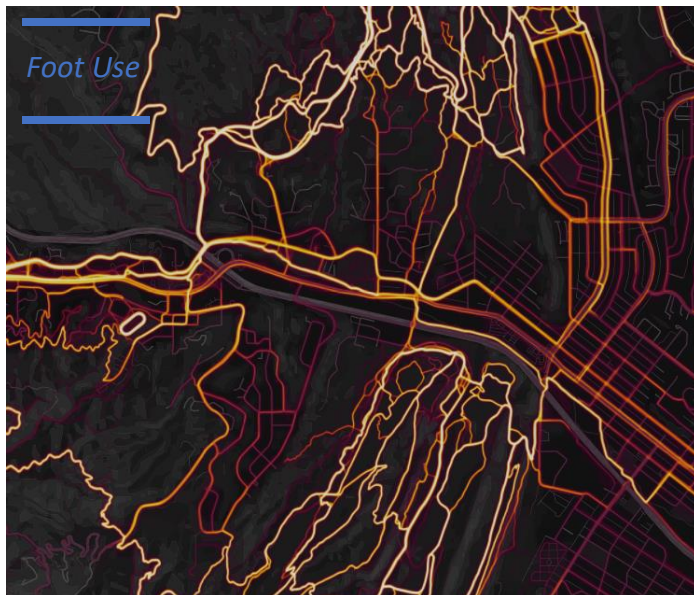


## Legacy Loop





## Midland MOCC



## Appendix C

### Detailed Development & Redevelopment Assumptions

Greenway Redevelopment Area Detailed Assumptions			
	Sand Creek	MOCC	Legacy Loop
<b>Basic Land Use Assumptions</b>			
Land Area Coverage with Multifamily @80%	37%	37%	37%
Footprint of building in square feet per acre	16,182	16,182	16,182
Average floors per building	2.5	3	3.5
Total square feet of Building	40,455	48,546	56,637
Construction value/square foot of building	\$ 125	150	\$ 150
Average building value/acre	\$ 5,056,867	\$ 7,281,889	\$ 8,495,537
Average residential unit size	1,150	1,100	1,100
Usable area per building	80%	80%	80%
Average persons per unit	2.0	2.0	2.0
Percent of growth attributable to Greenway	65%	33%	65%
<b>Redevelopment Potential Acres</b>			
Vacant Land <500 Feet	61.9	6.4	32.0
Vacant Land - 2,000 Feet [1]	71.4	9.3	10.1
Redevelopment Bldg Land	16.2	29.7	133.8
Total Land Available	133.4	45.4	175.9
<b>Percent of Land Developed over 50 Years</b>			
Percent of Land 500 Feet	57%	80%	70%
Percent of Land 2000 Feet	35%	50%	40%
Redevelopment (scrape & rebuild)	50%	80%	50%
<b>Total Acres Developed/Redeveloped</b>	64.3	33.5	93.3
Total Percent Developed/Redeveloped	48%	74%	53%
Total Land Value Increment/sf	\$ 4.68	\$ 1.76	\$ 1.28
Total Incremental Land Value	\$ 13,097,684	\$ 2,574,516	\$ 5,211,327
Building Development	\$ 324,998,873	244,073,416	\$ 793,025,442
Total Development /Redevelopment	\$ 338,096,557	246,647,932	\$ 798,236,770
<b>Non-Redeveloped Commercial Appreciation</b>			
Commercial Total Value <500 Feet	\$ 87,470,157	\$ 28,747,710	\$ 33,883,240
Commercial Percent Appreciation Potential %	11%	9%	16%
Commercial Appreciation Potential <500 Feet	\$ 9,387,508	\$ 2,467,171	\$ 5,362,374