The Trail:
Economic Impact Analysis 2016

Photo Credit: Ted Eubanks
TABLE OF CONTENTS

Executive Summary ........................................................................................................................................... 3
Methodology ................................................................................................................................................... 5
Trail User Profile ......................................................................................................................................... 7
Economic Impact ........................................................................................................................................... 12
  Annual Impact ........................................................................................................................................... 13
  Capital Improvement Projects Impact ....................................................................................................... 14
Positive Externalities of the Trail .................................................................................................................. 15
  Ecological Benefits ................................................................................................................................... 16
  Transportation Benefits ............................................................................................................................. 18
  Health Benefits ......................................................................................................................................... 23
  Corporate Location Benefits ...................................................................................................................... 24
  Qualitative Benefits ................................................................................................................................... 26
Appendix ....................................................................................................................................................... 27
About Angelou Economics ............................................................................................................................... 40
EXECUTIVE SUMMARY

Introduction

Winding throughout the heart of central Austin is the Ann and Roy Butler Hike-and-Bike Trail at Lady Bird Lake (the Trail), a lush, urban path that follows along the water’s edge and passes skyscrapers, neighborhoods, ball fields and cultural attractions. With nearly 2.6 million visits annually, the 10-mile-hike-and-bike Trail is one of the Austin’s most recognized and popular recreational areas.

The Trail was developed in the 1970s out of a sense of community spirit and responsibility, and in 2003 The Trail Foundation (TTF) was formed to ensure that the Trail remains Austin’s premier urban greenspace for this and for future generations.

Today, The Trail Foundation prides itself in protecting and enhancing the Trail. They have fulfilled their mission through careful improvements to the Trail’s infrastructure, amenities, and environment, while honoring the original vision of the Trail’s founders.

AngelouEconomics has been retained by TTF to measure the economic impact of the Trail as well as the positive externalities that the Trail provides, including its ecological, public health, corporate location, and transportation benefits. The City and The Trail Foundation’s efforts in protecting and improving the Trail provide Austin and its residents with invaluable benefits in many aspects of every-day life. The following report is a testament to the sweeping positive impacts that the Trail provides to Austin.

The Trail’s Impact on Austin

- **Economic Impact**: The Trail involves capital improvement projects as well as ongoing maintenance activities to preserve and improve the Trail. These expenditures have a positive annual impact on the local community.
- **Ecological Benefits**: Quantifies the environmental impacts of the Trail based off data gathered in the Ecological Restoration Guidelines report.
- **Transportation**: Illustrates the story of the Trail as a major access point, connecting people to events held at Zilker Park, Auditorium Shores, and other downtown venues. It also includes a traffic congestion relief analysis.
- **Health Benefits**: An analysis of the health benefits that accrue to residents and health care providers through reduced claims that are directly related to the Trail.
- **Corporate Location**: The impact of the Trail on corporate location decisions in the proximal region of downtown Austin.
EXECUTIVE SUMMARY

Economic Impacts of The Trail

Annual Economic Impact of the Trail: $8.8M

- Full-time Job Equivalents: 88
- State & Local Tax Revenue: $195,755

Economic Impact of Capital Improvement Projects to the Trail Since 2009: $65.6M

- Full-time Job Equivalents: 369
- State & Local Tax Revenue: $1.5M

Positive Externalities of the Trail

- Annual Ecological Benefits: $495,182
- Annual Traffic Reduction Benefits: $727,103
- Annual Medical Cost Savings: $4.3M
- Corporate Real Estate Premium: For every ¼ mile closer to the Trail, office rents increase by $0.28/ft²*

Sources: AE, TTF, USDA, Texas A&M Transportation Institute, CDC

*For the average sized office space, this translates to an increase in annual lease amount by $4,404
Economic Impact

AngelouEconomics (AE) employed the IMPLAN (IMpact Analysis for PLANning) model for the analysis of the Trail. The total operational economic impact of the City and The Trail Foundation is the result of direct spending on capital improvement projects to the Trail, by TTF, the Austin Parks and Recreation Department, and Watershed Protection Department. These expenditures become revenue streams for local businesses that support or supply the Trail. As these businesses experience revenue growth, they can increase spending on new goods or employees. By hiring new employees or purchasing additional goods, money flows back into the local economy.

Economists call this snowball spending effect the “multiplier effect”, and it is comprised of direct, indirect, and induced impacts. AE utilizes IMPLAN’s Input-Output model to measure the effects of direct spending to Travis County. The following dollar amounts given in this report reflect the value of 2016 dollars.

The IMPLAN model utilizes multipliers that are specific to the state of Texas and Travis County. Moreover, these multipliers capture the unique relationships that exist between industries in the county. Through these multipliers, the model is able to measure the economic output of the direct, indirect, and induced effects, which are defined below.

**Direct**
Limited to the effects in the local economy that occur as a direct result of the City and The Trail Foundation expenditures.

**Indirect**
Includes increases to sales, incomes, and jobs in business sectors that support or supply the City and The Trail Foundation.

**Induced**
The household spending patterns of employees through all business sectors that experience increased earnings as a result of the City and The Trail Foundation.
METHODOLOGY

Trail User Survey

In conjunction with The Trail Foundation, AngelouEconomics created a Trail user survey in order to better understand the behavior and attitudes of Trail users. The survey was distributed to various professional, recreational, civic, and social groups throughout Austin. **In total, over 1,000 responses were collected.** The responses were used to build the impacts, and inform the assumptions provided in the subsequent sections of the report. The following section provides demographic information pertaining to Trail users. A copy of the survey can be found in the Appendix.
The Trail Economic Impact

TRAIL USER PROFILE

By far, the most common Trail activity is running or walking (86.2%). Next is biking (9.0%), followed by rowing, rafting, or boarding (3.8%). From these results, it’s evident that the Trail facilitates exercise for its users. An analysis of the health benefits provided to users who exercise on the Trail can be found on page 22, in addition to a transportation analysis which begins on page 18.

To determine which zip codes in Austin yield the highest percent of Trail users, respondents were asked to provide the zip code of their primary residence. Over 16% reside in zip code 78704 – more commonly known as the South Congress neighborhood (labeled 1 on the map). Over 50% of Trail users reside in one of the six zip codes that are adjacent to the Trail, however just four of the adjacent zip codes make it into the top five for Trail users. The odd one out? 78731 – which is labeled 4 on the map. The remaining usage is spread throughout the Austin-Round Rock-San Marcos MSA and beyond.
The most common Trail access point is the north side of MoPac. This is not surprising considering the availability of parking in this area and the proximity of Austin High School, which sees a 6% increase in morning weekday traffic during the school year. The next most common access point is the area between Auditorium Shores, 1st Street, and Congress Ave. In this stretch, there are many visitor attractions adjacent to the Trail, such as boat cruises, kayak and paddle board rentals, the off-leash dog area, Butler Park Pitch & Putt, and the bat viewing area.
Over 66% of survey respondents reported that they use the Trail multiple times per week. Nearly 45% of respondents use the Trail at least 1 – 3 times per week.

Additionally, the most common time to use the Trail is in the morning between 6:00AM and 12:00 noon, followed by the evening hours of 5:00pm and 7:00pm.
Trail usage data is taken from the Butler Trail pedestrian and cyclist counter, which is located beneath MoPac, on the north side of the bridge. It spans the entire sample period where data is available and reflects the total amount of pedestrians and bicyclists counted each day. The large spikes in Trail usage occur during the Zilker Kite Festival and Austin City Limits Music Festival, while the smaller spikes occur on weekends.
The Trail Economic Impact

TRAIL USER PROFILE

Trail User Demographics

Gender

- Female: 52%
- Male: 48%

The Trail is used about evenly among men and women, with women having a slight majority.

Age Range

- 18-20: 0.30%
- 21-29: 9.49%
- 30-39: 22.98%
- 40-49: 23.68%
- 50-59: 25.17%
- 60+: 18.38%

The vast majority of survey respondents (71.83%) are between ages 30 and 59, while individuals younger than 29 account for 9.79% of survey respondents.
ECONOMIC IMPACT

Annual Economic Impact Model vs. Impact of Capital Improvement Projects

In order to gain a comprehensive understanding of the economic impact of the Trail, two separate economic impact models were undertaken for this report. This two-model approach was utilized to address temporal limitations that exist within the expenditure data.

The Parks and Recreation Department (PARD), Watershed Protection Department, and TTF’s operational expenditures are given for the most recent fiscal year (2015). The remaining data pertains to capital improvement projects which span across six years. Therefore, two separate economic impact models are built to capture the annual impacts that occur as a result of maintaining the Trail, as well as the economic impact that result from the numerous improvement projects to the Trail over time.

It is important to note that PARD, Watershed Protection Department, and TTF expenditures vary from year to year, so the annual economic impact figures cannot be taken as an average over past years, since these expenditure continue to expand as the Trail continues to grow.

Annual Economic Impact Model

This economic impact model is comprised of PARD, Watershed Protection, and TTF’s operational expenditures. These expenditures comprise various maintenance activities to the Trail, as well as the operational expenses of TTF. The sum of these two models is considered the total annual operational impact of the Trail.

Impact of Capital Improvement Projects to the Trail

Over the years, numerous capital improvement projects have been completed on the Trail to enhance its quality and accessibility. The capital improvement projects include the following:

- Lighting of Butler Trail
- Johnson Creek Trailhead Restroom
- Boardwalk Trail at Lady Bird Lake
- Auditorium Shores Improvements
- Butler Trail ADA Signs
- Butler Trail Improvements
- Numerous Public Restrooms
- Pfluger Circle
- Numerous Bridges
- Lakeshore Zone
- Shoal Creek Peninsula
ECONOMIC IMPACT

Annual Economic Impact of the Trail (FY2015)

- The Trail contributed $8.8M to Travis County’s economy in 2015.
- The Trail is responsible for 88 full-time job equivalents.
- The Trail provides over $3.2M in income to employees throughout Travis County.
- Despite TTF’s tax exemption status, the businesses that support its operations have generated $195,755 in state and local tax revenues.
- For every $1 invested in TTF in 2015, there was $2.05 returned in total economic output.

Top Impacts on Major Sectors

<table>
<thead>
<tr>
<th>Real Estate &amp; Housing Markets: $1.3M</th>
<th>Construction &amp; Maintenance: $542,223</th>
<th>Insurance Agencies: $376,041</th>
<th>Wholesale Trade: $147,688</th>
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Annual Economic Impact (FY2015)

<table>
<thead>
<tr>
<th></th>
<th>Full-Time Job Equivalents</th>
<th>Labor Income</th>
<th>Total Economic Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>59</td>
<td>$1,753,022</td>
<td>$4,286,730</td>
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<tr>
<td>Indirect</td>
<td>17</td>
<td>$842,482</td>
<td>$2,815,123</td>
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<tr>
<td>Induced</td>
<td>12</td>
<td>$578,504</td>
<td>$1,683,451</td>
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<tr>
<td>Total</td>
<td>88</td>
<td>$3,174,006</td>
<td>$8,785,305</td>
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</tbody>
</table>

Total State & Local Tax Revenue: $195,755

Sources: AE, TTF, IMPLAN
ECONOMIC IMPACT

Economic Impact of Capital Improvement Projects

- Capital improvement projects contributed **$65.6M** to Travis County’s economy in 2015.
- Capital improvement projects account for **406 full-time job equivalents**.
- Capital improvement projects provide over **$24.3M in income** to employees throughout Travis County.
- Nearly **38%** of the total economic output is attributed to downstream businesses’ and employees, through indirect and induced impacts.
- For every **$1** invested into capital improvement projects, there was **$1.61** returned in total economic output.

### Economic Impact of Capital Improvement Projects (2010 – 2017)

<table>
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<tr>
<th></th>
<th>Full-Time Job Equivalents</th>
<th>Labor Income</th>
<th>Total Economic Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct</td>
<td>241</td>
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<td>$40,851,487</td>
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<tr>
<td>Indirect</td>
<td>75</td>
<td>$4,259,917</td>
<td>$11,659,327</td>
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<tr>
<td>Induced</td>
<td>90</td>
<td>$4,501,503</td>
<td>$13,097,153</td>
</tr>
<tr>
<td>Total</td>
<td>406</td>
<td>$24,343,731</td>
<td>$65,607,967</td>
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</table>

### Top Impacts on Major Sectors

<table>
<thead>
<tr>
<th>Construction &amp; Maintenance:</th>
<th>$40.0M</th>
<th>Retail:</th>
<th>$3.8M</th>
<th>Real Estate &amp; Housing Markets:</th>
<th>$3.3M</th>
<th>Wholesale Trade:</th>
<th>$2.7M</th>
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<tbody>
<tr>
<td><strong>Wholesale Trade</strong>:</td>
<td></td>
<td></td>
<td></td>
<td><strong>Real Estate &amp; Housing Markets</strong>:</td>
<td></td>
<td><strong>Wholesale Trade</strong>:</td>
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</tr>
<tr>
<td><strong>Construction &amp; Maintenance</strong>:</td>
<td>$40.0M</td>
<td><strong>Retail</strong>:</td>
<td>$3.8M</td>
<td><strong>Real Estate &amp; Housing Markets</strong>:</td>
<td>$3.3M</td>
<td><strong>Wholesale Trade</strong>:</td>
<td>$2.7M</td>
</tr>
</tbody>
</table>

Total State & Local Tax Revenue: **$1.5M**

- **Sales Tax**: $714,431
- **Property Tax**: $590,785
- **Other**: $223,627

Sources: AE, TTF, IMPLAN
Positive Externalities of the Trail

In economics, an externality is the consequence of an economic activity experienced by unrelated third parties. They can be positive or negative, yet in the case of The Trail are overwhelmingly positive. The following section estimates the impacts of the following positive externalities, which include:

- **Ecological Benefits**: Quantifies the ecological impacts of the Trail based on data gathered in the Ecological Restoration Guidelines report.

- **Transportation Impact**: Illustrates the story of the Trail as a major access point connecting people to events held at Zilker Park, Auditorium Shores, and other downtown venues. It also includes a traffic congestion analysis that is directly related to the Trail.

- **Health Benefits**: An analysis of the health benefits that accrue to residents and health care providers through reduced claims that are directly related to the Trail.

- **Corporate Location**: The impact of the Trail on corporate location decisions in the proximal region of downtown Austin.
ECOLOGICAL BENEFIT

Quantifying the Ecological Benefits of the Trail

Lady Bird Lake and the surrounding Trail, urban forest, and natural areas are valuable ecological assets for the City of Austin. This region performs essential tasks for the residents of Austin, which include:

- Cleaning the Air
- Reducing Noise Pollution
- Enhancing Water Quality
- Sequestering Carbon
- Intercepting Rainfall
- Mitigating Flooding
- Reducing Erosion
- Decreasing Urban Temperatures
- Shading Recreation Areas
- Protecting the Shoreline
- Building Soil
- Providing Wildlife Habitat
- Increasing Public Health
- Increasing Property Values
- Reducing Infrastructure costs
- Making People Happy

The following section quantifies the ecological benefits provided by Lady Bird Lake, Trail, urban forest, and natural areas.

Data was obtained from The Butler Trail Urban Forestry and Natural Area Management Guidelines, an ecological report commissioned by The Trail Foundation. To quantify the value provided by the urban forest surrounding the Trail, this report utilized the National Tree Benefit Calculator from the USDA Forest Service.

The Tree Benefit Calculator uses inputs of location, tree species and tree size to calculate the ecological and economic value provided by trees on an annual basis. A map of the tree’s that have been included in the sample can be found in the Appendix.

Source: TTF, The Butler Trail Urban Forestry and Natural Area Management Guidelines, Siglo Group
The Trail Economic Impact

ECOLOGICAL BENEFIT

Tree Benefit Estimation

- Property Value: $148,549
- Energy Savings: $49,577
- CO₂ Reduction: $26,187
- Natural Gas Consumption Reduction: $27,956
- Water Runoff Reduction: $211,615
- Air Quality Improvements: $31,298

Total Benefits: $495,182 Per Year

Average Benefit per Tree: $65.10

See Appendix for Benefit Definitions

Source: National Tree Benefit Calculator
TRANSPORTATION BENEFITS

Connecting Austin

The Butler Trail boasts over 10-miles of hike-and-bike trail along Austin’s most recognized and popular recreational areas, attracting over 2.6 million visitors each year.

The Butler Trail provides Austin residents with direct connections to the following features:

- Deep Eddy Pool
- Stephen F. Austin High School
- City Hall
- Radisson and Four Seasons Hotel
- Austin Rowing Club
- Waller Creek
- Mexican American Cultural Center
- Edward Rendon Sr. Park at Festival Beach
- Holly Shores
- Longhorn Shores
- Lakeshore Park
- International Shores
- The Boardwalk
- Austin American Statesman
- Auditorium Shores
- Butler Shores
- Zilker Metropolitan Park
- Barton Creek
- Zilker Zephyr Train
- Lou Neff Point
Auditorium Shores

Situated between the former Palmer Auditorium and the shores of Lady Bird Lake, Auditorium Shores is an outdoor urban park where Austin residents enjoy many concerts and events.

According to the survey given to Trail users, the area between Auditorium Shores, the 1st St. Bridge, and South Congress Bridge is the second most common access point to the Trail – and for good reason too. Within Auditorium Shores you’ll find an off-leash dog area, a tribute statue to Stevie Ray Vaughn, as well as stretching and exercise equipment. Nearby is The Long Center for the Performing Arts, the Palmer Events Center, as well as the Dougherty Arts Center.

During SXSW, Austin’s premier film, media, and music festival, participants flock to the SXSW Outdoor Stage at Lady Bird Lake for the largest shows of the event – which is held at Auditorium Shores. Over the course of the festival, 50,000 people attend concerts at this stage.

Both events, along with numerous other concerts, movie screenings, firework displays, and food festivals bring thousands of people to Auditorium Shores. The entire north border of the park is The Butler Trail, providing ease of access to these events from all over the Austin area.
Austin City Limits Music Festival

For two weekends each year, Austin City Limits Music Festival (ACL) attracts thousands of music lovers from all over the world to experience what has become one of the country’s premier music festivals. In 2015, Austin City Limits Music Festival attracted nearly 65,000 music fans per day for six days.

The Butler Trail provides out-of-town visitors and locals with premier walking access to nearby hotels and residential areas during the festival. It also serves as the officially designated drop off point (Roverta Crenshaw Bridge/Johnson Creek Trailhead).

In a survey given in 2015 to ACL attendees, only 26% of respondents reportedly spent money on taxi’s, Uber’s, or car parking during the festival – implying that the vast majority of attendees must be walking or biking to ACL via the Trail.

To date, the west side Butler Trail pedestrian counter (which is located underneath MoPac, North side) recorded the highest volume of walking and biking traffic on Saturday, October 1, 2016 which was during weekend one of this year’s ACL. During that time:

- Number of pedestrians and cyclists counted on the Saturday during ACL.
- Increase from the average amount of weekend single day traffic.
- Even the Boardwalk counter, which is 1.8 miles from the festival, saw a 48% increase in traffic during ACL.

Source: TTF

There are large spikes in Trail usage over both ACL weekends, demonstrating the Trail’s importance in getting people to the festival.
Other Major Events

While ACL and Auditorium Shores have the largest impact on Trail usage, other major events draw large numbers to the Trail. The Zilker Kite Festival, which took place on March 6, 2016 saw an increase in hike-and-bike traffic on the Trail, which was 211% more than it would normally see on a typical weekend.

What is truly impressive, is how Trail usage is impacted by events that are not adjacent to the Trail.

For example, Eeyore’s Birthday Party takes place in Pease Park which is over a mile away from the Trail. Each year, thousands flock to the park to celebrate the birthday of Eeyore, a character from Winnie-the-Pooh. In 2016, the Trail saw a 35% increase in hike-and-bike traffic than it would normally see on a given weekend.

Increases in hike-and-bike traffic for events that take place away from the Trail, demonstrate the Trail’s importance and value in connecting Austin. Clearly, residents are utilizing the Trail to travel throughout the city, especially for special events.

Events with the largest increase to hike-and-bike traffic:

- **211%**
  - Zilker Kite Festival
  - Zilker Park
  - March 6, 2016

- **55%**
  - Carnaval Brasileiro
  - Palmer Events Center
  - February 27, 2016

- **51%**
  - Zilker Garden Festival
  - Zilker Park
  - April 2, 2016

- **35%**
  - Eeyore’s Birthday
  - Pease Park
  - April 30, 2016

Source: TTF, AE
The Trail and Traffic Congestion Reduction

Every Austin resident will agree that Austin has a traffic problem, and to the dismay of many, the data confirms it. Austin is home to some of the most congested roadways in the nation. According to the Texas A&M Transportation Institute, in 2014 Austin had the 10th highest Travel Time Index in the country. This means that during peak commute times, it takes Austin residents 1.33 times longer to travel the same distance than it would during non-peak commute times. In other words, if a commute should take 30 minutes during non-peak times, then during peak times it will take an extra 10 minutes.

Fortunately, the Trail helps keep cars off the roads. Due to its expansive reach, the Trail offers Austin residents an alternative to sitting in traffic. According to a survey given to Trail users, 4.58% of Trail users commute to work via the Trail. Although this may seem like a nominal percentage, it makes a very large impact on traffic congestion.

Over 124,000 commutes are reduced annually as people choose the Trail to commute to work. By keeping these individuals off the roads via the Trail, nearly $727,103 is saved annually in congestion costs to Austin businesses and residents. These costs include the value saved in travel delay and extra fuel that would have been consumed if these users were sitting in traffic.

Source: AE, TTF, Texas A&M Transportation Institute, WNYC Data News Team
HEALTH BENEFITS

The Trail as a Public Health Asset

The Trail provides the city of Austin with 10 miles of lush, urban pathway which is ideal for walkers, joggers, and bikers of all ages. **According to the survey, when exercising 87% of Trail users prefer to be in a healthy, natural environment.** Therefore it should come as no surprise that the Trail is a hub for physical activity among Austin residents.

According to the survey, **nearly 97% of Trail users exercise on the Trail**, where 93% of users report running, walking, or biking as their primary reason for using the Trail. Not every city can boast a public amenity that facilitates such high levels of physical activity, which is what makes the Trail an invaluable public health asset to the city of Austin.

So why not quantify the impact that the Trail has on public health expenditures? Any doctor will agree that regular exercise provides numerous health benefits, many of which can actualize into lower medical expenses.

Luckily, the Centers for Disease Control conducted a study which provides one way to quantify the cost of insufficient levels of physical activity among Americans. Using this study as a baseline, it is determined that **over 45% of adult users exercise at least 150 minutes per week on the Trail**, saving $4.3 million annually in total health-care expenditures.

Sources: CDC, AE, TTF

$4,329,967

The annual amount of health-care expenditures saved for Austin adults that primarily exercise on the Trail.
Corporate Location Decisions and the Trail

Essential to any corporate location decision is an understanding of how the quality of life and on-site amenities of a potential office space location might impact productivity, retention, employee satisfaction, and overall well-being. According to the World Green Building Council, nearby recreational spaces and parks provide opportunities for employees to walk or jog throughout the day in safe pathways, which enable them to increase their typical exercise regime.

The LIVESTRONG Foundation explains that exercise boosts workplace productivity through alertness and increased energy levels. When an employee exercises, they increase blood flow to their brain, which helps them sharpen awareness and complete tasks throughout the day. Additionally, regular exercise gives employees more energy throughout the day. Higher energy levels are associated with better performance, ability, and accuracy in the office.

The following section provides a hedonic real estate pricing model which assesses the impact of Trail proximity on corporate lease rates.
Office Lease Valuation Using a Hedonic Pricing Model

Hedonic pricing models are used to explain how various building attributes impact real estate prices through regression analysis. Using a hedonic price model, the following analysis identifies the impact that proximity to the Trail has on corporate leasing rates. Since many characteristics are considered when making corporate location decisions, hedonic price models are useful in determining the value of certain amenities, and establishing the significance of various building characteristics, while controlling for elements that might be more likely attributable to factors other than the Trail.

The sample in this model is derived from 90 office leases within Austin’s Central Business District (CBD) dating back to August of 2014. Each variable was chosen to control for specific physical characteristics and location amenities that might impact corporate lease rates. A full variable list can be found in the Appendix.

From the sample of office leases, as the distance between the property and the Trail decreases by 1%, the triple net (NNN) lease rate increases by .09% holding all other variables constant. This means that lease rates are increasing as they move closer to the Trail.

In the sample, the average triple net lease rate is $24.38/month and the average Trail distance is 1.96 miles. Therefore, reducing the average office’s distance to the Trail by ¼ of a mile, is equivalent to an increase in NNN lease rate by $0.28/ft². For the average sized office space (15,460 ft²), moving ¼ mile closer to the Trail would increase the average annual lease amount by $4,404 (where the average annual lease rate is $376,902).
QUALITATIVE BENEFITS

Invaluable Public Asset
Since its inception in the 1970’s, the Trail has been sewn into the very fibers of Austin. Just like Austin’s weirdness, its famous musicians, and the University of Texas, the Trail has been integral in building the brand of the city. Like Central Park in New York City or the Golden Gate Bridge in San Francisco, the Trail at Lady Bird Lake is a landmark that makes Austin unique and memorable.

Quality of Life
Beyond building Austin’s brand, the Trail provides the city with a quality of life asset – one that cannot be understated. Whether residents are taking an early morning stroll, riding their bike to ACL, or going for a quick jog, the Trail undoubtable enriches the quality of life for residents of Austin.

Workforce Attraction & Retention
All major cities in the United States strive to attract top talent. Having access to beautiful, natural environments are attractive features that talented workers look for in a city. The Trail is an asset that helps attract talent to Austin, and one that helps retain them for many years.

Spiritual Getaway
The Trail is a safe haven for residents, giving them a spiritual escape in a healthy, natural environment. This sentiment has been shared by countless residents, and was documented during the Heron Creek Engagement Project in 2013. To the right you will find quotes taken from the Trail Memories board, which was designed so that residents could write on it and share their feelings towards the Trail.
APPENDIX

Appendix Table of Contents

I. Additional Definitions
II. Trail Counter Analysis
III. Ecological Definitions
IV. Map of Trees Calculated in Ecological Sample
V. Congestion Reduction Calculations
VI. Health Benefit Calculations
VII. Corporate Location Calculations
VIII. Trail User Survey
IX. References
I. Additional Definitions

**Multipliers:** unique to the region being studied and used to calculate the specific effects brought about by a change to a regional economy. For instance, a positive economic activity will have a multiplier greater than 1. This means that the economic impacts are greater than just the direct expenditures from the analyzed activity. Simply put, a multiplier is the ratio that defines the total economic output created for each dollar invested.

**Jobs:** are created through induced effects and are full-time equivalents

**Tax Impacts:** include federal, state, and local impacts are included in the total economic output. The “Other” tax category includes the following state and local taxes: corporate profits, dividends, income, motor vehicle licensing, and social contributions.

**Labor Income:** includes all forms of employment income. This includes both wages and benefits
II. Trail Counter Analysis

There are two pedestrian and cyclist counters located along the Trail, and are indicated on the map below. The Butler Trail counter is located underneath MoPac on the north side of the bridge, and the Boardwalk counter is located at the west entrance of the boardwalk.

To estimate the number of Trail visitors, monthly data was obtained from both counters. The counters do not have data for some months, so assumptions were made based on seasonal trends in trail usage.

The annual number of visits provided in this report (2.6 million), is the total amount of pedestrians and cyclists that were counted over a 12-month period at both counting sites.

It is important to note the following limitations of this estimate: Visitors may have been counted twice if they passed a counter in one direction, turned around, and passed through the counter again in the opposite direction. Additionally, since the counters are located at two points along the 10-mile Trail, many visitors are not counted at all if they do not pass a counter. Due to the fact that the Trail has many access points, in addition to numerous bridges where users may cut across, it is impossible to make definitive assumptions that account for over or under inflation of the number of total visits.

Essential to the congestion relief and health benefits section of this report was determining the number of unique, local visitors to the Trail. This figure was calculated by adjusting the number of Trail visits to reflect the duration and frequency of usage reported by users in the survey.
III. Ecological Definitions

❖ **Property Value:** Using each tree species leaf surface area (LSA), this model calculates the increases in property values caused by trees with greater LSA. The values are annual and accumulate incrementally over time, since trees add more leaf surface area each season.

❖ **Energy Savings:** Trees modify climate and conserve building energy use in the following ways:
  ❖ Shading reduces the amount of heat absorbed and stored by buildings.
  ❖ Evaporation converts liquid water to water vapor and cools the air by using solar energy that would otherwise heat the air.
  ❖ Tree canopies slow down winds, which reduces the amount of heat lost from a home.

❖ **CO₂ Reduction:** Trees sequester CO₂ as well as reduce heating and air conditioning demands for buildings, which reduces emissions associated with power production.

❖ **Natural Gas:** Trees placed nearby homes can increase home energy efficiency. In warm months, trees shade buildings which keep them cool. Although they hinder sunlight in the winter months, the net effect is positive on energy savings, which reduce energy costs and natural gas consumption.

❖ **Water Runoff:** Urban storm water runoff brings chemicals and litter from surfaces (like roads and parking lots) into bodies of water. Trees act as mini-reservoirs, controlling runoff by:
  ❖ Intercepting rain on leaves, branches and bark
  ❖ Increasing infiltration and storage of rainwater through the tree’s root system
  ❖ Reducing soil erosion by slowing rainfall before it strikes the soil.

❖ **Air Quality:** Urban forests can mitigate the health effects of pollution.

Tree species data from The Trail Foundation’s *Guidelines for Urban Forestry and Ecological Restoration* report were used to calculate the various ecological benefits. The average diameter at breast height was calculated for each tree species. Next, using the National Tree Benefit Calculator (NTBC), individual benefits were scaled up by the number of trees of that species within the Trail. The NTBC controls for zip code and land use type (i.e. Park).
IV. Map of Trees Cataloged in Ecological Sample
V. Congestion Reduction Calculations

In the Trail user survey, respondents were asked if they used the Trail to commute to work. If a respondent answered yes, they were asked how they would get to work if they did not have access to the Trail. Using the following formula, the number of users that commute to work via the Trail, that would otherwise drive was calculated.

\[
\text{Number of local Trail users} \times \text{Percent that commute to work via the Trail} \times \text{Percent that would otherwise commute via car}
\]

Survey respondents were also asked how frequently they used the Trail to commute to work. For each response, a yearly estimate of commutes was designated, and the number of Trail users that commute to work via the Trail, that would otherwise drive, was divided amongst the responses accordingly. The sum of each commuter frequency response was taken, to estimate the total commutes reduced per year via the Trail.

<table>
<thead>
<tr>
<th>Commuter Frequency via the Trail</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Daily</td>
<td>16.67%</td>
</tr>
<tr>
<td>Once per week</td>
<td>10.00%</td>
</tr>
<tr>
<td>1 – 4 times per week</td>
<td>36.67%</td>
</tr>
<tr>
<td>Seasonally</td>
<td>36.67%</td>
</tr>
</tbody>
</table>

Next, the average commute time was calculated using data provided by the WNYC News Team. Since this data is broken down by zip code, an average was taken from the top five Trail user zip codes (19.78 minutes). Additionally, Texas A&M’s Transportation Institute estimates that it costs the average commuter in Austin $17.67 per hour of commute. This includes the cost of travel delay as well as excess fuel consumption estimates using state averages. Therefore, 19.78 minutes of commuting cost $5.83 per commuter in Austin.

Finally, this figure was multiplied by the amount of commutes reduced per year via the Trail, giving a total of $727,103 saved by commuting via the Trail.

Sources: AE, TTF, WNYC, and Texas A&M
VI. Health Benefits Calculations

To calculate the total amount of health-care expenditures saved by Trail exercising users, we first needed to calculate how exercise levels would be impacted if users were no longer able to access the Trail. The following calculations were conducted using data from the Trail user survey.

To do so, we split up our sample of Trail exercisers (users who primarily exercise on the Trail) into groups defined by the Centers of Disease Control (CDC) criteria of physical activity levels.

Exercise Groups

<table>
<thead>
<tr>
<th>Group</th>
<th>Exercise Criteria per Week</th>
<th>Percent of Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>At least 150 min.</td>
<td>45.2%</td>
</tr>
<tr>
<td>Insufficiently Active</td>
<td>Less than 150 min.</td>
<td>49.6%</td>
</tr>
<tr>
<td>Inactive</td>
<td>No exercise</td>
<td>5.2%</td>
</tr>
</tbody>
</table>

Next, users were asked how much their exercise levels would decrease if they were unable to access the Trail (0-25%, 26-50%, etc.). Responses were used to build new exercise groups, which estimate the percent of users that would fall into each exercise criteria if they could no longer use the Trail for exercise.

Exercise Reduction Rates

<table>
<thead>
<tr>
<th>Group</th>
<th>Percent of Users</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>19.7%</td>
<td>-25.5%</td>
</tr>
<tr>
<td>Insufficiently Active</td>
<td>60.6%</td>
<td>+11.0%</td>
</tr>
<tr>
<td>Inactive</td>
<td>19.7%</td>
<td>+14.5%</td>
</tr>
</tbody>
</table>

Without access to the Trail, 25.5% of active users would move into the insufficiently active (11% increase) or inactive (14.5% increase) exercise groups.

The CDC estimates that the mean annual expenditure difference for inactive adults compared to active adults is $1,311, and the mean annual difference for insufficiently active adults compared to active adults is $576, since these adults are still getting some exercise. Using these annual expenditure differences, the total health-care savings attributed to Trail exercise was then calculated.

In total, users who exercise on the Trail, who otherwise would be insufficiently active or inactive, save $4,329,967 annually in total medical expenses.

Sources: CDC, AE, TTF
APPENDIX

VII. Hedonic Price Model

Regression equation:

$$\ln(\text{NNN Lease Rate}) = \alpha_0 + \beta_0(SQFT) + \beta_1(START) + \beta_2(LENGTH) + \beta_3(GREEN) + \beta_4(FITNESS) + \beta_5(FOOD) + \beta_6(PARKING RATIO) + \beta_7(STORIES) + \beta_8(BUILDING SQFT) + \beta_9(LEASE TYPE) + \beta_{10}(AGE) + \beta_{11}(ZIP CODE) + \beta_{12}\ln(DIST TO TRAIL) + \beta_{13}\ln(DIST TO CAPITAL) + \varepsilon$$

<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NNN Lease Rate</td>
<td>Triple net lease rate</td>
</tr>
<tr>
<td>SQFT</td>
<td>Square footage of the leasing space</td>
</tr>
<tr>
<td>START</td>
<td>The start date of the lease</td>
</tr>
<tr>
<td>LENGTH</td>
<td>The length of the lease</td>
</tr>
<tr>
<td>GREEN</td>
<td>Dummy variable denoting green building initiatives</td>
</tr>
<tr>
<td>FITNESS</td>
<td>Dummy variable denoting if there is a fitness center on site</td>
</tr>
<tr>
<td>FOOD</td>
<td>Dummy variable denoting if there is a food court or restaurant on site</td>
</tr>
<tr>
<td>PARKING RATIO</td>
<td>The number of on-site parking spaces divided by the building square footage multiplied by 1000.</td>
</tr>
<tr>
<td>STORIES</td>
<td>The number of stories of the entire building</td>
</tr>
<tr>
<td>BUILDING SQFT</td>
<td>The total square footage of the building</td>
</tr>
<tr>
<td>LEASE TYPE</td>
<td>The document type of the lease (blend &amp; extend, renewal, and new lease)</td>
</tr>
<tr>
<td>AGE</td>
<td>The age of the building</td>
</tr>
<tr>
<td>ZIP CODE</td>
<td>The zip code of the office lease</td>
</tr>
<tr>
<td>DIST TO TRAIL</td>
<td>The distance from the building to the Trail</td>
</tr>
<tr>
<td>DIST TO CAPITAL</td>
<td>The distance from the building to the Capital Building</td>
</tr>
</tbody>
</table>
VIII. Trail User Survey

The Trail Foundation Survey

Demographics

1. Please select your age range:
   - 18-29
   - 30-39
   - 40-49
   - 50-59
   - 60 or older

2. Please select your age range:
   - 18-29
   - 30-39
   - 40-49
   - 50-59
   - 60 or older

3. Please select your gender:
   - Male
   - Female

4. What zip code do you live in?:

5. Please select the neighborhood you live in:

6. If you are not an Austin resident, where do you live?

7. When accessing Butler Trail at Lady Bird Lake (the Trail) from home or work, how far do you typically have to travel?
   - < 0.1 miles
   - 0.1 - 0.25 miles
   - 0.26 - 0.5 miles
   - 0.61 - 0.75 miles
   - 0.76 - 1 mile
   - 1 - 1.5 miles
   - 1.5 - 2 miles
   - > 2 miles

8. How do you typically get to the Trail?
   - Run/Walk
   - Bike
   - Car
   - Public Transportation
   - Other (please specify):

9. What is your typical access point to the Trail (Please select all that apply)?
   - Auditorium Shores (1st Street/Congress)
   - Holly Street Power Plant Area
   - 1-35 Bridge Area
   - Southern Trailhead Boardwalk (Lakecresent Blvd.)
   - MoPac North Side
   - MoPac South Side
   - Pfluger Pedestrian Bridge/Lamar
   - Zilker Park
   - Barton Springs
   - Other (please specify):
APPENDIX

Trail Use

10. How often do you use the Trail?
   - Daily
   - 1-3 times per week
   - 4-6 times per week
   - Once per week
   - 1-3 times per month
   - Once per month

11. Would you use the Trail more often if you could?
   - Yes
   - No

12. What is the primary reason you do not use the Trail more often?
   - Time
   - Lack of interest
   - Difficult access
   - Would like more trail options
   - Connectivity
   - Other (please specify):

13. When do you most often use the Trail?
   - Morning (before 10 AM)
   - Midday (10 AM – 2 PM)
   - Afternoon (2 PM – 6 PM)
   - Evening (after 6 PM)

14. What is the primary reason you use the Trail?
   - Running/walking
   - Biking
   - Kayaking/rafting/boarding
   - Site seeing (e.g. birding, bat viewing, nature viewing)
   - Socializing
   - Other (please specify):

15. Do you use the Trail to commute to work?
   - Yes
   - No

16. If yes, how frequently?
   - Daily
   - Once a week
   - 1-3 times a week
   - Seasonally (write all that apply): Spring, Summer, Fall, Winter

17. If you didn’t use the Trail to commute, how would you get to work?
   - Walk
   - Bike
   - Car
   - Bus
   - Other (please specify):
### Health & Wellness

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>If you didn't use the Trail to commute, how would you get to work?</td>
<td>Walk, Bike, Car, Bus, Other (please specify):</td>
</tr>
<tr>
<td>If you use the Trail to commute to places other than work, what are they?</td>
<td>Music venues/bars, Auditorium shores park, Other Park, Barton Springs, Festivals, City/community organized events, Other (please specify):</td>
</tr>
<tr>
<td>Do you exercise on the Trail?</td>
<td>Yes, No</td>
</tr>
<tr>
<td>What type of exercises do you typically do on the Trail (check all that apply)?</td>
<td>Walking, Biking, Jogging, Other (please specify):</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
<tbody>
<tr>
<td>Is the Trail your primary exercise location?</td>
<td>Yes, No, Other (please specify):</td>
</tr>
<tr>
<td>Would you prefer to exercise in a healthy, natural trail environment or a non-trail environment? Please rank your preference (1 = low preference towards trail, 5 = high preference towards trail)</td>
<td></td>
</tr>
<tr>
<td>If you were unable to access the Trail, how much would your exercise level decrease?</td>
<td>0 - 25%, 26 - 50%, 51 - 75%, 76 - 100%, &gt; 100%</td>
</tr>
<tr>
<td>Approximately how much time do you spend exercising on the Trail per visit?</td>
<td>&lt; 30 minutes, 30 - 60 minutes, 1 - 1.5 hours, 1.5 - 2 hours, &gt; 2 hours</td>
</tr>
</tbody>
</table>
26. Did proximity to the Trail influence your housing decision?
   - Yes
   - No

24. What premium would you be willing to pay (in rent or house payment per month) to live the following distances from the Trail? (i.e., it would be worth an additional $100/month to live 1 mile from the trail)
   - 1/4 mile =
   - 1/2 mile =
   - 3/4 mile =
   - 1 mile =

27. Based on the various activities that the Trail provides and the quality of the Trail itself, how much would you be willing to pay for a comparable experience at a gym, boot camp, exercise class, etc. (on an annual basis)?
   

The Trail Economic Impact | 38
IX. References


AngelouEconomics partners with client communities and regions across the United States and abroad to candidly assess current economic development realities and identify opportunities.

Our goal is to leverage the unique strengths of each region to provide new, strategic direction for economic development.

As a result, AngelouEconomics’ clients are able to diversify their economies, expand job opportunities and investment, foster entrepreneurial growth, better prepare their workforce, and attract ‘new economy’ companies.

To learn more, visit www.angeloueconomics.com

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