MEMORANDUM

To:	Friends of the Lowcountry Low Line
From:	HR&A Advisors, Inc.
Date:	September 23, 2016
Re:	The Economic Impact of the Lowcountry Low Line

OVERVIEW

The Friends of the Lowcountry Low Line have proposed the creation of a transformative, exceptionally designed, new linear park that transcends the Charleston Peninsula. As envisioned, the Charleston Lowcountry Low Line (the "Low Line") is planned to activate a 13.2-acre, 1.7-mile area of a disused Norfolk Southern railroad. In addition to a 9-acre Low Line park, the Norfolk Southern property will unlock four developable parcels within the property boundaries.

HR&A Advisors, Inc. ("HR&A"), an economic development consulting firm specializing in the planning and implementation of open spaces, analyzed local economic and job creation impacts of the Low Line to allow public and private stakeholders to articulate the unique value of this proposed project. This study builds upon HR&A's previous incremental impact analysis and considers the following potential direct and indirect economic impacts, which support jobs and local spending attributable to the project:

- Construction and operation of the Low Line
- Unlocked buildout of on-site real estate development
- Incremental density of undeveloped "soft sites" in the area surrounding the park
- Economic impacts of additional tourists who visit the Low Line

HR&A projects the following direct and indirect economic impacts to the City of Charleston economy over the next 20 years as a result of the development of the Low Line, on-site development parcels, off-site development, and tourism. This estimate represents maximum impact of anticipated benefits.

- **Jobs:** 9,090 construction jobs <u>and</u> 4,620 permanent jobs
- **Labor Income:** $350 million in total construction wages <u>and</u> $243 million in *annual* permanent job wages
- **Economic Output (spending):** $1.1 billion in total economic output resulting from construction spending <u>and</u> $467 million in *annual* economic spending resulting from operations spending

Over the next 20 years, the development of the Low Line can result in $4.8 billion total economic output, including $90 million of total additional tourism spending, to the Charleston economy.

In addition to new jobs and increased spending, the development of the Low Line is anticipated to catalyze other economic benefits, not quantified in this analysis. Ancillary benefits of the Low Line include the park's role as a local brand-builder, a safe mobility corridor, and a highly-sought amenity for businesses and residents choosing where to locate.

PROJECTED ECONOMIC BENEFIT

HR&A projects a substantial gain of new jobs, labor income and economic output (value of goods & services) over the next twenty years as a result of investment in the Low Line.

- **Jobs,** either one-time construction jobs-years or permanent full-time equivalent employees employed in retail stores, offices, and other buildings
- **Labor income,** including wages received by employees and income received by proprietors in the City of Charleston
- **Economic output (spending),** defined as the total value of production across all industries and equivalent to the aggregate spending in the area of analysis

The following one-time (construction-related) and ongoing (permanent) impacts describe impacts associated with creation of the (1) Low Line and well as impacts associated with the (2) development of on-site real estate, (3) increased density of off-site real-estate development and (4) expanded tourism.

Table 1: Total Impacts of Development of the Low Line

Construction Impacts	Job-Years	Labor Income	Economic Output
Development of the Low Line (incl. Real Estate)			
Direct Impact	5,670	$232.9M	$773.5M
Multiplier Impact	3,420	$106.9M	$318.0M
Total	**9,090**	**$349.8M**	**$1,122.1M**

Permanent Impacts	Jobs	Labor Income		Economic Output	
	FTE	**Stabilized Yr.**	**20-Year NPV**	**Stabilized Yr.**	**20-Year NPV**
Development of the Low Line (incl. Real Estate & Tourism)					
Direct Impact	3,580	$192.3M	$1,533.8M	$317.9M	$2,503.3M
Multiplier Impact	1,040	$50.3M	$395.8M	$148.9M	$1,172.7M
Ongoing Total	**4,620**	**$242.5M**	**$1,929.6M**	**$466.8M**	**$3,676.0M**

Table 2: Construction Impacts of the Development of the Low Line

Construction Impacts	Job-Years[1]	Labor Income	Economic Output
Low Line (Park) Impact			
Direct Impact	150	$7.2M	$22.3M
Multiplier Impact	70	$2.8M	$8.3M
Sub-Total	**220**	**$10.0M**	**$30.6M**
On-Site Real Estate Impact			
Direct Impact	1,410	$66.6M	$245.8M
Multiplier Impact	980	$33.9M	$101.1M
Sub-Total	**2,390**	**$100.5M**	**$346.9M**
Off-Site Real Estate Impact			
Direct Impact	4,110	$166.3M	$527.7M
Multiplier Impact	2,370	$73.0M	$216.9M
Sub-Total	**6,480**	**$239.3M**	**$744.6M**
Total Impact			
Direct Impact	5,670	$232.9M	$773.5M
Multiplier Impact	3,420	$106.9M	$318.0M
Construction Total	**9,090**	**$349.8M**	**$1,122.1M**

[1] Job-years are a measure of the number of jobs required to finish the project in one year.

Table 3: Ongoing Impacts of the Development of the Low Line

Permanent Impacts	Jobs	Labor Income		Economic Output	
	FTE	Stabilized Yr.	20-Year NPV	Stabilized Yr.	20-Year NPV
Low Line (Park) Impact					
Direct Impact	30	$1.3M	$14.0M	$3.1M	$34.2M
Multiplier Impact	10	$.5M	$5.8M	$1.9M	$20.4M
Sub-Total	**40**	**$1.8M**	**$19.8M**	**$5.0M**	**$54.6M**
On-Site Real Estate Impact					
Direct Impact	1,020	$67.1M	$662.0M	$88.0M	$867.0M
Multiplier Impact	300	$14.4M	$141.3M	$42.3M	$417.0M
Sub-Total	**1,320**	**$81.5M**	**$803.3M**	**$130.3M**	**$1,284.0M**
Off-Site Real Estate Impact					
Direct Impact	2,460	$121.3M	$830.0M	$221.1M	$1,540.0M
Multiplier Impact	710	$34.6M	$240.0M	$102.2M	$708.0M
Sub-Total	**3,170**	**$155.9M**	**$1,070.0M**	**$323.3M**	**$2,248.0M**
Tourism Spending					
Direct Impact	70	$2.6M	$27.8M	$5.7M	$62.1M
Multiplier Impact	20	$.8M	$8.7M	$2.5M	$27.3M
Sub-Total	**90**	**$3.4M**	**$36.5M**	**$8.2M**	**$89.4M**
Total Impact					
Direct Impact	3,580	$192.3M	$1,533.8M	$317.9M	$2,503.3M
Multiplier Impact	1,040	$50.3M	$395.8M	$148.9M	$1,172.7M
Ongoing Total	**4,620**	**$242.5M**	**$1,929.6M**	**$466.8M**	**$3,676.0M**

METHODOLOGY & ASSUMPTIONS

HR&A quantified net-new economic impacts of the Low Line, defined as the incremental effects that would not be generated but for the acquisition and subsequent envisioned development of the Low Line and its adjacent parcels. The creation of the Low Line produces new local economic activity from spending on the construction and operations of the park and build out of real estate parcels within the Norfolk Southern property boundaries. Outside of the boundaries, the creation of the Low Line results in new local economic activity from additional visitor spending and increased density on adjacent off-site real estate development.

Local Economic Impact

HR&A used IMPLAN, an industry standard input-output model, to analyze the economic impacts of the construction and ongoing operation of the proposed Low Line and on-site real estate parcels. IMPLAN analyzes interactions among 536 sectors in the economy and traces patterns of local commodity purchases and sales. The analysis is predicated on the concept of the "multiplier effect," where direct, new economic activity in an area's economy, such as new spending on construction materials or staff jobs, generates further spending and job creation because businesses and individuals in a regional economy are interdependent and purchase goods and services from each other. Direct and multiplier effects are defined below:

- **Direct:** the initial change in spending or employment attributable to new investment
- **Multiplier Effects – Indirect:** the change in spending or employment by businesses that supply the directly affected industry (e.g. business spending resulting from direct activities such as the purchase of park landscaping material from nearby suppliers)
- **Multiplier Effects – Induced:** the change in household spending of employees who are compensated for working in the directly and indirectly affected industries. (e.g. household spending resulting from direct activities such as food and beverage spending by construction workers while on the job)

This analysis considers these effects outputs generated by one-time construction spending and ongoing operations spending:

- **Construction Spending**: costs associated with both the initial construction of the Low Line park as well as the full buildout of on-site real estate parcels
- **Operation Spending:** costs associated with the ongoing operations of the Low Line park and jobs (estimated on a per square foot basis) that result from the ongoing operation of real estate development

Low Line Spending

Park Construction

The Low Line is envisioned to be a best-in-class open space that unites the community through, recreation, mobility and moments of respite. Spending to build the Low Line will produce one-time construction jobs and economic output. To estimate potential construction costs of the Low Line, HR&A utilized inputs from the development of signature linear park projects, comparable in scale and/or impact as the envisioned Low Line. To inform a refined estimate of economic impacts, HR&A analyzed per acre construction costs of several linear park typologies, outlined below and detailed in **Table 4.**

- **Core precedents,** such as the Katy Trail and the Atlanta BeltLine's Eastside Corridor
- **Signature linear parks** in large metropolitan cities such as the Rose Kennedy Greenway in Boston, the High Line in New York City
- **Local high-quality open spaces,** for instance, recently constructed or renovated parks Charleston including Gadsdenboro and Colonial Lake parks

The range of potential construction costs is predominately driven by geographic region, proximity to or construction of infrastructure (e.g. bridges, overpasses), adjacencies to waterfront, and park programming. Environmental remediation can add considerable costs to a project.

Table 4: Construction Costs of Comparable Linear Parks

Comparable Parks	Total Cost ($2016)	Cost/Acre ($2016)
Core Precedents		
Katy Trail (existing)	$32,100,000	$1,071,000
Katy Trail (proposed renovation)	$14,300,000	$1,667,000
Atlanta BeltLine (Eastside Trail)	$11,900,000	$373,000
Signature Linear Parks		
Rose Kennedy Greenway	$44,700,000	$2,884,000
High Line	$198,500,000	$29,629,000
Local High-Quality Open Spaces		
Gadsdenbroro Park	$7,600,000	$1,523,000
Colonial Lake Park	$5,900,000	$1,970,000

Sources: New York Times, Atlanta BeltLine, New York City Economic Development Corporation, Rose Fitzgerald Kennedy Greenway Conservancy, City of Charleston Budget, Charleston City Paper, HR&A
Notes:
1. Costs are in $2016, adjusted from year built costs using the BLS CPI calculator.
2. Costs include related hard and soft construction costs.
3. High Line construction costs are shown only for reference. Because of its elevated nature, extraordinary build, and New York City location, High Line construction costs were not considered directly comparable to the Low Line.
4. Colonial Lake Park cost/acre calculation omits area of lake.

Based on this data, and consultation with local park experts and landscape architects, HR&A estimates that the **Low Line will cost between $18 million and $25 million ($2 million to $2.8 million per acre)**. This estimate includes a low and high range of costs to reflect design and geo-technical uncertainties. For purposes of understanding the maximum economic impact of the Low Line, this analysis utilizes a park construction spending input of $25 million.

The cost to build a high-quality Low Line results in the following one-time construction impacts:

Table 5: Economic Impact of Low Line Construction

Construction Impacts	Job-Years	Labor Income	Economic Output
Low Line (Park) Impacts			
Direct Impact	150	$7.2M	$22.3M
Multiplier Impact	70	$2.8M	$8.3M
Sub-Total	**220**	**$10.0M**	**$30.6M**

Operations & Maintenance Costs

Once constructed, the ongoing operations and maintenance ("O&M") of the Low Line will generate permanent job creation and economic output. To develop O&M costs projections for the Low Line, HR&A drew on national linear park precedents as well as input from local park experts.

Table 6: Operation and Maintenance Costs of Comparable Linear Parks

Comparable Parks	Annual Cost	Annual Cost/Acre
Katy Trail	$725,000	$24,000
Atlanta BeltLine (Eastside Trail)	$11,000,000	$579,000
Rose Kennedy Greenway	$6,200,000	$397,000
High Line	$7,600,000	$491,000

Sources: Friends of the Katy Trail, Atlanta BeltLine, Rose Fitzgerald Kennedy Greenway Conservancy, Friends of the High Line

HR&A projects that, at full build-out, the Low Line will incur $1.4 million to $3.1 million ($150,000 to $350,000 per acre) in annual operating costs. Actual costs incurred may be affected by overall visitation, intensity of use of certain spaces, design and programming of the space, and the governance model implemented to manage and govern the space. For purposes of understanding the maximum economic impact of the Low Line, this analysis utilizes a park O&M spending input of $3.1 million per year.

The estimated ongoing operations and maintenance spending of the Low Line results in the following permanent impacts:

Table 7: Economic Impact of Low Line Operations

Permanent Impacts	Jobs	Labor Income		Economic Output	
	FTE	Stabilized Yr.	20-Year NPV	Stabilized Yr.	20-Year NPV
Low Line (Park) Impacts					
Direct Impact	30	$1.3M	$14.0M	$3.1M	$34.2M
Multiplier Impact	10	$.5M	$5.8M	$1.9M	$20.4M
Sub-Total	**40**	**$1.8M**	**$19.8M**	**$5.0M**	**$54.6M**

On-Site Development Construction and Operations Costs

The creation of the Low Line unlocks four key sites for development, which when constructed, will produce one-time and permanent job creation in addition to economic output. HR&A ascertained the potential development costs associated with the anticipated buildout of the four on-site parcels. The parcels, named Parcel A – Parcel D, are directly adjacent to the Low Line and are within the Norfolk Southern property boundary. In sum, the four on-site parcels provide over 4 acres of developable land.

On-site development construction and operations are informed by previous market analysis, nearby comparable development and conversations with local developers. Specifically, HR&A examined (1) the maximum buildable square feet of each parcel, (2) projected development typology and (3) localized per square foot construction and operations costs of development. For purposes of this analysis, we assume that Parcels A and B are developed in 2017. Parcels C and D are anticipated to be a part of a second phase of development, constructed in 2020.

Table 8: On-Site Development Parcels

On-Site Development Parcel	Estimated Year Developed	Estimated Buildable SF (w/ proposed density increase)
Parcel A	2017	139,000
Parcel B	2017	252,000
Parcel C	2020	433,000
Parcel D	2020	76,000
Total On-Site Real Estate		***900,000***

Maximum Buildable Square Feet: HR&A projected density of new development based on knowledge of existing prototypical projects, ongoing City zoning initiatives, and market dynamics. For Parcels A-C, HR&A assumed a density consistent with a proposed increased height district allowance around the Low Line terminal. For Parcel D, HR&A assumed a density consistent with the base zoning allowed by Upper Peninsula Initiative, a nascent zoning bonus program designed to attract a broad mix of uses to Charleston's East Central neighborhood.

Projected Development Typology: Due to the limited programmatic information available for projects that are in pre-development and pre-entitlement, HR&A projected future development use mix consistent with Courier Square Phase I, a recently constructed development that is prototypical of future development in the

Low Line area. Based on this precedent use mix, HR&A anticipates Parcels A-D will be developed as 70% multifamily use, 25% office use and 5% retail use.

PSF Construction Costs and Operations Assumptions: Based on conversations with local developers, HR&A estimates that residential and ground floor retail construction would cost about $308 per gross square foot on the parcels, including 30% soft costs and accounting for the local design standards of the Charleston Board of Architectural Review (BAR). HR&A also estimates the that office construction would cost $218 per gross square foot, including 30% soft costs. To inform impact of ongoing operation and maintenance activity, HR&A assumes that retail uses will employ one employee per 550 gross square feet of development, residential use employs one employee per 100 units and that office use will employ one employee per 250 gross square feet of development.

Based on these assumptions, the Low Line catalyzes on-site real estate development with the following estimated economic impact:

Table 9: Economic Impact of On-Site Real Estate Construction

Construction Impacts	Job-Years	Labor Income	Economic Output
On-Site Real Estate Impact			
Direct Impact	1,410	$66.6M	$245.8M
Multiplier Impact	980	$33.9M	$101.1M
Sub-Total	**2,390**	**$100.5M**	**$346.9M**

Table 10: Economic Impact of On-Site Real Estate Operations

Permanent Impacts	Jobs	Labor Income		Economic Output	
	FTE	Stabilized Yr.	20-Year NPV	Stabilized Yr.	20-Year NPV
On-Site Real Estate Impact					
Direct Impact	1,020	$67.1M	$662.0M	$88.0M	$867.0M
Multiplier Impact	300	$14.4M	$141.3M	$42.3M	$417.0M
Sub-Total	**1,320**	**$81.5M**	**$803.3M**	**$130.3M**	**$1,284.0M**

Off-Site Real Estate

Experiencing demand from young professionals, college students, and those seeking a walkable urban environment, Charleston's highly trafficked and desirable downtown has made the area a hot market for both residential and commercial development. The Low Line, and its ability to provide light and air relief and recreational opportunities, produces meaningful impetus to increase development density in the area, particularly for parcels at the edge of an exceptionally designed park. This analysis attributes potential increases in development density to the creation of the Low Line.

In concert with discussions with developers and City officials, HR&A identified ten soft sites that lie in the Low Line area[2], with direct and immediate access to the future park. These soft sites have tentative, flexible, or no plans for development and would be well positioned for increased height allowance. HR&A also assumed a modestly accelerated buildout schedule for nearby off-site properties due to the development premium generated by the Low Line.

HR&A measured the ***incremental effects*** of increased development density surrounding the Low Line. To evaluate incremental effects, HR&A measured the buildable square footage potential for new development with (height increase) and without (base zoning) increased density attributed to the development of the Low Line. Based on evaluation of market potential, HR&A estimates that 2,362,000 square feet of total incremental real estate development is attributable to the Low Line. For parcels where development plans were unavailable, HR&A assumed that these development parcels would be built with a use mix consistent with Courier Square Phase I and construction costs and operations assumptions detailed above.

Based on these assumptions, off-site real estate generates the following incremental economic impact:

Table 11: Economic Impact of Off-Site Real Estate Construction

Construction Impacts	Job-Years	Labor Income	Economic Output
Off-Site Real Estate Impact			
Direct Impact	4,110	$166.3M	$527.7M
Multiplier Impact	2,370	$73.0M	$216.9M
Sub-Total	**6,480**	**$239.3M**	**$744.6M**

Table 12: Economic Impact of Off-Site Real Estate Operations

Permanent Impacts	Jobs	Labor Income		Economic Output	
	FTE	**Stabilized Yr.**	**20-Year NPV**	**Stabilized Yr.**	**20-Year NPV**
Off-Site Real Estate Impact					
Direct Impact	2,460	$121.3M	$830.0M	$221.1M	$1,540.0M
Multiplier Impact	710	$34.6M	$240.0M	$102.2M	$708.0M
Sub-Total	**3,170**	**$155.9M**	**$1,070.0M**	**$323.3M**	**$2,248.0M**

Tourism Spending

As an attractive and innovative open space, the creation of the Low Line will draw tourists and bolster economic growth in Charleston as a regional and national tourism destination. Through well-cited tourism literature, we understand that traveling millennials, and increasingly other demographic cohorts, seek walkable environments and open spaces that support their interests and activities. The Charleston Area Visitor Report sites that, in 2015, the area's waterfront parks marked the second most popular destination for

[2] East of King St; West of St. Phillip St (between Line and Spring St) or West of Meeting St (between Mary and Spring St); North of Mary St; South of I-26 on-ramp at Sheppard St

Charleston visitors. The creation of iconic urban parks, such as the Low Line, will provide an eye-catching, activated open space and thus support increased tourist visitation and spending in downtown.

HR&A estimates that a trip to the Low Line will extend a tourist's visit to Charleston by a quarter of a day, based on comparable park visitation analysis. To estimate the incremental effect of new tourism to the Low Line, HR&A drew upon the following key data sources:

- **Visitation to Comparable Parks:** visitation statistics for anchor parks, including Centennial Park in Nashville, Piedmont Park in Atlanta, and the River Walk in San Antonio provide a benchmark for understanding the potential for high-quality urban open spaces to drive visitation. Other signature parks, including Klyde Warren Park and the High Line provide reference points for understanding the potential for additional visitors.
- **Tourism Demographics:** tourist data and spending profiles from the Charleston Visitors Bureau and the College of Charleston Office of Tourism Analysis inform an understanding of how and where tourists will spend their money during their extended stay.

Based on visitation to comparable parks, HR&A estimates that the Low Line will attract about 500,000 visitors, 125,000 of whom will be tourists visiting from outside of the Metropolitan Statistical Area. Spending from tourist visiting from outside the MSA comprise new local economic activity and net-new economic impacts associated with the construction of the Low Line.

Considering the current spending habits of non-local visitors to Charleston, HR&A projects a total of $8.2 million in incremental annual visitor spending, or $90 million (present value) visitor spending over the next 20 years.

Based on the outlined assumptions, the permanent impacts of additional tourism spending are as follows:

Table 13: Economic Impact of Increased Tourism Spending

Permanent Impacts	Jobs	Labor Income		Economic Output	
	FTE	**Stabilized Yr.**	**20-Year NPV**	**Stabilized Yr.**	**20-Year NPV**
Tourism Spending					
Direct Impact	70	$2.6M	$27.8M	$5.7M	$62.1M
Multiplier Impact	20	$.8M	$8.7M	$2.5M	$27.3M
Sub-Total	**90**	**$3.4M**	**$36.5M**	**$8.2M**	**$89.4M**

ADDITIONAL ECONOMIC BENEFITS

HR&A estimated the additive economic impact of two possible extensions to the Low Line linear park.

- **Woolfe Street to Marion Square:** a 1.1-acre extension connecting Low Line to Marion Square and the Historic Downtown.
- **Grace Bridge Connection:** a 1.5-acre extension that would allow continuous pedestrian and bike access across Ravel Bridge.

Assuming comparable construction and operations costs as the Low Line's main segment, the Low Line extensions would have a moderate impact on job creation and economic output. HR&A estimates that the Low Line with both the Marion Square and Grace Bridge and extensions would cost an additional $7.3 million to build and generate an additional 70 construction jobs and 10 permanent positions for operations and maintenance.

Table 14: Costs and Economic Impact of Possible Low Line Extensions

Extensions	Acres	Construction Cost	Construction Jobs	Construction Economic Output	Permanent Jobs	Permanent Economic Output
Marion Square	1.1	$3.1M	30	$3.7M	4	$5.8M
Grace Bridge	1.5	$4.2M	40	$5.1M	6	$7.8M
Total Extension Impact	***2.6***	***$7.3M***	***70***	***$8.8M***	***10***	***$13.6M***
Low Line (main segment)	8.96	$25.1M	220	$30.6M	40	$54.6M
Total Potential Impact	***11.56***	***$32.4M***	***290***	***$39.4M***	***50***	***$68.2M***

ANCILLARY BENEFITS

Open Space as Value Creation

Signature parks generate substantial civic and economic value by serving as public amenities, destinations and local brand-builders. Open spaces are an increasingly important part of many regional economic development strategies as municipalities recognize of the value that parks create for their communities and regional economies. Open spaces like the Low Line can serve as welcoming gateways and meaningful landmarks for residents and visitors alike.

The Low Line will serve as a piece of social infrastructure that supports quality of life for all residents and an equitable future for all communities. The Low Line will be an instrumental mobility corridor for Charleston, providing connections to downtown Charleston on bike or foot and alleviating traffic. Investment in the Low Line could be crucial step towards stitching together communities along its path and providing a free public health and community amenity in support of a unified and economically vibrant Peninsula.

The Low Line will attract residents and business to Charleston. As seen by the vibrancy in the areas around Dallas' Katy Trail or New York City's High Line, linear parks add significant quality of life benefits to residents and workers in their neighboring areas. These areas then become more attractive to potential residents and businesses. As Charleston's emerging tech industry takes hold, company leaders are likely to look to quality of life factors, such as parks or local cultural attractions, as key criteria for location decisions. Of the fastest growing companies, one in five leaders named quality of life factors such as parks or local cultural attractions as key criteria in choosing where to launch their companies[3].

[3] What Do the Best Entrepreneurs Want in a City?: Lessons from America's Fastest-Growing Companies, Endeavor Insight