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### Economic contribution of the Lowry Park Zoo to the Hillsborough County economy

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# **The Economic Contribution of the Lowry Park Zoo to the Hillsborough County Economy**

An Analysis Performed by

**CENTER FOR ECONOMIC DEVELOPMENT RESEARCH**  
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## *Preface*

The Lowry Park Zoological Society of Tampa, Inc. was created in 1988 and is organized as a private, not-for-profit entity for the purpose of maintaining and promoting the development of the Lowry Park Zoological Garden. Sources of operating funds for the Lowry Park Zoological Society include gate admissions, restaurant and gift shop sales, concessions, membership fees, fundraising and special event revenues, educational charges, contributions, and grants. Lowry Park Zoological Society commissioned this study and the Center for Economic Development Research, College of Business Administration, University of South Florida performed the study. The purpose of the study is to quantify the Society's economic contribution to Hillsborough County. The Center for Economic Development Research provides information and conducts research on issues related to economic growth and development in the Nation, in the state of Florida, and particularly in the central Florida region. The Center serves the faculty, staff, and students of the College of Business Administration, the University, and individuals and organizations in the University's service area. Activities at the Center for Economic Development Research are designed to further the objectives of the University and specifically the objectives of the College of Business Administration.

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## EXECUTIVE SUMMARY

**During FY 2001-02, the Lowry Park Zoo's economic contribution to Hillsborough County's economy was, on average, 888.5 jobs throughout the year. The workers in these jobs produced goods and service valued at \$71.67 million and earned money wages equal to \$24.28 million.**

The purpose of this research is to estimate the economic contributions of Lowry Park Zoo to Hillsborough County, Florida.

We base this study on the activities of the Lowry Park Zoo during fiscal year (FY) 2001-02, which began October 1, 2001 and ended September 30, 2002. The Zoo provided us with Combined Financial Statements and Independent Auditors' Reports for the Lowry Park Zoological Society of Tampa, Inc. and Affiliate, dated September 30, 2002 and copies of internal capital budget and attendance reports. We also used the State of Florida's Enhanced Quarterly Unemployment Insurance (EQUI) database to look up employment and payroll data from State unemployment insurance records.

First, we separately examine the effect on the economy of continuing operations, capital improvements, and additional spending by visitors during the Zoo's FY 2001-02. Then, we model the simultaneous effects. The simultaneous effects are slightly greater than the sum of effects, when taken separately, due the dynamics of the economy.

- During FY 2001-02, continuing operations at the Zoo contributed 257 jobs (including an approximate 10 full-time equivalent volunteer jobs), which paid money wages totaling just over \$7.07 million or an average of \$27,500 each for the year. The workers in these jobs produced an output valued at about \$16.53 million.
- During FY 2001-02, spending for capital improvements at the Zoo was about \$8.61 million. This spending rippled through Hillsborough County's economy resulting in total output valued at \$19.22 million, and providing, on average, 181 jobs throughout the year. The workers in these jobs received money wages totaling \$5,526,000 or an average of \$30,530 each on the year.
- During FY 2001-02, attendance at the Zoo was 683,301 persons. Of these attendees we estimate that 100,223 were daytrippers and 247,295 had a single night's stay in Hillsborough County associated with their attendance at the Zoo. (The remaining attendees were locals. We ignore locals' spending as being incidental to going to the Zoo, because it substitutes for spending that would have occurred in Hillsborough County even if the local does not visit the Zoo.) The visitors – daytrippers and overnights -- generated 427 jobs, on average throughout the year, in Hillsborough County. The workers in

these jobs produced output valued at slightly over \$34.5 million and earned money wages totaling about \$11.2 million or an average of \$26,295 each on the year.

Visitors generated more jobs than continuing operations or capital improvements. However, capital improvements – primarily construction projects -- added more value to the economy in terms of output that was produced.

The simultaneous effects of continuing operations, capital improvements and visitors during its FY 2001-02 motivate the total economic contribution of Lowry Park Zoo for Hillsborough County's economy. The Zoo contributed, on average, 888.5 jobs throughout the year. The workers in these jobs produced goods and service valued at \$71.67 million and earned money wages equal to \$24.28 million.

We also examine the anticipated economic contributions to Hillsborough County during fiscal years 2002-03 through 2005-06. During fiscal years 2002-03 through 2005-06, on average, we anticipate that the Lowry Park Zoo will contribute 802.4 jobs to Hillsborough County's economy. The workers in these jobs will annually produce output valued at \$64.46 million and for their work receive money wages totaling \$24.32 million. This average economic contribution is slightly below the FY 2001-02 contribution mainly due to a projected decrease in the Zoo's annual capital budgets.

## I. Introduction.

The purpose of this study is to estimate the economic contributions of Lowry Park Zoo to Hillsborough County, Florida.

We base this study on the activities of the Lowry Park Zoological Society in Hillsborough County during fiscal year (FY) 2001-02, which began October 1, 2001 and ended September 30, 2002. The Society provided information that is the basis for this analysis. The information included Combined Financial Statements and Independent Auditors' Reports for the Lowry Park Zoological Society of Tampa, Inc. and Affiliate, dated September 30, 2002 and copies of internal capital budget and attendance reports. We also used the State of Florida's Enhanced Quarterly Unemployment Insurance (EQUI) to look up employment and payroll data from State unemployment insurance records.

The conceptual foundation of this analysis is the understanding that job creation in one industry begets additional jobs in related industries. In addition, further jobs are created to support an increased level of aggregate household income and spending resulting from the inter-industry job creation. This phenomenon of job creation, with concomitant increased levels of income and production, is called the multiplier or ripple effect. For this analysis, the economic effect of the Society, as it ripples through the economy, is estimated using the *REMI<sup>TM</sup> Policy Insight* regional economic impact model. We describe the model in **Appendix B**.

## II. Conceptual Foundation of the Analysis.

When jobs are created in an industry, these jobs motivate the creation of additional jobs in related industries. The Frenchman Francois Quesnay, founder of the physiocratic or “natural order” philosophy of economic thought, first described inter-industry relationships in 1758. The physiocrats depicted the flow of goods and money in a nation, and thus made the first attempt to describe the circular flow of wealth on a macroeconomic basis. Wassily Leontief was born in Russia in 1906 and first studied economic geography at the University of St. Petersburg before moving to Berlin and China. He came to the United States in 1931 and, after a brief 3-month stint at the National Bureau of Economic Research in New York, Harvard University hired him. At Harvard, Professor Leontief undertook a research project that encompassed a 42-industry input-output table showing how changes in one sector of the economy lead to changes in other sectors. From this research, he developed the concept of multipliers from input-output tables, and was subsequently awarded the Nobel Prize in economics in 1973 for his development of input-output (I-O) economics.

For example, an increase in purchases (first round) of output from a manufacturing industry in a region may require that the manufacturing industry, in order to expand output, purchase (second round) factor inputs from other industries of the regional economy. In turn, these other industries may have to purchase (third round) inputs to deliver the supporting production of factors to the manufacturing industry. The rounds of spending will continue with each round becoming increasingly weaker in its impact because of leakage from the region attributable to imports, savings, and taxes.

The first round is called the *direct effect* of the change in demand in an industry of the economy. The second and subsequent rounds are collectively referred to as the *indirect effects* of inter-industry purchases in response to the direct effect. Changes in spending by households as income increases due to changes in the level of production are also included in the indirect effects. The *total effect* is the sum of the direct and indirect effects. Because increased production is a desired outcome for an area’s economy, we call the total effect or impact an *economic contribution* to the area.



### III. History, Organization, and Function

In the late 1930's, a small zoo was established in the Plant Park area of Tampa with a collection of local native animals. In 1957, Lowry Park became home to the growing population of zoo animals with the decision to move to a more centrally located facility. At that time, Lowry Park was owned by the City of Tampa and maintained by Tampa's Parks Department. In 1961, the Zoo obtained an Asian Elephant, the Zoo's first large exotic animal. This acquisition provided motivation for the Zoo to expand and diversify the animal collection. In 1982, the Lowry Park Zoo Association was formed to raise awareness of the Zoo and to promote a public/private partnership to fund the development of a first-class zoological garden. By 1984, the Zoo Association had envisioned a \$20 million capital campaign, and the City of Tampa had committed \$8 million to construction of the first phase, which included habitat expansion and new parking, entrance, and office facilities. As the first phase of construction neared completion in early 1988, the Zoo Association became the Lowry Park Zoological Society, a private, non-profit organization dedicated to the maintenance and ongoing development of the zoological garden. The City of Tampa still owns the 41 acres of land where the Zoo is situated. A second phase of habitat expansion was completed in early 1991. Additional facilities open to the public include the Saunders Pavilion, a 10,000 square-foot special use facility completed in 1995 and the Harrell Discovery Center, a 1,500 square-foot interactive facility finished in 1997. Currently, a "Next Generation" of capital improvements and expansion is being planned and implemented. As each Zoo facility expansion and new or renovated facility is completed, Zoo patronage is expected to steadily grow.

In its first year of operation after the initial habitat expansion phase in 1988, over 614,000 people visited the Zoo facilities. Since that time, a steady stream of people has visited the Zoo each year. In 2001, total attendance was 683,583 people<sup>1</sup>.

Volunteer activity provides a valuable benefit to the Zoo that is not financially indicated in Zoo operation reports. In this study, the contributions by volunteers to the Zoo are included as a part of the overall Zoo function to obtain a full picture of total Zoo operational activity. In FY 2002, volunteers logged a total of 21,334 hours. This volunteer activity equates to 10.26 full-time jobs (assuming 2,080 hours per year for each full-time job). The major contributors to this total were 89 docents who donated over 15,000 hours in various capacities throughout the Zoo and during special events. Approximately 600 volunteers contributed close to 2,000 hours to fundraising activities. Interns contributed close to 1,000 hours to the summer camp program, while Zoo crew volunteers contributed another 1,000 hours performing maintenance.

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<sup>1</sup> From "Tampa Bay Convention and Visitor's Bureau Research Study: Analysis of the 2001 Hillsborough County Visitor" prepared by The Bonn Marketing Research Group.

#### IV. Method of Analysis.

We examine the economic contribution of Lowry Park Zoo through direct and indirect effects. To quantify direct effects we use the Expenditure Approach for continuing operations, capital improvements, and additional spending in the area by visitors. For a non-profit organization, like the Lowry Park Zoological Society, the Expenditure Approach presumes that the economic value of the Zoo's output equals its cost to produce that output. Additionally, we use sales as a measure of the direct effect for an independently owned eating place on the Zoo's premises. We virtually remove the direct effects from Hillsborough County's economy using the *REMI*<sup>TM</sup> model. The *REMI*<sup>TM</sup> model calculates the total effects if the economic activity generated by the Zoo ceased. This lost production includes both the production of industries directly affected by the cessation and the production lost indirectly through the "ripple effect" as the flow of goods and services is reduced throughout the economy.

We obtain expenditure data of continuing operations for model input from financial statements. Operating expenses (which include payroll costs) are combined with depreciation and interest expense. To this amount, we add the estimated value of volunteer effort to obtain total expenditures for FY 2001-02 of over \$9.7 million. The \$9.7 million spent by Lowry Park Zoo is virtually removed in application of the *REMI*<sup>TM</sup> *Policy Insight* software to determine the economic contribution of continuing operations to the Hillsborough County economy.

We also obtained expenditure data of capital improvements for model input from the financial statements. Almost \$7.4 million of capital improvement in various categories was expensed in FY 2001-02. We included construction in progress valued at over \$1.2 million at the end of the fiscal year. The \$8.6 million of total capital expenditures in FY 2001-02 is virtually removed using the *REMI*<sup>TM</sup> model to determine the contribution of the capital improvement activity to the Hillsborough County economy.

In addition, we use the Enhanced Quarterly Unemployment Insurance (EQUI) records to determine the Lowry Park Zoological Society's average employment for FY 2001-02. The EQUI data are based on information provided to the State of Florida with unemployment insurance premiums paid by employers. From the EQUI data, we determine an annual average number of employees, though actual employment fluctuates from month to month. Then, based on payroll costs shown in the Lowry Park Zoological Society's financial statements, we determine the average wage paid to full-time employees at the Zoo. This average wage is then used to determine the value of volunteer effort. We also use the jobs and average wage data to calculate implied multipliers.

The value of visitor spending while attending Lowry Park Zoo is captured in the above expenditure data. However, visitors to Hillsborough County spend additional amounts before and after attending the Zoo. We describe visitor classifications in **Appendix A** and include locals, daytrippers and overnights. Local visitors are excluded from the analysis due to their choice to substitute spending in one area of Hillsborough

County over another. Spending by daytrippers is different than spending by overnighters, hence the separation for analysis. Daytrippers, who by definition commute to short term activities, likely attend the Zoo the same day as returning home and therefore spend little outside their primary target destination – in this case, the Zoo. Daily spending by overnighters, for example, includes meals, hotel, and transportation. While it is likely that other area activities are the primary destination attracting overnight visitors to Hillsborough County, we presume that these visitors spend a day at the Zoo. Thus, we conservatively allocate overnighter spending for a single night's stay to the Zoo's economic contribution to Hillsborough County. The number of daytrippers and overnighters is virtually removed using the *REMI*<sup>TM</sup> model to determine the contribution of the additional visitor spending to the Hillsborough County economy.

The only independent vendor at Lowry Park Zoo is an onsite McDonald's eating establishment. We estimated sales data for model input from notes to the Zoo's financial statements. The value of these sales is aggregated with all economic activities and virtually removed using the *REMI*<sup>TM</sup> model to determine the total economic contribution of all activities to the Hillsborough County economy.

Finally we model virtual removal of anticipated expenditures for Lowry Park Zoo continuing operations, capital improvements, and added visitor spending for FY 2002-03 through FY 2005-06.

V. Economic Contributions of the Lowry Park Zoological Society, Fiscal Year 2001-02

In this section, we report the economic effects of continuing operations, capital improvements, and additional spending by visitors during the Zoo's FY 2001-02.

**Table 1, Panel A**, reports the direct contribution to Hillsborough County's economy from continuing operations at the Zoo. Review of the EQUI data suggests employment at the Zoo was generally stable throughout the year. According to EQUI data, on average, the Zoo employed about 168 persons during FY 2001-02 at an average annual money wage of \$19,932. In addition, volunteers put in more than 21,000 hours of effort in support of the Zoo's continuing operations during FY 2001-02. This contribution by volunteers is equivalent to slightly over 10 full-time jobs. Based on the average annual money wage for paid employees, the contribution of the volunteers totals \$204,503. We estimate that the work accomplished by employees and volunteers produced a direct output valued at nearly \$9.77 million during FY 2001-02.

Table 1  
Lowry Park Zoo

Panel A  
Direct Contribution of Continuing Operations in Fiscal Year 2001-02  
(dollar amounts in 2001 \$s)

Location	Industry	Category	Jobs Annual Avg.	Annual Money Wages & Salaries		Annual Avg. Wages & Salaries	Value of Output
Hillsborough	Zoological Gardens	Paid Employees	167.70	\$3,342,607		\$19,932	
Hillsborough	Zoological Gardens	Volunteers	10.26	\$204,503	note 1	\$19,932	
Hillsborough	Zoological Gardens	Total Zoo	177.96	\$3,547,110			\$9,769,724

note 1 - Volunteer work annualized at 2,080 hours per job per year; "Annual Money Wages & Salaries" is an estimate of the value of volunteer work at same average annual wage as paid employees

Panel B  
Total Contribution of Continuing Operations in Fiscal Year 2001-02  
(dollar amounts in 2001 \$s)

Location	Jobs Annual Avg.	Value of Output	Annual Money Wages & Salaries	
Hillsborough	257.10	\$16,530,000	note 2	\$7,072,000

note 2 - Our model reports output in 96\$. We use an output adjustment factor of 1.14, based on CPI - Total for 96\$ to 01\$.

Panel C  
Implied Multipliers for Continuing Operations in Fiscal Year 2001-02

Location	Employment	Output	Wages & Salaries
Hillsborough	1.53	1.69	2.12

**Panel B** of Table 1 shows the total contribution to Hillsborough County's economy from continuing operations during FY 2001-02. The total contribution consists of the direct contribution plus the multiplier, or ripple, effect of the direct contribution as it moves through Hillsborough County's economy. We report the total contribution using three different measurements of economic activity: jobs, output, and money wages. During FY 2001-02, continuing operations at the Zoo supported 257 jobs (including the approximate 10 full-time equivalent volunteer jobs), which paid money wages and salaries totaling just over \$7.07 million. In FY 2001-02, the total contribution to Hillsborough's economy, as measured by output, was approximately \$16.53 million.

**Panel C** of Table 1 provides the multipliers that are implied by the total contribution vis-à-vis the direct contribution of continuing operations at the Zoo. For every two employees or volunteers at the Zoo, another job is created in Hillsborough County in order to supply the workers at the Zoo with the goods and services that they need to do their jobs and to satisfy their demands for personal (household) consumption. And, for every dollar paid in money wages to employees of the Zoo (and imputed for the Zoo's volunteers), another \$1.12 is earned by other Hillsborough County workers, whose jobs are due the multiplier effect. Similarly, for every dollar's worth of output that is produced by the Zoo's workers, another \$0.69 of output is generated within the County.

In FY 2001-02, several capital improvements were completed or in progress at Lowry Park Zoo. For instance, the "Next Generation" expansion implemented in 2001 included design and construction of the first phase of an Africa exhibit, an exhibit of Australian character named Wallaroo, a Manatee exhibit, and other exhibits and projects for customer comfort, safety, and convenience. The other exhibits and improvements include the following:

- Camel Ride equipment, construction, and purchase of camels
- Siamong and colobus exhibit
- Upgrade of phones, security cameras, and point of sale systems
- Retrofit of bathrooms
- Retrofit of leopard and tiger night houses
- Replacement of carousel awning
- Lightning rods
- Retrofit of covered bridge

**Table 2** reports the economic contribution to Hillsborough County due to capital improvements taking place at the Zoo during FY 2001-02. Direct spending for capital improvements was about \$8.61 million. This spending rippled through the County's economy resulting in total output valued at \$19.22 million, and providing, on average, 181 jobs throughout the year. The workers in those jobs received money wages totaling \$5,526,000 or an average of \$30,530 on the year.

Table 2  
Lowry Park Zoo

Contribution of Capital Improvements in Fiscal Year 2001-02  
(dollar amounts in 2001 \$s)

Location	Contribution	Value of Output	Implied Output Multiplier	Jobs Annual Avg.	Annual Money Wages & Salaries
Hillsborough	Direct	\$8,616,137			
Hillsborough	Indirect	\$10,604,263			
Hillsborough	Total	\$19,220,400 <small>note 1</small>	2.23	181.0	\$5,526,000

note 1 - Our model reports output in 96\$. We use an output adjustment factor of 1.14, based on CPI - Total for 96\$ to 01\$.

During its FY 2001-02, Lowry Park Zoo accommodated 683,301 attendees. Since 1988, the Zoo has experienced approximately 10% annualized growth rate in attendance. Attendance by groups is an important part of total attendance. Besides a strong promotional campaign for group attendance by school-age children on field trip outings, a variety of community outreach efforts are used to attract attendance by other groups, such as nursing center and retirement center residents, children’s hospitals, migrant pre-school children and special needs center residents. In FY 2001-02, nearly 75,000 of the attendee total were part of one of 1,455 groups to go to the Zoo. The groups included 660 public and private school groups, comprising over 47,000 attendees. In addition, about 59,000 attendees were associated with special events, such as ribbon cuttings, grand openings, and press events. The gate total (individual admissions) during the fiscal year was 474,569 attendees.

We place each of the 683,301 attendees into one of three categories. The three categories are 1) locals, 2) daytrippers, and 3) overnights. Locals are Hillsborough County residents. Daytrippers are residents of counties near Hillsborough. The daytrippers travel into Hillsborough County to attend Lowry Park Zoo, but do not remain overnight. Overnights live beyond Hillsborough and its neighboring counties. Overnights stay in a hotel / motel and eat meals at restaurants in Hillsborough County. Although overnights may stay more than one night during a particular trip, for the purpose of this analysis we consider one night’s stay sufficient for a visit to the Zoo. Thus, although a visitor may stay in Hillsborough County for several consecutive nights, we conservatively count one night per overnigher for the purpose of estimating the additional economic contribution of these visitors.

The economic activity of these attendees, while at the Zoo, is captured in the measurement of economic contribution of the Zoo’s continuing operations. We deem that there is no incremental economic impact of additional spending by locals. The rationale is that this is a substitute economic activity for that which would occur elsewhere in the County. For example, an attendee who pays fare to travel to the Zoo by bus would have otherwise traveled to a local shopping mall. Hence, the spending for bus fare to the Zoo substitutes for the spending of bus fare to the mall.

However, we must account for additional spending that is related to their trip to the Zoo for daytrippers and overnights. We refer to the daytrippers and overnights as visitors. This additional spending occurs while the visitors are away from the Zoo, but still in Hillsborough County.

Our process for categorizing each of the 683,301 is in Appendix A. We estimate that during the FY 2001-02 there were 100,223 daytrippers and 247,295 overnights out of the 683,301 attendees. **Table 3** reports the economic contribution to Hillsborough County's economy of these 347,528 visitors. Visitors, who go to Lowry Park Zoo, generate 427 jobs, on average throughout the year, in Hillsborough County. The workers in these jobs produce output valued at slightly over \$34.5 million and earn money wages totaling about \$11.2 million.

Table 3  
Lowry Park Zoo

Additional Contribution of Visitors in Fiscal Year 2001-02  
(dollar amounts in 2001 \$s)

Number	Category	Value of Output	Jobs Annual Avg.	Annual Money Wages & Salaries
100,233	daytrippers	\$243,504	3	\$78,200
247,295	overnights	\$34,291,200	424	\$11,150,000
347,528	total visitors	\$34,534,704 note 1	427	\$11,228,200

note 1 - Our model reports output in 96\$. We use an output adjustment factor of 1.14, based on CPI - Total for 96\$ to 01\$.

**Table 4** reports the contribution to Hillsborough County of all economic activities related to Lowry Park Zoo during its FY 2001-02. These activities are continuing operations, capital improvements, and additional visitor spending, which were reported separately in Tables 1 through 3. In addition, we add the impact of the operation of a McDonald's restaurant on the Zoo's premises to complete the full economic contribution, because we believe that a restaurant would not be operating in that location if the Zoo were not there.<sup>2</sup> The results we show in Table 4 for all economic activities account for a synergistic effect. That is, the contribution of all economic activities, even when we exclude the McDonald's restaurant, are greater than the sum of the activities, i.e. continuing operations, capital improvements and the added contribution of visitors, when taken individually.

Table 4  
Lowry Park Zoo

Total Contribution of Continuing Operations in Fiscal Year 2001-02  
(dollar amounts in 2001 \$s)

Location	Jobs Annual Avg.	Value of Output	Annual Money Wages & Salaries
Hillsborough	888.5	\$71,671,800 note 1	\$24,280,000

note 1 - Our model reports output in 96\$.

We use an output adjustment factor of 1.14, based on CPI - Total for 96\$ to 01\$.

During its FY 2001-02 the Lowry Park Zoo contributed, on average, 888.5 jobs to Hillsborough County's economy. The workers in these jobs produced goods and service valued at \$71.67 million and earned money wages equal to \$24.28 million.

In summary, in this section we first report our analysis of the Zoo's economic contribution from each of three discrete activities. The activities are continuing operations, capital improvements, and additional spending by visitors. By examining each of these activities separately, we find that the attraction of visitors to Hillsborough County leads to the highest contribution. During FY 2001-02 we estimate that visitors, both daytrippers and overnights, generated just over \$34.5 million in sales in Hillsborough County in addition to their spending at the Zoo. Of course, visitors who stay overnight in a hotel or motel, and eat at a local restaurant generate most sales.

We believe that our estimate of visitors' economic contribution is conservative on two fronts. First, the reported total attendance during the year was 683,301 persons. From total attendance, we approximate that 335,773 were Hillsborough County residents. We do not consider Hillsborough County residents to be visitors and any added spending

<sup>2</sup> By agreement, a percentage of the restaurant's sales is paid to the Zoo. We estimate the restaurant's sales at \$533,000 (October 2001 to September 2002) based on the amount paid under the agreement.



by these residents during a trip to the Zoo is substituted for spending they would have occurred in the County anyway. Thus, we attribute no added impact for these 335,773 attendees. The remaining attendees are visitors: 100,233 daytrippers and 247,295 overnighers. We estimate the additional economic contribution of a daytripper from outside Hillsborough County at a modest \$2.43 per visit to the Zoo.

Second, we allow overnighers one-night's stay relative to attendance at the Zoo. While we have no specific information, it seems reasonable that some overnighers may stay several days and visit more than one attraction. However, we believe that one overnight is a conservative allocation for a visit to the Zoo. We estimate the additional economic contribution of an overnigher at \$138.67 per visit to the Zoo.

Following the attraction of visitors as the most valuable contribution of the Zoo, we find capital improvements. The Lowry Park Zoo financial statements indicate capital improvements during FY 2001-02 costing just over \$8.6 million. These capital projects contributed an average of 181 jobs during the year, money wages totaling more than \$5.5 million for people working in Hillsborough County and production valued at almost \$20.0 million.

While continuing operations generated more jobs and higher total money wages than capital improvements, the value of the output from continuing operations was lower than the value of the output generated by capital improvements. Continuing operations contributed an average of 257 jobs during the year, money wages totaling about \$7.1 million and production valued at \$16.5 million.

Lastly for FY 2001-02, we examine the simultaneous and dynamic impact of continuing operations (a McDonald's restaurant located on the Zoo's premises is also included), capital improvements and the added contribution of visitors. During its FY 2001-02, we find the full contribution of Lowry Park Zoo to Hillsborough County's economy an average of 888 jobs, paying total money wages equal to nearly \$24.3 million and producing output valued at nearly \$71.7 million.

## VI. Anticipated Economic Contributions of the Lowry Park Zoological Society

In the previous section we report our analysis of Lowry Park Zoo's economic contribution to Hillsborough County during its FY 2001-02. Our analysis is based on historical data gleaned from the Zoo's financial statements and attendance records. In this section we extend our analysis to the anticipated economic contributions to Hillsborough County during FY 2002-03 through FY 2005-06.

Major growth and expansion of Lowry Park Zoo was initiated in the 1980's. A significant Zoo expansion phase opened in 1988 and was followed by a second phase of expansion in the early 1990's. During the mid-1990's, Zoo expansion included facilities to provide more activities for attendees. Currently, implementation of the "Next Generation" of capital improvements and facility expansion, conceptualized in FY 2000-01, is well under way at Lowry Park Zoo. During the next several years, several additional facility expansions are planned for implementation. Included in the funding plan are the completion phases of the Africa exhibit. The Africa exhibit includes an "Elephant Nite House" and "Elephant Exhibit," which will house a variety of animals from Africa. Required infrastructure improvements include a tunnel under an existing public roadway with associated retention ponds, canals, and permitting. The Wild Australia Safari exhibit will include a tram ride with animal feeding opportunities for visitors. A tour along area canals by boat is planned, along with new exhibits to house flamingo, rhino, and wild dog species. The Africa exhibit is planned for total completion by 2008; however, funding projections beyond FY 2004-05 are less than the initial phases. Improvements and refurbishment to the existing Zoo facilities are also planned in the distant future.

We base our analysis of anticipated economic contributions on planned spending for capital improvements and certain assumptions about the growth in spending for continuing operations as well as the growth in attendance and visitors. Planned spending for capital improvements during FY 2002-03 through FY 2004-05 are \$4,599,950; \$5,900,000; and \$3,500,000 respectively. Furthermore, we estimate capital expenditures in 2005-06 as the average amount of planned spending in the prior three years or \$4,666,650.

In addition, we assume expenses for continuing operations will increase at 2.655% per year. We base this assumption on the Consumer Price Index average geometric rate of inflation from 1996 to 2001. (We increase sales at the McDonald's eating place at the same rate as continuing operations.) Also, we assume growth rates for daytrippers and overnighters will be 1% and 1.5% per annum, respectively.

**Table 5** reports the anticipated economic contributions of Lowry Park Zoo for FY 2002-03 through FY 2005-06. We estimate the anticipated contributions from the planned spending for capital improvements and our assumptions about increasing expenses for continuing operation and the growth in visitors as detailed above.

Table 5  
Lowry Park Zoo

Total Contribution - Fiscal Years 2002-03 through 2005-06  
(dollar amounts in 2001 \$s)

Location	Fiscal Year	Jobs Annual Avg.	Value of Output		Annual Money Wages & Salaries
Hillsborough	2002-03	800.8	\$63,087,600	note 1	\$22,730,000
Hillsborough	2003-04	828.1	\$67,089,000	note 1	\$24,820,000
Hillsborough	2004-05	777.5	\$62,130,000	note 1	\$24,000,000
Hillsborough	2005-06	803.1	\$65,550,000	note 1	\$25,710,000
Hillsborough	all	Average =	802.4	\$64,464,150	\$24,315,000

note 1 - Our model reports output in 96\$.

We use an output adjustment factor of 1.14, based on CPI - Total for 96\$ to 01\$.

During FY 2002-03 through FY 2005-06, on average, we anticipate that the Lowry Park Zoo will contribute 802 jobs to Hillsborough County's economy. The workers in these jobs will annually produce output valued at just under \$64.5 million and for their work receive money wages totaling slightly over \$24.3 million.

We note that the anticipated average economic contribution of the Zoo during FY 2002-03 through FY 2005-06, is less than the contribution estimated for FY 2001-02. The main reason for the projected decline in economic contribution is that planned capital expenditures decline over the period. If new projects are subsequently added to the Zoo's capital budget, there will be a corresponding increase in economic contribution.

## VII. Conclusion

We examine the economic contribution of Lowry Park Zoo through direct and indirect effects. To quantify direct effects we use the Expenditure Approach for continuing operations, capital improvements and additional spending in the area by visitors. For a non-profit organization, like the Lowry Park Zoo, the Expenditure Approach presumes that the economic value of the Zoo's output equals its cost to produce that output. Additionally, we use sales as a measure of the direct effect for an independently owned eating place on the Zoo's premises. We virtually remove the direct effects from Hillsborough County's economy using the *REMI*<sup>TM</sup> model. The *REMI*<sup>TM</sup> model calculates the total effect if the economic activity generated by the Zoo ceased. The total effect is the lost production directly attributable to a cessation of the Zoo's activities and the production lost indirectly through the "ripple effect" as the flow of goods and services is reduced throughout the economy. Because increased production is a desired outcome for an area's economy, we call the total effect or impact an economic contribution to the area.

During its FY 2001-02 the Lowry Park Zoo contributed, on average, 888.5 jobs to Hillsborough County's economy. The workers in these jobs produced goods and services valued at about \$71.7 million and earned money wages nearly equal to \$24.3 million.<sup>3</sup>

Also, by examining each of the Zoo's economic activities separately, we find that the attraction of visitors to Hillsborough County leads to the highest contribution. During FY 2001-02 we estimate that visitors, both daytrippers and overnights, generated just over \$34.5 million in sales in Hillsborough County in addition to their spending at the Zoo.

Furthermore, during fiscal years 2002-03 through 2005-06, on average, we anticipate that the Lowry Park Zoo will contribute 802 jobs to Hillsborough County's economy. Measured in 2001 dollars, the workers in these jobs will annually produce output valued at just under \$64.5 million and for their work receive money wages totaling slightly over \$24.3 million. We conclude that the economic contribution of the Zoo for Hillsborough County will decline through fiscal years 2002-03 to 2005-06 due to decreasing capital budgets.

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<sup>3</sup> To provide a frame of reference for the Zoo's economic contribution, we note that in 2001 in Hillsborough County there were, on average, 756,800 workers, who produced goods and service valued at \$70.6 billion and who earned money wages totaling \$19.4 billion

Appendix A

Estimation Process for Visitor Categories

The staff of Lowry Park Zoo reports a total attendance of 683,301 persons during FY 2001-02. We place the attendees into one of three categories. The three categories are 1) locals, 2) daytrippers, and 3) overnigheters. Locals are Hillsborough County residents. Daytrippers are residents of counties near Hillsborough. The daytrippers travel into Hillsborough County to attend Lowry Park Zoo, but do not remain overnight. Overnigheters live beyond Hillsborough and its neighboring counties. Overnigheters stay in a hotel / motel and eat meals at restaurants in Hillsborough County.

**Chart A1** shows the process we used to estimate visitor categories for the 683,301 attendees. A total of 74,949 attendees came to the Zoo as a member of a group. Of these, 47,348 were from public and private schools and 17,797 of these attendees were from Hillsborough County public schools. We categorize the 17,797 Hillsborough County school group attendees as locals. We categorize the rest of the 29,551 school group attendees, who are from nearby counties to Hillsborough County, daytrippers. And, we categorize the half of the remaining 27,601 non-school related group attendees as locals (13,800) and the other half as daytrippers (13,801).

Chart A1  
Lowry Park Zoo

Estimation of Visitor Categories

<u>Number of Attendees</u>	<u>Visitor Category</u>	<u>Remarks</u>
683,301		total attendees
less	17,797	locals
<u>665,504</u>		
less	29,551	daytrippers
<u>635,953</u>		
less	13,800	locals
less	13,801	daytrippers
<u>608,352</u>		
less	304,176	locals
<u>304,176</u>		
less	56,881	daytrippers
less	56,881	overnigheters
<u>190,414</u>		
less	156,651	overnigheters
less	<u>33,764</u>	overnigheters
0		

Summary

<u>Category</u>	<u>Number</u>
Locals	335,773
Daytrippers	100,233
Overnigheters	<u>247,295</u>
Total Attendees	683,301

When we reduce the total attendance of 683,301 by the total number of group attendees, the remainder is 608,352. We assume that half of these attendees are locals residing in Hillsborough County. We then base the category of these remaining 304,176 attendees on an analysis previously conducted by The Bonn Marketing Research Group for the Tampa Bay Convention and Visitors Bureau. The analysis, titled “Analysis of the 2001 Hillsborough County Visitor,” reports that 37.4% of visitors to Hillsborough County originate their trip within Florida, 51.5% originate from other states, and 11.1% are international visitors.

We assume that 113,762 (37.4% of 304,176) attendees originate their trip in Florida. We further assume that half reside near Hillsborough County and place these 56,881 attendees in the category of daytrippers. We assume the other half are overnights from more distant Florida counties. Hence, we have another 56,881 overnights.

Finally, we categorize the 156,651 (51.5% of 304,176) attendees from out-of-state and the 33,764 (11.1% of 304,176) international visitors as overnights.

## Appendix B

### Regional Economic Development Policy Analysis

*The Center for Economic Development Research (CEDR), College of Business Administration, University of South Florida (USF), uses the **REMI Policy Insight™** model to estimate economic and demographic effects that policy initiatives or external events may cause on a regional economy. Data - the last available historical year is 2000 - for each of USF's seven county economic development region, Hernando, Hillsborough, Manatee, Pasco, Pinellas, Polk and Sarasota; as well as the counties of Brevard, Lake, Orange, Osceola, Seminole and Volusia; and a consolidation of the remaining 54 Florida counties are available. The REMI software is managed by CEDR and available to the USF community for research and teaching purposes. The following article briefly explains the policy insight model.*

Founded in 1980, Regional Economic Models, Inc. (REMI) constructs models that reveal the economic and demographic effects that policy initiatives or external events may cause on a local economy. REMI™ Policy Insight model users include national, regional, state, and city governments, as well as universities, nonprofit organizations, public utilities and private consulting firms. REMI™ users in Florida include the State of Florida (Legislature, Governor's Office, Agency for Workforce Innovation), Tampa Bay Regional Planning Council, the University of South Florida, Florida State University, City of Jacksonville, Florida's Space Coast Economic Development Commission, and the Northeast Florida Regional Planning Council.

REMI™ is a dynamic model that predicts how changes in an economy will occur on a year-by-year basis. The model is sensitive to a wide range of policy and project alternatives as well as interactions between regional economies and the national economy. The model uses data from the Bureau of Economic Analysis, the Bureau of Labor Statistics, the Department of Energy, the Census Bureau and other public sources.

The model's dynamic property means that it forecasts not only what will happen but also when it will happen. This results in long-term predictions that have general equilibrium properties. This means that the long-term properties of general equilibrium models are preserved without sacrificing the accuracy of event timing predictions and without simply taking elasticity estimates from secondary sources.

REMI™ is a structural model, meaning that it clearly includes cause and effect relationships. The model shares two key underlying assumptions with mainstream economic theory: households maximize utility and producers maximize profits. Because these assumptions make sense to most people, the model can be understood by intelligent lay people as well as trained economists.

In the model, businesses produce goods to sell to other firms, consumers, investors, governments and purchasers outside of the region. The output is produced using labor, capital, fuel and intermediate inputs. The demand for labor, capital and fuel

per unit of output depends on their relative costs, because an increase in the price of any one of these inputs leads to substitution away from that input to other inputs. The supply of labor in the model depends on the number of people in the population and the proportion of those people who participate in the labor force. Economic migration affects the population size. People will move into an area if the real after-tax wage rates or the likelihood of being employed increases in a region.

Supply and demand for labor in the model determines the wage rates. These wage rates, along with other prices and productivity, determine the cost of doing business for every industry in the model. An increase in the cost of doing business causes either an increase in price or a cut in profits depending on the market for the product. In either case, an increase in cost would decrease the share of the local and US market supplied by local firms. This market share combined with the demand described above determines the amount of local output. There are also many other feedback loops in the model such as the feedback from changes in wages and employment to income and consumption, the feedback of economic expansion to investment, and the feedback of population to government spending.

The model brings together the fundamental economic elements mentioned in the previous two paragraphs to determine a baseline forecast for each year. The model includes all the inter-industry relationships that are in an input-output model, like IMPLAN Professional<sup>TM</sup>, and goes beyond the input-output model by including added relationships with population, labor supply, wages, prices, profits, and market shares.

A feature, which distinguishes the REMI<sup>TM</sup> model from other economic simulation models, is the way REMI<sup>TM</sup> handles the labor market. In the basic REMI<sup>TM</sup> model, the general equilibrium demand for labor slopes downward and the general equilibrium supply of labor slopes upward. The wage responds to derived labor demand and there is an inverse relationship between the wage and market share. Thus, as the demand for labor rises, the wage rises and market share falls. Also, migration responds directly (positively) to a change in the wage, thereby increasing the labor supply.

In contrast with REMI<sup>TM</sup>, a basic input-output model suppresses the labor intensity response to wage rates, market shares responses to regional competitiveness, and migration response to real after-tax wage rates and relative employment rates. The result is a horizontal labor supply curve and a vertical labor demand curve. Employment is a fixed proportion of output. Thus, a basic input-output model is linear with respect to a change in output or employment. Labor is immobile, i.e. migration is not an alternative to unemployment. An implied assumption of labor immobility is that there are unemployed workers in the region if the number of jobs is to increase. Labor immobility is the assumption used in Type I (without household sector) and Type II (with household sector) input-output models.